# APPENDIX A WATERSHED MONITORING DATA

# RAINFALL GAUGE DATA

# RAINFALL GAUGE DATA – LAKE ELSINORE (STATION 067)

Riverside County Flood Control

Year 2018/19 Table Type Rain

Site	067	7		Elsir	nore	NWS	Automa	tic
Variable	e 11.	.10		Rainf	fall	in	Inches,	Auto
Figures	are	for	period	ending	08:0	00		

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Day
1						0.01	0.03	0.43			0.02		1
2				0.02				0.03	0.27				2
3								0.83	0.11				3
4				0.03				0.06					4
5				0.01				0.39					5
6						0.37	0.45	0.08	0.18				6
7						1.08	0.02	0.01	0.25				7
8			0.02			0.01			0.04				8
9													9
10								0.09					10
11							0.01	0.16					11
12							0.24	0.01	0.41				12
13				0.99			0.06		0.01				13
14				0.28			0.01	1.96					14
15							0.43	1.24					15
16		0.01					0.61	0.09			0.01		16
17							0.13				0.03		17
18						0.01	0.50	0.25			0.04		18
19							0.01	0 01			0.04		19
20					0 01			0.01	0.00		0.24		20
21					0.01			0.14	0.26				21
22					0.02			0.25	0.06		0.04		22
23					0.01				0.01		0.24		23
24		0 0 1				0 00					0.01		24
25		0.04				0.09					0 01		25
26						0 01					0.01		20
27						0.01					0.10		27
28					0.06								20
29					0.06								29
3U 21					0.52								20
31													31
Mean	0.00	0.00	0.00	0.04	0.02	0.05	0.08	0.22	0.05	0.00	0.02	0.00	
Maximum	0.00	0.04	0.02	0.99	0.52	1.08	0.61	1.96	0.41	0.00	0.24	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.05	0.02	1.33	0.62	1.57	2.50	6.02	1.59	0.00	0.68	0.00	
	Summaries				No	tes							

All recorded data is continuous and reliable

Annual	Mean	0.04
Annual	Total	14.3

Maximum Minimum 1.96 0.00

\_\_\_\_\_

Daily

# RAINFALL GAUGE DATA-PERRIS CDF (STATION 152)

Year 2018/19 Table Type Rain

Site	152	2		Perri	Perris CDF						
Variable	11.	10		Rainf	fall	in	Inches,	Auto			
Figures	are	for	period	ending	08:0	00					

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Day
1						0.01		0.50					1
2								0.06	0.29				2
3								0.82	0.10				3
4				0.02				0.02					4
5				0.01				0.69					5
6						0.35	0.49	0.06	0.17				6
7						0.89	0.02	0.01	0.23		0.45		7
8						0.01			0.02		0.01		8
9									0.01				9
10								0.05			0.07		10
11								0.04			0.01		11
12							0.19		0.28				12
13				0.76			0.08		0.01				13
14							0.01	1.82					14
15				0.01			0.40	0.80					15
16							0.89	0.02					16
17							0.12	0.01			0.02		17
18							0.26	0.09					18
19											0.07		19
20											0.02		20
21								0.18	0.26				21
22					0.06			0.01	0.06				22
23					0.01				0.01		0.24		23
24											0.02		24
25					0.01	0.04							25
26						0.06							26
27											0.14		27
28											0.01		28
29					0.08								29
30					1.00								30
31													31
Mean	0.00	0.00	0.00	0.03	0.04	0.04	0.08	0.18	0.05	0.00	0.03	0.00	
Maximum	0.00	0.00	0.00	0.76	1.00	0.89	0.89	1.82	0.29	0.00	0.45	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.00	0.00	0.00	0.79	1.16	1.35	2.45	5.16	1.42	0.00	1.05	0.00	

Summaries	Notes								
	All recorded data is continuous and reliable								

Annual Mean 0.04 Annual Total 13.3 Minimum 0.00 Maximum 1.82

Daily

# RAINFALL GAUGE DATA – PIGEON PASS (STATION 155)

Riverside County Flood Control

Year 2018/19 Table Type Rain

Site	155	5		Pigeo	on Pa	ass			
Variable	11.	10		Rainf	all	in	Inches,	Auto	
Figures	are	for	period	ending	08:0	00			

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Day
1 2 3 4				0.12		0.01		0.51 0.18 0.82 0.47	0.43 0.98	0.03	0.01		1 2 3 4
5								0.68		0.01			5
6						0.31	0.35	0.08	0.12		0 01		6
/	0 0 2					0.90	0 01	0.01	0.41		0.01		/
0 9	0.02						0.01		0.15				o Q
10		0.06						0.17			0.05		10
11								0.10			0.12		11
12							0.18		0.10		0.01		12
13				0.71			0.03		0.02				13
14				0.10				2.03					14
15							0.25	1.46					15
16							0.82	0.20			0.06	0 01	16
1 / 1 0	0 05						0.57	0 1 2			0.09	0.01	1 / 1 0
19	0.05						0.90	0.13			0 37		19
20								0.01			0.13		20
21								0.30	0.51		0.01	0.01	21
22					0.11			0.02	0.03				22
23					0.01			0.01	0.01		0.43		23
24											0.02		24
25						0.05					0.01		25
26						0.05					10.0		26
27											0.39		28
29					0.13						0.01		29
30					1.02					0.02			30
31													31
Mean	0.00	0.00	0.00	0.03	0.04	0.04	0.10	0.26	0.09	0.00	0.06	0.00	
Maximum	0.05	0.06	0.00	0.71	1.02	0.90	0.98	2.03	0.98	0.03	0.43	0.01	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.07	0.06	0.00	0.93	1.26	1.27	3.20	7.19	2.74	0.06	1.72	0.02	

Summaries	Notes
	All recorded data is continuous and reliable

Annual Mean 0.05 Annual Total 18.5 Minimum Maximum 2.03 0.00

Daily

# RAINFALL GAUGE DATA – SAN JACINTO (STATION 186)

Riverside County Flood Control

27

0.00

0.01

0.00

0.02

Riverside county Flood Concroi										пш	DAI VI29 0	utput 08	/00/2019
Site Variable Figures	186 e 11.10 are for p	eriod er	San Jacin Rainfall nding 08:0	to NWS Aut in Inches 0	tomatic , Auto						Ye. Tal	ar ble Type	2018/19 Rain
Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Мау	Jun	Day
1							0.26	0.67			0.04		1
2								0.07	0.23			0.01	2
3								0.83	0.12			0.01	3
4				0.01				0.20	0.01				4
5								0.49					5
6						0.29	0.72	0.09	0.17				6
7						0.94		0.01	0.26		0.13		7
8						0.01			0.02				8
9													9
10								0.06			0.09		10
11								0.17					11
12	0.05						0.16	0.01	0.31				12
13				0.29			0.08						13
14				0.17				2.09	0.01				14
15							0.17	1.35					15
16							0.67	0.12					16
17							0.19	0.01			0.01		17
18							0.24	0.09					18
19							0 01	0.01			0.32		19
20							0.01	0 0 0			0.17		20
21					0 0 7			0.30	0.39		0.01		21
22					0.0/			0.20	0.12		0 4 0		22
23									0.01		0.49		23
24						0 00					0.06		24
25						0.09							25
26						0.24							26

30 31					1.14					0.34	
Mean	0.00	0.00	0.00	0.01	0.04	0.05	0.08	0.24	0.05	0.01	0.05
Maximum	0.05	0.00	0.00	0.29	1.14	0.94	0.72	2.09	0.39	0.34	0.49
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.05	0.00	0.00	0.46	1.30	1.57	2.49	6.75	1.64	0.40	1.61
	Summaries		 All	recorded	No <sup>.</sup> data is d	tes continuou:	s and rel:	iable			

Annual Mean 0.04 Annual Total 16.3 Maximum

Daily

ximum Minimum 2.09 0.00

# RAINFALL GAUGE DATA – WINCHESTER (STATION 248)

Riverside County Flood Control

2018/19

Table Type Rain

Year

Site	248	3		Winch	lester					
Variable	11.	10		Rainf	all	in	Inches,	Auto		
Figures	are	for	period	ending	08:0	00				

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Day
1 2 3 4							0.09	0.54 0.06 0.69 0.13	0.35 0.13				1 2 3 4
5				0.01				0.42					5
6						0.29	0.51	0.11	0.11		0.01		6
7						0.85	0.01		0.21		0.18		7
8						0.01			0.01		0.01		8
9									0.01				9
10								0.11					10
11								0.08					11
12							0.18	0.01	0.45				12
13				0.43			0.02	1 00					13
14 15				0.24			0 21	1.90					14
15				0.01			0.21	0.03					16
17							0.01	0.09			0 02		17
18							0.30	0.20			0.02		18
19	0.02						0.00	0.01			0.17		19
20							0.01				0.09		20
21								0.09	0.74				21
22					0.04			0.13	0.19				22
23					0.01			0.01			0.20		23
24											0.02		24
25						0.06							25
26						0.01					0.04		26
27											0.04		27
28					0 0 0						0.01		28
29					0.09								29 30
31					0.91								31
Mean	0.00	0.00	0.00	0.02	0.04	0.04	0.07	0.19	0.07	0.00	0.02	0.00	
Maximum	0.02	0.00	0.00	0.43	0.94	0.85	0.61	1.90	0.74	0.00	0.20	0.00	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.02	0.00	0.00	0.69	1.07	1.22	2.03	5.38	2.20	0.00	0.76	0.00	
	Summaries				No	tes							
			All	recorded	data is	continuou	s and rel	iable					

Annual Mean 0.04 Annual Total 13.3

Maximum Minimum Daily 1.90

0.00

# STREAM GAUGE DATA (Excel Worksheet)

ANALYTICAL MONITORING REPORTS

**STORM 1** 

November 29, 2018 - December 3, 2018



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 5
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Elsinore 7-2018 to 6-2020 Lake Elsinore 7-2018 to 6-2020
Report Date:	20-Dec-2018	Work Order Number:	B8K3472

Received on Ice (Y/N):

Temp: 2 °C

Yes

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be

responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

## **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8K3472-01	S-03-112918	Liquid	11/29/18 13:30	Garth Engelhorn/Aus	11/30/18 08:18	Mallory Graves
B8K3472-02	S-03-112918 DUP	Liquid	11/29/18 13:30	Garth Engelhorn/Aus	11/30/18 08:18	Mallory Graves
B8K3472-03	S-03-112918 FB	Liquid	11/29/18 14:00	Garth Engelhorn/Aus	11/30/18 08:18	Mallory Graves

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



# Client Name: Wood Environment&Infrastructure Solutions, In Analytical Report: Page 2 of 5 Contact: John Rudolph Project Name: Amec Foster Wheeler-Lake Address: 9210 Sky Park Court #200 Project Name: Elsinore 7-2018 to 6-2020 San Diego, CA 92123 Project Number: Lake Elsinore 7-2018 to 6-2020 Report Date: 20-Dec-2018 Work Order Number: B8K3472 Received on Ice (Y/N): Yes Temp: 2 °C

Laboratory Reference Number B8K3472-01									
Sample Description S-03-112918		<u>Matrix</u> Liquid		Sampled Date/Tir 11/29/18 13:30		imeReceived Date/Time011/30/188:18		<u>Time</u> 8	
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Aggregate Organic Compounds		10	10		014 50400	10/01/40 0	4.00 107		
Chemical Oxygen Demand	64	10	7.4	mg/L	SM 5210B	12/01/18 0	1:02 JGZ 8:39 JCW		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	olutions, In Analytic			Analytical Re	port: Page 3 of	ort: Page 3 of 5				
Contact:	John Rudolph				Project Name: Amec Foster Wheeler-I				ke	
Address:	9210 Sky Park Court #20	0				<b>D</b> : (N	Elsinore 7	Elsinore 7-2018 to 6-2020		
	San Diego, CA 92123					Project Num	iber: Lake Elsii	nore 7-2018 to 6	5-2020	
Report Date:	20-Dec-2018				Wor	k Order Num	ber: B8K3472			
					Receive	ed on Ice (Y/N	N): Yes	Temp: 2	°C	
	Laboratory Reference Number									
			B8K	3472-02	2					
Sample Description	n		Matrix		Sar	Sampled Date/Time		Received Date/Time		
S-03-112918 DU	P		Liquid		1	11/29/18 13:30		11/30/18 8:18		
Analyte(s)		Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Aggregate Organic	Compounds									
Biochemical Oxygen	Demand	ND	10	10	mg/L	SM 5210B	12/01/18	01:02 JGZ		

7.4

mg/L SM 5220D

Chemical Oxygen Demand

location 6100 Quail Valley Court Riverside, CA 92507-0704

69

10

P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

12/12/18 18:39 JCW



Client Name: Contact: Address:	structure S	Solutions, In			Analytical Report: Project Name: Project Number:		Page 4 of 5 Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Lake Elsinore 7-2018 to 6-2020			
Report Date:	20-Dec-2018				Wor	k Order Nun	ber: B8K34	72		
					Receiv	ed on Ice (Y/N	N): Yes	Ter	mp: 2	°C
		<u>l</u>	<u>aboratory F</u>	Reference N 3472-03	lumber S					
Sample Description S-03-112918 FB			<u>Matrix</u> Liquid		<u>Sar</u> 1	Sampled Date/Time 11/29/18 14:00		Received Date/Time 11/30/18 8:18		<u>1e</u>
Analyte(s)		Result	RDL	MDL	Units	Method	Analysis Da	ate Analy	st	Flag
Aggregate Organic Biochemical Oxygen	c Compounds Demand	ND	2.5	2.5	mg/L	SM 5210B	12/01/ <sup>,</sup>	18 01:02 J(	ЭΖ	

7.4

mg/L SM 5220D

Chemical Oxygen Demand

location 6100 Quail Valley Court Riverside, CA 92507-0704

ND

10

P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

12/12/18 18:39

JCW



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report:Page 5 of 5Project Name:Amec Foster Wheeler-Lake<br/>Elsinore 7-2018 to 6-2020Project Number:Lake Elsinore 7-2018 to 6-2020

#### Work Order Number: B8K3472

Received on Ice (Y/N): Yes Temp: 2 °C

#### Notes and Definitions

ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)

- NR: Not Reported
- RDL: Reportable Detection Limit

Report Date: 20-Dec-2018

- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In

Analytical Report: Page 1 of 1

Contact: John Rudolph Address: 9210 Sky Park Cour San Diego, CA 9212	: #200 3		Project I Project Nu	Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Imber: Lake Elsinore 7-2018 to 6-2020
Report Date: 20-Dec-2018			Work Order Nu	mber: B8K3472
			Received on Ice (Y	/N): Yes Temp: 2 °C
Destination Lab: Babcock Laboratories 6100 Quail Valley Court Riverside, CA 92507 (051452 3251	Cha	in of Custody		Page of
(951)055-5551	ure Contact: Garth	Engelhorn	Fax: No.	Additional Reporting Requests
Phone No. 760-644-0167	email: garth.en	gelhorn@altaenviron.com		
Project Name: Lake Elsinore Project	Turn Around Ti	me: Routine		
Project Location: Salt Creek/San Jacinto/Canyon Lake	*Lab TAT Appr	oval By:		
Sampler Information	# of Containers &	Sample Type	Analysis Requested Matrix	Notes
Name: Gayth F. /Austin K.				
Employer: <u>AITA</u> Signature:	p	of Containers le 15220D		
Samala ID Data Time	Inprese 12S04 1NO3	otal # c coutine cesamp cod SN SOD SN		
S-03-1/2918 41/29/18 13:2			Stormwa	iter
5-03-112918-DUP 11/24/18 13:3		2 $X$ $X$ $X$	Stormul	ter
5-03-112918-FB 1/29/18/14:0		2 0 10 10	Sto/mwa	te/
	+ $+$ $+$ $+$ $+$ $+$ $+$			
	┥┥┥┥			
	+ $+$ $+$ $+$ $+$ $+$ $+$			
	+ $+$ $+$ $+$ $+$ $+$ $+$			
Polinguished By (sign) Print	Name (Company	Date/Time R4	Preieved By (sign)	rint Name /Company
Reinfuensneu by (sign) Print	allen latte III	3d/8 DF20 MANN	mana Mallora Gra	Ves / Alta Environmental
17 CONTAR	Sel. arriver 11/1	Male		11

Sample meets laboratory acceptance criteria? Yes No

18

681

Permission to continue? Yes No

301

Deviation/Notes: Signature/Date:

120

Marst

Kmarshal

Logged in By/Date:

NOV 3 0 2018

of

Lab No. 38813472

Page

mailing P.O Box 432 Riverside, CA 92502-0432

Mallne

Samples submitted on ice Yes No

N/A

Custody Seals intact? Yes No

Samples intact (Yes) No.

Temperature:

Mallory Graves

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 5		
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-l	_ake
Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Elsinore 7-201 Salt Creek/Sar Lake	8 to 6-20 n Jacinto	20 /Canyon
Report Date:	20-Dec-2018	Work Order Number:	B8K3432		
		Received on Ice (Y/N):	Yes	Temp:	8 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample	dentifi	cation
--------	---------	--------

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8K3432-01	S-03-113018ROUTINE	Liquid	11/30/18 10:54	Garth E./Austin K.	11/30/18 13:35	Mallory Graves
B8K3432-02	S-03-113018-DUPROUTINE -	Liquid	11/30/18 10:54	Garth E./Austin K.	11/30/18 13:35	Mallory Graves
B8K3432-03	S-03-113018-FBROUTINE	Liquid	11/30/18 12:15	Garth E./Austin K.	11/30/18 13:35	Mallory Graves

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 20-Dec-2018

Analytical Report:	Page 2 of 5					
Project Name:	Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020					
Project Number:	r: Salt Creek/San Jacinto/Canyo Lake					
Work Order Number:	B8K3432					
Received on Ice (Y/N):	Yes	Temp:	8 °C			

## Laboratory Reference Number

## B8K3432-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
S-03-113018	Liquid	11/30/18 10:54	11/30/18 13:35

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	37	3.0	0.35	mg/L	SM 2340B/EP 200.7	A 12/11/18 12:1	6 KCS	
Calcium	11	1.0	0.31	mg/L	EPA 200.7	12/11/18 12:1	6 KCS	
Magnesium	2.2	1.0	0.35	mg/L	EPA 200.7	12/11/18 12:1	6 KCS	
Anions								
Nitrate as N	0.99	0.20	0.055	mg/L	EPA 300.0	12/01/18 01:5	50 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	12/01/18 01:5	50 KBS	
Solids								
Total Dissolved Solids	92	10	10	mg/L	SM 2540C	12/05/18 23:2	20 CMR	
Total Suspended Solids	28	2	2	mg/L	SM 2540D	12/06/18 12:0	3 ATR	
Nutrients								
Ammonia-Nitrogen	0.32	0.10	0.048	mg/L	SM4500NH3F G	l 12/04/18 12:1	7 SLL	
Kjeldahl Nitrogen	1.5	0.20	0.13	mg/L	EPA 351.2	12/10/18 15:0	)4 SLL	
Organic Nitrogen	1.2	0.2		mg/L	Calculation			
Total Nitrogen	2.5	0.2	0.13	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.38	0.050	0.016	mg/L	SM 4500P E	12/01/18 12:0	)0 JB	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



In Analytical Report: Project Name:	Page 3 of 5 Amec Foster Wheeler-Lake					
Project Number:	Elsinore 7-2018 to 6-2020 Salt Creek/San Jacinto/Canyon Lake					
Work Order Number:	B8K3432					
Received on Ice (Y/N):	Yes Temp: 8 °C					
y Reference Number						
3K3432-02						
	In Analytical Report: Project Name: Project Number: Work Order Number: Received on Ice (Y/N): Y Reference Number BK3432-02					

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
S-03-113018-DUP	Liquid	11/30/18 10:54	11/30/18 13:35

Analyte(s)	Result	RDL	MDL	Units	Method /	Analysis Date	Analyst	Flag
Cations								
Total Hardness	38	3.0	0.35	mg/L	SM 2340B/EP 200.7	A 12/11/18 12:2	21 KCS	
Calcium	12	1.0	0.31	mg/L	EPA 200.7	12/11/18 12:2	1 KCS	
Magnesium	2.2	1.0	0.35	mg/L	EPA 200.7	12/11/18 12:2	21 KCS	
Anions								
Nitrate as N	0.92	0.20	0.055	mg/L	EPA 300.0	12/01/18 02:0	)2 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	12/01/18 02:0	2 KBS	
Solids								
Total Dissolved Solids	87	10	10	mg/L	SM 2540C	12/05/18 23:2	20 CMR	
Total Suspended Solids	30	2	2	mg/L	SM 2540D	12/05/18 20:0	)5 KL	
Nutrients								
Ammonia-Nitrogen	0.32	0.10	0.048	mg/L	SM4500NH3H G	I 12/04/18 12:1	9 SLL	
Kjeldahl Nitrogen	1.2	0.10	0.063	mg/L	EPA 351.2	12/06/18 15:3	30 SLL	
Organic Nitrogen	0.9	0.1		mg/L	Calculation			
Total Nitrogen	2.1	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.26	0.050	0.016	mg/L	SM 4500P E	12/01/18 12:0	)0 JB	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 4 of 5						
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake						
Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Salt Creek/San Jacinto/Canyon						
Report Date:	20-Dec-2018	Work Order Number:	Lake B8K3432						
roport Dato.		Received on Ice (Y/N):	Yes	Temp:	8 °C				
	Laboratory F	Reference Number							
	B8K	(3432-03							

Sample Description	<u>Matrix</u>	Sampled Date/Time	Received Date/Time
S-03-113018-FB	Liquid	11/30/18 12:15	11/30/18 13:35

Analyte(s)	Result	RDL	MDL	Units	Method A	Analysis Date	Analyst	Flag
Cations								
Total Hardness	48	3.0	0.35	mg/L	SM 2340B/EP/ 200.7	A 12/11/18 12:5	8 KCS	
Calcium	16	1.0	0.31	mg/L	EPA 200.7	12/11/18 12:5	8 KCS	
Magnesium	1.7	1.0	0.35	mg/L	EPA 200.7	12/11/18 12:5	8 KCS	
Anions								
Nitrate as N	0.52	0.20	0.055	mg/L	EPA 300.0	12/01/18 02:3	9 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	12/01/18 02:3	9 KBS	
Solids								
Total Dissolved Solids	140	10	10	mg/L	SM 2540C	12/05/18 23:2	0 CMR	
Total Suspended Solids	ND	2	2	mg/L	SM 2540D	12/05/18 20:0	5 KL	
Nutrients								
Ammonia-Nitrogen	ND	0.10	0.048	mg/L	SM4500NH3H G	12/04/18 12:2	0 SLL	
Kjeldahl Nitrogen	0.50	0.10	0.063	mg/L	EPA 351.2	12/06/18 14:2	5 SLL	
Organic Nitrogen	0.5	0.1		mg/L	Calculation			
Total Nitrogen	1.0	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	12/01/18 12:0	0 JB	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 5 of 5						
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake						
Address:	9210 Sky Park Court #200	Project Number:	Elsinore 7-2018 to 6-2020 Salt Creek/San Jacinto/Canyon						
	San Diego, CA 92123	r toject Number.	Lake	odenito	Carryon				
Report Date:	20-Dec-2018	Work Order Number:	B8K3432						
		Received on Ice (Y/N):	Yes	Temp:	8 °C				

#### Notes and Definitions

- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 1					
Contact:	John Rudolph	Project Name:	Amec Foste	er Wheeler-Lake				
Address:	9210 Sky Park Court #200	Project Number:	Elsinore 7-2018 to 6-2020					
	San Diego, CA 92123	Project Number.	Lake	San Jacinto/Canyon				
Report Date:	20-Dec-2018	Work Order Number:	B8K3432					
		Received on Ice (Y/N):	Yes	Temp: 8 °C				
		1	Page	sf [				
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(951)653-3351		re Contact: Garth Engelhorn Fax: No.							Add	litional	Reporting	g Requests													
Client: Amec Foster Wheeler Environment and Int	rastructur	e	email: garth.engelhorn@altaenviron.com							$\square$	nclude	QC Data A	Package												
Project Name: Lake Elsinore Project			Turn Around Time: Routine			ne	>									al A									
Project Location: Salt Creek/San Jacinto/Canyon L	.ake		Haf	*	Lab TAT	Appro	val			1	By:									T			6		
Sampler Information			Pr	eserva	atives		S	ampl	e Typ	-	-		Ana	lysis	Requ	leste	d		T	_	Matrix			Notes	
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Sample ID Date	e Time	'n	H25	NH			To	Ro	Re	ž	ž	An	Ě	10	ö	TIS	P	10	P I	P L					
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Custody Seals Intactives No N/A						Dovis	ation	/Not		0	/							Page of							
Samples intact? Yes No						Classe		/Date																	
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Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Elsinore 7-2018 to 6-2020 1515101305 FY 2018-2019
Report Date:	02-Jan-2019	Work Order Number:	B8L0200

Received on Ice (Y/N): Yes Temp: 3 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

## **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8L0200-01	S-04-120218	Liquid	12/02/18 11:30	Garth	12/03/18 12:33	Austin Kay
				Engelhorn/Aus		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



## Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 02-Jan-2019

Chemical Oxygen Demand

Analytical Report: Page 2 of 3 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

#### Work Order Number: B8L0200

mg/L SM 5220D

Received on Ice (Y/N): Yes Temp: 3 °C

N-BOD2

12/12/18 19:56 JCW

	La	boratory R B8L	teference N 0200-01	<u>lumber</u>				
S-04-120218		<u>Ma</u> Liq	<u>trix</u> uid	<u>Sar</u> 1	npled Date/ 2/02/18 11::	<u>Time Re</u> 30	eceived Date 12/03/18 12	<u>ə/Time</u> :33
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Compounds Biochemical Oxygen Demand	<60.45	10	10	mg/L	SM 5210B	12/03/18 1	9:28 JCW	N-BOD, N-BOD1.

7.4

44

10

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 3 of 3 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

#### Work Order Number: B8L0200

Received on Ice (Y/N): Yes Temp: 3 °C

#### Notes and Definitions

Report Date: 02-Jan-2019

N-BOD The reported result is an estimated value because the result did not meet method calculation criteria.

- N-BOD1 Dilution water blank exceeds 0.20 mg/L. As per method, data is reportable as qualified.
- N-BOD2 The LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

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Client Name: Wood Environment&Infrastructure Solutions, In

Analytical Report: Page 1 of 1

ontact: Jonn Rudolph ddress: 9210 Sky Park San Diego, CA	Cour 9212	t #2 23	00															Ρ	roje	ect Nun	ame: nber:	Ame Elsi 151	nore 5101	7-20 <sup>-</sup> 305 F	77 2018 TY 2018	
rt Date: 02-Jan-2019																١	Wo	rk (	Orde	er Num	ber:	B8L	.0200	)		
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6100 Quail Valley Court Riverside, CA 925	07					(	Cha	in d	of C	us	toc	y														
(951)653-3351	t and Infra	structu	re	-	Co	ntact: G	iarth I	Ingel	horn							Fax:	: No.					Addition	al Report	ing Requ	ests	
Phone No. 760-644-0167	t unu miro	ioti dota			em	ail: gar	th.en	gelho	rn@a	altae	nviro	on.co	m													
Project Name: Lake Elsinore Project		i			Tui	n Arou	nd Ti	me:∮ wal	louti	18	2	B	v:			ä				а 						
Project Location: Salt Creek/San Jacinto/	Canyon La	ke		# of (	Contain	ers &	Appro	S	ampl	е Тур	be		<u>.</u>		Analys	is Rec	nueste	he		Matrix			Notes	5		
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Temperature:°c				- 20-			Sign	ature	/Dat	e:	_		-					-					č.			

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

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Report Date:	02-Jan-2019	Work Order Number:	B8L0201
Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	1515101305 FY 2018-2019
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 3

Received on Ice (Y/N): Yes Temp: 3 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

## **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8L0201-01	S-04-120218ROUTINE	Liquid	12/02/18 11:30	Garth	12/03/18 12:33	Mallory
				E./Austin K.		Graves

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



## Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Analytical Report: Page 2 of 3 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

Report Date: 02-Jan-2019

#### Work Order Number: B8L0201

Received on Ice (Y/N): Yes Temp: 3 °C

# Laboratory Reference Number

## B8L0201-01

Sample Description	<u>Matrix</u>	Sampled Date/Time	Received Date/Time
S-04-120218	Liquid	12/02/18 11:30	12/03/18 12:33

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	72	15	1.8	mg/L	SM 2340B/EP 200.7	A 12/12/18 13:4	47 KCS	
Calcium	20	5.0	1.6	mg/L	EPA 200.7	12/12/18 13:4	47 KCS	
Magnesium	5.2	5.0	1.8	mg/L	EPA 200.7	12/12/18 13:4	47 KCS	
Anions								
Nitrate as N	0.73	0.20	0.055	mg/L	EPA 300.0	12/04/18 00:3	33 RER	
Nitrite as N	0.099	0.10	0.059	mg/L	EPA 300.0	12/04/18 00:3	33 RER	J
Solids								
Total Dissolved Solids	150	10	10	mg/L	SM 2540C	12/05/18 23:2	20 CMR	
Total Suspended Solids	32	10	10	mg/L	SM 2540D	12/06/18 14:0	01 ATR	
Nutrients								
Ammonia-Nitrogen	0.11	0.10	0.048	mg/L	SM4500NH3H G	I 12/04/18 13:0	00 SLL	
Kjeldahl Nitrogen	1.0	0.10	0.063	mg/L	EPA 351.2	12/06/18 14:	53 SLL	
Organic Nitrogen	0.9	0.1		mg/L	Calculation			
Total Nitrogen	1.8	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.28	0.050	0.016	mg/L	SM 4500P E	12/04/18 08:2	23 ATR	
Total Phosphorus	0.45	0.05	0.02	mg/L	SM 4500P B E	E 12/10/18 17:4	45 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 3 of 3 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

#### Work Order Number: B8L0201

Received on Ice (Y/N): Yes Temp: 3 °C

#### Notes and Definitions

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- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit

Report Date: 02-Jan-2019

- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&Infrastructure Solutions, In
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Analytical Report:	Page 1 of 1
Project Name:	Amec Foster Wheeler-Lake
	Elsinore 7-2018 to 6-2020
Project Number:	1515101305 FY 2018-2019

Yes

Report Date: 02-Jan-2019

#### Work Order Number: B8L0201

Received on Ice (Y/N):

Temp: 3 °C

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Destination Lab: Babcock Laboratories 6100 Quail Valley Court Riverside, CA 92507		С	hain	of C	usto	ody														
(951)653-3351	- <b>b</b>	Contact	Garth F	ngelhor	'n						Fax: I	No.			<del>.</del>	5	Additio	nal Reporti	ng Requests	]
Client: Amec Foster Wheeler Environment and Infra Phone No. 760-644-0167	structure	email: ga	rth.eng	elhorn(	altae	nviro	n.com	n				Ъ.						ide QC Data	Package	
Project Name: Lake Elsinore Project		Turn Aro	und Tim	e: Rou	tine	>														
Project Location: Salt Creek/San Jacinto/Canyon Lal	(e #of C	*Lab TAT	Approv	al		T	By:	:		•										-
Sampler Information	Pres	ervatives		Sam	ole Typ	e			An	alysis	Requ	Jester	d		-	Matrix		Notes		-
Name: <u>GAAA E. Mushink</u> Employer: <u>AIA</u> Signature: <u>MA</u> Sample ID Date S-04-1202.18 (212/15)		HNO3	r . Tratel # of Containers	Routine	Resample	Special Special	NIGHTER STATEOU.	Ammonia SM4500 - NU25	KN EPA 351.3	Total Phosphorous SM 4500-PE	OrthoPhosphate SM4500-PE	TSS SM2540C	TDS EPA 160.1	C Total Hardness SM2340C	Total Nitrogen (calc)	Stormwater			4	
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AUSA AUSA	N Kery/10/10		12/3	18 1	1.77	-			_×	Æ	)				4	trans.				
Samples submitted on ice: Yes No Custody Seals intact; Yes No (N/A) Samples intact; Yes No 3 Temperature: °C			Samp Permi Devia Signal	e meet ssion to tion/No cure/Da	s labo o conti otes: ite:	ratory nue?	Yes	ptanc No	e crit	eria?	Yeg	No				Logged in E	Lab No	9810 Page	2019 1 <sub>of</sub> 1	- - -
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#### *mailing* P.O Box 432 Riverside, CA 92502-0432

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 1
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore 7-2018 to 6-2
	San Diego, CA, 92123	Work Order Number:	B8K3457
Report Date:	20-Dec-2018	Received on Ice (Y/N	Yes Temp: 8 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

## Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	By
B8K3457-01	S-03-113018	Liquid	11/30/18 10:54	Garth E./Austin K.	11/30/18 13:35	Mallory Graves
B8K3457-02	S-03-113018-DUP	Liquid	11/30/18 10:54	Garth E./Austin K.	11/30/18 13:35	Mallory Graves
B8K3457-03	S-03-113018-FB	Liquid	11/30/18 12:15	Garth E./Austin K	11/30/18 13:35	Mallory Graves

Note: Requested Low Level Total Phosphorus analysis was subcontracted to Eurofins CalScience.

### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is not is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name: Contact: Address:	Wood Environment&Infrastructure So John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: <b>Work Order Number:</b>	Page 1 of 1 Amec Foste Lake Elsino <b>B8K3457</b>	er Wheeler-Lake re 7-2018 to 6-2
Report Date:	20-Dec-2018	Received on Ice (Y/N	Yes	Temp: 8 °C

Client: Amec Foster Wheeler Environment at	nd Infrastructur	re		c	ontact:	Garth	Enge	elhor	n	nuire	00.00	m			Fa	ix: No	0.	100				Additio	onal Repo	rting Requests
Phone No. 760-644-0167				e Tr	mail: ga	rtn.en	igein	Rout	ine										-					
Project Name: Lake Elsinore Project Project Location: Salt Creek/San Jacinto/Can	yon Lake			*	Lab TAT	Appr	oval				В	y:									X		1	
Samples Information			# of (	Conta	iners &			Samp	le Typ	pe				Anah	ysis R	eque	ested			N	Aatrix		Not	es
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Samples submitted on ice Yes No						Sam	nissi	neets	conti	inue	Yes	Wo	nice c	anen		2					Logged in I	By/Date:		
Custody Seals intact, Yes No N/A						Devi	iation	n/No	tes:	nuc.	ث	/									V.ABIOTRACE.ISSN		Page	of
Temperature:						Sign	ature	e/Dat	te:												-		-	
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# eurofins

## WORK ORDER NUMBER: 18-12-0165

Calscience





AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For Client: Babcock Laboratories, Inc. Client Project Name: B8K3457 Attention: Cindy A. Waddell 6100 Quail Valley Court Riverside, CA 92507-0704

Hoteleen M. Burney FOL

Approved for release on 12/13/2018 by: Carla Hollowell Project Manager

ResultLink >

Email your PM >

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Calscience

### Contents

B8K3457 18-12-0165			
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2	Sample Summary.	4
3	Detections Summary.	5
4	Client Sample Data	6 6
5	Quality Control Sample Data.	7 7
6	Glossary of Terms and Qualifiers	8
7	Chain-of-Custody/Sample Receipt Form.	9

Work Order: 18-12-0165

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#### **Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 12/04/18. They were assigned to Work Order 18-12-0165.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

#### Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

#### **Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

#### Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

#### Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

#### **DoD Projects:**

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



Client:	Babcock Laboratories, Inc.	Work Order:	18-12-0165
	6100 Quail Valley Court	Project Name:	B8K3457
	Riverside, CA 92507-0704	PO Number:	
		Date/Time Received:	12/04/18 12:15
		Number of Containers:	3
Attn:	Cindy A. Waddell		

#### ıy

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
B8K3457-01	18-12-0165-1	11/30/18 10:54	1	Aqueous
B8K3457-02	18-12-0165-2	11/30/18 10:54	1	Aqueous
B8K3457-03	18-12-0165-3	11/30/18 10:54	1	Aqueous



Client: Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704		Work Order:1Project Name:BReceived:1			: 18 ne: B8 12	3-12-0165 3K3457 2/04/18		
Attn:	Cindy A. Waddell						Page 1 of 1	
Client Sa	ampleID							
Analy	<u>/te</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>Units</u>	<u>Method</u>	Extraction	
B8K3457	'-01 (18-12-0165-1)							
Phos	phorus, Total	0.31		0.010	mg/L	EPA 365.1	N/A	
B8K3457	2-02 (18-12-0165-2)							
Phos	phorus, Total	0.32		0.010	mg/L	EPA 365.1	N/A	

Subcontracted analyses, if any, are not included in this summary.

\* MDL is shown



Babcock Laboratories, Inc.			Date Recei	ved:			12/04/18
6100 Quail Valley Court			Work Order	r:			18-12-0165
Riverside, CA 92507-0704			Preparation	n:			N/A
			Method:				EPA 365.1
			Units:				mg/L
Project: B8K3457						Pa	age 1 of 1
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
B8K3457-01	18-12-0165-1-A	11/30/18 10:54	Aqueous	ACA 1	N/A	12/12/18 14:14	181212L01
Parameter		Result	RL		DF	Qua	alifiers
Phosphorus, Total		0.31	0.0	)10	1.00		
B8K3457-02	18-12-0165-2-A	11/30/18 10:54	Aqueous	ACA 1	N/A	12/12/18 14:14	181212L01
Parameter	-	Result	RL	•	DF	Qua	alifiers
Phosphorus, Total		0.32	0.0	010	1.00		
B8K3457-03	18-12-0165-3-A	11/30/18 10:54	Aqueous	ACA 1	N/A	12/12/18 14:14	181212L01
Parameter	·	Result	RL		DF	Qua	alifiers
Phosphorus, Total		ND	0.0	010	1.00		
Method Blank	099-16-889-17	N/A	Aqueous	ACA 1	N/A	12/12/18 14:14	181212L01
Parameter		Result	RL	•	DF	Qua	alifiers
Phosphorus, Total		ND	0.0	)10	1.00		



Babcock Laboratories, Inc.				Date Receiv	ved:					12/04/18
6100 Quail Valley Court				Work Order	:					18-12-0165
Riverside, CA 92507-0704				Preparation	:					N/A
				Method:						EPA 365.1
Project: B8K3457									Page	1 of 1
Quality Control Sample ID	Туре	Matr	ix	Instrument	Date Pre	pared	Date /	Analyzed	LCS/LCSD B	atch Number
Quality Control Sample ID 099-16-889-17	Type LCS	Matr Aqu	ix eous	Instrument	Date Pre N/A	pared	Date / 12/12	Analyzed /18 14:14	LCS/LCSD B 181212L01	atch Number
Quality Control Sample ID 099-16-889-17 099-16-889-17	Type LCS LCSD	Matr Aqu Aqu	ix eous eous	Instrument ACA 1 ACA 1	Date Pre N/A N/A	epared	Date / 12/12 12/12	Analyzed /18 14:14 /18 14:14	LCS/LCSD B 181212L01 181212L01	atch Number
Quality Control Sample ID 099-16-889-17 099-16-889-17 Parameter	Type LCS LCSD Spike Added	Matr Aqu LCS Conc.	rix eous eous <u>LCS</u> <u>%Rec.</u>	Instrument ACA 1 ACA 1 LCSD Conc.	Date Pre N/A N/A LCSD %Rec.	epared	Date / 12/12 12/12 . CL	Analyzed /18 14:14 /18 14:14 <u>RPD</u>	LCS/LCSD B 181212L01 181212L01 <u>RPD CL</u>	atch Number

Phosphorus, Total

RPD: Relative Percent Difference. CL: Control Limits

Page 1 of 1

#### Calscience

#### Work Order: 18-12-0165

Glossary of Terms and Qualifiers

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
В	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
Е	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
Х	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Printed: 11/30/2018 16:44

#### SUBCONTRACT ORDER

**Babcock Laboratories, Inc.** 

#### **B8K3457**

### 18-12-0165

**SENDING LABORATORY:** 

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Waddell Eurofins Calscience, Inc. 7440 Lincoln Way Garden Grove, CA 92841-1427 Phone :(714) 895-5494 Fax: (714) 894-7501

**RECEIVING LABORATORY:** 

System Name: Wood Environmental Sampler: Garth E./Austin K.

Analysis	Ez Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: B8K3457-01 Liquid	0	Sampled: 11/30/18 10:54	S-03-113018		<i>Proj.No.:<u>Lake Elsinore</u> 7-2018 to 6-2020</i>
Subout_02 Containers Supplied: 250 mL Poly - H2SO4 (A)	12/27/18 23:59	12/10/18 10:54	Low Level Total Pho	sphorus	
Sample ID: B8K3457-02 Liquid	È	Sampled: 11/30/18 10:54	S-03-113018-DUP		<i>Proj.No.:<u>Lake Elsinore</u> <u>7-2018 to 6-2020</u></i>
Subout_02 Containers Supplied: 250 mL Poly - H2SO4 (A)	12/27/18 23:59	12/10/18 10:54	Low Level Total Pho	osphorus	
Sample ID: B8K3457-03 Liquid	3	Sampled: 11/30/18 10:54	S-03-113018-FB		<i>Proj.No.:<u>Lake Elsinore</u> <u>7-2018 to 6-2020</u></i>
Subout_02 Containers Supplied: 250 mL Poly - H2SO4 (A)	12/27/18 23:59	12/10/18 10:54	Low Level Total Pho	osphorus	

an an ann an an ann an ann an ann an ann an a	All Containers Intact:	YesNo	Samples Preserved Properly:	YesNo
Samples Received at oC	Sample Labels / COC Agree:	YesNo	Custody Seals Present:	YesNo
Please forward all acknowledgem NO HARDCOPIES PLEASE.	ents of sample receipt, final $\int \frac{2}{2} \frac{2}{3}$	reports and invoices to	data@babcocklabs.com	
Released By (Fedex)	Date 7	Received By	Date <i>E 12/4/18</i> Daté	1215
Released By	Daic	Roberted Dy		Page 1 of 1

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🔆 eurofins			WORK ORDE	R NUMBEI	r: <u>18<sup>agr</sup></u>	2 <sup>1_0</sup> 0	165
	Calscience	SAMPLE RECEIPT	CHECKLIST	c	COLER		F /
CLIENT Baba	ock lab	S: Inc:			F· 12	1041	2018
TEMPERATURE: (Cr Thermometer ID: SC6	iteria: 0.0°C – 6. 6 (CF: 0.0°C); Te de temperature c	0°C, not frozen except sedin mperature (w/o CF): <u>3 - 4</u> criteria (PM/APM contacted b	nent/tissue) <u> <u> </u> </u>	<u>-4</u> °c;	Blank	<b>∠</b> Sa	ample
☐ Sample(s) outsi ☐ Sample(s) received Ambient Temperature	de temperature d d at ambient temp e:	perature; placed on ice for tr	ansport by courier	r sampling	Checke	ed by:	<i>F</i> o
CUSTODY SEAL: Cooler	ent and Intact ent and Intact	<ul> <li>Present but Not Intact</li> <li>Present but Not Intact</li> </ul>	Not Present	□ N/A □ N/A	Checke Checke	ed by: <u>/</u> ed by: _/	pfo ffo
SAMPLE CONDITION Chain-of-Custody (CC COC document(s) rec Sampling date	N: DC) document(s) ceived complete Sampling time	received with samples	containers	onuished time	Yes	No □ □	N/A
Sampler's name indic Sample container lab Sample container(s) i Proper containers for Sufficient volume/mas Samples received wit	ated on COC el(s) consistent v ntact and in good analyses reques ss for analyses re hin holding time	vith COC					
Proper preserved aque Unpreserved aque	I Chlorine Dis hemical(s) noted ous sample(s) re	ses received within To-finited ssolved Sulfide	d Oxygen				
Acid/base preserved Container(s) for certa U Volatile Organic Carbon Dioxide	samples - pH wit in analysis free c s □ Dissolved (SM 4500) □ F	hin acceptable range of headspace Gases (RSK-175)	lved Oxygen (SM 45 lydrogen Sulfide (Ha	00) ach)			□ ,⊄
Tedlar™ bag(s) free o	of condensation	· · · · · · · · · · · · · · · · · · ·	(Trip Blan	 k Lot Numb	🗆		
Aqueous:       □       VOA       □       VO         □       250AGB       □       250CGB         □       1AGB       □       1AGBna2       I         Solid:       □       4ozCGJ       □       8oz         Air:       □       Tedlar™       □       Cani         Container:       A = Amber       □       Amber	DAh □ VOAna₂ □ □ 250CGBs (pH_ □ 1AGBs (pH2) zCGJ □ 16ozCGJ ster □ Sorbent Tu B = Bottle. C = Cle	100PJ □ 100PJna2 □ 125AG     _2) □ 250PB □ 250PBn (pH_     □ 1AGBs (O&G) □ 1PB □ 1PB     □ Sleeve () □ EnCores <sup>®</sup> (     be □ PUF □ Othe     ar, E = Envelope, G = Glass, J	B □ 125AGBh □ 125 _2) □ 500AGB □ 500 Bna (pH12) □ 233 ) □ TerraCores <sup>®</sup> ( ar Matrix ( = Jar, P = Plastic, and	AGBp □ 125 DAGJ □ 500A <u> </u>	PB □ 125 GJs (pH □ □ usealable B	PBznna (µ 2) □ 500 _ □ □ □ ag	)PB
Preservative: b = buffer s = H <sub>2</sub> SO	ed, $\mathbf{f}$ = filtered, $\mathbf{h}$ = 4, $\mathbf{u}$ = ultra-pure, $\mathbf{x}$	HCl, <b>n</b> = HNO <sub>3</sub> , <b>na</b> = NaOH, <b>n</b> = Na <sub>2</sub> SO <sub>3</sub> +NaHSO <sub>4</sub> .H <sub>2</sub> O, <b>znna</b>	<b>a₂</b> = Na₂S₂O₃, <b>p</b> = H₃P = Zn (CH₃CO₂)₂ + Na	O₄, Labelo OH	ed/Checke Reviewe	ed by: <u></u> ed by: _	wie

2017-08-29 Revision

STORM 2 December 5-7, 2018



Client Name: Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 4
Contact: John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address: 9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Elsinore 7-2018 to 6-2020 Lake Elsinore 7-2018 to 6-2020
Report Date: 20-Dec-2018	Work Order Number:	B8L0776

Received on Ice (Y/N):

Temp: 3 °C

Yes

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8L0776-01	S-03-12052018	Liquid	12/05/18 16:50	Austin Kay	12/06/18 12:24	Mallory Graves
B8L0776-02	S-04-12062018	Liquid	12/06/18 09:08	Austin Kay	12/06/18 12:24	Mallory Graves

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



#### Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Analytical Report: Page 2 of 4 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: Lake Elsinore 7-2018 to 6-2020

12/18/18 11:48 JCW

#### Work Order Number: B8L0776

Received on Ice (Y/N): Yes Temp: 3 °C

	La	boratory R B8L	<u>eference 1</u> 0776-01	<u>Number</u>				
Sample Description S-03-12052018		<u>Ma</u> Liq	<u>trix</u> uid	<u>Sar</u> 1	npled Date/ <sup>-</sup> 2/05/18 16:{	<u>Fime Re</u> 50 1	eceived Date 2/06/18 12	<u>ə/Time</u> ::24
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Compounds Biochemical Oxygen Demand	ND	10	10	mg/L	SM 5210B	12/06/18 2	1:05 JGZ	N-BOD1, N-BOD2

7.4

mg/L SM 5220D

55

10

Chemical Oxygen Demand

Report Date: 20-Dec-2018

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Contact: Address:	Wood Environment&Infra John Rudolph 9210 Sky Park Court #20 San Diego, CA 92123	structure S 0	olutions, In			Analytical Re Project Na Project Nun	port: Page 3 of ame: Amec Fos Elsinore 7 nber: Lake Elsir	4 ter Wheeler-L -2018 to 6-20 nore 7-2018 to	ake 20 6-2020
Report Date:	20-Dec-2018				Wor	k Order Num	ber: B8L0776		
					Receive	ed on Ice (Y/N	N): Yes	Temp:	3 °C
		<u>L</u>	aboratory F	Reference N	lumber				
			B8L	0776-02					
Sample Description S-04-12062018	<u>n</u>		<u>Ma</u> Liq	<u>ıtrix</u> uid	<u>Sar</u> 1	npled Date/T 2/06/18 09:0	<u>"ime R</u> 18	<u>eceived Date/</u> 12/06/18 12:2	<u>Time</u> 24
Analyte(s)		Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Biochemical Oxygen	c Compounds Demand	ND	10	10	mg/L	SM 5210B	12/07/18 <sup>-</sup>	11:30 JCW	N-BOD2

7.4

mg/L SM 5220D

Chemical Oxygen Demand

location 6100 Quail Valley Court Riverside, CA 92507-0704

41

10

P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

12/18/18 11:48 JCW



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report:Page 4 of 4Project Name:Amec Foster Wheeler-Lake<br/>Elsinore 7-2018 to 6-2020Project Number:Lake Elsinore 7-2018 to 6-2020

#### Work Order Number: B8L0776

Received on Ice (Y/N): Yes Temp: 3 °C

#### Notes and Definitions

N-BOD1 Dilution water blank exceeds 0.20 mg/L. As per method, data is reportable as qualified.

- N-BOD2 The LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (**if MDL is reported**), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit

Report Date: 20-Dec-2018

- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In

Analytical Report: Page 1 of 1

Contact: Address:	John Rudolph 9210 Sky Park San Diego, CA	Court 9212:	: #20 3	00														Pr	Proj ojec	ect ct Ni	Name umber	: Al El : La	mec Fost Isinore 7- ake Elsin	ter W -2018 iore 7	'heeler- 3 to 6-20 '-2018 t	Lake )20 o 6-202
Report Date:	20-Dec-2018															v	/or	k O	rde	r Nu	ımber	: В	8L0776			
																Rec	eiv	ed o	on Ic	e (Y	7/N):		Yes		Temp:	3 °C
Destination 1 6100 Quail V	Lab: Babcock Laboratories Jalev Court Riverside, CA 9250	07					Cha	ain	of	Cus	tod	ly											Page	of	1	
(951)653-33	51			_								-	-		-	Fax: I	No.	÷				Addi	tional Reporting	Request	s	
Client: Amed	Foster Wheeler Environment	and Infras	structur	е	 1	Contact email: (	t: Garth garth.e	Enge	orn@	n Paltae	nviro	n.com	n'		- <u>-</u>			- 20				, iuu	inement repa	// -		
Project Nam	e: Lake Elsinore Project					Turn Ar	round 1	'ime:	Rout	ine	>														1	
Project Loca	tion: Salt Creek/San Jacinto/C	anyon Lak	e	1	t of Co	*Lab T/	AT App	roval		1.7		By:	:		-						na la comercia de la Comercia de la comercia de la comerci					
	Sampler Information	•			Prese	ervatives		-	Samp	ole Typ	pe	-	-	A	nalysi	s Requ	ested		<u>i</u>	Ma	trix		Notes	v		
Name: Employ Signatu <u>S = 03</u> ,	Austin K. er: Alta ire: Alta ire: Alta sample ID - 12052018 - 12052018	Date 0/5/18	Time 16:50	Unpreserved	H2S04	0		L L Total # of Containers	X X Routine	Resample	Special		SULT SUNS UND							Sto	ormwater Downate					
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Samples su Custody Sea	bmitted on ice2 Yes No als intact? Yes No (N/A)						San Per	nple n missio	neets on to	conti	ratory nue?	y accep Yes N	ptano No	ce crit	etia?	Yes	10		,		Logged in B	y/Date:				
Samples int	tack? Yes No 2	t					Dev	iatior	Not	tes:		-0,-			-		<u></u>						Page			
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*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 1 of 4
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200 San Diego, CA 92123	Project Number:	Elsinore 7-2018 to 6-2020 1515101305 FY 2018-2019
Report Date:	02-Jan-2019	Work Order Number:	B8L1036

Received on Ice (Y/N):

Temp: 1 °C

Yes

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B8L1036-01	S-03-12072018	Liquid	12/07/18 10:43	Garth E./Austin K.	12/07/18 17:50	Garth Engelhorn/Alt a
B8L1036-02	S-04-12072018	Liquid	12/07/18 11:28	Garth E./Austin K.	12/07/18 17:50	Garth Engelhorn/Alt a

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



#### Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 02-Jan-2019

Analytical Report: Page 2 of 4 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

#### Work Order Number: B8L1036

Received on Ice (Y/N): Yes Temp: 1 °C

#### Laboratory Reference Number

#### B8L1036-01

Sample DescriptionMatrixSampled Date/TimeReceived Date/TimeS-03-12072018Liquid12/07/18 10:4312/07/18 17:50

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	240	6.0	0.70	mg/L	SM 2340B/EP 200.7	A 12/18/18 20:3	37 KCS	
Calcium	57	2.0	0.62	mg/L	EPA 200.7	12/18/18 20:3	37 KCS	
Magnesium	22	2.0	0.70	mg/L	EPA 200.7	12/18/18 20:3	37 KCS	
Anions								
Nitrate as N	0.79	0.20	0.055	mg/L	EPA 300.0	12/08/18 10:2	23 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	12/08/18 10:2	23 KBS	
Solids								
Total Dissolved Solids	530	20	20	mg/L	SM 2540C	12/13/18 13:2	25 BBR	
Total Suspended Solids	130	5	5	mg/L	SM 2540D	12/13/18 17:4	45 KL	
Nutrients								
Ammonia-Nitrogen	0.25	0.10	0.048	mg/L	SM4500NH3F G	1 12/11/18 13:4	40 SLL	
Kjeldahl Nitrogen	1.9	0.10	0.063	mg/L	EPA 351.2	12/12/18 14:2	26 SLL	
Organic Nitrogen	1.7	0.1		mg/L	Calculation			
Total Nitrogen	2.7	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.14	0.050	0.016	mg/L	SM 4500P E	12/08/18 11:	15 JB	
Total Phosphorus	0.49	0.05	0.02	mg/L	SM 4500P B E	E 12/17/18 16:2	28 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 3 of 4	
Contact:	John Rudolph	Project Name:	Amec Foster W	/heeler-Lake
Address:	9210 Sky Park Court #200		Elsinore 7-201	8 to 6-2020
	San Diego, CA 92123	Project Number:	1515101305 F	Y 2018-2019
Report Date:	02-Jan-2019	Work Order Number:	B8L1036	
		Received on Ice (Y/N):	Yes	Temp: 1 °C

Laboratory Reference Number

#### B8L1036-02

Sample Description S-04-12072018

Matrix Liquid

Sampled Date/Time Received Date/Time 12/07/18 11:28

12/07/18 17:50

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	99	6.0	0.70	mg/L	SM 2340B/EP 200.7	PA 12/18/18 20:4	42 KCS	
Calcium	22	2.0	0.62	mg/L	EPA 200.7	12/18/18 20:4	12 KCS	
Magnesium	11	2.0	0.70	mg/L	EPA 200.7	12/18/18 20:4	42 KCS	
Anions								
Nitrate as N	0.73	0.20	0.055	mg/L	EPA 300.0	12/08/18 10:3	35 KBS	
Nitrite as N	0.081	0.10	0.059	mg/L	EPA 300.0	12/08/18 10:3	35 KBS	J
Solids								
Total Dissolved Solids	150	10	10	mg/L	SM 2540C	12/13/18 13:2	25 BBR	
Total Suspended Solids	360	10	10	mg/L	SM 2540D	12/13/18 17:4	45 KL	
Nutrients								
Ammonia-Nitrogen	0.11	0.10	0.048	mg/L	SM4500NH3F G	12/11/18 12:1	14 SLL	
Kjeldahl Nitrogen	1.2	0.10	0.063	mg/L	EPA 351.2	12/12/18 14:2	27 SLL	
Organic Nitrogen	1.1	0.1		mg/L	Calculation			
Total Nitrogen	2.0	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.26	0.050	0.016	mg/L	SM 4500P E	12/08/18 11:1	15 JB	
Total Phosphorus	0.80	0.05	0.02	mg/L	SM 4500P B B	E 12/17/18 16:2	28 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, In Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 4 of 4 Project Name: Amec Foster Wheeler-Lake Elsinore 7-2018 to 6-2020 Project Number: 1515101305 FY 2018-2019

#### Work Order Number: B8L1036

Received on Ice (Y/N): Yes Temp: 1 °C

#### Notes and Definitions

J Estimated value

Report Date: 02-Jan-2019

- PblkJ The analyte was detected in the Method Blank at a concentration between the MDL and the MRL.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

#### Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Short\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Contact: John Rudolp	h		Project I	Name: Amec Foster	Wheeler-Lake
Address: 9210 Sky Pa San Diego, 0	rk Court #200 CA 92123		Project Nu	imber: 1515101305	FY 2018-2019
oort Date: 02-Jan-2019			Work Order Nu	mber: B8L1036	
			Received on Ice (Y	/N): Yes	Temp: 1 °C
				2	
Destination Lab: Babcock Laboratories		Chain of Custody		Page of	
6100 Quail Valley Court Riverside, CA 925 (951)653-3351	"WOOD ENVIVO	NYINHAI	Faul No	Additional Departing Doquests	1
Client: Amec Foster Wheeler Environmen Phone No. 760-644-0167	t and Infrastructure Cor em	tact: Garth Engelhorn il: garth.engelhorn@altaenviron.com	Fax: No.	Additional Reporting Requests	
Project Name: Lake Elsinore Project	Tur	n Around Time: Routine		<i>a</i>	
Project Location: Salt Creek/San Jacinto/C	Canyon Lake 4 of Contain	ers & Sample Type Anal	lysis Requested Matrix	Notes	
			щ	4	
Name: Gath C. / Aush	<u> </u>	<b>1</b>	14500-PE 500-PE 10C 10C	5	a) (
Employer: Alta		0 0 00-NH	e SM4		
	pa	A 300 A 300 SM45 SM45 351.3	sphore states dness dness anic N	, 2 	
Signature:	nreserv 04 03	al # of al # of iample scial scial rate Ef rite SN imonia	tal Pho thoPhc S SM25 S EPA tal Org tal Org		
Sample ID	Date Time D H H	3 X X X X X X X X X X X X X X X X X X X	P     D <td>ter</td> <td>-</td>	ter	-
5-04-12072018	12/7/18/11:28 1 1 1	3 X X X X X	XXXX b V & Spann	te	-
					-
Relinquished By (sign)	Print Name /Company	14/1 12/7/19 1245 WWL-	ev (sign) P	K. Marshall	-
- Corta					
Samples submitted on ice? Yes		Sample meets laboratory acceptance criter	ria?Yes No	Lab No.	ă.
Custody Seals intact? Yes No N/A	5	Permission to continue? Yes No Deviation/Notes:	Logged	Page of	-
Temperature:°C		Signature/Date:		A	
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			R8I	1036 學業	훩틪
			12/07/	2018 17:50	
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	ă.				

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

STORM 3 January 16-20, 2019



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 4		
Contact: John Rudolph	Project Name:	AMEC-Lake E	Elsinore	
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsinore	;	
San Diego, CA 92123	Work Order Number:	B9A2149		
Report Date: 31-Jan-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9A2149-01	CLS-011619	Liquid	01/16/19 15:10	Austin Kay	01/17/19 11:50	Austin Kay

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 2 of 4		
Contact:	John Rudolph	Project Name:	AMEC-Lake El	sinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore		
	San Diego, CA 92123	Work Order Number:	B9A2149		
Report Date:	31-Jan-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

	<u>La</u>	boratory R B9A	<u>eference 1</u> 2149-01	<u>lumber</u>						
Sample Description CLS-011619		<u>Ma</u> Liq	i <u>trix</u> uid	<u>Sar</u> 0	npled Date/ <sup>-</sup> 1/16/19 15: <sup>-</sup>	<u>Time Re</u> 10 0	Received Date/Time 01/17/19 11:50			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag		
Aggregate Organic Compounds Biochemical Oxygen Demand	ND	10	10	mg/L	SM 5210B	01/18/19 00	:10 JGZ	N-BOD2		
Chemical Oxygen Demand	35	10	7.4	mg/L	SM 5220D	01/28/19 15	:45 SLL			

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 4	
Contact: John Rudolph	Project Name:	AMEC-Lake Elsinore	
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsinore	
San Diego, CA 92123	Work Order Number:	B9A2149	
Report Date: 31-Jan-2019	Received on Ice (Y/N):	Yes Temp:	1

#### Aggregate Organic Compounds - Batch Quality Control

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag	
Batch 9A17114 - Analyzed as re	eceived											
Blank (9A17114-BLK1)					Prepared	& Analyze	ed: 01/18/1	9				
Biochemical Oxygen Demand	ND	1.0	1.0	mg/L								
LCS (9A17114-BS1)					Prepared	& Analyze	ed: 01/18/1	9				
Biochemical Oxygen Demand	142	1.0	1.0	mg/L	198		71.6	85-115			Q-BOD2	
Duplicate (9A17114-DUP1)		Source:	B9A2052-0	)1	Prepared	& Analyze	ed: 01/18/1	9				
Biochemical Oxygen Demand	ND	5.0	5.0	mg/L		ND				20		
Batch 9A28112 - Acid Digest												
Blank (9A28112-BLK1)					Prepared	& Analyze	ed: 01/28/1	9				
Chemical Oxygen Demand	ND	10	7.4	mg/L								
LCS (9A28112-BS1)					Prepared	& Analyze	ed: 01/28/1	9				
Chemical Oxygen Demand	516	10	7.4	mg/L	500		103	95-105				
Matrix Spike (9A28112-MS1)		Source:	B9A2495-0	)1	Prepared	& Analyze	ed: 01/28/1	9				
Chemical Oxygen Demand	383	13	9.9	mg/L	333	39.2	103	80-120				
Matrix Spike Dup (9A28112-MSD1)		Source:	B9A2495-0	)1	Prepared	& Analyze	ed: 01/28/1	9				
Chemical Oxygen Demand	383	13	9.9	mg/L	333	39.2	103	80-120	0.00	20		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119 °C



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 4 of 4 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore

Work Order Number: B9A2149

Received on Ice (Y/N): Yes Temp: 1 °C

Report Date: 31-Jan-2019

#### **Notes and Definitions**

- N-BOD2 The LCS is outside method acceptance limits. As per method, data is reportable as gualified.
- Q-BOD2 This LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&Infrastructure Solutions, Inc
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Report Date: 31-Jan-2019

Analytical Report:	Page 1 of 1
Project Name:	AMEC-Lake Elsinore
Project Number:	Lake Elsinore

Yes

#### Work Order Number: B9A2149

Received on Ice (Y/N):

Temp: 1 °C

6100 Quail Valley Court Riverside, CA 925	07					Cha	ain	of(	Cu	sto	dy																	
(951)653-3351	11.6				Contact	Garth	Enge	alhorr							Fax	: No.						Add	ditional F	Reportir	ng Requ	ests		
Client: Amec Foster Wheeler Environmen Phone No. 760-644-0167	t and mira:	structure			email: ga	rth.e	ngelh	orn@	alta	enviro	on.co	om																
Project Name: Lake Elsinore Project		t.			Turn Aro	und 1	lime:	Rout	ine	>																		
Project Location: Salt Creek/San Jacinto/C	Canyon Lak	æ			*Lab TAT	Арр	roval				E	By:								-								
			# 0	of Cont	ainers &			Samp	le Ty	pe				Analy	sis Re	ques	ted			м	atrix			Notes				
Name: Austin Kay		_		leser					-													C	Wr	îC	$\checkmark$			
Employer: <u>Alfa</u>		-	ved				Containers	1.			5220D	5210B										v						
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Samples submitted on ice? (Yes No Custody Seals intact? Yes No MA		<u> </u>				San Per	nple r missi	neets on to	labo cont	orator tinue	y aco Yes	cepta No	nce ci	iteria	Wes	No				B	9A	2]	14	9				

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 8	3
Contact: John Rudolph	Project Name:	Amec Foste	er Wheeler-Lake Elsinore
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsino	ore Proj. Salt Creek/SJ/C
San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date: 21-Feb-2019	Received on Ice (Y/N):	No	Temp: 2 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9A2522-01	CLS-012019	Liquid	01/20/19 09:02	Austin Kay	01/21/19 13:42	Austin Kay

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 21-Feb-2019

Analytical Report: Page 2 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore Proj. Salt Creek/SJ/C

#### Work Order Number: B9A2522

Received on Ice (Y/N): No

Temp: 2 °C

#### Laboratory Reference Number B9A2522-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CLS-012019	Liquid	01/20/19 09:02	01/21/19 13:42

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	240	15	1.8	mg/L	SM 2340B/EP 200.7	PA 01/30/19 20:0	2 MEL	
Calcium	64	5.0	1.6	mg/L	EPA 200.7	02/01/19 14:5	0 KCS	
Magnesium	21	5.0	1.8	mg/L	EPA 200.7	01/30/19 20:0	2 MEL	
Anions								
Nitrate as N	0.17	0.20	0.055	mg/L	EPA 300.0	01/21/19 19:2	0 RER	J
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	01/21/19 19:2	0 RER	
Solids								
Total Dissolved Solids	510	20	20	mg/L	SM 2540C	01/24/19 14:4	7 BBR	
Total Suspended Solids	14	2	2	mg/L	SM 2540D	01/24/19 18:5	58 MWM	
Nutrients								
Ammonia-Nitrogen	0.21	0.10	0.048	mg/L	SM4500NH3F G	H 01/22/19 13:3	88 SLL	
Kjeldahl Nitrogen	1.3	0.10	0.063	mg/L	EPA 351.2	01/31/19 10:5	51 SLL	
Organic Nitrogen	1.1	0.1		mg/L	Calculation			
Total Nitrogen	1.5	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	01/22/19 08:1	9 ATR	
Total Phosphorus	0.11	0.05	0.02	mg/L	SM 4500P B B	E 01/22/19 18:1	5 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake	Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt Cre	ek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	No Temp: 2 °C	C

#### **Cations - Batch Quality Control**

Applyto(c)	Popult	וחם		Linite	Spike	Source Result	%REC	%REC	RPD	RPD Limit	Flag	
Analyte(S)	Result	RDL		Units	LCVCI	Result	/iiteo	Linito		Linin	riag	
Batch 9A29150 - EPA 200.2												
Blank (9A29150-BLK1)				I	Prepared	01/29/19	Analyzed	: 01/30/19				
Magnesium	ND	1.0	0.35	mg/L								
LCS (9A29150-BS1)				I	Prepared	01/29/19	Analyzed	01/30/19				
Magnesium	14.9	1.0	0.35	mg/L	17.0		87.5	85-115				
LCS Dup (9A29150-BSD1)				I	Prepared	01/29/19	Analyzed	01/30/19				
Magnesium	15.3	1.0	0.35	mg/L	17.0		90.1	85-115	2.95	20		
Matrix Spike (9A29150-MS1)		Source	: B9A2522-0	1	Prepared	01/29/19	Analyzed	01/30/19				
Magnesium	35.5	5.0	1.8	mg/L	17.0	21.4	83.2	70-130				
Matrix Spike (9A29150-MS2)		Source: B9A2820-06				Prepared: 01/29/19 Analyzed: 01/30/19						
Magnesium	29.5	2.0	0.70	mg/L	17.0	15.5	82.4	70-130				
Batch 9B01059 - EPA 200.2												
Blank (9B01059-BLK1)				I	Prepared	& Analyze	ed: 02/01/1	9				
Calcium	ND	1.0	0.31	mg/L								
LCS (9B01059-BS1)				I	Prepared	& Analyze	ed: 02/01/1	9				
Calcium	17.0	1.0	0.31	mg/L	17.0		99.8	85-115				
LCS Dup (9B01059-BSD1)				I	Prepared	& Analyze	ed: 02/01/1	9				
Calcium	16.9	1.0	0.31	mg/L	17.0		99.5	85-115	0.281	20		
Matrix Spike (9B01059-MS1)		Source	: B9A2522-0	1RE1	Prepared	01/29/19	Analyzed	02/01/19				
Calcium	76.4	5.0	1.6	mg/L	17.0	63.6	75.3	70-130				

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster W	/heeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore F	Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	No	Temp: 2 °C

#### **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9A21137 - Analyzed as Re	eceived IC										
Blank (9A21137-BLK1)				F	repared	& Analyze	d: 01/21/1	9			
Nitrite as N	ND	0.10	0.059	mg/L							
Nitrate as N	ND	0.20	0.055	mg/L							
LCS (9A21137-BS1)		Prepared & Analyzed: 01/21/19									
Nitrite as N	2.39	0.10	0.059	mg/L	2.50		95.8	90-110			
Nitrate as N	5.40	0.20	0.055	mg/L	5.65		95.5	90-110			
Matrix Spike (9A21137-MS1)		Source	: B9A2513-0	<b>1</b> F	Prepared & Analyzed: 01/21/19						
Nitrite as N	2.23	0.10	0.059	mg/L	2.50	ND	89.2	80-120			
Nitrate as N	5.67	0.20	0.055	mg/L	5.65	0.248	95.9	75-131			
Matrix Spike Dup (9A21137-MSD1)		Source	: B9A2513-0	<b>1</b> F	repared	& Analyze	d: 01/21/1	9			
Nitrite as N	2.26	0.10	0.059	mg/L	2.50	ND	90.3	80-120	1.22	20	
Nitrate as N	5.74	0.20	0.055	mg/L	5.65	0.248	97.3	75-131	1.33	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster Wh	neeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Pi	roj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	No	Temp: 2 °C

#### **Solids - Batch Quality Control**

Analyte(s)	Result	RDI		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
	· toout			•						-	- 0
Batch 9A24010 - Analyzed as re	eceived										
Blank (9A24010-BLK1)					Prepared	& Analyze	d: 01/24/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
LCS (9A24010-BS1)					Prepared	& Analyze	d: 01/24/1	9			
Total Dissolved Solids	738	10	10	mg/L	746		98.9	90-110			
Duplicate (9A24010-DUP1)		Source:	B9A2651-0	1	Prepared	& Analyze	d: 01/24/1	9			
Total Dissolved Solids	219	10	10	mg/L		207			5.63	20	
Duplicate (9A24010-DUP2)		Source:	B9A2651-0	2	Prepared	& Analyze	d: 01/24/1	9			
Total Dissolved Solids	208	10	10	mg/L		204			1.94	20	
Batch 9A24045 - Analyzed as re	eceived										
Blank (9A24045-BLK1)					Prepared	& Analyze	d: 01/24/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L							
LCS (9A24045-BS1)					Prepared	& Analyze	d: 01/24/1	9			
Total Suspended Solids	494	50	50	mg/L	500		98.8	90-110			
Duplicate (9A24045-DUP1)		Source:	B9A2468-0	1	Prepared	& Analyze	d: 01/24/1	9			
Total Suspended Solids	127	5	5	mg/L		129			1.56	25	
Duplicate (9A24045-DUP2)		Source:	B9A2471-0	2	Prepared	& Analvze	d: 01/24/1	9			
Total Suspended Solids	7.50	2	2	mg/L		6.00			22.2	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-La	ake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt	Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	No Temp: 2	2 °C

#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9A22081 - Filter if turbid.											
LCS (9A22081-BS1)				F	Prepared	& Analyze	d: 01/22/1	9			
Ortho Phosphate Phosphorus	0.513	0.42	0.016	mg/L	0.500		103	90-110			
Matrix Spike (9A22081-MS1)		Source	: B9A2522-0	) <b>1</b> F	Prepared	& Analyze	d: 01/22/1	9			
Ortho Phosphate Phosphorus	0.483	0.42	0.016	mg/L	0.500	ND	96.6	80-120			
Matrix Spike Dup (9A22081-MSD1)		Source	: B9A2522-0	) <b>1</b> F	Prepared	& Analyze	d: 01/22/1	9			
Ortho Phosphate Phosphorus	0.486	0.42	0.016	mg/L	0.500	ND	97.1	80-120	0.565	20	
Batch 9A22106 - Acid Digest											
LCS (9A22106-BS1)				F	Prepared	& Analyze	d: 01/22/1	9			
Total Phosphorus	0.539	0.05	0.02	mg/L	0.500		108	85-115			
Matrix Spike (9A22106-MS1)		Source	: B9A2536-0	) <b>1</b> F	Prepared	& Analyze	d: 01/22/1	9			
Total Phosphorus	0.711	0.05	0.02	mg/L	0.500	0.175	107	80-120			
Matrix Spike Dup (9A22106-MSD1)		Source	: B9A2536-0	) <b>1</b> F	Prepared	& Analyze	d: 01/22/1	9			
Total Phosphorus	0.708	0.05	0.02	mg/L	0.500	0.175	107	80-120	0.404	20	
Batch 9A22112 - Analyzed as rec	eived										
Blank (9A22112-BLK1)				F	Prepared	& Analyze	d: 01/22/1	9			
Ammonia-Nitrogen	ND	0.10	0.048	mg/L							
LCS (9A22112-BS1)				F	Prepared	& Analyze	d: 01/22/1	9			
Ammonia-Nitrogen	0.790	0.10	0.048	mg/L	0.780	-	101	90-110			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 7 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster W	/heeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore F	Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9A2522	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	No	Temp: 2 °C

#### **Nutrients - Batch Quality Control**

	Desult	וסס		Linita	Spike	Source		%REC	חחם	RPD Limit	Flog
Analyte(s)	Result	RDL		Units	Level	Result	%REC	LIIIIIIS	RFD	LIIIIIL	Flag
Batch 9A22112 - Analyzed as red	eived										
Matrix Spike (9A22112-MS1)		Source	: B9A2344-02	2	Prepared	& Analyze	d: 01/22/1	9			
Ammonia-Nitrogen	0.801	0.10	0.048	mg/L	0.780	0.0834	92.0	80-120			
Matrix Spike Dup (9A22112-MSD1)		Source	: B9A2344-02	2	Prepared	& Analyze	d: 01/22/1	9			
Ammonia-Nitrogen	0.779	0.10	0.048	mg/L	0.780	0.0834	89.2	80-120	2.80	20	
Batch 9A30137 - Acid Digest											
Blank (9A30137-BLK1)					Prepared:	01/30/19	Analyzed	: 01/31/19			
Kjeldahl Nitrogen	ND	0.10	0.063	mg/L							
LCS (9A30137-BS1)					Prepared:	01/30/19	Analyzed	: 01/31/19			
Kjeldahl Nitrogen	1.07	0.10	0.063	mg/L	1.00		107	80-120			
Matrix Spike (9A30137-MS1)		Source	: B9A2736-0 <sup>-</sup>	1	Prepared:	01/30/19	Analyzed	: 01/31/19			
Kjeldahl Nitrogen	128	8.0	5.0	mg/L	80.0	57.4	88.5	42-154			
Matrix Spike (9A30137-MS2)		Source	: B9A2761-0 <sup>,</sup>	1	Prepared:	01/30/19	Analyzed	: 01/31/19			
Kjeldahl Nitrogen	0.781	0.10	0.063	mg/L	1.00	ND	78.1	42-154			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com


Analytical Report: Page 8 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore Proj. Salt Creek/SJ/C

#### Work Order Number: B9A2522

Received on Ice (Y/N): No

Temp: 2 °C

# Notes and Definitions

Report Date: 21-Feb-2019

J	Estimated value
ND:	Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit

\* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

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Client Name:	Wood Environment&Infrastructure Solutions, Inc
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Report Date: 21-Feb-2019

Analytical Report:	Page 1 of 1
Project Name:	Amec Foster Wheeler-Lake Elsinore
Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C

No

#### Work Order Number: B9A2522

Received on Ice (Y/N):

Temp: 2 °C

Destination Lab: Babcock Laboratories 6100 Quail Valley Court Riverside, CA 9250	7					C	hair	1 0	f Cı	isto	yk													Page <u> </u> c	of		
(951)653-3351 Client: Amag Factor Wheeler Environment	and Infras	tructur	P		Co	ntact: (	Garth	Enge	lhorr	1					I	ax: I	Vo.						Additio	nal Reporting Requ	ests		
Phone No. 760-644-0167	and minus	liuctur	<u> </u>		en	nail: ga	rth.en	gelh	orn@	altaen	viron.	com												de QC Data Packag			
Project Name: Lake Elsinore Project					Tu	rn Arou	und Ti	me:	Routi	ne																	
Project Location: Salt Creek/San Jacinto/Ca	anyon Lake	e I		# of C	*L ontair	ab TAT	Appr	oval			-	By:			1						-						
Sampler Information				Pre	servat	ives		5	Samp	e Type		-		An	alysis	Requ	leste	d	-	-1-	Ma	atrix		Notes			
Name: Ausfin Kay Employer: Alta Signature: And Sample ID CLS-012019	Date 1/20/19	Time 09:02	Unpreserved	- H2S04	HN03			C Total # of Containers	Routine	Resample	Nitrate EPA 300.0	Nitrite SM4500 - NO2B	Ammonia SM4500-NH3 H	KN EPA 351.3	Total Phosphorous SM 4500-PE	Contho Phosphate SM4500-PE	K TSS SM2540C	🗙 TDS EPA 160.1	Total Hardness SM2340C	Total Organic Nitrogen (calc)	A Total Nitrogen (calc)	ormwater					
			-		-			_	_		+-	+-	-	-	-		-										
Delinguick - d Du (sign)		Print N	ame	/Com	Danv			Dat	e/Tin	ne	-		Rece	eieve	d By (	sign)						Print	Name /Cor	npany			
Kelinduistien py (zigil)	Aust	inthe	w/	Alfa	5		1/2	11	913	3:41		Λ	1			А,	,			<u> </u>	1-			Qaa			
00			11				1/2	1/19	71.	3:42	2 1	le	Ma	na	C4	ell	m	ir	L	le f	thr	n li	Ima	n CSB			
Samples submitted on ice? (Yes) No Custody Seals intact? Yes No N/A Samples intact? Yes) No							Sam Pern Devi Sign	ple n nissio atior ature	neets on to n/Not e/Dat	labora contin es: e:	tory a ue? Ye	iccept es Ni	tance D	e crit	eria? '	Yes	No				<b>B</b> 1/2	<b>9</b> A	25 9 13:5	<b>22</b>		加累	

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

STORM 4 January 31, 2019 - February 6, 2019



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 6	
Contact: John Rudolph	Project Name:	AMEC-Lake Elsinore	
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsinore Project	
San Diego, CA 92123	Work Order Number:	B9B0042	
Report Date: 15-Feb-2019	Received on Ice (Y/N):	Yes Temp	: 1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	<u>By</u>
B9B0042-01	S-03-020119	Liquid	02/01/19 06:46	Bridgette Reddingto	02/01/19 10:41	Bridgette Reddington
B9B0042-02	S-04-020119	Liquid	02/01/19 07:40	Bridgette Reddingto	02/01/19 10:41	Bridgette Reddington
B9B0042-03	CLS-020119	Liquid	02/01/19 09:00	Bridgette Reddinato	02/01/19 10:41	Bridgette Reddington

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 2 of	6	
Contact:	John Rudolph	Project Name:	AMEC-Lak	ke Elsinore	
Address:	9210 Sky Park Court #200	Project Number:	: Lake Elsinore Project		
	San Diego, CA 92123	Work Order Number:	B9B0042		
Report Date:	15-Feb-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

	La	boratory R B9B	teference N 0042-01	<u>lumber</u>				
S-03-020119		<u>Ma</u> Liq	<u>trix</u> uid	<u>Sar</u> 0	npled Date/ 2/01/19 06:4	<u>Time Re</u> 46 0	ceived Date 2/01/19 10	<u>ə/Time</u> :41
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Compounds Biochemical Oxygen Demand Chemical Oxygen Demand	ND 35	10 10	10 7.4	mg/L mg/L	SM 5210B SM 5220D	02/01/19 22 02/08/19 09	2:24 HRL 9:50 KAA	N-BOD2

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Contact:	Wood Environment&Infrastructure Solutions, Ind John Rudolph	Analytical Report: Project Name:	Page 3 of 6 AMEC-Lake Elsinore						
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Project						
	San Diego, CA 92123	Work Order Number:	B9B0042						
Report Date:	15-Feb-2019	Received on Ice (Y/N):	Yes Temp:	1 °C					
	Laboratory Reference Number B9B0042-02								

S-04-020119	<u>Matrix</u>	Sampled Date/Time	Received Date/Time
	Liquid	02/01/19 07:40	02/01/19 10:41

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Compounds Biochemical Oxygen Demand	ND	5.0	5.0	mg/L	SM 5210B	02/01/19 22:2	4 HRL	N-BOD2
Chemical Oxygen Demand	16	10	7.4	mg/L	SM 5220D	02/08/19 09:5	0 KAA	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report: Pag	ge 4 of 6							
Contact:	John Rudolph	Project Name: AM	IEC-Lake Elsinore							
Address:	9210 Sky Park Court #200	Project Number: Lak	ke Elsinore Project							
	San Diego, CA 92123	Work Order Number: B9	B0042							
Report Date:	15-Feb-2019	Received on Ice (Y/N): Y	Yes Temp: 1 °C							
	Laboratory Reference Number B9B0042-03									

Sample Description	<u>Matrix</u>	Sampled Date/Time	Received Date/Time
CLS-020119	Liquid	02/01/19 09:00	02/01/19 10:41

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Aggregate Organic Compounds Biochemical Oxygen Demand	ND	5.0	5.0	mg/L	SM 5210B	02/01/19 22:2	24 HRL	N-BOD2
Chemical Oxygen Demand	ND	10	7.4	mg/L	SM 5220D	02/08/19 09:5	50 KAA	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 6		
Contact:	John Rudolph	Project Name:	AMEC-Lake Elsino	ore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj	ect	
	San Diego, CA 92123	Work Order Number:	B9B0042		
Report Date:	15-Feb-2019	Received on Ice (Y/N):	Yes Ter	mp:	1 °C

# Aggregate Organic Compounds - Batch Quality Control

					Spike	Source		%REC		RPD	_
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B01073 - Analyzed as red	ceived										
Blank (9B01073-BLK1)					Prepared	& Analyze	d: 02/01/1	9			
Biochemical Oxygen Demand	ND	1.0	1.0	mg/L							
LCS (9B01073-BS1)				I	Prepared	& Analyze	d: 02/01/1	9			
Biochemical Oxygen Demand	154	1.0	1.0	mg/L	198		78.0	85-115			Q-BOD2
Duplicate (9B01073-DUP1)		Source:	B9B0063-0	1	Prepared	& Analyze	d: 02/01/1	9			
Biochemical Oxygen Demand	232	50	50	mg/L		213			8.66	20	
Batch 9B07054 - Acid Digest											
Blank (9B07054-BLK1)				I	Prepared:	02/07/19	Analyzed	: 02/08/19			
Chemical Oxygen Demand	ND	10	7.4	mg/L							
LCS (9B07054-BS1)				I	Prepared:	02/07/19	Analyzed	: 02/08/19			
Chemical Oxygen Demand	488	10	7.4	mg/L	500		97.7	95-105			
Matrix Spike (9B07054-MS1)		Source:	B9B0100-0	1	Prepared:	02/07/19	Analyzed	: 02/08/19			
Chemical Oxygen Demand	447	13	9.9	mg/L	333	288	47.8	80-120			QFpas, QMout
Matrix Spike Dup (9B07054-MSD1)		Source:	B9B0100-0	1	Prepared:	02/07/19	Analyzed	: 02/08/19			
Chemical Oxygen Demand	450	13	9.9	mg/L	333	288	48.7	80-120	0.683	20	QFpas, QMout

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 6 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore Project

Work Order Number: B9B0042

Received on Ice (Y/N): Yes Temp: 1 °C

Report Date: 15-Feb-2019

#### **Notes and Definitions**

- N-BOD2 The LCS is outside method acceptance limits. As per method, data is reportable as gualified.
- Q-BOD2 This LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- QFpas Follow-up result within laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 1	
Contact:	John Rudolph	Project Name:	AMEC-Lake Els	sinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore F	Project
	San Diego, CA 92123	Work Order Number:	B9B0042	
Report Date:	15-Feb-2019	Received on Ice (Y/N):	Yes	Temp:

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Destination 6100 Quail \	Lab: Babcock Laboratories 'alley Court Riverside, CA 9250	17					Chai	in (	of (	Cus	toc	ly												Pa	ige	<u> </u>			
(951)653-33	51 Foster Wheeler Environment	and Infras	tructure		Co	ntact: (	Garth E	Inge	lhorn	1						Fax: N	0.					Ado	litional I	Repor	ting F	Reque	sts		
Phone No. 7	60-644-0167				er	nail: ga	rth.eng	gelho	orn@	altae	nviro	on.co	m					in pre-	-										
Project Nan	e: Lake Elsinore Project				Tu	Irn Aro	und Tir	me:¶	Routi	ne-	. ر																		
Project Loca	tion: Salt Creek/San Jacinto/C	anyon Lak	e	# of	*L Contai	ab TAT	Appro	oval		le Tur		В	y:											Note					
	Sampler Information			Pr	eserval	tives		2	ampi		16	-		A	nalysis	Requ	ested	T		Matri	X	-		NOL					
Name: Employ Signatu S - O S - O C L S - O	Bridg <u>ette</u> Reddi er: <u>Alta</u> re: <u>Bridgette Reddi</u> - <u>sample ID</u> 3 - 020119 4 - 020119 020119	ngton ingtn Date 2/1/19 2/1/19 2/1/19	Time 1 06412 1 0740 1 07900 1	H2504	HNO3			A A A Total # of Containers	Routine	Resample	Special	X X COD SM5220D	BOD SM5210B							Storn	nwater	pH pH pH	taki taki tak	un un en	at at	06: 07: 09:	46 40 00		
	Polinguished By (sign)		Print Nan	ne /Co	mpany			Dat	e/Tin	ne	-		Re	eceiev	ved By	(sign)					Print	Name	/Compa	ny					
Bridg	ette Readingtro	ALT	TA En	/IRO/	NMEA	ITAL	02/0	01/1	91	0:	41			9	ß		5.			JB.	ESI	3					DET.		
Samples su Custody Se Samples in Temperatu	ibmitted on ice?/Yeg No als intact? Yes No /NA tact? Yes No ire:0	5					Samp Perm Devia Signa	ole m hissio ation ature	neets on to n/Not e/Dat	labo conti es: e:	rator	y acc Yes	eptan <sup>)</sup> No	ice crit	teria	Yeen	0		2. A	<b>39</b> /01/2 JG	<b>B</b> (2019	<b>)()</b> 12:	<b>42</b>						
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mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

Temp: 1 °C



Client Name: Wo	ood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 1	0
Contact: Joh	nn Rudolph	Project Name:	Amec Foste	er Wheeler-Lake Elsinore
Address: 921	10 Sky Park Court #200	Project Number:	Lake Elsino	ore Proj. Salt Creek/SJ/C
Sar	n Diego, CA 92123	Work Order Number:	B9B0437	
Report Date: 21-	Feb-2019	Received on Ice (Y/N):	Yes	Temp: 3 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

# Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9B0437-01	S-03-020419	Liquid	02/04/19 09:30	Austin Kay	02/05/19 13:47	Austin Kay
B9B0437-02	S-04-020419	Liquid	02/04/19 10:30	Austin Kay	02/05/19 13:47	Austin Kay

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Report Date: 21-Feb-2019

Analytical Report: Page 2 of 10 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore Proj. Salt Creek/SJ/C

#### Work Order Number: B9B0437

Received on Ice (Y/N): Yes

Temp: 3 °C

# Laboratory Reference Number B9B0437-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
S-03-020419	Liquid	02/04/19 09:30	02/05/19 13:47

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	150	15	1.8	mg/L	SM 2340B/EP 200.7	PA 02/13/19 16:2	27 KCS	
Calcium	37	5.0	1.6	mg/L	EPA 200.7	02/13/19 16:2	27 KCS	
Magnesium	13	5.0	1.8	mg/L	EPA 200.7	02/13/19 16:2	27 KCS	
Anions								
Nitrate as N	0.35	0.20	0.055	mg/L	EPA 300.0	02/06/19 02:3	32 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	02/06/19 02:	32 KBS	
Solids								
Total Dissolved Solids	350	20	20	mg/L	SM 2540C	02/07/19 21:4	45 JGZ	
Total Suspended Solids	78	5	5	mg/L	SM 2540D	02/08/19 08:	30 ATR	
Nutrients								
Ammonia-Nitrogen	ND	1.0	0.48	mg/L	SM4500NH3F G	l 02/08/19 12:2	21 SLL	
Kjeldahl Nitrogen	1.5	0.20	0.13	mg/L	EPA 351.2	02/08/19 11:	14 SLL	
Organic Nitrogen	1.5	1.0		mg/L	Calculation			
		1.0						
Total Nitrogen	1.9	1.0	0.13	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.21	0.050	0.016	mg/L	SM 4500P E	02/05/19 16:4	49 ATR	
Total Phosphorus	0.46	0.05	0.02	mg/L	SM 4500P B E	E 02/11/19 15:4	42 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions	, Inc Analytical Report:	Page 3 of 1	0
Contact:	John Rudolph	Project Name:	Amec Foste	er Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsind	re Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp: 3 °C
	Laborato	n Deference Number		

Laboratory Reference Number

# B9B0437-02

Sample Description S-04-020419

<u>Matrix</u> Liquid

Sampled Date/Time Received Date/Time 02/04/19 10:30

02/05/19 13:47

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	72	15	1.8	mg/L	SM 2340B/EF 200.7	PA 02/13/19 16:2	29 KCS	
Calcium	18	5.0	1.6	mg/L	EPA 200.7	02/13/19 16:2	29 KCS	
Magnesium	6.8	5.0	1.8	mg/L	EPA 200.7	02/13/19 16:2	29 KCS	
Anions								
Nitrate as N	0.44	0.20	0.055	mg/L	EPA 300.0	02/06/19 02:4	4 KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	02/06/19 02:4	14 KBS	
Solids								
Total Dissolved Solids	170	10	10	mg/L	SM 2540C	02/07/19 21:4	45 JGZ	
Total Suspended Solids	150	10	10	mg/L	SM 2540D	02/08/19 08:3	30 ATR	
Nutrients								
Ammonia-Nitrogen	ND	5.0	2.4	mg/L	SM4500NH3F G	H 02/07/19 12:3	33 DNF	
Kjeldahl Nitrogen	0.89	0.20	0.13	mg/L	EPA 351.2	02/08/19 10:1	12 SLL	
Organic Nitrogen	ND	5.0		mg/L	Calculation			
Total Nitrogen	ND	5.0	0.13	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.21	0.050	0.016	mg/L	SM 4500P E	02/05/19 16:4	19 ATR	
Total Phosphorus	0.57	0.05	0.02	mg/L	SM 4500P B I	E 02/11/19 15:4	12 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 10
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Temp: 3 °C

# **Cations - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B12117 - EPA 200.2											
Blank (9B12117-BLK1)				F	repared	& Analyze	d: 02/13/1	9			
Calcium	ND	1.0	0.31	mg/L							
Magnesium	ND	1.0	0.35	mg/L							
LCS (9B12117-BS1)				F	repared	& Analyze	d: 02/13/1	9			
Calcium	16.6	1.0	0.31	mg/L	17.0		97.7	85-115			
Magnesium	16.3	1.0	0.35	mg/L	17.0		95.6	85-115			
LCS Dup (9B12117-BSD1)				F	repared	& Analyze	d: 02/13/1	9			
Calcium	17.8	1.0	0.31	mg/L	17.0		105	85-115	7.16	20	
Magnesium	17.5	1.0	0.35	mg/L	17.0		103	85-115	7.54	20	
Matrix Spike (9B12117-MS1)		Source:	B9B0142-0	1RE1 F	repared	& Analyze	d: 02/13/1	9			
Calcium	28.7	2.0	0.62	mg/L	17.0	11.7	100	70-130			
Magnesium	18.6	2.0	0.70	mg/L	17.0	1.81	98.9	70-130			
Matrix Spike (9B12117-MS2)		Source:	B9B0460-0	<b>6</b> F	repared	& Analyze	d: 02/13/1	9			
Calcium	64.4	5.0	1.6	mg/L	17.0	48.2	95.6	70-130			
Magnesium	25.3	5.0	1.8	mg/L	17.0	8.47	99.3	70-130			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 10
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Temp: 3 °C

# **Anions - Batch Quality Control**

Analvte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B05115 - Analyzed as Re	ceived IC										0
Blank (9B05115-BLK1)				F	repared	& Analyzed	d: 02/05/1	9			
Nitrite as N	ND	0.10	0.059	mg/L							
Nitrate as N	ND	0.20	0.055	mg/L							
LCS (9B05115-BS1)				F	repared	& Analyzed	d: 02/05/1	9			
Nitrite as N	2.49	0.10	0.059	mg/L	2.50		99.8	90-110			
Nitrate as N	5.31	0.20	0.055	mg/L	5.65		94.0	90-110			
Matrix Spike (9B05115-MS1)		Source:	B9B0390-0 <sup>2</sup>	1 F	repared	& Analyzed	d: 02/06/1	9			
Nitrite as N	2.33	0.10	0.059	mg/L	2.50	ND	93.3	80-120			
Nitrate as N	5.68	0.20	0.055	mg/L	5.65	0.309	95.0	75-131			
Matrix Spike (9B05115-MS2)		Source	B9B0435-0 <sup>2</sup>	1 F	repared	& Analyzed	d: 02/06/1	9			
Nitrite as N	0.118	0.10	0.059	mg/L	2.50	ND	4.70	80-120		(	QMint
Nitrate as N	7.00	0.20	0.055	mg/L	5.65	1.51	97.2	75-131			
Matrix Spike Dup (9B05115-MSD1)		Source:	B9B0390-0 <sup>2</sup>	1 F	repared	& Analyzed	d: 02/06/1	9			
Nitrite as N	2.41	0.10	0.059	mg/L	2.50	ND	96.5	80-120	3.36	20	
Nitrate as N	5.81	0.20	0.055	mg/L	5.65	0.309	97.3	75-131	2.28	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 10
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Temp: 3 °C

# **Solids - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B07065 - Analyzed as	s received										
Blank (9B07065-BLK1)					Prepared	& Analyze	d: 02/07/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
LCS (9B07065-BS1)					Prepared	& Analyze	d: 02/07/1	9			
Total Dissolved Solids	728	10	10	mg/L	746		97.6	90-110			
Duplicate (9B07065-DUP1)		Source:	B9B0216-0	1	Prepared	& Analyze	d: 02/07/1	9			
Total Dissolved Solids	504	10	10	mg/L		497			1.40	20	
Duplicate (9B07065-DUP2)		Source:	B9B0373-0	1	Prepared	& Analyze	d: 02/07/1	9			
Total Dissolved Solids	290	10	10	mg/L		290			0.00	20	
Batch 9B08013 - Analyzed as	s received										
Blank (9B08013-BLK1)					Prepared	& Analyze	d: 02/08/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L							
LCS (9B08013-BS1)					Prepared	& Analyze	d: 02/08/1	9			
Total Suspended Solids	486	50	50	mg/L	. 500	<b>y</b>	97.2	90-110			
Duplicate (9B08013-DUP1)		Source:	B9B0205-0	1	Prepared	& Analyze	d: 02/08/1	9			
Total Suspended Solids	104	10	10	mg/L		114			9.17	25	
Duplicate (9B08013-DUP2)		Source:	B9B0419-0	2	Prepared	& Analyze	d: 02/08/1	9			
Total Suspended Solids	336	10	10	mg/L		362			7.45	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 7 of 10
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Temp: 3 °C

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B05153 - Filter if turbid.											
LCS (9B05153-BS1)				F	repared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.495	0.050	0.016	mg/L	0.500		99.0	90-110			
Matrix Spike (9B05153-MS1)		Source:	B9B0437-0	1 F	Prepared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.739	0.050	0.016	mg/L	0.500	0.209	106	80-120			
Matrix Spike Dup (9B05153-MSD1)		Source:	B9B0437-0	1 F	repared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.752	0.050	0.016	mg/L	0.500	0.209	109	80-120	1.83	20	
Batch 9B07017 - Acid Digest											
Blank (9B07017-BLK1)				F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	ND	0.10	0.063	mg/L							
LCS (9B07017-BS1)				F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	0.807	0.10	0.063	mg/L	1.00		80.7	80-120			
Matrix Spike (9B07017-MS1)		Source:	B9B0626-0 <sup>-</sup>	1 F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	136	8.0	5.0	mg/L	80.0	49.3	108	42-154			
Matrix Spike (9B07017-MS2)		Source:	B9B0626-02	<b>2</b> F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	3.94	0.20	0.13	mg/L	2.00	1.83	106	42-154			
Batch 9B07029 - Analyzed as rec	eived										
Blank (9B07029-BLK1)				F	Prepared	& Analyze	d: 02/07/1	9			
Ammonia-Nitrogen	ND	0.10	0.048	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 8 of 10	
Contact:	John Rudolph	Project Name:	Amec Foster V	Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp: 3 °C

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B07029 - Analyzed as ree	ceived										
LCS (9B07029-BS1)					Prepared	& Analyze	d: 02/07/1	9			
Ammonia-Nitrogen	0.747	0.10	0.048	mg/L	0.780		95.8	90-110			
Matrix Spike (9B07029-MS1)		Source	: B9B0734-(	02	Prepared	& Analyze	d: 02/07/1	9			
Ammonia-Nitrogen	6.02	0.10	0.048	mg/L	0.780	6.00	1.65	80-120			QFpas, QMout, QOcal
Matrix Spike Dup (9B07029-MSD1)		Source	: B9B0734-	02	Prepared	& Analyze	d: 02/07/1	9			
Ammonia-Nitrogen	5.97	0.10	0.048	mg/L	0.780	6.00	NR	80-120	0.716	20	QFpas, QMout, QOcal
Batch 9B08026 - Analyzed as ree	ceived										
Blank (9B08026-BLK1)					Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	ND	0.10	0.048	mg/L							
LCS (9B08026-BS1)					Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	0.746	0.10	0.048	mg/L	0.780		95.6	90-110			
Matrix Spike (9B08026-MS1)		Source	: B9B0734-(	02RE1	Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	38.0	2.0	0.95	mg/L	7.80	28.7	119	80-120			
Matrix Spike Dup (9B08026-MSD1)		Source	: B9B0734-(	02RE1	Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	36.3	2.0	0.95	mg/L	7.80	28.7	97.4	80-120	4.56	20	
Batch 9B11073 - Acid Digest											
LCS (9B11073-BS1)					Prepared	& Analyze	d: 02/11/1	9			
Total Phosphorus	0.531	0.05	0.02	mg/L	0.500		106	85-115			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 9 of 10	
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	Proj. Salt Creek/SJ/C
	San Diego, CA 92123	Work Order Number:	B9B0437	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp: 3 °C

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B11073 - Acid Digest										
Matrix Spike (9B11073-MS1)		Source: B9A3855	Source: B9A3855-05 Prepared & Analyzed: 02/11/19							
Total Phosphorus	0.815	0.05 0.02	mg/L	0.500	0.278	107	80-120			
Matrix Spike Dup (9B11073-MSD1)		Source: B9A3855	-05	Prepared	& Analyzed	d: 02/11/19	Э			
Total Phosphorus	0.806	0.05 0.02	mg/L	0.500	0.278	106	80-120	1.06	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 10 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore Proj. Salt Creek/SJ/C

# Work Order Number: B9B0437

Received on Ice (Y/N): Yes

Temp: 3 °C

Report Date: 21-Feb-2019

#### Notes and Definitions

J Estimated value

- QFpas Follow-up result within laboratory acceptance criteria.
- QMint Due to matrix interference, the MS and/or MSD did not meet laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- QOcal The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Report Date: 21-Feb-2019

Analytical Report:	Page 1 of 1
Project Name:	Amec Foster Wheeler-Lake Elsinore
Project Number:	Lake Elsinore Proj. Salt Creek/SJ/C

Yes

#### Work Order Number: B9B0437

Received on Ice (Y/N):

Temp: 3 °C

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*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 8		
Contact: John Rudolph	Project Name:	AMEC-Lake	Elsinore	
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsinore	9	
San Diego, CA 92123	Work Order Number:	B9B0653		
Report Date: 21-Feb-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

# Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9B0653-01	CLS - 020619	Liquid	02/06/19 11:34	Austin Kay	02/06/19 13:40	Austin Kay

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 8 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore

# Work Order Number: B9B0653

Received on Ice (Y/N): Yes Temp: 1 °C

Report Date: 21-Feb-2019

# Laboratory Reference Number B9B0653-01

Sample Description	<u>Matrix</u>	Sampled Date/Time	Received Date/Time
CLS - 020619	Liquid	02/06/19 11:34	02/06/19 13:40

Analyte(s)	Result	RDL	MDL	Units	Method A	Analysis Date	Analyst	Flag
Cations								
Total Hardness	230	15	1.8	mg/L	SM 2340B/EP/ 200.7	A 02/14/19 17:20	) KCS	
Calcium	59	5.0	1.6	mg/L	EPA 200.7	02/14/19 17:20	) KCS	
Magnesium	20	5.0	1.8	mg/L	EPA 200.7	02/14/19 17:20	) KCS	
Anions								
Nitrate as N	0.21	0.20	0.055	mg/L	EPA 300.0	02/07/19 04:14	t KBS	
Nitrite as N	ND	0.10	0.059	mg/L	EPA 300.0	02/07/19 04:14	\$ KBS	
Solids								
Total Dissolved Solids	470	10	10	mg/L	SM 2540C	02/13/19 11:50	) DNF	
Total Suspended Solids	16	2	2	mg/L	SM 2540D	02/12/19 14:28	3 MWM	
Nutrients								
Ammonia-Nitrogen	0.070	0.10	0.048	mg/L	SM4500NH3H G	02/08/19 12:20	SLL	J
Kjeldahl Nitrogen	0.86	0.10	0.063	mg/L	EPA 351.2	02/08/19 11:1	5 SLL	
Organic Nitrogen	0.8	0.1		mg/L	Calculation			
Total Nitrogen	1.1	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	02/06/19 17:07	7 ATR	
Total Phosphorus	0.14	0.05	0.02	mg/L	SM 4500P B E	02/19/19 15:0	5 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 8		
Contact:	John Rudolph	Project Name:	AMEC-Lake Els	sinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore		
	San Diego, CA 92123	Work Order Number:	B9B0653		
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

# **Cations - Batch Quality Control**

Analvte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B14018 - EPA 200.2											
Blank (9B14018-BLK1)				F	repared	& Analyzed	d: 02/14/1	9			
Calcium	ND	1.0	0.31	mg/L							
Magnesium	ND	1.0	0.35	mg/L							
LCS (9B14018-BS1)				F	Prepared	& Analyzed	d: 02/14/1	9			
Calcium	17.0	1.0	0.31	mg/L	17.0		99.8	85-115			
Magnesium	16.5	1.0	0.35	mg/L	17.0		97.3	85-115			
LCS Dup (9B14018-BSD1)				F	Prepared	& Analyzed	d: 02/14/1	9			
Calcium	16.5	1.0	0.31	mg/L	17.0		96.9	85-115	3.00	20	
Magnesium	16.0	1.0	0.35	mg/L	17.0		94.2	85-115	3.21	20	
Matrix Spike (9B14018-MS1)		Source:	B9B0357-0 <sup>4</sup>	1 F	Prepared	& Analyzed	d: 02/14/1	9			
Calcium	18.4	2.0	0.62	mg/L	17.0	1.94	97.1	70-130			
Magnesium	16.4	2.0	0.70	mg/L	17.0	ND	96.4	70-130			
Matrix Spike (9B14018-MS2)		Source:	B9B0357-02	<b>2</b> F	Prepared	& Analyze	d: 02/14/1	9			
Calcium	30.9	2.0	0.62	mg/L	17.0	13.7	102	70-130			
Magnesium	19.9	2.0	0.70	mg/L	17.0	3.25	98.0	70-130			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 8		
Contact:	John Rudolph	Project Name:	AMEC-Lake Els	sinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore		
	San Diego, CA 92123	Work Order Number:	B9B0653		
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

# **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B06142 - Analyzed as Re	ceived IC										
Blank (9B06142-BLK1)				F	repared	& Analyze	d: 02/07/1	9			
Nitrite as N	ND	0.10	0.059	mg/L							
Nitrate as N	ND	0.20	0.055	mg/L							
LCS (9B06142-BS1)				F	repared	& Analyze	d: 02/07/1	9			
Nitrite as N	2.51	0.10	0.059	mg/L	2.50		100	90-110			
Nitrate as N	5.25	0.20	0.055	mg/L	5.65		93.0	90-110			
Matrix Spike (9B06142-MS1)		Source	: B9B0625-0 <sup>,</sup>	1 F	repared	& Analyze	d: 02/07/1	9			
Nitrite as N	2.38	0.10	0.059	mg/L	2.50	ND	95.3	80-120			
Nitrate as N	5.36	0.20	0.055	mg/L	5.65	0.153	92.2	75-131			
Matrix Spike (9B06142-MS2)		Source	: B9B0749-0 <sup>-</sup>	1 F	repared	& Analyze	d: 02/07/1	9			
Nitrite as N	3.51	0.10	0.059	mg/L	2.50	0.953	102	80-120			
Nitrate as N	18.3	0.20	0.055	mg/L	5.65	12.7	99.8	75-131			
Matrix Spike Dup (9B06142-MSD1)		Source	: B9B0625-0 <sup>,</sup>	1 F	repared	& Analyze	d: 02/07/1	9			
Nitrite as N	2.43	0.10	0.059	mg/L	2.50	ND	97.4	80-120	2.18	20	
Nitrate as N	5.51	0.20	0.055	mg/L	5.65	0.153	94.8	75-131	2.73	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 8		
Contact:	John Rudolph	Project Name:	AMEC-Lake El	sinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore		
	San Diego, CA 92123	Work Order Number:	B9B0653		
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes	Temp:	1 °C

# **Solids - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B12123 - Analyzed as	s received										
Blank (9B12123-BLK1)					Prepared	& Analyze	d: 02/12/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L							
LCS (9B12123-BS1)					Prepared	& Analyze	d: 02/12/1	9			
Total Suspended Solids	494	50	50	mg/L	500		98.8	90-110			
Duplicate (9B12123-DUP1)		Source:	B9B0636-02	2	Prepared	& Analyze	d: 02/12/1	9			
Total Suspended Solids	1120	50	50	mg/L		1020			9.35	25	
Duplicate (9B12123-DUP2)		Source:	B9B0640-01	1	Prepared	& Analyze	d: 02/12/1	9			
Total Suspended Solids	70.0	10	10	mg/L		64.0			8.96	25	
Batch 9B13075 - Analyzed as	s received										
Blank (9B13075-BLK1)					Prepared	& Analvze	d: 02/13/1	9			
Total Dissolved Solids	ND	10	10	mg/L		j		-			
LCS (9B13075-BS1)					Prepared	& Analvze	d: 02/13/1	9			
Total Dissolved Solids	722	10	10	mg/L	746	<b>y</b>	96.8	90-110			
Duplicate (9B13075-DUP1)		Source:	B9B0641-01	1	Prepared	& Analyze	d: 02/13/1	9			
Total Dissolved Solids	389	10	10	mg/L		383		-	1.55	20	
Duplicate (9B13075-DUP2)		Source:	B9B0645-01	1	Prepared	& Analvze	d: 02/13/1	9			
Total Dissolved Solids	503	10	10	mg/L		488			3.03	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 8
Contact:	John Rudolph	Project Name:	AMEC-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore
	San Diego, CA 92123	Work Order Number:	B9B0653
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Temp:

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B05153 - Filter if turbid.											
LCS (9B05153-BS1)				F	Prepared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.495	0.050	0.016	mg/L	0.500		99.0	90-110			
Matrix Spike (9B05153-MS1)		Source:	B9B0437-0	1 F	Prepared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.739	0.050	0.016	mg/L	0.500	0.209	106	80-120			
Matrix Spike Dup (9B05153-MSD1)		Source:	B9B0437-0	1 F	Prepared	& Analyze	d: 02/05/1	9			
Ortho Phosphate Phosphorus	0.752	0.050	0.016	mg/L	0.500	0.209	109	80-120	1.83	20	
Batch 9B07017 - Acid Digest											
Blank (9B07017-BLK1)				F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	ND	0.10	0.063	mg/L							
LCS (9B07017-BS1)				F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	0.807	0.10	0.063	mg/L	1.00		80.7	80-120			
Matrix Spike (9B07017-MS1)		Source:	B9B0626-0 <sup>-</sup>	1 F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	136	8.0	5.0	mg/L	80.0	49.3	108	42-154			
Matrix Spike (9B07017-MS2)		Source:	B9B0626-02	<b>2</b> F	Prepared:	02/07/19	Analyzed:	02/08/19			
Kjeldahl Nitrogen	3.94	0.20	0.13	mg/L	2.00	1.83	106	42-154			
Batch 9B08026 - Analyzed as rec	eived										
Blank (9B08026-BLK1)				F	Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	ND	0.10	0.048	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119 1 °C



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 7 of 8	
Contact:	John Rudolph	Project Name:	AMEC-Lake Elsino	re
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	
	San Diego, CA 92123	Work Order Number:	B9B0653	
Report Date:	21-Feb-2019	Received on Ice (Y/N):	Yes Ten	np:

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B08026 - Analyzed as red	ceived										
LCS (9B08026-BS1)					Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	0.746	0.10	0.048	mg/L	0.780		95.6	90-110			
Matrix Spike (9B08026-MS1)		Source:	B9B0734	02RE1	Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	38.0	2.0	0.95	mg/L	7.80	28.7	119	80-120			
Matrix Spike Dup (9B08026-MSD1)		Source:	B9B0734	02RE1	Prepared	& Analyze	d: 02/08/1	9			
Ammonia-Nitrogen	36.3	2.0	0.95	mg/L	7.80	28.7	97.4	80-120	4.56	20	
Batch 9B19072 - Acid Digest											
LCS (9B19072-BS1)				I	Prepared	& Analyze	d: 02/19/1	9			
Total Phosphorus	0.493	0.05	0.02	mg/L	0.500		98.7	85-115			
Matrix Spike (9B19072-MS1)		Source	B9B1441	·09 I	Prepared	& Analyze	d: 02/19/1	9			
Total Phosphorus	0.625	0.05	0.02	mg/L	0.500	0.129	99.2	80-120			
Matrix Spike Dup (9B19072-MSD1)		Source	B9B1441	- <b>0</b> 9 l	Prepared	& Analyze	d: 02/19/1	9			
Total Phosphorus	0.651	0.05	0.02	mg/L	0.500	0.129	104	80-120	4.04	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119 1 °C



Analytical Report: Page 8 of 8 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore

#### Work Order Number: B9B0653

Received on Ice (Y/N): Yes Temp: 1 °C

Report Date: 21-Feb-2019

#### **Notes and Definitions**

J	Estimated value
ND:	Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit

\* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

#### e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&Infrastructure Solutions, Inc
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Analytical Report: Page 1 of 1 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore

Yes

#### Work Order Number: B9B0653

Received on Ice (Y/N):

Temp: 1 °C

Report Date: 21-Feb-2019

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Project Name: Lake Elsinore Project				I	furn Arc	ound <sup>·</sup>	Time:	Rout	tine	>									,									
Project Location: Salt Creek/San Jacinto/Ca	anyon Lak	ke T	#0	f Conta	Lab TA	T App	proval			-	B	iy:												-	-,			
Sampler Information			P	reserv	atives			Samp	ole Typ	pe			A	Analy	/sis R	eques	ted			-	Matrix		N	lotes				
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STORM 5 February 14-18, 2019



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 4	ł	
Contact: John Rudolph	Project Name:	AMEC-Lak	e Elsinore	
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsino	ore Project	
San Diego, CA 92123	Work Order Number:	B9B1764		
Report Date: 01-Mar-2019	Received on Ice (Y/N):	Yes	Temp:	5 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

# Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9B1764-01	CLS-021419	Liquid	02/14/19 10:45	Austin Kay	02/14/19 12:52	Austin Kay

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 4 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore Project

#### Work Order Number: B9B1764

Received on Ice (Y/N): Temp: 5 °C Yes

Laboratory Reference Number B9B1764-01 Sample Description Sampled Date/Time Received Date/Time Matrix CLS-021419 02/14/19 10:45 02/14/19 12:52 Liquid Analyte(s) Result RDL MDL Units Method **Analysis Date** Analyst Flag Aggregate Organic Compounds **Biochemical Oxygen Demand** ND 10 10 ATR N-BOD1, mg/L SM 5210B 02/15/19 12:55 N-BOD2 Chemical Oxygen Demand 41 10 7.4 mg/L SM 5220D 02/19/19 15:25 KAA

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 4		
Contact:	John Rudolph	Project Name:	AMEC-Lake E	Isinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	Project	
	San Diego, CA 92123	Work Order Number:	B9B1764		
Report Date:	01-Mar-2019	Received on Ice (Y/N):	Yes	Temp:	5 °C

# Aggregate Organic Compounds - Batch Quality Control

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag	
Batch 9B15011 - Analyzed as re	eceived											
Blank (9B15011-BLK1)					Prepared	& Analyze	d: 02/15/1	9				
Biochemical Oxygen Demand	ND	1.0	1.0	mg/L								
LCS (9B15011-BS1)					Prepared	& Analyze	d: 02/15/1	9				
Biochemical Oxygen Demand	127	1.0	1.0	mg/L	198		64.0	85-115			Q-BOD2	
Duplicate (9B15011-DUP1)		Source:	B9B1723-0	01	Prepared	& Analyze	d: 02/15/1	9				
Biochemical Oxygen Demand	289	50	50	mg/L		262			9.81	20		
Batch 9B19086 - Acid Digest												
Blank (9B19086-BLK1)					Prepared	& Analyze	d: 02/19/1	9				
Chemical Oxygen Demand	ND	10	7.4	mg/L								
LCS (9B19086-BS1)					Prepared	& Analyze	d: 02/19/1	9				
Chemical Oxygen Demand	511	10	7.4	mg/L	500		102	95-105				
Matrix Spike (9B19086-MS1)		Source:	B9B1932-0	01	Prepared	& Analyze	d: 02/19/1	9				
Chemical Oxygen Demand	368	13	9.9	mg/L	333	29.9	101	80-120				
Matrix Spike Dup (9B19086-MSD1)		Source:	B9B1932-0	01	Prepared	& Analyze	d: 02/19/1	9				
Chemical Oxygen Demand	377	13	9.9	mg/L	333	29.9	104	80-120	2.47	20		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 4 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore Project

Work Order Number: B9B1764

Received on Ice (Y/N): Yes

Temp: 5 °C

Report Date: 01-Mar-2019

#### **Notes and Definitions**

- N-BOD1 Dilution water blank exceeds 0.20 mg/L. As per method, data is reportable as qualified.
- N-BOD2 The LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- Q-BOD2 This LCS is outside method acceptance limits. As per method, data is reportable as qualified.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

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Report Date: 01-Mar-2019

Analytical Report: Page 1 of 1 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore Project

# Work Order Number: B9B1764

Received on Ice (Y/N): Yes

Temp: 5 °C

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Project Name: Lake Elsinore Project					Irn Ar	ound T	ime:	Rout	ine	>																		
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Analytical Report: Page 1 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number:B9B2112Received on Ice (Y/N):Yes

Temp: 1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

### **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	<u>By</u>	Date Submitted	By
B9B2112-01	CLS - 021819	Liquid	02/18/19 6:28	Austin Kay	02/19/19 09:58	Bridgette Reddington

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number: B9B2112

Received on Ice (Y/N): Yes Temp: 1 °C

### Laboratory Reference Number B9B2112-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CLS - 021819	Liquid	02/18/19 06:28	02/19/19 9:58

Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Cations								
Total Hardness	220	3.0	0.35	mg/L	SM 2340B/EP 200.7	PA 02/26/19 21:34	4 KCS	
Calcium	55	1.0	0.31	mg/L	EPA 200.7	02/26/19 21:3	4 KCS	
Magnesium	19	1.0	0.35	mg/L	EPA 200.7	02/26/19 21:34	4 KCS	
Anions								
Nitrate as N	0.48	0.20	0.055	mg/L	EPA 300.0	02/19/19 18:0	2 KBS	
Nitrite as N	0.069	0.10	0.059	mg/L	EPA 300.0	02/19/19 18:03	2 KBS P	blkJ, J
Solids								
Total Dissolved Solids	430	10	10	mg/L	SM 2540C	02/21/19 15:3	9 BBR	
Total Suspended Solids	150	5	5	mg/L	SM 2540D	02/21/19 18:14	4 MWM	
Nutrients								
Ammonia-Nitrogen	0.11	0.10	0.048	mg/L	SM4500NH3F G	02/20/19 12:23	3 SLL	
Kjeldahl Nitrogen	1.1	0.10	0.063	mg/L	EPA 351.2	02/20/19 16:24	4 SLL	
Organic Nitrogen	1.0	0.1		mg/L	Calculation			
Total Nitrogen	1.6	0.2	0.06	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.094	0.050	0.016	mg/L	SM 4500P E	02/19/19 15:5	1 ATR	
Total Phosphorus	0.32	0.05	0.02	mg/L	SM 4500P B E	E 02/25/19 10:3	5 ATR	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number: B9B2112

Received on Ice (Y/N):	Yes	Temp: 1	1 °C
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### **Cations - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B25125 - EPA 200.2											
Blank (9B25125-BLK1)				F	Prepared:	02/25/19	Analyzed:	02/26/19			
Calcium	ND	1.0	0.31	mg/L							
Magnesium	ND	1.0	0.35	mg/L							
LCS (9B25125-BS1)				F	Prepared:	02/25/19	Analyzed:	02/26/19			
Calcium	16.6	1.0	0.31	mg/L	17.0		97.7	85-115			
Magnesium	16.3	1.0	0.35	mg/L	17.0		95.8	85-115			
LCS Dup (9B25125-BSD1)				F	Prepared:	02/25/19	Analyzed:	02/26/19			
Calcium	16.8	1.0	0.31	mg/L	17.0		98.7	85-115	1.07	20	
Magnesium	16.6	1.0	0.35	mg/L	17.0		97.7	85-115	2.05	20	
Matrix Spike (9B25125-MS1)		Source:	B9B1783-0	1 6	Prepared:	02/25/19	Analyzed:	02/26/19			
Calcium	17.3	2.0	0.62	mg/L	17.0	1.00	95.9	70-130			
Magnesium	16.4	2.0	0.70	mg/L	17.0	ND	96.4	70-130			
Matrix Spike (9B25125-MS2)		Source:	B9B1956-0	1RE1	Prepared:	02/25/19	Analyzed:	02/26/19			
Calcium	45.7	5.0	1.6	mg/L	17.0	29.3	96.8	70-130			
Magnesium	33.7	5.0	1.8	mg/L	17.0	16.9	98.9	70-130			

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Analytical Report: Page 4 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work	Order	Number:	B9B2112
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Received on Ice (Y/N)	Yes	Temp:	1	°C
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### **Anions - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9B19143 - Analyzed as Re	ceived IC										
Blank (9B19143-BLK1)				F	repared	& Analyze	d: 02/19/1	9			
Nitrite as N	0.0640	0.10	0.059	mg/L						J	
Nitrate as N	0.176	0.20	0.055	mg/L						J	I
LCS (9B19143-BS1)				F	repared	& Analyze	d: 02/19/1	9			
Nitrite as N	2.40	0.10	0.059	mg/L	2.50		95.8	90-110			
Nitrate as N	5.64	0.20	0.055	mg/L	5.65		99.9	90-110			
Matrix Spike (9B19143-MS1)		Source	: B9B2094-01	I F	repared	& Analyze	d: 02/19/1	9			
Nitrite as N	2.67	0.10	0.059	mg/L	2.50	0.305	94.6	80-120			
Nitrate as N	6.50	0.20	0.055	mg/L	5.65	0.871	99.6	75-131			
Matrix Spike (9B19143-MS2)		Source	: B9B2111-01	I F	repared	& Analyze	d: 02/19/1	9			
Nitrite as N	2.34	0.10	0.059	mg/L	2.50	0.0780	90.4	80-120			
Nitrate as N	5.52	0.20	0.055	mg/L	5.65	0.223	93.7	75-131			
Matrix Spike Dup (9B19143-MSD1)		Source	: B9B2094-01	I F	repared	& Analyze	d: 02/19/1	9			
Nitrite as N	2.62	0.10	0.059	mg/L	2.50	0.305	92.5	80-120	1.95	20	
Nitrate as N	6.48	0.20	0.055	mg/L	5.65	0.871	99.2	75-131	0.358	20	

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Analytical Report: Page 5 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number: B9B2112

Received on Ice (Y/N):	Yes	Temp:	1	°C	
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#### **Solids - Batch Quality Control**

Apolyto(a)	Popult	וחפ		Lloito	Spike	Source Result	%REC	%REC	RPD	RPD Limit	Flag
Analyte(s)	Result	RDL		Units	LCVCI	Result		Linito		Linin	Tidg
Batch 9B21013 - Analyzed as	received										
Blank (9B21013-BLK1)					Prepared	& Analyze	d: 02/21/1	9			
Total Dissolved Solids	ND	10	10	mg/l	-						
LCS (9B21013-BS1)					Prepared	& Analyze	d: 02/21/1	9			
Total Dissolved Solids	746	10	10	mg/l	746		100	90-110			
Duplicate (9B21013-DUP1)		Source:	B9B2270-0	1	Prepared	& Analyze	d: 02/21/1	9			
Total Dissolved Solids	248	10	10	mg/l	_	252			1.60	20	
Duplicate (9B21013-DUP2)		Source:	B9B2270-02	2	Prepared	& Analyze	d: 02/21/1	9			
Total Dissolved Solids	248	10	10	mg/l	_	242			2.45	20	
Batch 9B21054 - Analyzed as	received										
Blank (9B21054-BLK1)					Prepared	& Analyze	d: 02/21/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/l	_						
LCS (9B21054-BS1)					Prepared	& Analyze	d: 02/21/1	9			
Total Suspended Solids	490	50	50	mg/l	500		98.0	90-110			
Duplicate (9B21054-DUP1)		Source:	B9B2033-0	1	Prepared	& Analyze	d: 02/21/1	9			
Total Suspended Solids	ND	2	2	mg/l	_	ND				25	
Duplicate (9B21054-DUP2)		Source:	B9B2033-02	2	Prepared	& Analyze	d: 02/21/1	9			
Total Suspended Solids	ND	2	2	ma/l	_	ND				25	

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Analytical Report: Page 6 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Received on Ice (Y/N):	Yes	Temp:	1	°C	
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### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B19149 - Filter if turbid.											
LCS (9B19149-BS1)				F	Prepared	& Analyze	d: 02/19/1	9			
Ortho Phosphate Phosphorus	0.510	0.050	0.016	mg/L	0.500		102	90-110			
Matrix Spike (9B19149-MS1)		Source:	B9B2112-0	<b>1</b> F	Prepared	& Analyze	d: 02/19/1	9			
Ortho Phosphate Phosphorus	0.628	0.050	0.016	mg/L	0.500	0.0944	107	80-120			
Matrix Spike Dup (9B19149-MSD1)		Source:	B9B2112-0	<b>1</b> F	Prepared	& Analyze	d: 02/19/1	9			
Ortho Phosphate Phosphorus	0.633	0.050	0.016	mg/L	0.500	0.0944	108	80-120	0.868	20	
Batch 9B19151 - Analyzed as rec	ceived										
Blank (9B19151-BLK1)				F	Prepared	& Analyze	d: 02/20/1	9			
Ammonia-Nitrogen	ND	0.10	0.048	mg/L							
LCS (9B19151-BS1)				F	Prepared	& Analyze	d: 02/20/1	9			
Ammonia-Nitrogen	0.746	0.10	0.048	mg/L	0.780		95.6	90-110			
Matrix Spike (9B19151-MS1)		Source	: B9B1886-0	<b>2</b> F	Prepared	& Analyze	d: 02/20/1	9			
Ammonia-Nitrogen	58.5	5.0	2.4	mg/L	39.0	22.2	92.9	80-120			
Matrix Spike Dup (9B19151-MSD1)		Source	: B9B1886-0	<b>2</b> F	Prepared	& Analyze	d: 02/20/1	9			
Ammonia-Nitrogen	59.9	5.0	2.4	mg/L	39.0	22.2	96.6	80-120	2.43	20	
Batch 9B20081 - Acid Digest											
Blank (9B20081-BLK1)				F	Prepared	& Analyze	d: 02/20/1	9			
Kjeldahl Nitrogen	ND	0.10	0.063	mg/L							

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Analytical Report: Page 7 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number: B9B2112

Received on Ice (Y/N):	Yes	Temp:	1	°C	
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#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9B20081 - Acid Digest											
LCS (9B20081-BS1)				l	Prepared	& Analyze	ed: 02/20/1	9			
Kjeldahl Nitrogen	0.960	0.10	0.063	mg/L	1.00		96.0	80-120			
Matrix Spike (9B20081-MS1)		Source:	: B9B2050-0	)1	Prepared	& Analyze	ed: 02/20/1	9			
Kjeldahl Nitrogen	135	8.0	5.0	mg/L	80.0	52.7	103	42-154			
Matrix Spike (9B20081-MS2)		Source	: B9B2050-0	)2	Prepared	& Analyze	ed: 02/20/1	9			
Kjeldahl Nitrogen	133	8.0	5.0	mg/L	80.0	50.4	103	42-154			
Batch 9B22052 - Acid Digest											
LCS (9B22052-BS1)				[	Prepared	: 02/22/19	Analyzed	: 02/25/19			
Total Phosphorus	0.536	0.05	0.02	mg/L	0.500		107	85-115			
Matrix Spike (9B22052-MS1)		Source:	: B9B2294-0	)1	Prepared	: 02/22/19	Analyzed	: 02/25/19			
Total Phosphorus	2.29	0.05	0.02	mg/L	0.500	2.33	NR	80-120			QFpas, QMout
Matrix Spike Dup (9B22052-MSD1)		Source	B9B2294-0	01	Prepared	: 02/22/19	Analyzed	: 02/25/19			
Total Phosphorus	2.30	0.05	0.02	mg/L	0.500	2.33	NR	80-120	0.375	20	QFpas, QMout

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Analytical Report: Page 8 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Report Date: 05-Mar-2019

Work Order Number: B9B2112

Received on Ice (Y/N): Yes

Temp: 1 °C

#### **Notes and Definitions**

- J Estimated value
- PblkJ The analyte was detected in the Method Blank at a concentration between the MDL and the MRL.
- QFpas Follow-up result within laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

Cindy Caddlea Cindy A. Waddell

cc:

e-Standard No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Report Date: 05-Mar-2019

Analytical Report: Page 9 of 9 Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore - Salt Creek/San J

Yes

Work Order Number: B9B2112

Received on Ice (Y/N):

Temp: 1 °C

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# FIELD WATER QUALITY DATA

#### San Jacinto Watershed Nutrient TMDL Monitoring Stormwater Sample Field Water Quality Parameters

		S-03	S-03	S-04	S-03	S-03	S-04	S-04	CLS	CLS	CLS	CLS	S-03	S-04	CLS	CLS	CLS	CLS	CLS
Analyte	Units	11/29/2018	11/30/2018	11/30/2018	12/5/2018	12/6/2018	12/6/2018	12/6/2018	1/16/2019	1/17/2019	1/17/2019	1/18/2019	2/1/2019	2/1/2019	2/1/2019	2/5/2019	2/6/2019	2/14/2019	2/15/2019
		14:11	11:00	11:04	16:25	12:12	9:16	12:38	13:14	10:15	15:22	9:34	6:59	7:49	9:07	14:40	11:35	10:42	9:19
Temperature	Celsius	14.5	13.4	13.2	9.9	12.1	9.8	11.8	13.5	12.2	13.6	12.4	8.9	9.6	11.8	12.0	11.3	12.4	11.5
pH	pH units	8.10	7.82	7.76	7.30	7.68	6.98	7.37	7.52	7.99	7.72	7.96	8.04	8.06	8.12	7.87	7.87	7.69	7.79
Conductivity	uS/cm	125	197	186	197	127	326	160	1,466	983	958	862	1,042	196	854	887	884	802	691
Turbidity	NTU	37.20	26.40	85.00	35.50	38.50	14.50	86.40	8.71	1.38	8.92	3.07	4.70	53.80	9.10	11.10	11.60	22.90	25.20
Dissolved Oxygen	mg/L	8.44	7.53	8.73	8.94	8.88	8.86	8.72	9.60	9.98	9.78	10.15	9.50	7.83	10.10	10.02	10.29	10.23	10.52

# CHEMISTRY SUMMARY DATA TABLES

# San Jacinto Watershed Nutrient TMDL Monitoring Stormwater Sample Chemical Analysis Summary - 2018-2019

Analyte	Sample Type	e Method	Units	S-03-112918	S-03-113018	S-03-12052018	S-03-12072018	S-03-020119	S-03-020419	S-04-120218	S-04-12062018	S-04-020119	S-04-12072018	S-04-020419	CLS-011619	CLS-012019	CLS-020119	CLS - 020619	CLS-021419	CLS - 021819
				11/29/2018	11/30/2018	12/5/2018	12/7/2018	2/1/2019	2/4/2019	12/2/2018	12/6/2018	2/1/2019	12/7/2018	2/4/2019	1/16/2019	1/20/2019	2/1/2019	2/6/2019	2/14/2019	2/18/2019
				13:30	10:54	16:50	10:43	6:46	9:30	11:30	9:08	7:40	11:28	10:30	15:10	9:02	9:00	11:34	10:45	6:28
Ammonia-Nitrogen	Composite	SM4500NH3H	mg/L	NS	0.32	NS	0.25	NS	ND(<0.48)	0.11	NS	NS	0.11	0.38	NS	0.21	NS	(0.070)J	NS	0.11
Biochemical Oxygen Demand1	Grab	SM 5210B	mg/L	ND(<10)	NS	ND(<10)	NS	ND(<10)	NS	<60.45	ND(<10)	ND(<5.0)	NS	NS	ND(<10)	NS	ND(<5.0)	NS	ND(<10)	NS
Chemical Oxygen Demand1	Grab	SM 5220D	mg/L	64	NS	55	NS	35	NS	44	41	16	NS	NS	35	NS	ND(<7.4)	NS	41	NS
Kjeldahl Nitrogen	Composite	EPA 351.2	mg/L	NS	1.5	NS	1.9	NS	1.5	1.0	NS	NS	1.2	0.89	NS	1.3	NS	0.86	NS	1.1
Nitrate as N	Composite	EPA 300.0	mg/L	NS	0.99	NS	0.79	NS	0.35	0.73	NS	NS	0.73	0.44	NS	(0.17)J	NS	0.21	NS	0.48
Nitrite as N	Composite	EPA 300.0	mg/L	NS	ND(<0.059)	NS	ND(<0.059)	NS	ND(<0.059)	(0.099)J	NS	NS	(0.081)J	ND(<0.059)	NS	ND(<0.059)	NS	ND(<0.059)	NS	0.069
Organic Nitrogen	Composite	Calculation	mg/L	NS	1.2	NS	1.7	NS	1.5	0.9	NS	NS	1.1	0.51	NS	1.1	NS	0.8	NS	0.96
Total Nitrogen	Composite	Calculation	mg/L	NS	2.5	NS	2.7	NS	1.9	1.8	NS	NS	2.0	1.33	NS	1.5	NS	1.1	NS	1.6
Total Phosphorus	Composite	SM 4500P B E	mg/L	NS	0.31	NS	0.49	NS	0.46	0.45	NS	NS	0.8	0.57	NS	0.11	NS	0.14	NS	0.32
Ortho Phosphate Phosphorus	Composite	SM 4500P E	mg/L	NS	0.38	NS	0.14	NS	0.21	0.28	NS	NS	0.26	0.21	NS	ND(<0.016)	NS	ND(<0.016)	NS	0.094
Total Dissolved Solids	Composite	SM 2540C	mg/L	NS	92	NS	530	NS	350	150	NS	NS	150	170	NS	510	NS	470	NS	430
Total Hardness	Composite	SM 2340B/EPA 200.7	mg/L	NS	37	NS	240	NS	150	72	NS	NS	99	72	NS	240	NS	230	NS	220
Total Suspended Solids	Composite	SM 2540D	mg/L	NS	28	NS	130	NS	78	32	NS	NS	360	150	NS	14	NS	16	NS	150
Notes:																				
1. Biochemical Oxygen Demand an	nd Chemical Oxy	gen Demand were analyzed	l for the fi	rst discrete grab s	sample only.															
mg/L = milligrams per liter																				
ug/L = micrograms per liter																				
mg/kg = milligrams per kilogram																				
NS = Not Sampled																				
ND = Parameter not detected at the	e indicated detect	ion limit.																		
J = Qualified with a "J" flag, result	s were evaluated	to the Method Detection L	imit (MD	L). The reported	concentration is >	MDL and < Reporti	ng Limit (RL) and is	estimated.												
SM = standard method																				
EPA - U.S. Environmental Protect	ion Agency																			

EPA = U.S. Environmental Protection Agency

## San Jacinto Watershed Nutrient TMDL Monitoring Stormwater QA/QC Sample Analysis Summary - 2018-2019

Analyte	Sample Type	Method	Units	S-03-112918 DUP	S-03-113018-DUP	S-03-112918 FB	S-03-113018-FB
				11/29/2018	11/30/2018	11/29/2018	11/30/2018
				13:30	10:54	14:00	12:15
Ammonia-Nitrogen	Composite	SM4500NH3H	mg/L	NS	0.32	NS	ND(<0.048)
Biochemical Oxygen Demand <sup>1</sup>	Grab	SM 5210B	mg/L	ND(<10)	NS	ND(<2.5)	NS
Chemical Oxygen Demand <sup>1</sup>	Grab	SM 5220D	mg/L	69	NS	ND(<7.4)	NS
Kjeldahl Nitrogen	Composite	EPA 351.2	mg/L	NS	1.2	NS	0.5
Nitrate as N	Composite	EPA 300.0	mg/L	NS	0.92	NS	0.52
Nitrite as N	Composite	EPA 300.0	mg/L	NS	ND(<0.059)	NS	ND(<0.059)
Organic Nitrogen	Composite	Calculation	mg/L	NS	0.9	NS	0.5
Total Nitrogen	Composite	Calculation	mg/L	NS	2.1	NS	1.0
Total Phosphorus	Composite	SM 4500P B E	mg/L	NS	0.32	NS	ND(<0.0028)
Ortho Phosphate Phosphorus	Composite	SM 4500P E	mg/L	NS	0.26	NS	ND(<0.016)
Total Dissolved Solids	Composite	SM 2540C	mg/L	NS	87	NS	140
Total Hardness	Composite	SM 2340B/EPA 200.7	mg/L	NS	38	NS	48
Total Suspended Solids	Composite	SM 2540D	mg/L	NS	30	NS	ND(<2)

Notes:

1. Biochemical Oxygen Demand and Chemical Oxygen Demand were analyzed for the first discrete grab sample only.

mg/L = milligrams per liter

ug/L = micrograms per liter

mg/kg = milligrams per kilogram

NS = Not Sampled

ND = Parameter not detected at the indicated detection limit.

J = Qualified with a "J" flag, results were evaluated to the Method Detection Limit (MDL). The reported concentration is > MDL and < Reporting Limit (RL) and is estimated.

SM = standard method

EPA = U.S. Environmental Protection Agency

APPENDIX B - QUARTERLY LAKE MONITORING REPORTS

QUARTER 1 – JULY TO SEPTEMBER 2019

# Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring 2019-2020 Quarter 1 Report



Prepared for: Lake Elsinore & San Jacinto Watersheds Project Authority 11615 Sterling Avenue Riverside, California 92503

Prepared by: Wood Environment and Infrastructure Solutions, Inc. 9210 Sky Park Court, Suite 200 San Diego, CA 92123

February 24, 2020



# Lake Elsinore

### Monitoring Dates

July 26, 2019, August 27, 2019 and September 26, 2019. Sampling is required monthly in Lake Elsinore during summer months (June – September) and bi-monthly during the remainder of the year (October – May).

### Monitoring Locations

Water quality monitoring took place at five locations in Lake Elsinore: Sites LE01, LE02, LE03 and the two in-lake data sondes maintained by Elsinore Valley Municipal Water District (EVMWD): the Lakeshore Sonde and the Grand Avenue Sonde. These sites are depicted in Figure 1.

### Weather

July 26, 2019 – Clear and hot, high of 102°F, WNW winds up to 12 mph in the afternoon. August 27, 2019– Sunny and clear. Hot. High of 100°F, WSW winds up to 12 mph in the afternoon. September 26, 2019 – Little to no wind in the morning, up to 8 mph in the late afternoon. Overcast skies and mild with a high of 77°F.

### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the project specific Work Plan and there were no equipment failures or delay. Field monitoring included the following activities at each location or where noted:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen; (All stations)
- Depth-integrated water chemistry sample for Total Dissolved Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus; (Site LE02 only)
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples; (Site LE02 only)
- Secchi disk measurements; (All stations)
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed; (Site LE02 only)
- Visual observations and photos of lake conditions.

A summary of water quality profile data are presented in Tables 1 through 3 and results of the water chemistry analyses are presented in Tables 4 through 6.

Satellite imagery of chlorophyll-a estimated concentrations, turbidity, and harmful algal bloom (HAB) probability based on remote sensing data are presented in Figures 2 through 10. Data gaps in the satellite images may be due to cyanobacterial slicks on the surface of the lake.

Copies of field datasheets are provided in Appendix A.



Figure 1. Lake Elsinore Sampling Locations

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	Water Column Mean
		Temp (°C)	29.0	27.6	27.2	27.1	27.0	26.8	26.8			27.4
	10.50	Sp. Cond (µS/cm)	3655	3647	3646	3645	3645	3645	3647		-	3647
LEUI	10.50	рН	9.12	9.05	9.00	8.98	8.96	8.94	8.94			9.00
		DO (mg/L)	8.3	4.5	3.4	2.4	1.8	2.3	1.1			3.4
		Temp (°C)	27.6	27.5	27.4	27.3	27.2	27.2	27.2	27.1		27.3
1 Eoop	00.25	Sp. Cond (µS/cm)	3646	3646	3647	3647	3646	3646	3646	3646	-	3646
LE02	00.35	рН	9.11	9.07	9.04	9.03	9.02	9.02	9.01	9.00		9.04
		DO (mg/L)	6.3	4.0	3.3	2.9	2.8	2.5	2.2	1.9		3.2
		Temp (°C)	27.7	27.6	27.6	27.5	27.5	27.4	-			27.6
1 502	00.05	Sp. Cond (µS/cm)	3645	3644	3643	3643	3643	3644	1	-	-	3644
LLUJ	00.05	рН	9.11	9.10	9.07	9.06	9.06	9.04				9.07
		DO (mg/L)	5.6	5.6	4.3	3.9	3.7	2.6	-	-	-	4.3
		Temp (°C)	28.5	28.3	27.6	27.3	27.2	27.2	27.1	26.9		27.5
Lakeshore	10.35	Sp. Cond (µS/cm)	3650	3648	3647	3647	3646	3646	3646	3646		3647
Sonde <sup>c</sup>	10.55	рН	9.15	9.13	9.02	8.98	8.94	8.93	8.93	8.89		9.00
		DO (mg/L)	9.7	7.8	3.6	2.6	1.5	1.3	0.3	0.3	-	3.4
		Temp (°C)	28.6	27.8	27.6	27.3	27.2	27.1	26.8	-	-	27.5
Grand Ave	10.15	Sp. Cond (µS/cm)	3650	3645	3646	3647	3647	3646	3646			3647
Sonde	10.15	pН	9.12	9.06	9.00	8.97	8.96	8.94	8.87			8.99
		DO (mg/L)	9.2	5.9	3.6	2.8	2.2	1.8	0.3			3.7

Table 1. Lake Elsinore *In-situ* Water Column Profile – July 26, 2019

a- Bottom depth measurement taken at 5.5 m

b- Bottom depth measurement taken at 6.5 m

c- Bottom depth measurement taken at 6.5 m

Afternoon measurements not taken during this monitoring event.

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	Water Column Mean
		Temp (°C)	28.4	27.4	26.9	26.8	26.6	26.4				27.1
	10.45	Sp. Cond (µS/cm)	3770	3767	3759	3758	3759	3759				3762
	10.45	рН	9.23	9.18	9.09	9.06	8.99	8.94				9.08
		DO (mg/L)	12.8	9.5	6.6	5.2	2.9	1.6				6.4
LEUT		Temp (°C)	30.5	28.2	26.9	26.5	26.5	26.4				27.5
	14.40	Sp. Cond (µS/cm)	3774	3781	3759	3759	3759	3760				3765
	14.40	pН	9.25	9.17	9.04	8.91	8.90	8.89				9.03
		DO (mg/L)	15.5	13.1	7.6	3.4	2.9	2.4				7.5
		Temp (°C)	26.8	26.8	26.7	26.7	26.5	26.5	26.5	26.4		26.6
	00.00	Sp. Cond (µS/cm)	3757	3757	3758	3760	3760	3759	3760	3760		3759
	06.00	рН	9.09	9.06	9.04	9.04	8.98	8.97	8.96	8.95		9.01
		DO (mg/L)	7.1	6.1	5.5	4.3	3.5	3.0	2.8	2.3		4.3
LE02		Temp (°C)	31.9	27.7	27.1	26.9	26.8	26.6	26.6	26.5		27.5
	15.05	Sp. Cond (µS/cm)	3787	3758	3760	3758	3885	3759	3759	3760		3778
	13.05	рН	9.24	9.24	9.09	9.02	8.97	8.93	8.93	8.91		9.04
		DO (mg/L)	13.2	14.5	10.1	6.1	4.4	2.9	3.1	2.1		7.1
		Temp (°C)	27.3	27.0	26.9	26.8	26.8	26.7				26.9
	10.30	Sp. Cond (µS/cm)	3753	3755	3753	3756	3757	3759				3756
	10.50	рН	9.19	9.1	9.07	9.04	9.02	8.98				9.07
I ⊑02 <sup>b</sup>		DO (mg/L)	10.3	6.6	5.9	4.5	4.0	3.0				5.7
LEUS		Temp (°C)	28.9	27.7	27.2	26.8	26.8	26.7				27.4
	15.20	Sp. Cond (µS/cm)	3749	3755	3759	3756	3758	3760				3756
	13.20	pН	9.39	9.28	9.05	8.98	8.96	8.93				9.10
		DO (mg/L)	17.9	15.8	4.9	4.2	3.3	2.0				8.02
		Temp (°C)	29.5	27.2	26.9	26.8	26.7	26.6	26.5	26.4		27.1
Lakeshore	16.00	Sp. Cond (µS/cm)	3766	3757	3757	3758	3760	3760	3760	3762		3760
Sonde	10.00	рН	9.30	9.15	9.05	9.01	8.98	8.95	8.94	8.89		9.03
		DO (mg/L)	15.4	14.0	7.0	4.7	3.8	3.4	1.8	0.5		6.3
		Temp (°C)	29.5	27.3	26.9	26.8	26.7	26.6	26.6			27.2
Grand Ave	15.35	Sp. Cond (µS/cm)	3766	3759	3757	3757	3758	3758	3759			3759
Sonde <sup>c</sup>	10.00	рН	9.29	9.16	9.04	8.99	8.97	8.96	8.95			9.05
		DO (mg/L)	14.4	10.3	5.7	4.3	3.6	3.3	3.2			6.4

Table 2. Lake Elsinore In-situ Water Column Profile – August 27, 2019

a- Bottom depth measurement taken at 6.5 m

b- Bottom depth measurement taken at 4.5 m

c- Bottom depth measurement taken at 5.5 m

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	Water Column Mean
		Temp (°C)	24.2	24.3	24.2	24.2	24.2	24.1				24.2
	7.40	Sp. Cond (µS/cm)	3850	3850	3850	3851	3850	3851				3850
	7.43	pН	9.29	9.27	9.26	9.23	9.18	9.14				9.23
		DO (mg/L)	6.8	6.7	6.5	5.8	3.4	2.7		-	-	5.3
LEUT		Temp (°C)	24.5	24.6	24.5	24.1	24.1	24.1				24.3
	14.00	Sp. Cond (µS/cm)	3851	3851	3852	3851	3851	3852				3851
	14:00	pН	9.30	9.30	9.29	9.20	9.17	9.15				9.24
		DO (mg/L)	9.1	8.7	8.8	4.3	3.6	3.2				6.3
		Temp (°C)	24.0	24.0	24.0	24.1	24.0	24.0	24.0	24.0		24.0
	Q·11	Sp. Cond (µS/cm)	3850	3852	3852	3852	3851	3852	3852	3852	-	3852
	0.11	рН	9.17	9.18	9.17	9.18	9.17	9.17	9.17	9.17		9.17
		DO (mg/L)	4.4	3.9	3.7	3.8	3.7	3.8	3.8	3.8	-	3.9
LE02		Temp (°C)	24.1	24.1	24.1	24.1	24.1	24.0	24.0	1	1	24.1
	12.51	Sp. Cond (µS/cm)	3850	3851	3851	3851	3852	3852	3852	-	-	3851
	13.51	рН	9.29	9.27	9.26	9.25	9.23	9.18	9.18			9.24
		DO (mg/L)	8.5	7.6	7.2	6.6	6.5	4.2	4.7			6.5
		Temp (°C)	23.8	23.9	23.9	23.9	23.9	23.9		1	1	23.9
	7.58	Sp. Cond (µS/cm)	3840	3843	3843	3845	3845	3845		-	-	3844
	7.50	pН	9.20	9.21	9.21	9.21	9.21	9.20				9.21
L Eosp		DO (mg/L)	6.1	5.9	5.6	5.6	5.5	5.5				5.7
LE03		Temp (°C)	24.6	24.5	24.5	24.0	23.9	23.9		-	-	24.2
	12.40	Sp. Cond (µS/cm)	3843	3844	3848	3846	3848	3847				3846
	13.40	pН	9.35	9.32	9.22	9.18	9.17	9.17				9.24
		DO (mg/L)	11.6	10.1	5.3	5.0	4.7	4.2				6.8
		Temp (°C)	24.7	24.1	24.0	24.0	24.0	24.0	24.0	24.0	-	24.1
Lakeshore	10.20	Sp. Cond (µS/cm)	3855	3855	3853	3852	3852	3852	3852	3852		3853
Sonde <sup>c</sup>	10.20	рН	9.25	9.24	9.18	9.17	9.17	9.16	9.16	9.16		9.19
		DO (mg/L)	6.8	5.9	3.9	3.8	3.6	3.6	3.6	3.4		4.3
		Temp (°C)	24.4	24.0	24.0	23.9	23.9	23.9	23.9			24.0
Grand Ave	10.45	Sp. Cond (µS/cm)	3865	3852	3852	3850	3850	3850	3850			3853
Sonde <sup>d</sup>	10.43	рН	9.24	9.20	9.21	9.22	9.22	9.22	9.20			9.22
		DO (mg/L)	6.7	4.8	5.1	5.2	5.7	5.5	4.9			5.4

 Table 3. Lake Elsinore In-situ Water Column Profile – September 26, 2019

a- Bottom depth measurement taken at 6.4m during morning profile readings

b-Bottom depth measurement taken at 4.5m and 4.6m for morning and afternoon readings, respectively.

c- Bottom depth measurement taken at 6.4m

d-Bottom depth measurement taken at 5.7m

Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02
SM 2540C	Total Dissolved Solids	mg/L	40	2000 <sup>3</sup>	Depth Integrated	<u>2100</u>
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND
EPA 351.2	Kjeldahl Nitrogen	mg/L	0.4	NA	Depth Integrated	4.3
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	4.3
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.2 <sup>c1</sup> CCC: 0.2 <sup>c1</sup>	Depth Integrated	0.11
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.019 J
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.116
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Surface (0-2m)	63.5
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Depth Integrated	61.4

Table 4. Water Chemistry for Lake Elsinore – July 26, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

° - Values are site specific dependent upon pH and temperature recorded at each location. Target based on equations in 2004 TMDL

permit Table 5-9n. <sup>d</sup> - Summer average

<sup>1</sup> – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL

<sup>2</sup> – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL <sup>3</sup> – Santa Ana Region Basin Plan Objective

RL - Reporting Limit

TMDL - Total Maximum Daily Load

NA - Not applicable/ available

ND - Not detected

J - concentration between MDL and RL (estimated)

Bold Underline - Indicates exceedance of Basin Plan

		<b>,</b>			,	
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02
SM 2540C	Total Dissolved Solids	mg/L	20	2000 <sup>3</sup>	Depth Integrated	<u>2200</u>
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND
EPA 351.2	Kjeldahl Nitrogen	mg/L	0.4	NA	Depth Integrated	4.2
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	4.2
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.3 <sup>c1</sup> CCC: 0.22 <sup>c1</sup>	Depth Integrated	0.12
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	ND
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.104
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Surface (0-2m)	81.9
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Depth Integrated	99.1

# Table 5. Water Chemistry for Lake Elsinore – August 27. 2019

Notes: <sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

°- Values are site specific dependent upon pH and temperature recorded at each location. Target based on equations in 2004 TMDL permit Table 5-9n. <sup>d</sup> - Summer average

 $^{1}$  – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL  $^{2}$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

<sup>3</sup> – Santa Ana Region Basin Plan Objective

**RL-Reporting Limit** 

TMDL- Total Maximum Daily Load NA – Not applicable/ available

ND – Not detected

Bold Underline - Indicates exceedance of Basin Plan

			oopto			
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02
SM 2540C	Total Dissolved Solids	mg/L	40	2000 <sup>3</sup>	Depth Integrated	<u>2200</u>
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND
EPA 351.2	Kjeldahl Nitrogen	mg/L	0.2	NA	Depth Integrated	5.1
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	5.1
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.03 <sup>c1</sup> CCC: 0.21 <sup>c1</sup>	Depth Integrated	ND
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	ND
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.108
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Surface (0-2m)	165
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>d1</sup> , 40 <sup>d2</sup>	Depth Integrated	128

### Table 6. Water Chemistry for Lake Elsinore – September 26, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

°- Values are site specific dependent upon pH and temperature recorded at each location. Target based on equations in 2004 TMDL

permit Table 5-9n. <sup>d</sup> - Summer average <sup>1</sup> – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL

 $^{\rm 2}$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL <sup>3</sup> – Santa Ana Region Basin Plan Objective

RL-Reporting Limit TMDL- Total Maximum Daily Load

NA – Not applicable/ available ND – Not detected

Bold Underline - Indicates exceedance of Basin Plan



Figure 2. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations July 26, 2019 Data gaps in northwest corner of lake are due to reflected sunglint



Figure 3. Satellite Imagery of Lake Elsinore Turbidity Measurements July 24, 2019 Data gaps in northwest corner of lake are due to reflected sunglint



wood.

Harmful Algal Bloom (HAB) Indicator Likelihood Lake Elsinore July 26, 2019 Satellite Flyover Event 0 400 800 N Meters

Figure 4. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood July 26, 2019 Data gaps in northwest corner of lake are due to reflected sunglint



Figure 5. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations August 27, 2019



Figure 6. Satellite Imagery of Lake Elsinore Turbidity Measurements August 27, 2019



Figure 7. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood August 27, 2019



Figure 8. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations September 26, 2019



Figure 9. Satellite Imagery of Lake Elsinore Turbidity Measurements September 26, 2019



Figure 10. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood September 26, 2019

# Canyon Lake

### Monitoring Dates

August 27, 2019. Pre-alum application water quality monitoring was also performed during this monitoring event. Year-round bi-monthly monitoring is required for Canyon Lake.

### **Locations**

Four locations were sampled in Canyon Lake: Sites CL07, CL08, CL09 and CL10. These sites are depicted in Figure 11.

### <u>Weather</u>

August 27, 2019– Sunny and clear. Hot. High of 101°F, WSW winds up to 12 mph in the afternoon.

### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the TMDL Work Plan for the August 27<sup>th</sup> event and there were no equipment failures or delays. Field monitoring included the following activities at each location or where noted:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen;
- Depth-integrated (surface-to-bottom) water chemistry samples for Total Dissolved Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus, Total and Dissolved Aluminum;
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples;
- Secchi disk measurements;
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed;
- Visual observations and photos of lake conditions.

A summary of water quality profile data are presented in Table 7. Results of the water chemistry analyses are presented in Table 8.

Satellite imagery of chlorophyll-a, turbidity, and HAB probability based on remote sensing data are presented in Figures 12 through 14. Satellite chlorophyll-a estimated concentrations in portions of the eastern arm of Canyon Lake, and portions of the main lake body are impacted by, an "edge-effect" of the nearby land mass, the consequence of which can be artificially elevated chlorophyll-a concentrations. These data have been flagged and removed from the maps.

Copies of field datasheets are provided in Appendix A.



Figure 11. Canyon Lake Sampling Locations
Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	14 m	15 m	16 m	17 m	Water Column Mean - All	Water Column Mean - Epilimnion	Water Column Mean - Hypolimnion
		Temp (°C)	28.1	28.0	27.8	27.8	27.7	26.6	21.9	18.3	15.5	14.8	14.1	13.8	13.7	13.5	13.4				20.3	27.9	13.9
CL 07 <sup>a</sup>	10.15	Sp. Cond (µS/cm)	725	725	724	724	724	724	678	644	627	624	616	623	624	618	624				668	724	621.5
CLU7	10.15	pН	8.50	8.52	8.53	8.51	8.51	7.71	7.18	7.00	7.06	7.09	7.10	7.08	7.15	7.17	7.08				7.61	8.51	7.11
		DO (mg/L)	7.3	7.3	7.2	7.1	7.1	2.0	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2				2.7	7.2	0.2
		Temp (°C)	29.6	29.1	28.4	28.0	27.8	25.8	20.5	17.4	15.5	14.6	14.1	13.8	13.7	13.5	13.5			-	20.4	28.6	13.9
CI 07 <sup>8</sup>	15:30	Sp. Cond (µS/cm)	712	728	723	723	724	726	667	644	625	621	619	626	625	624	628				668	722	624
CL07	13.30	pН	8.52	8.57	8.56	8.52	8.49	7.69	7.12	7.13	7.20	7.26	7.32	7.35	7.41	7.44	7.39				7.73	8.53	7.36
		DO (mg/L)	7.8	7.9	7.7	7.5	7.2	1.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2				2.7	7.6	0.2
		Temp (°C)	28.4	28.0	28.0	27.9	27.8	26.3	21.6	17.7	16.2										24.7	28.0	16.2
CL OP <sup>b</sup>	00.30	Sp. Cond (µS/cm)	718	717	718	718	721	710	676	640	635										695	718	635
CLUO	09.30	pН	8.52	8.50	8.50	8.49	8.42	7.53	7.13	6.99	6.98										7.90	8.49	6.98
		DO (mg/L)	7.5	7.4	7.3	7.2	6.5	0.4	0.3	0.3	0.3		-	1						-	4.1	7.2	0.3
		Temp (°C)	28.9	29.0	28.3	28.1	27.8	26.9	22.0	16.9	16.0		-	1					-	-	24.9	28.4	16.0
CL 09b	15.10	Sp. Cond (µS/cm)	710	720	717	718	719	712	663	637	634		-	1						-	692	717	634
CLUO	10.10	pН	8.61	8.61	8.60	8.61	8.47	7.75	7.36	7.13	7.21		-	-							8.04	8.58	7.21
		DO (mg/L)	8.3	8.3	8.0	7.9	7.0	1.0	0.3	0.3	0.2										4.6	7.9	0.2
		Temp (°C)	27.7	27.7	27.7	27.5	26.3	20.7	17.3												25.0	27.7	17.3
CL 00	09.45	Sp. Cond (µS/cm)	867	868	868	874	917	910	903												887	869	903
CLU9	00.45	pН	8.79	8.78	8.76	8.55	7.55	6.89	6.90	-	1		-	1					-	-	8.03	8.72	6.90
		DO (mg/L)	8.1	8.1	8.0	6.3	0.4	0.3	0.2												4.5	7.6	0.2
		Temp (°C)	29.6	28.3	27.8	27.5	26.6	21.3	17.2	1	1		-	1						1	25.5	28.3	17.2
CL 00	14.55	Sp. Cond (µS/cm)	851	866	883	898	913	923	903	1	1		-	1					-	-	891	875	903
OL03	14.00	pН	8.77	8.73	8.72	8.40	7.64	6.80	6.84	-	1		-	1						-	7.99	8.66	6.84
		DO (mg/L)	9.1	9.4	9.0	6.4	0.7	0.3	0.3	-	-		-	1						-	5.0	8.5	0.3
		Temp (°C)	27.4	27.3	27.4	27.4															27.4		
CI 10 <sup>c</sup>	07:20	Sp. Cond (µS/cm)	922	922	922	921															922		
CLIU	07.30	рН	8.70	8.69	8.68	8.68															8.69		
		DO (mg/L)	6.9	6.8	6.9	6.8							-	-							6.9		
		Temp (°C)	31.0	29.5	27.9	27.6				-	1		-	1						-	29.0	-	
CI 10 <sup>c</sup>	14:45	Sp. Cond (µS/cm)	898	917	944	924															921		
0110	14.45	pН	8.69	8.72	8.58	8.29				-										-	8.57		
		DO (mg/L)	9.2	10.0	8.6	6.1															8.5		

Table 7. Canyon Lake In situ Water Column Profile – August 27, 2019

Hypolimnion

Epilimnion

Thermocline

No Shading - Indicates that there is no stratification

a- Bottom measurement in the afternoon taken at 13.5m

b- Bottom measurement in the afternoon taken at 7.5m

c- Bottom measurement in the afternoon taken at 2.5m

	-			,					
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	CL07	CL08	CL09	CL10
SM 2540C	Total Dissolved Solids	mg/L	10	700 <sup>3</sup>	Depth Integrated	370	420	560	600
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	3.4	1.3	10	ND
EPA 300.0	Nitrate as N	mg/L	0.2	10	Depth Integrated	ND	ND	ND	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND	ND	ND	ND
EPA 351.2	Kjeldahl Nitrogen	mg/L	0.1-0.2	NA	Depth Integrated	2.1	0.97	2.9	1.2
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	2.1	0.97	2.9	1.2
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 2.25-16.76 <sup>c1</sup> CCC: 0.35-2.71 <sup>c1</sup>	Depth Integrated	1.3	0.18	1.9	ND
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.23	0.016J	0.025J	ND
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.239	0.044	0.085	0.039 F
EPA 200.7	Total Aluminum	μg/L	100	NA	Depth Integrated	ND	34 J	75 J	230
EPA 200.7	Dissolved Aluminum	μg/L	100	NA	Depth Integrated	ND	ND	ND	47 J
EPA 10200 H	Chlorophyll-a	μg/L	1.0	25 <sup>b1</sup> , 40 <sup>b2</sup>	Surface (0-2m)	6.66	6.66	13.8	19.9
EPA 10200 H	Chlorophyll-a	μg/L	1.0	25 <sup>b1</sup> , 40 <sup>b2</sup>	Depth Integrated	33.3	36.3	64.5	19.5

#### Table 8. Canyon Lake Water Chemistry – August 27, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature. Target based on equations in 2004 TMDL permit Table 5-9n.

<sup>1</sup> – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL

<sup>2</sup> – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

<sup>3</sup>- Santa Ana Region Basin Plan Objective

RL-Reporting Limit

TMDL- Total Maximum Daily Load

NA – Not applicable/available

NS - Not sampled; ND - Not detected

 $J-\mbox{concentration}$  between MDL and RL (estimated)

F- Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) was outside acceptance limits

Bold Underline - Indicates exceedance of Basin Plan

Wood E&I Solutions, Inc. 2019-20 Lake Elsinore and Canyon Lake Nutrient TMDL In-Lake Monitoring Quarter 1 Report February 24, 2020



Figure 12. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations August 27, 2019Data near the edges of the main lake body and narrow portions of the eastern arm have been flagged due to mixing of water and land data pixels, and have been removed from the dataset (i.e. blacked out).

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Figure 13. Satellite Imagery of Canyon Lake Turbidity Measurements August 27, 2019



Figure 14. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood August 27, 2019 Data near the edges of the main lake body and narrow portions of the eastern arm have been flagged due to mixing of water and land data pixels, and have been removed from the dataset (i.e. blacked out). Appendix A Field Datasheets July 26, 2019 Field Datasheets

#### FIELD DATASHEET

Date: 07/26/2019 Location	(Circle) Lake Elsinore/Canyon Lake Station: LEO
Time on Station: $1050$	Time off Station: 1110
Weather Conditions: sunny	Wind (mph & direction): ()
Lat: on target	Long: On target
Water Depth (m): $5.8$	Secchi Depth (m): 0.4
Water Chemistry Sample?: Y N	Chl-a Sample?: Y N Surface volume filtered (ml): Fisherral management
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll
	(~500 mL fill volume preferred)

#### Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH	DO (mg/L)
0	29.0	3655	9.12	8.3	15				
1	27.6	3647	9.05	e. L	16				
2	27.2	3646	9.00	3.4	17				
3	27.1	3645	8.98	2.4	18				
4	27.0	3645	8.96	1.8	19				
5	26.8	3645	8.94	2.3	20				
65.5	2.6.8	3647	8.94	1.1	21				
7					22				
8 .					23			·	
9					24				
10					25				
11					26				
12					27				
13					28				
14					29				

10-

### FIELD DATASHEET

Date: 07/26/2019 Location	(Circle): Lake Elsinore/Canyon Lake	Station: Lakeshore
Time on Station: 1035	Time off Station: 1045	
Weather Conditions: Sunny	Wind (mph & direction	n):
Lat: on target	Long: on target	
Water Depth (m): $7.1$	Secchi Depth (m): 0.4	
Water Chemistry Sample?: Y /	Chl-a Sample?: Y / 🕅 Surface volume filtered (ml):	Plankton Sample?: Y (N)
	Depth-Integrated volume filtered (ml)	,
	*Do not exceed 7 PSI or 14 in. Hg whe	on filtering chlorophyll
	(~500 mL fill volume preferred)	

Comments:

surface Sonde Lost

		· · · ·					Chialk	(FU)	
Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH	DO (mg/L)	Depth (m)	Chig (26)	Sp. Cond (uS/cm),	PHI	(mg/L)-
0	28.5	3650	9.15	9.7	<b>1/</b> 5	27.7	6.9		
1	28.3	3648	9.13	7.8	<sup>(</sup> 16)	34.64	8.61		
2	27.6	3647	9.02	3.6	14	35.45	8.91		
3	27.3	3647	8,98	2.6	48	33.36	8,37		
4	27.2	3646	8.94	1.5	19/	31.78	7.95		
5	27.2	3646	8,93	1.3	20	31.53	7.89		
6	27.1	3646	8.93	0.3	21	31.75	7.96		
16.5	26.9	3646	8.89	0.3	22/	33.89	8.47		
8					/23				
9					24				
10					25/				
11					26				
12					27				
13					28		. <u>.</u>		
14					29)				

Lake Elsinore and Canyon Lake TNTP Offset Monitoring 2018-19

#### FIELD DATASHEET

Date: 07/26/2019 Location	(Circle): Lake Elsinore Canyon Lake Sta	tion: Grand Ave	Sonde
Time on Station: 1015	Time off Station: 1030		
Weather Conditions: Sunny	Wind (mph & direction): (	)	
Lat: on target	Long: <u>ontarget</u>		
Water Depth (m): $(0, 4)$	Secchi Depth (m): 0.4	<u> </u>	
Water Chemistry Sample?: Y	Chl-a Sample?: Y (N) Algae Surface volume filtered (ml):	Sample?: Y	
· · · · · ·	Depth-Integrated volume filtered (ml):		
	*Do not exceed 7 PSI or 14 in. Hg when filter	ring chlorophyll	n. 1
	(~500 mL fill volume preferred)	:	

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pН	DO (mg/L)	chla (Hg/L)	chla (RFO)
0	28.6	3650	9.12	9.2	31.38	7.83
0.5	27.8	3646	9.07	8.0	31.69	7.88
1	27.8	3645	9.06	5.9	35.60	8.41
2	27.6	3646	9.00	3.6	36.78	8.95
3	27.3	3647	8,97	2,8	35.03	8.45
4	27.2	3647	8.96	2.2	34.11	8.40
5	27.1	3646	8,94	[.8	32.00	7.63
6	26.8	3646	8.87	6.3	33.2	8.17
7						
8	·.			· · · · · · · · · · · · · · · · · · ·		
9	·			·		
10						
11						1
12	•					)
13						1

\* replace Do caps next month

Lake Elsinore and Canyon Lake TNTP Offset Monitoring 2018-19

## FIELD DATASHEET

Date: 0726 Location	(Circle): Lake Elsinore/Canyon Lake Station: <u>LE02</u>
Time on Station: 0835	Time off Station:
Weather Conditions: <u>Sunny</u>	Wind (mph & direction): O
Lat: <u>On target</u>	Long: on target
Water Depth (m): 6.9	Secchi Depth (m): 0.5
Water Chemistry Sample?: Y / N	Chl-a Sample?: Y / NAlgae Sample?: Y / NSurface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	**Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll
	(~500 mL fill volume preferred)

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pН	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Chia
0 *	27.5	3646	9.11	6.3	79.8	8.02	21.9091C 5.41 RFU
0.5	27.6	3646	9.09	4.9	79.9	8.05	31.2 "9/
1	27.5	3646	9.07	4.0	80.7	8.00	(+. +0 RFO
2	27.4	3647	9.04	3.3	81.0	8.62	
3	27.3	3647	9.03	2.9	81.3	9.36	
4	27,2	3646	9.02	2.8	81.4	9.23	
5	27.2	3646	9.02	2,5	81.5	8.78	
6	27.2	3646	9.01	2.2	81.6	8.60	
16.5	27.1	3646	9.00	1.9	81.4	8.61	
8		·					_
9							
10							
11						*	
12							_
13							

### FIELD DATASHEET

Date: 07/26/2019 Location (	Circle) Lake Elsinore Canyon Lake Station: LE 03
Time on Station: 0805	Time off Station: 0830
Weather Conditions: <u><u>Sunny</u></u>	Wind (mph & direction): 0830
Lat: on target	Long: on target
Water Depth (m): 5.3	Secchi Depth (m): 0.4
Water Chemistry Sample?: Y /N	Chl-a Sample?: Y/N Plankton Sample?: Y/N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll
	(~500 mL fill volume preferred)

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pН	DO (mg/L)
0	27.7	3645	9.11	5.6	15				
1	27.6	3644	9.10	5.6	16				
2	27.6	3643	9.07	4.3	17				
3	27.5	3643	9.06	3.9	18		· ·		
4	27.5	3643	9.06	3.7	19				
5	27,4	3644	9.04	2.6	20		<u>-</u>		
6					21			-	
7					22				
8					23				
9					24				
10					25				
11					26				
12					27				
13					28				
14					29				

August 27, 2019 Field Datasheets

# FIELD DATASHEET

Date: 8/27.19 Location (	Circle): Lake Elsingre/Canyon Lake	Station: CLOF
Time on Station: 1015	Time off Station: 1160	
Weather Conditions: Junny, Clea	Wind (mph & direction	on): <u>~3-5mph</u>
Lat: On target	Long:	
Water Depth (m):	Secchi Depth (m):M	
Water Chemistry Sample?: Y / N	Chl-a Sample?: Y / N Surface volume filtered (ml):	Plankton Sample?: Y / N *
	Depth-Integrated volume filtered (m	l)
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> w (~500 mL fill volume preferred)	hen filtering chlorophyll

Comments:

·		Sp					Sn	ĸ	
Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
(Q	28.1	725	8.60	7.26	12	13.7	623.6	7.15	0.20
1	28.0	725	8.52	7.30	13	13,5	617.8	7.17	0.2D
2	27.8	724	8.53	7.24	14135	13.4	623.7	7.08	0.20
3	27.8	724	8,51	7.11	15		· · ·		·
4	27.7.	724	8.51	7.07	16				· . 
5	26.4	724	7,71	1.97	17				
6	21.9	678	7,18	0.35	18				
7	18.3	(044	7.00	6.28	19				
8	15.5	627	7.00	0.23	20				
9	14.8	623.8	7.09	0.23	21				
10	14.1	(erro.2	7.10	0.22	22				
11	13.8	U23.2	7.08	0.21	23		·		

### FIELD DATASHEET

Date: $\frac{2}{27/19}$ Location (C	ircle): Lake Elsinore/Canyon Lake Station: <u>CLO</u>
Time on Station: 1530	Time off Station: 1545
Weather Conditions: Ocar + Sing	Wind (mph & direction):
Lat: On Target	Long:
Water Depth (m): 14	Secchi Depth (m): $ZO_{m}$
Water Chemistry Sample?	Chl-a Sample?: Y / V Plankton Sample?: Y / V
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred)

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	29.10	712	8,52	7.77	12 <sup>′</sup>	13,7	625	7.41	0.22
1	29.1	728	8.57	7.86	13	13.5	(024	7.44	0.22
2	28.4	723	8.50	7.74	14/15	13.5	628	7.39	0.20
3	28.0	723	8.52	7.53	15			•	
4	27,8	724	8,49	7.17	16				
5	25,8	724	FIA	1.0A	17				
6	20,5	ULIT	7.12	0.29	18				
• 7	17.4	644	7,13	0.25	19				
8	15.5	625	7,20	0.24	20			-	
9	14.6	621	7.26	0.23	21				
10	14.1	619	7.32	0,23	22				
11	13.8	626	7.35	0.22	23				

### FIELD DATASHEET

Date: \$/27/19 Location (	Circle): Lake Elsinore/Canyon Lake	Station: <u>CLQP</u>
Time on Station: 0930	Time off Station: 0950	— . · · · · · · · · · · · · · · · · · ·
Weather Conditions: Colm + Son	Wind (mph & din	rection): 1-2 5W
Lat: On Truset	Long:	·
Water Depth (m): $\frac{7.95}{1000}$	Secchi Depth (m):	8
Water Chemistry Sample?: $M / N$	Chl-a Sample?: XN Surface volume filtered (ml):	Plankton Sample?: YN
	Depth-Integrated volume filtere	d (ml):
	*Do not exceed 7 <b>PSI</b> or 14 in. E (~500 mL fill volume preferred	Ig when filtering chlorophyll

Comments:

		Morn	,	· •		A	Arrow,	n els	510
Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	28.4	718	8.52	7.53	12 B	Z8.9	710	8.61	834
1	28.0	717-	8.50	7.44	13	29.0	720	8.11	b.30
2	28.0	718	8,50	7,33	142	78,3	717	4.60	8.03
3	27,9	718	8.49	7, Z (	153	28.1	718	3.61	7.85
4	Z7.8	72	8.4Z	6.53	16.4	27.8	719	8.47	6.97
5	z6.3	710	7,53	0-40	17S	26.1	712	7.75	0,95
6	0.21.6	176	7.13	0,31	18 (	22.0	663	7.31	0,31
7 -	17,7	640	8.99	0.26	19 Z	6.9	637	7.13	0,26
875	11,2	635	6.98	0,25	2075	16.0	134	7.21	0,24
9					21				
10					22				
11					23				

### FIELD DATASHEET

Date: 8.27.19 Location	(Circle): Lake Elsinore/Canyon Lake	> Station: $CL DQ$
Time on Station: 0845	Time off Station: 0915	· · · · · ·
Weather Conditions: SIMMY , CIE	Wind (mph & dire	ection): <u>~3-5mph</u>
Lat: ON Edropet	Long:	
Water Depth (m): $6, 7$	Secchi Depth (m):	.9
Water Chemistry Sample?: $\partial Y / N$	Chl-a Sample?:	Plankton Sample
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 PSI or 14 in. Hg (~500 mL fill volume preferred)	when filtering chlorophyll

Comments:

	. 1	Marny				A	tonia	n Ø	1455
Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	Z7,7	867	8,79	8.13	12-0	29.6	851	8.77	9.14
1	27.7	868	3,78	8,12	13	ZS.3	866	8.73	9.43
2	27.7	868	8.76	7.96	14 Z	272	883	8,72	9,00
3	27,5	874	3.55	6.34	153	27.S	898	8.40	6.36
4	26.3	917	7.55	0.39	16 4	26.6	913	7.64	0.74
5	20.7°	910	6.89	0.28	175	21,3	923	6.80	0.32
6	17.3	903	6.90	0.24	186	17,2	903	134	0,28
7					19		· · · · ·	e. P	
8					20				
9					21				
10					22			,	
11					23				

### FIELD DATASHEET

Date: 8/27/19 Location (Cir	rcle): Lake Elsinore/Canyon Lake	Station: CLID
Time on Station: <u>6730</u>	Time off Station: $0830$	
Weather Conditions: Clear, Sunn	Wind (mph & direc	tion): <u>~3-5 mph</u>
Lat: On Target	Long:	
Water Depth (m): $2.95$	Secchi Depth (m):	<b>/</b>
Water Chemistry Sample?: Ø/ N	Chl-a Sample?: Ø/N Surface volume filtered (ml):	Plankton Sample?:
	Depth-Integrated volume filtered (	ml):

\*Do not exceed 7 **PSI** or **14 in. Hg** when filtering chlorophyll (~500 mL fill volume preferred)

Comments:

		Arrah	• •	. ·	•	L	Auro	co Q	1445
Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0 .	27.4	922	\$.70	6.93	p20	31.0	898	8.69	9.17
1	27,3	922	8.69	1.84	13	29.5	917	8.72	9.96
2	27.4	922	8.68	6.36	14 2	27.9	944	8,58	8.50
X.S	27.4	921	8.18	6.84	1525	27.0	924	8,29	6.09
4					16				
5					17				
6		:			18				
7					19	- -			
8					20				
9	· •				21				
10			* .		22				
11					23				

### FIELD DATASHEET

Date: 8-27-19 Location (C	ircle): Lake Elsinore/Canyon Lake-	> Station: NOAN SKI aveg
Time on Station: 1400	Time off Station: 1415	
Weather Conditions: Sunny hot	Wind (mph & dire	ection): $\sqrt{3}$ MPN
Lat: ON target	Long:	
Water Depth (m): $u.5 m$	Secchi Depth (m):	·
Water Chemistry Sample?: Y / 🕅	Chi-a Sample?: Y / 🕅 Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 <b>PSI</b> or 14 in. H	g when filtering chlorophyll

### Comments:

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	18.5	423	8.47	8.78	12				
1	28.1	627	8,40	8.35	13				
2	27.8	428	8,28	7.52	14			· .	
3	27.6	429	8.04	6.27	15			I	
4	27.4	431	7.92	5,34	16				
5	27.D	1033	7.92	LUF	17		• .		
6	24.7	635	6.78	0,30	18				
7					19		·		
8					20				
9					21				
10					22				
11					23				

### FIELD DATASHEET

Date: 8/27/2019 Location (	Circle): Lake Elsinore Canyon Lake	Station: LEO1
Time on Station: 0:45	Time off Station: 0:00	
Weather Conditions: Sung 164	Calm Wind (mph & direction	on): <u>none</u>
Lat: 33066098	Long: -17.36419	· · ·
Water Depth (m): 70 5.4	Secchi Depth (m): 63M	
Water Chemistry Sample?: Y	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered (ml	):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> wł (~500 mL fill volume preferred)	en filtering chlorophyll
Comments:		

Depth (m)	Temp (°C)	Sp. Cond (µS/çm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	28.4	3700	9.23	12.77	12				
1	27.4	3767	9.18	9.63	13		-		
2	26.9	37.59	9.09	6.60	14	-			
3	26.8	37.58	9.06	5.ZI	15				
. 4	26.6	37,39	8.99	2.89	16				
5	26.4	37.59	8.94	1.68	17				
6					18				
7					19				
8					20				
9					21				
10					22				· .
11					23				

# FIELD DATASHEET

Date: <u>8/27/201</u> 9 Location (	Circle: Lake Elsinore/Canyon Lake	Station: LEOI
Time on Station: U:40	Time off Station: 19:00	توريد
Weather Conditions:	St Wind (mph & dire	ection): 8-6=0MPH
Lat: 33.66898	Cled Long: -17.3	6419
Water Depth (m): $5.4 \text{ M}$	Secchi Depth (m):3	M
Water Chemistry Sample?: Y /	Chl-a Sample?: Y / N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. H</b> g (~500 mL fill volume preferred)	g when filtering chlorophyll

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
0	30.5	37.74	9.25	15.5	12				
1	28.2	3781	9.17	13.1	13				
2	26.9	3759	9.04	7.61	14				
3	26.5	3759	8.91	3.37	15				
4.	26.5	3769	8.90	2.90	16				
5	26.4	3760	8.89	2.43	17				
6					18				
7					19				
8			· · ·		20				
9					21				
10					22				
11					23		-		

### FIELD DATASHEET

Date: 8/2	7/2019	Loca	tion (Circ	le) Lake E	lsinore/Ca	nyon Lake	e St	ation:	FOZ
Time on Station: 10216									
Weather C	onditions:	Survey	Hot c	alm	Wind	(mph & di	rection):	None	
Lat: <u>3</u> 2	5-66-	34	- <b>-</b>	Lon	g:[	1.38	542		
Water Dep	oth (m):	1.7m		Seco	hi Depth	(m):	3		et al. Alternation
Water Che	emistry Sar	nple?(Y)/ N	Į (	Chl-a Samp Surface vol	ole?:(Y)/ N lume filter	red (ml):	950 <sup>Plan</sup>	kton Samp	ole (Y) N
LE-02	-Supp	The O	84 <b>0</b> 1 84 <b>0</b> 1	Depth-Inter Do not exc (~500 mL	grated volu eed 7 <b>PSI</b> fill volum	ume filtere or 14 in. I a preferre	d (ml): <u>}</u> Ig when filt d)	50 Fering chlo	rophyll
Comments: LE-07 Dept Inty ded The									
	De	ph may	) - MEC	1100		,			
	De	pr may	forme C Serv	my k :	083	0			·
Depth (m)	De Temp (°C)	Sp. Cond (µS/cm)	pH (units)	アノ 化 : DO (mg/L)	OT 3	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0	Temp (°C) Z6,8	Sp. Cond (μS/cm) 37 57	pH (units) 9.09	DO (mg/L) 7.\Z	083 Depth (m) 12	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1	De Temp (°C) 26.8 26.8	Sp. Cond (µS/cm) 37 <b>5</b> 7 37 <b>5</b> 7	pH (units) 9.09 9.06	DO (mg/L) 7.\Z 6.\3	083 Depth (m) 12 13	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1 2	De (°C) 26.8 26.8 26.7	Sp. Cond (µS/cm) 37 <b>5</b> 7 37 <b>5</b> 7 37 <b>5</b> 8	pH (units) 9.09 9.06 9.04	$DO \\ (mg/L) \\ 7.12 \\ 6.13 \\ 6.6 \\ 9.66 \\ 9$	O & ?         Depth         (m)         12         13         14	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1 2 3	De Temp (°C) 26.8 26.8 26.7 26.7	Sp. Cond (µS/cm) 3757 3757 3757 3758 3760	pH (units) 9.09 9.06 9.04 9.04	DO (mg/L) 7.\Z 6.\3 	O & ? Depth (m) 12 13 14 15	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1 2 3 4	Temp (°C) 26.8 26.8 26.7 26.7 26.7	Sp. Cond (µS/cm) 37.57 37.57 37.57 37.58 37.60 37.60	pH (units) 9.09 9.06 9.04 9.04 9.04 8.98	DO (mg/L) 7.\Z 6.\3 	O & ? Depth (m) 12 13 14 15 16	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1 2 3 4 5	Temp (°C) 26.8 26.8 26.7 26.7 26.5 26.5	Sp. Cond (µS/cm) 37 <b>5</b> 7 37 <b>5</b> 7 37 <b>5</b> 7 37 <b>6</b> 0 37 <b>6</b> 0 37 <b>6</b> 0	pH (units) 9.09 9.06 9.04 9.04 9.98 8.98 8.97	$\frac{DO}{(mg/L)}$ $\frac{7.12}{6.13}$ $\frac{6.5}{3.46}$ $\frac{4.3}{3.04}$	083 Depth (m) 12 13 14 15 16 17	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)
Depth (m) 0 1 2 3 4 5 6	Temp (°C) 26.8 26.8 26.8 26.7 26.7 26.5 26.5 26.5	Sp. Cond (µS/cm) 37.57 37.57 37.57 37.60 37.60 37.59 37.60	pH (units) 9.09 9.04 9.04 9.04 9.98 8.98 8.96	$\frac{DO}{(mg/L)}$ $\frac{7.12}{6.13}$ $\frac{6.3}{3.46}$ $\frac{3.04}{2.76}$	083 Depth (m) 12 13 14 15 16 17 18	C Temp (°C)	Sp. Cond (µS/cm)	. pH (units)	DO (mg/L)

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Wood Environment and Infrastructure Solutions, Inc.

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### FIELD DATASHEET

Date: <u>8/27/20</u> 9 Location (C	ircle). Lake Elsi	ingre Canyon Lake	Station: 170Z
Time on Station: 19:05	Time off Statio	on: 15°15	
Weather Conditions: Schny Hot,	Calm	Wind (mph & direction	): <u>S-6-10 MPH</u>
Lat: 33.6634	Long:	-117.3542	2
Water Depth (m): $6.7$	Secchi	Depth (m):3M	
Water Chemistry Sample?: Y /N	Chl-a Sample Surface volu	?: Y N ne filtered (ml):	Plankton Sample?:Y
	Depth-Integra	ated volume filtered (ml)	
	*Do not excee (~500 mL fi	d 7 <b>PSI</b> or <b>14 in. Hg</b> whe ll volume preferred)	n filtering chlorophyll

Comments:

2200ml in Cobi

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
. 0	31.9	3887	9.24	13.19	12				
1	17.7	3758	9.24	14.47	13				
2	7.7.1	3760	9.19	10.11	14				
3	26.9	3768	9.02	6.06	15				
. 4	26.8	3885	8.97	4.38	16				
5	26.6	3759	8.93	2.85	17		-		
6	26.6	3759	8.93	3.2	18				
7	76.5	3760	8.91	2014	19				
8			-		20				
. 9					21				
10					22				
11					23				

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	FIELD DATASHEET	
Date: 8/27/2019 Location	(Circle): Lake Elsinore Canyon Lake	Station: LEO3
Time on Station: 10:30	Time off Station: 10:35	
Weather Conditions: Schng He	wind (mph & direct	ction): <u>None</u>
Lat: 33.66494	Long: -17. 2416	5
Water Depth (m): $4.8 \text{ M}$	Secchi Depth (m):3	) W
Water Chemistry Sample?: Y /N	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered (	(ml):
	*Do not exceed 7 PSI or 14 in. Hg	when filtering chlorophyll
	(~500 mL fill volume preferred)	

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)
	0	17.3	3793	9.19	10.25	15				:
	1	27.0,	37.55	9.10	6.64	16		,		
	2	\$26.9	3753	9.07	5.91	17				
	3	26.8	37.56	9.04	4.5	18				
	4	26.8	37.57	9.02	3.98	19				
4.5	15	26.7	37.59	8.98	2.97	20				
	6					21				
	7					22				
	8					23			1	
	9					24				
	10					25				
,	11					26				
	12					27				
	13					28				
	14					29		1		

	FIELD DATASHEET	· · · · · · · · · · · · · · · · · · ·
Date: 8/27/2019 Location (C	ircle). Lake Elsinore/Canyon Lake	Station: 4503
Time on Station: 15:20	Time off Station: 16° 30	
Weather Conditions: Sanny, Hot	Wind (mph & direction	):
Lat: 33-654199	Long: -117, 24181	
Water Depth (m): <u>4.8</u> m	Secchi Depth (m): 3M	<u> </u>
Water Chemistry Sample?: Y	Chl-a Sample?: Y (N) Surface volume filtered (ml):	Plankton Sample?: YN
	Depth-Integrated volume filtered (ml):	
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> whe (~500 mL fill volume preferred)	n filtering chlorophyll

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	28.9	3749	9.39	17.9	12				-
	1	27.7	3755	9.28	16.8	13				
	2	27.2	3769	9.05	4.94	14				
	3	26.8	3756	8.98	4.24	15				
	4	16.8	3758	8.96	3.26	16				
4.5	5	26.7	3760	8.93	1.95	17				
	6		-			18				
	7	i N				19		· · · · · · · · · · · · · · · · · · ·	:	
	8					20				
	9					21				
	10					22				
	11					23			ļ	

### FIELD DATASHEET

Date: 8/27/2019 Location (0	Circle): Lake Elsinore/Canyon Lake	Station: 1-3Heshore
Time on Station: 6.00	Time off Station: 16:15	-
Weather Conditions: Hot Sommy Lat: 53.6657	Calwa Wind (mph & dire $Clear Long: -17.35$	ection): <u>S-6-10 MPH</u> Z81
Water Depth (m): $7.6$	Secchi Depth (m):	2m
Water Chemistry Sample?: Y / N	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> (~500 mL fill volume preferred)	g when filtering chlorophyll

Comments:

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pĤ (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	29.5	3766	9.30	15.35	12	/			
1	27.2	3757	9.15	14.00	13				
2	26.9	3757	9.05	7.01	14				
3	26.8	3758	9:01	4.71	15			° 9	
. 4 .	26.7	3760	8.98	3.84	16				i
5	26.6	3760	8,95	3.37	17			3	s
6	26.5	3760	8.94	1.8Z	18				
7	26.4	3762	8.89	0.48	19				
8					20		<i>‡</i> .		
9					21	~		۵	
10				*	22				
11			at .		23	r.			

### FIELD DATASHEET

Date: 8/27/2019 Location (0	Circle): Cake Elsinore Canyon Lake Station: Catand Neue	)
Time on Station: 15:35	Time off Station: 6:60	
Weather Conditions: 1-lot, Sanny	Clear, Wind (mph & direction): <u>S-6-10 MPH</u>	
Lat: 33.66050	Long: -117.35Z36	
Water Depth (m): <u>GoO</u>	Secchi Depth (m): $3n_1$	
Water Chemistry Sample?: Y /N	Chl-a Sample?: Y N Plankton Sample?: Y N	
	Depth-Integrated volume filtered (ml):	
•	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred)	

Comments:

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;	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	19.5	3766	9.29	14.41	12				
	1	17.3	3759	9.16	10.33	13				
	2	26.9	3757	9.04	5.74	14				
	3	26.8	3767	8.99	4.30	15				
	4	26.7	3758	897	3.60	16				
	5	26.6	3758	8.96	3,33	17				
5.5	6	26.6	3759	8.95	3.19	18				
	7			- · ·		19				
	8		- 			20				
	9					21		1		
	10					22				
	11					23				

### FIELD DATASHEET

Date: 8-27-19 Location (C	ircle): Lake Elsinore/Canyon Lake Station: <u>MNA SKi</u> aveq
Time on Station: 1400	Time off Station: 1415
Weather Conditions: Sunny Not	Wind (mph & direction): $\sqrt{3}$ MDN
Lat: ON FAVQLE	Long:
Water Depth (m): $(\mu, 5 \text{ m})$	Secchi Depth (m):
Water Chemistry Sample?: Y / 🕅	Chl-a Sample?: Y / Plankton Sample?: Y / N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred)

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	28.5	623	8.47	8.78	12				
1	28.1	627	8,40	8,35	13				
2	27.8	428	8,28	7.52	14				
3	27.6	429	8.06	(e.27	15				
4	27.4	631	7.92	5,34	16				
5	27.0	(133)	7.62	1.U7	17				
6	24.7	635	6.78	0,30	18			·	
7					19				
8					20				
9					21				
10					22				
11					23				

September 26, 2019 Field Datasheets

### FIELD DATASHEET

Date: 09/26/2019 Location (C	Circle): Lake Elsinore Canyon Lake	Station: LEO1
Time on Station: 07:43	Time off Station: 07:52	
Weather Conditions: Colm, Overca	Wind (mph & direction	): None
Lat: 33.66898	Long: -117.36418	· · ·
Water Depth (m): <u>6.6</u>	Secchi Depth (m): .25	
Water Chemistry Sample?: Y N	Chl-a Sample?: Y /N Surface volume filtered (ml)://_	Plankton Sample?: Y/N
	Depth-Integrated volume filtered (ml):	_N/A
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> whe (~500 mL fill volume preferred)	n filtering chlorophyll

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
<b>0</b>	24.2	3860	9.29	6.77	12			-	
1	24.3	3860	9.27	6.65	13				
. 2	24.2	3860	9.26	6.51	14				
3	24.2	3851.	9.23	5.76	15				
4	24.2	3850	9.18	3042	16				
5	24.1	3861	9.14	2.74	17				
6					18				
• 7					19				
8					20				
9					21				
10					22				
11					23				

# FIELD DATASHEET

Date: 09/26/2019 Location	Circle): Lake Elsinore Canyon Lake Station: LEOZ
Time on Station: 08:11	Time off Station: $ O_{o}^{*} O$
Weather Conditions: <u>Sonny</u> , Co	Wind (mph & direction): <u>Jone</u>
Lat: 33.66336	Long: -117.35421
Water Depth (m): 6.6	Secchi Depth (m): 025
Water Chemistry Sample? (Y/N	Chl-a Sample?: Y N Plankton Sample? Y N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml): 500
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll

(~500 mL fill volume preferred)

Comments:

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Bottle Time: 8:30 - Integrated 8:40 - Sorf

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	24.0	3860	9.17	4.38	. 12				
	1	24.0	3862	9.18	3.91	13				
	2	24.0	3852	9.17	3.72	14				
	3	24.1	3852	9.18	3.76	15				
	4	24.0	3861	9.17	3.73	16				
	5	24.0	3852	9017	3.76	17				
· .	6	24.0	3862	9.17	3.19	18				
6.4	X	24.0	3852	9.017	3.78	<b>19</b>				
·	8			-		20				
	9					21				
	10					22				
	11					23				

### FIELD DATASHEET

Date: 09/16/2019 Location (C	Circle): Lake Elsinore/Canyon Lake Station: <u>LEO3</u>
Time on Station: 07:68	Time off Station: 08:65
Weather Conditions: Calm 1 Olkso	Wind (mph & direction): None
Lat: 33.66494	Long:117.34164
Water Depth (m): <u> </u>	Secchi Depth (m): <u>23</u>
Water Chemistry Sample?: Y	Chl-a Sample?: Y /N Plankton Sample?: Y /N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed <b>7 PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred)

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
1	0	13.8	3840	9.2	6.07	12				
	1	23.9	3843	9.21	5.92	13				
	2	23.9	384B	9.21	5.62	14		\		
	3	23.9	3845	9.21	6.65	15			je se	
	4	23.9	3846	9.21	6.47	16				
.6	34	23.9	3845	9.2	5.47	17				
	6					18		•		
	7					19				
	8					20				
	9					21	· · · · · · · · · · · · · · · · · · ·			
	10					22				
	11					23				

# FIELD DATASHEET

Date: <u>9126/2019</u> Location (C	Circle): Lake Elsinore/Canyon Lake	Station: FOT
Time on Station: 14:00	Time off Station:	
Weather Conditions: OverCast, 5	ligns Wind Wind (mph & direction	on): 0-6, West
Lat: 33.66898	Long: -117.364118	3
Water Depth (m): 606	Secchi Depth (m): 2	-6
Water Chemistry Sample?: Y /N	Chl-a Sample?: Y / N Surface volume filtered (ml):	Plankton Sample?: Y /N
	Depth-Integrated volume filtered (m	nl):
• •	*Do not exceed 7 PSI or 14 in. Hg w	hen filtering chlorophyll
	(~500 mL fill volume preferred)	

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH	DO (mg/L)
0	14.5	3851	9.30	9.07	15				
1	24.6	3851	9.30	8.69	16				
2	24.5	3852	9.29	8-76	17				
3	24.1	3861	9.20	4.26	18				
4	1.4.1	3851	9.17	3.69	19				·
. 5	2401	3862	9.15	3.24	20				
6					21		· · · · ·		
7					22			<u> </u>	
. 8					23				
9					24				
10					25				
11					26			·	
12					27				
13					28				
14					29				

### FIELD DATASHEET

Date: <u>9/26/2019</u> Location	(Circle) Lake Elsinore/Canyon Lake	Station: LEOZ
Time on Station: 13:61	Time off Station: 13:67	
Weather Conditions:	3lignt Wind (mph & direct	ion): O-B, West
Lat: 33.66335	Long:7.351	-121
Water Depth (m): 6.6	Secchi Depth (m):25	
Water Chemistry Sample?: Y N	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered (n	1l):
	*Do not exceed 7 PSI or 14 in. Hg w	hen filtering chlorophyll
	(~500 mL fill volume preferred)	

### Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)
0	2401	3860	9.29	8.48	15				
1	24.1	3861	9.27	7.64	16				
2	2401	385	9.26	7.23	17				
3	24.1	386	q.15	6.68	18				
4	24.1	3892	9,23	6.48	19				
5	24.0	3862	9.18	4.24	20				
6	24.0	3852	9.18	4.70	21			·	
7					22			-	
8					23				
9					24			· ·	
10					25				
11					26				
12		u.		-	27				· ·
13					28				· ·
14					29				

# FIELD DATASHEET

Date: 9/26/2019 Location (0	Circle): Lake Elsinore/Canyon Lake	Station: <u>1603</u>
Time on Station: 13:40	Time off Station: 3:47	
Weather Conditions: Overcast, Shire	ind (mph & directi	on): 0-3, West
Lat: 33 . 65 494	Long: -117. 3416	6
Water Depth (m): 4.9	Secchi Depth (m):29	)
Water Chemistry Sample?: Y / N	Chl-a Sample?: Y N Surface volume filtered (ml):	Plankton Sample?: Y N
	Depth-Integrated volume filtered (m	l):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> w (~500 mL fill volume preferred)	hen filtering chlorophyll

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	24.6	3843	9.35	11.6	12				
	1	24.5	3844	9.32	0.1	13				
	2	24.5	3848	9.22	5.3	14		-	·	
	3	Z4.0	3846	9.18	4.95	15				
	4	23.9	3848	9.17	41.66	16			· · · · · · · · · · · · · · · · · · ·	
4.6	×	23.9	3847	9.17	4.20	17	· · ·			
	6					18				
	7		2			19				
	8					20				
	9			·		21				
	10					22				
	11					23	······			

### FIELD DATASHEET

ate: 9/26/2019 Location (Circle): Lake Elsinore/Canyon Lake Station: Lateshore
me on Station: $0.20$ Time off Station: $0.40$
eather Conditions: Sumy Calm Wind (mph & direction): Une
$t: \frac{33.66571}{100000000000000000000000000000000000$
Vater Depth (m): 6.6 Secchi Depth (m): 025
Vater Chemistry Sample?: Y N Chl-a Sample?: Y N Plankton Sample?: Y N Surface volume filtered (ml):
Depth-Integrated volume filtered (ml):
*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll
(~500 mL fill volume preferred)

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН	DO (mg/L)
	0	24.7	3855	9.25	6.82	15				
	1	24,1	3855	9.24	5.87	16	-			
	2	24.0	3863	9.18	3.89	17				
	3	24.0	3852	9.17	3.75	18				
	4	24.0	3892	9.17	3.64	19				
-	5	24.0	386Z	9.16	3.64	20				
	-6	24.0	3862	9.16	3-58	21			•	-
Golf	James	24.0	3852	9.16	3.410	22				
	8					23				;
	9					24				
	10					25	· .			
	11					26	-			
1'	12		-			27				
	13					28				
	14					29				
## FIELD DATASHEET

(Circle) Lake Elsinore/Canyon Lake	Station: Grand Ave
Time off Station: 1:5	
Wind (mph & directi	on): Dove
Long: -117.352	233
Secchi Depth (m): 25	<u></u>
Chl-a Sample?: Y / N Surface volume filtered (ml):	Plankton Sample?: Y /N
Depth-Integrated volume filtered (m	l):
*Do not exceed 7 PSI or 14 in. Hg w	hen filtering chlorophyll
(~500 mL fill volume preferred)	
	Chl-a Sample?: Y / N Surface volume filtered (ml): Depth-Integrated volume filtered (m *Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> w (~500 mL fill volume preferred)

Comments:

Changed DO Probe

	Depth (m)	Temp (°Ċ)	Sp. Cond (µS/cm)	рН	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µŜ/cm)	pН	DO (mg/L)
	0	24.4	3869	9.24	6.74	15			9	
	1	24.0	3852	9.2	4.8	16				
•	2	24.0	3852	9.21	5.06	17	-			
1.	3	23.9	3860	9.22	5.18	18				
	4	23.9	3850	9.2Z	5.68	19				
	5	23.9	3850	9.22	5.51	20				
5.7	6	13.9	3890	9.20	4.92	21				
	7	•			l.	22				ļ
	8			•	· ·	23				
	9			<i>2</i>		24	. •			
	10					25				
	11					26				
	12					27				
	13					28				
. [	14		-			29				

Wood Environment and Infrastructure Solutions, Inc.

QUARTER 2 – OCTOBER AND DECEMBER 2019

# Lake Elsinore and Canyon Lake Nutrient TMDL In-lake Monitoring 2019-2020 Quarter 2 Report



Prepared for: Lake Elsinore & San Jacinto Watershed Project Authority 11615 Sterling Avenue Riverside, California, 92503

Prepared by: Wood Environment and Infrastructure Solutions, Inc. 9210 Sky Park Court Suite 200 San Diego, CA 92123 February 25, 2020



# Lake Elsinore

#### Monitoring Dates

October 17, 2019 and December 20, 2019. The lake levels during the sampling events were 1238.54 feet and 1239.02 feet, respectively. Sampling is conducted monthly in Lake Elsinore during summer (June – September) and bi-monthly during the remainder of the year (October – May).

#### Monitoring Locations

Five locations were monitored in Lake Elsinore: Sites LE01, LE02, LE03 and the two in-lake data sondes maintained by Elsinore Valley Municipal Water District (EVMWD): Lakeshore Sonde and Grand Avenue Sonde. These sites are depicted in Figure 1.

#### <u>Weather</u>

October 17, 2019 – Sunny and calm in the morning with 0-2 mph winds. Gusty winds in the afternoon prevented staff from collection afternoon water quality readings, including EVMWD sonde sites. Temperatures reflected a low of 61°F and high of 82°F.

December 20, 2019– Sunny and clear in the morning, with partly cloudy skies in the afternoon. Very calm with winds 0-2 mph. Temperatures reflected a low of 40°F and high of 73°F.

#### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the project specific Work Plan, with the exception of the afternoon water quality profiles not being performed on October 17 due to high winds and unsafe conditions. Additionally, the pH probe used for the December 20 monitoring event reported erroneous measurements inconsistent with typical results. The pH readings taken during this event are considered inaccurate and the meter probe has since been serviced and replaced. Field monitoring included the following activities at each location or where noted:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen (all sites);
- Depth-integrated water chemistry sample for Total Dissolved Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus, Total and Dissolved Aluminum (Site LE02 only);
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples (Site LE02 only);
- Secchi disk measurements (all sites);
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed (Site LE02 only);
- Visual observations and photos of lake conditions.

A summary of water quality profile data is presented in Tables 1 and 2. Results of the water chemistry analyses are presented in Tables 3 and 4.

Satellite imagery of chlorophyll-a estimated concentrations, turbidity, and harmful algal bloom (HAB) probability based on remote sensing data are presented in Figures 2 through 7. Due to field staff scheduling conflicts, satellite data from October 14 is used for comparison to the October 17 monitoring data.

Copies of field datasheets are provided in Appendix A.



Figure 1. Lake Elsinore Sampling Locations

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	Water Column Mean
		Temp (°C)	20.1	20.1	20.1	20.1	19.9	19.8		20.0
	7.55	Sp. Cond (µS/cm)	3897	3895	3894	3894	3897	3896		3896
LEUT	7.00	pН	9.31	9.30	9.30	9.30	9.28	9.27		9.29
		DO (mg/L)	5.5	5.3	5.3	5.3	4.5	4.4		5.0
		Temp (°C)	19.8	19.8	19.7	19.7	19.6	19.6	19.6	19.7
1 E02	00.15	Sp. Cond ( <sub>µ</sub> S/cm)	3897	3897	3896	3896	3896	3895	3896	3896
LLUZ	09.15	pН	9.32	9.27	9.26	9.24	9.22	9.21	9.19	9.24
		DO (mg/L)	6.2	4.5	4.2	3.9	3.4	3.1	2.4	3.9
		Temp (°C)	20.2	20.2	20.2	20.1	19.8	19.8		20.1
	9:4E	Sp. Cond (µS/cm)	3893	3893	3893	3895	3897	3897		3895
LE03	0.40	pH	9.32	9.31	9.30	9.25	9.19	9.18		9.26
		DO (mg/L)	6.3	5.8	5.7	4.2	2.1	1.9		4.3

Table 1. Lake	Elsinore	<i>In-situ</i> Water	Column	Profile -	October	17,	2019
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Note: Afternoon and data sonde measurements were not performed due to high winds and unsafe conditions.

a- Bottom depth measurement taken at 4.5m

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	Water Column Mean
		Temp (°C)	11.6	11.6	11.6	11.6	11.6	11.6			11.6
	07.40	Sp. Cond (µS/cm)	3844	3844	3844	3844	3844	3844			3844
	07.40	pН	ME	ME	ME	ME	ME	ME			ME
L E01		DO (mg/L)	2.4	2.1	2.1	2.0	2.0	2.0			2.1
LLUI		Temp (°C)	13.4	12.2	11.8	11.7	11.5	11.3			12.0
	15.20	Sp. Cond (µS/cm)	3849	3853	3838	3842	3845	3844			3845
	15.50	pН	ME	ME	ME	ME	ME	ME			ME
		DO (mg/L)	4.9	4.3	2.1	1.9	1.4	1.3			2.6
		Temp (°C)	11.9	11.9	11.9	11.9	11.9	11.9	11.9		11.9
	00.00	Sp. Cond (µS/cm)	3840	3840	3840	3840	3840	3841	3840		3840
	06.20	pН	ME	ME	ME	ME	ME	ME	ME		ME
		DO (mg/L)	1.9	1.7	1.6	1.6	1.6	1.5	1.5		1.6
LE02		Temp (°C)	14.5	12.1	11.9	11.9	11.9	11.9	11.9		12.3
	14.25	Sp. Cond (µS/cm)	3847	3847	3839	3839	3839	3840	3840		3842
	14.35	pН	ME	ME	ME	ME	ME	ME	ME		ME
		DO (mg/L)	3.9	3.3	1.6	1.4	1.3	1.3	1.3		2.0
		Temp (°C)	12.0	12.0	12.0	12.0	12.0	12.0			12.0
	07.55	Sp. Cond (µS/cm)	3827	3826	3826	3827	3829	3843			3830
	07.55	pН	ME	ME	ME	ME	ME	ME			ME
		DO (mg/L)	4.0	3.9	3.9	3.8	3.6	3.4			3.8
LE03		Temp (°C)	14.6	12.3	12.1	12.0	11.9	11.8			12.5
	14.15	Sp. Cond (µS/cm)	3827	3824	3821	3821	3827	3814			3822
	14.15	pН	ME	ME	ME	ME	ME	ME			ME
		DO (mg/L)	6.2	5.6	4.2	4.1	3.7	3.6			4.6
		Temp (°C)	14.4	12.1	11.9	11.8	11.8	11.8	11.7	11.7	12.2
Lakeshore	14.50	Sp. Cond (µS/cm)	3842	3887	3840	3840	3839	3839	3834	3834	3844
Sonde <sup>b</sup>	14.50	pН	ME	ME	ME	ME	ME	ME	ME	ME	ME
		DO (mg/L)	3.7	1.4	1.3	1.2	1.2	1.2	1.8	1.8	1.7
		Temp (°C)	12.2	12.1	12.0	11.9	11.9	11.9	11.9		12.0
Grand Ave	10.40	Sp. Cond (µS/cm)	3841	3837	3840	3839	3839	3839	3839		3839
Sonde <sup>c</sup>	10.40	pН	ME	ME	ME	ME	ME	ME	ME		ME
		DO (mg/L)	3.5	3.6	2.3	2.1	2.1	2.0	2.0		2.5

Table 2. Lake Elsinore In-situ Water Column Profile –December 20, 2019

ME- Meter Error. pH probe malfunction caused errorenous readings for this event (not reported).

a- Bottom depth measurement taken at 4.5m

b- Bottom depth measurement taken at 6.5m

c- Bottom depth measurement taken at 5.5m

		-			•	
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02
SM 2540C	Total Dissolved Solids	mg/L	40	2000 <sup>3</sup>	Depth Integrated	1800
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.5	NA	Depth Integrated	5.5
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	5.5
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 0.9 <sup>c1</sup> CCC: 0.2 <sup>c1</sup>	Depth Integrated	0.05 J
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.05 J
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.22
	Chlorophyllic		1.0	<b>2</b> Ed1 <b>4</b> Od2	Surface (0-2m)	139
EPA 10200 H	Спюгорпун-а	µg/∟	1.0	23°', 40°2	Depth Integrated	153

Table 3. Water Chemistry for Lake Elsinore – October 17, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature recorded at each location

<sup>d</sup> – Summer average

NA – Not applicable/ available

 $^1$  – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL  $^2$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL  $^3$  – Santa Ana Region Basin Plan Objective J – concentration between MDL and RL (estimated)

Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02
SM 2540C	Total Dissolved Solids	mg/L	20	2000 <sup>3</sup>	Depth Integrated	2200
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.4	NA	Depth Integrated	6.7
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	6.7
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.14 <sup>c1</sup> CCC: 0.42 <sup>c1</sup>	Depth Integrated	1.3
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.13
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.28 F
	Chlorophyllic		1.0	2Ed1 40d2	Surface (0-2m)	37.2
EFA 10200 H	Chiorophyli-a	µg/L	1.0	20 <sup>41</sup> , 40 <sup>42</sup>	Depth Integrated	NM <sup>e</sup>

Table 4. Water Chemistry for Lake Elsinore – December 20, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature

recorded at each location. As a result of the pH probe malfunction, a default pH value of 9.1 was used to approximate previous December monitoring events.

- <sup>d</sup> Summer average
- <sup>e</sup>- Sample dropped during laboratory preparation. Not recovered.
- NA Not applicable/ available
- ND Not detected
- NM Not measured

<sup>1</sup> – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL

 $^{2}$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

<sup>3</sup> – Santa Ana Region Basin Plan Objective

F- Matrix Spike ( $\dot{\text{MS}}$ ) and/or Matrix Spike Duplicate (MSD) was outside acceptance limits



Figure 2. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations October 14, 2019



Figure 3. Satellite Imagery of Lake Elsinore Turbidity Measurements October 14, 2019



Figure 4. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood October 14, 2019



Figure 5. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations December 20, 2019



Figure 6. Satellite Imagery of Lake Elsinore Turbidity Measurements December 20, 2019



Figure 7. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood December 20, 2019

# Canyon Lake

#### Monitoring Dates

October 17, 2019 and December 20, 2019. Year-round bi-monthly monitoring is required for Canyon Lake. The lake level on the days of sampling were 1375.75 feet and 1380.65 feet, respectively.

#### Locations

Four locations were sampled in Canyon Lake: Sites CL07, CL08, CL09, and CL10. These sites are depicted in Figure 8.

#### <u>Weather</u>

October – Sunny and clear in the morning with 0-2 mph NW winds. Sunny and breezy in the afternoon with 5-8 mph E winds. Low of 61°F and a high of 82°F.

December – Sunny and clear with winds 0-5 mph NE. Lows around 40°F, warming to 73°F.

#### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the TMDL Work Plan and there were no equipment failures or delays. Field monitoring included the following activities at each site:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen;
- Depth-integrated water chemistry sample for Total Dissolved Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus, Total and Dissolved Aluminum;
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples;
- Secchi disk measurements;
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed;
- Visual observations and photos of lake conditions.

A summary of water quality profile data are presented in Tables 5 and 6. Results of the water chemistry analyses are presented in Tables 7 and 8.

Satellite imagery of chlorophyll-a, turbidity, and cyanobacterial risk based on remote sensing data are presented in Figures 9 through 14. Due to scheduling conflicts, satellite data from October 14 is used for comparison to the October 17 monitoring data. Satellite chlorophyll-a concentrations in portions of the northern and eastern arms of Canyon Lake are likely impacted by the narrowness of the water body, resulting in an "edge-effect" of the nearby land mass, the consequence of which can be artificially elevated chlorophyll-a concentrations. These data have been flagged and removed from the maps. Copies of field datasheets are provided in Appendix A.



Figure 8. Canyon Lake Sampling Locations

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	Water Column Mean - All	Water Column Mean - Epilimnion	Water Column Mean - Hypolimnion
		Temp (°C)	21.2	21.0	20.8	20.7	20.6	20.5	20.3	20.1	15.7	15.0	14.4	14.1	14.1	13.9	18.0	20.7	14.1
CL 07	10.26	Sp. Cond (µS/cm)	736	783	784	784	784	788	789	789	655	648	653	657	666	660	727	778	659
CL07	10.20	pН	8.00	8.00	7.95	7.92	7.73	7.60	7.27	7.19	6.87	6.87	6.85	6.83	6.82	6.84	7.3	7.8	6.8
		DO (mg/L)	7.8	7.8	7.4	7.2	6.1	2.7	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	2.9	5.6	0.2
		Temp (°C)	21.2	21.2	21.1	20.7	20.4	20.3	20.3	19.0	16.3	14.8	14.5	14.0	13.9	13.8	18.0	20.7	14.1
CL 07	14.54	Sp. Cond (µS/cm)	786	786	785	786	790	787	786	757	668	656	652	665	667	669	731	787	663
CLU7	14.04	pН	8.13	8.13	8.11	7.84	7.72	7.62	7.50	7.00	6.83	6.82	6.82	6.77	6.75	6.72	7.3	7.9	6.8
		DO (mg/L)	8.7	8.6	8.2	4.5	5.9	3.2	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	3.0	5.6	0.2
		Temp (°C)	21.1	21.1	20.9	20.6	20.4	20.4	20.2	18.2							20.4		
CL 08	10.00	Sp. Cond (µS/cm)	615	783	784	786	787	784	781	763							760		
CLUU	10.00	pН	8.24	8.24	8.23	7.96	7.44	7.38	7.31	6.95							7.7		
		DO (mg/L)	8.8	8.8	8.6	3.3	2.1	1.5	1.1	0.3							4.3		
		Temp (°C)	21.6	21.5	21.3	20.4	20.3	20.3	20.2	19.9							20.7		
CL 08	14.30	Sp. Cond (µS/cm)	781	784	784	785	784	784	783	781							783		
OLUU	14.00	pН	8.30	8.29	8.18	7.58	7.39	7.35	7.27	7.18							7.7		
		DO (mg/L)	9.7	9.5	9.1	3.9	2.7	2.4	0.8	0.3							4.8		
		Temp (°C)	20.4	20.4	20.3	20.1	20.0	19.9	19.6								20.1		
	09.17	Sp. Cond (µS/cm)	996	996	994	991	996	1010	1020								1000		
CLU3	00.17	pН	8.23	8.39	8.39	7.79	7.47	7.28	7.02								7.8		
		DO (mg/L)	9.4	9.4	9.1	4.2	1.6	0.3	0.3								4.9		
		Temp (°C)	21.5	21.3	20.4	20.1	20.0	19.9	19.9								20.4		
	14.15	Sp. Cond (µS/cm)	977	983	985	988	996	1013	1016								994		
OLUU		pН	8.50	8.49	8.34	7.84	7.48	7.37	7.30								7.9		
		DO (mg/L)	11.3	11.4	9.1	3.7	1.3	0.4	0.3								5.4		
		Temp (°C)	20.5	20.6	20.5												20.5		
CI 10	8.28	Sp. Cond (µS/cm)	1055	1060	1072												1062		
02.0	0.20	pН	8.25	8.28	7.93												8.2		
		DO (mg/L)	8.4	8.4	8.4												8.4		
		Temp (°C)	22.0	21.6	20.8												21.5		
CL10	14:00	Sp. Cond (µS/cm)	1008	1045	1053												1035		
02.0	11.00	pН	8.05	8.39	8.35												8.3		
		DO (mg/L)	12.0	11.5	7.9												10.5		

Table 5. Canyon Lake In-situ Water Column Profile –October 17, 2019

Hypolimnion

Epilimnion

Thermocline

No Shading - Indicates that there is no stratification

a- Bottom measurement taken at 5.5m

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	14 m	15 m	Water Column Mean - All
		Temp (°C)	12.7	12.6	12.5	12.5	12.5	12.5	12.5	12.5	12.6	12.5	12.4	12.4	12.4	12.4	12.5	12.4	12.5
CI 07 <sup>a</sup>	10.10	Sp. Cond (µS/cm)	748	755	757	758	758	758	761	762	762	760	758	753	756	756	757	757	757
CLUI	10.10	pН	6.65	6.81	6.95	7.06	7.13	7.20	7.26	7.30	7.35	7.38	7.39	7.43	7.44	7.45	7.45	7.44	7.23
		DO (mg/L)	4.6	4.5	4.4	4.4	4.5	4.4	4.3	4.3	4.3	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.4
		Temp (°C)	14.1	13.1	12.7	12.5	12.5	12.5	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.6
CI 07 <sup>a</sup>	14.15	Sp. Cond (µS/cm)	762	770	762	762	762	762	761	760	757	755	754	755	756	756	757	758	759
0101		pН	7.78	7.75	7.67	7.63	7.61	7.59	7.59	7.58	7.58	7.56	7.57	7.56	7.54	7.55	7.55	7.54	7.60
		DO (mg/L)	5.9	5.2	4.7	4.6	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.2	4.1	4.1	4.0	4.4
		Temp (°C)	12.4	12.4	12.3	12.3	12.3	12.3	12.3	12.3	12.3								12.3
CI 08 <sup>b</sup>	09.30	Sp. Cond (µS/cm)	746	748	748	747	748	748	748	747	748								748
0200	00.00	pН	6.73	6.91	7.02	7.19	7.25	7.30	7.34	7.37	7.38								7.17
		DO (mg/L)	5.4	5.3	5.2	5.2	5.2	5.1	5.1	5.0	5.0								5.2
		Temp (°C)	13.5	13.0	12.5	12.4	12.3	12.3	12.3	12.2	12.2								12.5
CI 08 <sup>b</sup>	14:02	Sp. Cond (µS/cm)	732	747	747	751	749	749	748	747	748								746
0200		pН	7.61	7.69	7.68	7.65	7.64	7.61	7.61	7.59	7.59								7.63
		DO (mg/L)	6.4	6.3	5.3	5.1	5.1	5.1	4.8	4.7	4.6								5.3
		Temp (°C)	11.6	11.6	11.6	11.6	11.6	11.7	11.5	11.5									11.6
CI 09°	08:45	Sp. Cond (µS/cm)	923	929	928	928	929	976	1164	1181									995
0200		pН	6.47	7.16	7.42	7.56	7.70	7.58	7.16	7.04									7.26
		DO (mg/L)	6.9	6.8	6.8	6.7	6.6	0.7	0.3	0.3									4.4
		Temp (°C)	12.9	12.4	11.8	11.6	11.6	11.6	11.5										11.9
CL09	13:43	Sp. Cond (µS/cm)	900	925	933	932	935	944	1171										963
		pH	8.19	8.23	8.23	8.14	8.12	8.10	7.61										8.09
		DO (mg/L)	7.2	7.4	6.9	6.4	6.3	6.1	0.1										5.8
		Temp (°C)	11.6	11.6	11.6	11.6	11.7												11.6
CL10 <sup>d</sup>	07:52	Sp. Cond (µS/cm)	947	942	941	941	946												943
		pН	7.32	8.04	8.17	8.23	8.25												8.00
		DO (mg/L)	8.0	8.0	8.0	8.0	7.8												8.0
		Temp (°C)	13.6	12.6	11.8	11.7	11.7												12.3
CL10 <sup>d</sup>	13:30	Sp. Cond (µS/cm)	947	939	943	946	950												945
		pH	8.60	8.63	8.49	8.44	8.41												8.51
		DO (mg/L)	9.1	9.3	8.1	7.7	7.6												8.3

Table 6.	Canyon Lake	In-situ Water	Column	Profile	–December	20,	2019
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Note: No stratification observed during this event, therfore epilimnion and hypolimnion mean values are not reported.

a- Bottom measurement taken at 14.5m

b- Bottom measurement taken at 7.5m

c- Bottom measurement taken at 6.5m

d- Bottom measurement taken at 3.5m

				ake water Onennis	$d \mathbf{y} = \mathbf{O} \mathbf{c} \mathbf{c} \mathbf{o} \mathbf{b} \mathbf{c} \mathbf{r} \mathbf{r}, \mathbf{r}$	2013			
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface	CL07	CL08	CL09	CL10
SM 2540C	Total Dissolved Solids	mg/L	10	700	Depth Integrated	380	420	560	590
SM 2540D	Total Suspended Solids	mg/L	2	NA	Depth Integrated	4	ND	10	12
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	6.7	ND	ND	ND
EPA 300.0	Nitrate as N	mg/L	0.2	10	Depth Integrated	ND	ND	ND	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND	ND	ND	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.1	NA	Depth Integrated	2.7	0.71	1.2	1.1
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	2.7	0.71	1.2	1.1
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 5.7-26.2 <sup>c1</sup> CCC: 1.2-4.1 <sup>c1</sup>	Depth Integrated	1.7	0.57	ND	ND
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.23	ND	ND	0.027 J
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.24	0.024	0.043	0.062
EPA 200.7	Total Aluminum	µg/L	100	NA	Depth Integrated	ND	36 J	120	280
EPA 200.7	Dissolved Aluminum	µg/L	100	NA	Depth Integrated	ND	ND	ND	ND
	Chlorophyllic	ug/l	1.0	25b1 40b2	Surface (0-2m)	14.5	13.5	31.8	40.3
	Спюгорпун-а	µg/∟	1.0	20°', 40°2	Depth Integrated	33.7	14.7	17.9	27.9

Table 7 Canvon Lake Water Chemistry – October 17, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific; dependent upon pH and temperature
 <sup>1</sup> - 2020 TMDL Target, based on Table 5-9n of 2004 TMDL
 <sup>2</sup> - 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

NA – Not applicable/available

ND – Not detected

NS- Not Sampled

J – concentration between MDL and RL

		· • · · · · · · · · · · · · · · · · · ·		······,	, , ,				
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface	CL07	CL08	CL09	CL10
SM 2540C	Total Dissolved Solids	mg/L	10	700	Depth Integrated	440	420	540	540
SM 2540D	Total Suspended Solids	mg/L	2	NA	Depth Integrated	4	6	8	12
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND	ND	0.2	ND
EPA 300.0	Nitrate as N	mg/L	0.2	10	Depth Integrated	ND	ND	ND	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND	ND	ND	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.1	NA	Depth Integrated	1.2	1.2	1.5	1.7
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	1.2	1.2	1.5	1.7
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 8.4-29.5 <sup>c1</sup> CCC: 2.4-5.4 <sup>c1</sup>	Depth Integrated	0.34	0.31	0.24	0.085 J
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.018 J	0.019 J	0.052	0.021 J
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.047	0.054	0.095	0.086
EPA 200.7	Total Aluminum	µg/L	100	NA	Depth Integrated	81 J	87 J	120	180
EPA 200.7	Dissolved Aluminum	µg/L	100	NA	Depth Integrated	ND	ND	ND	ND
	Chlorophyll o		1.0	25b1 40b2	Surface (0-2m)	16.4	29.7	23.7	46.7
	Спюторнуп-а	µy/∟	1.0	20~, 40~-	Depth Integrated	20.7	21.9	19.0	55.4

Table 8. Canvon Lake Water Chemistry – December 20, 2019

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average
 <sup>c</sup> - Values are site specific dependent upon pH and temperature

NA – Not applicable/available ND – Not detected

NS- Not sampled

 $^1$  – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL  $^2$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

J – concentration between MDL and RL



Figure 9. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations October 14, 2019 Data near the edges of the main lake body and narrow portions of the eastern arm have been flagged due to mixing of water and land pixel data, and have been removed from the dataset (i.e. blacked out).



Figure 10. Satellite Imagery of Canyon Lake Turbidity Measurements October 14, 2019



Figure 11. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood October 14, 2019 Data near the edges of the main lake body and narrow portions of the eastern arm have been flagged due to mixing of water and land pixel data, and have been removed from the dataset (i.e. blacked out).



Figure 12. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations December 20, 2019



Figure 13. Satellite Imagery of Canyon Lake Turbidity Measurements December 20, 2019



Figure 14. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood December 20, 2018

Appendix A Field Datasheets October 17, 2019 Field Datasheets

## FIELD DATASHEET

Date: 10/17/2019 Location (Ci	ircle): Lake Elsinor Canyon Lake	Station: LEOI
Time on Station: 07:55	Time off Station: 08:40	
Weather Conditions: <u>SUNNY</u> Colw	Wind (mph & directio	n): Dove
Lat: 33.66898	Long: -117. 3641	9
Water Depth (m): 5.4	Secchi Depth (m)	
Water Chemistry Sample?: Y	Chl-a Sample?: Y N Surface volume filtered (ml):	Plankton Sample?: (P)N SIMPle Time ", 9; : 40
	Depth-Integrated volume filtered (ml	):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> wh (~500 mL fill volume preferred). Dis full (after first 250 mL are filtered).	en filtering chlorophyll scard lower chamber when

## Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	20.	3897	9.31	6.48	12	)			
	1	20.1	3895	9,30	5.32	13	<b>9</b> h	-		
	2	20.1	3894	9.30	5.34	14			2 6 . A	· · · ·
	3	20.1	2894	9.30	5.32	15				
	. 4	19.9	3897	9.28	4.46	16				
·	5	19.8	3896	9.27	4.37	17				
	6					18				
	7					19				
	8				······································	20				
	9		,			21		. /	<b>\</b>	
	10					22				
	11					23			¦ . \	

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## FIELD DATASHEET

Date: 10/17/2019 Location (Circle): Lake Elsinore Canyon Lake Station: LEOZ	
Time on Station: <u>9'</u> Time off Station:	
Weather Conditions: Song Calm Wind (mph & direction): 1000	
Lat: 33.066334 Long: -117.3542	
Water Depth (m): $6.5$ Secchi Depth (m): $0.3m$	
Water Chemistry Sample?: Y N <u>K SAMPLE TIME</u> : <u>1000</u> Chl-a Sample? Y N Surface, volume filtered (ml): <u>365</u>	J
Depth-Integrated volume filtered (ml): 400 (Some TNTP)	- 5 F.
O-O:       O 1 00       *Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll         SwRF       SwRF       SwRF         SwRF       SwRF       SwRF	n

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	19.8	3897	9.32	6.17	12				
1	19.8	3897	9.27	外松	13				
2	19.7	3896	9.26	4,48	14				
3	19.7	3896	9.24	19.87	15				
4	19.6	3896	9.22	3.91	16				
5	19.6	3895	9.21	3.09	17				
6	19.6	3896	9.19	2.42	18				
. 7					. 19				
8					20				
9					21				
10					22				
11					23				

Wood Environment and Infrastructure Solutions, Inc.

## FIELD DATASHEET

Date: $10/17/2019$ Location (C	Circle): Lake Elsinore/Canyon Lake Station: LEO3
Time on Station: 8:46	Time off Station: <u>9:10</u>
Weather Conditions: Sunney Ca	Wind (mph & direction): Done
Lat: 33,65494	Long: -17.34165
Water Depth (m): 4.6	Secchi Depth (m):
Water Chemistry Sample?: Y /N SAMPLE TIME:	Chl-a Sample?: Y/N Plankton Sample? YN Surface volume filtered (ml): Sample Time: 3:55
	Depth-Integrated volume filtered (ml):
	*Do not exceed <b>7 PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	20.2	3893	9.32	6.29.	12				e de la compañía de l
	1	20.2	3893	9.31	5.83	13	,	ж.		3
	2	20.2	3893	9.30	5.73	14				
	3	20.1	3895	9.25	4.16	15				
	4	19.8	3897	9.19	2.06	16	0.4		9	
.5	5	19.8	3897	9.18	1.9	17				
	6		See.	* 4 		18				
	7					19			1	
	8				8	20				
	9			Sa		21			-	
	10				÷	22				
	11		.*		9 <sup>40</sup>	23		7		

Zou plankton tun, #1: 110m1 +110 380m6 5-80 380m6 6-100Wood Environment and Infrastructure Solutions, Inc.

## FIELD DATASHEET

Date: 10/17/2019 Location	(Circle): Lake Elsinore/Canyon Lake Station: CLO7
Time on Station: 1026	Time off Station: $1048$
Weather Conditions: Sunny, cl	ear. Wind (mph & direction): $\bigcirc -2$ mpH ENE
Lat: ON target	Long: ON tamet
Water Depth (m): <u>3-35</u>	Secchi Depth (m):
Water Chemistry Sample?: Y / N SAMPLE TIME: <u>しんり</u>	Chl-a Sample?: Y / NPlankton Sample?: Y / NSurface volume filtered (ml): 500
1	Depth-Integrated volume filtered (ml): 500
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	2.2	730	G.00	7.8	12	14.1	666	6.82	0.2
1	21.0	783	8,00	7.8	13	(3.9	660	6.84	0.2
2	20.8	794	7.95	1.4	14				
3	20.7	784	7.92	7.2	15				;
4	20.6	784	7.73	6.1	16				
5	20.5	788	7.60	2.7	17				
6	20.3	789	7.27	0.3	18			,	
7	20-1	789	7.19	6.3	19				
8	15.7	655	6.97	6.2	20				
9	15.0	648	6.87	-0.2	21				
10	14.4	653	6.85	6.2	22				
11	14.1	657	6.83	0.2	23				

## FIELD DATASHEET

Date:	0/17/1	<u>n</u> Loo	cation (Cir	rcle): Lake	Elsinore	Canyon'La	ke	Station: C	207	
Time on	Station:	1454	· . ,	Time off S	tation:	1500			7	
Weather	Conditions	SIMU	Y.Wir	dy	Wine	d (mph & d	direction):	10 - 12	moh	F
Lat: <u>-</u>	. <u>4</u> ee	belon	)	) . Lo	ng:			· ·		
Water D	epth (m):	13.35	 	Sec	cchi Depth	ı (m): )	.4		-	
Water Cl SAMPLI	hemistry Sa E TIME:	umple?: Y /	Ð	Chl-a San Surface ve	nple?: Y olume filte	D ered (ml):_	Pla	nkton Sam	ple?: Y (N	D
				Depth-Int	egrated vo	lume filter	ed (ml):			
Commen	<u>ts:</u>		*	Do not ex (~500 mI full (after	ceed 7 PS L fill volur first 250 p	I or 14 in. ne preferre mL are filt	<b>Hg</b> when filed). Discard ered).	tering chlo lower chai	orophyll nber when	
	slight	the Nov	m o	if tava	gette	, preve	ent d	VIETN	on int	77
6	am o	ivea (	WIN	dy ca	ondit	ÎONS	).	3 7 -	- ] * **	U
1		Sn				1				
Depth (m)	Temp (°C)	Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)	
Depth (m) 0	Temp (°C) 21.2	$\frac{\text{Cond}}{(\mu\text{S/cm})}$	pH (units) 8,13	DO (mg/L) 8,7	Depth (m) 12	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	
Depth (m) 0 1	Temp (°C) 21.2 21.2	Cond (μS/cm) 7-86 7-86	pH (units) 8,13 8,13	DO (mg/L) 8,7 8,6	Depth (m) 12 13	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) (0[67 669	pH (units) $6,75$ $(a,72)$	$\frac{DO}{(mg/L)}$ $\frac{O_1 2}{O_2}$	
Depth (m) 0 1 2	Temp (°C) 21.2 21.2 21.1	Cond (µS/cm) 786 786 785	pH (units) 8,13 8,13 8,11	DO (mg/L) 8,7 8,0 8,2	Depth (m) 12 13 14	Temp (°C) 13,9 13,8	Sp. Cond (μS/cm) 667 669	pH (units) 6,75 6,72	DO (mg/L) 0,2	
Depth (m) 0 1 2 3	Temp (°C) 21.2 21.2 21.2 21.1 20.7	Cond (μS/cm) 786 786 785 786	pH (units) 8,13 8,13 8,13 8,11 7,84	DO (mg/L) 8.7 8.6 8.2 4.5	Depth (m) 12 13 14 15	Temp (°C) 13.9 13.8	Sp. Cond (µS/cm) (µS/cm) (µS/cm)	pH (units) 6,75 16,72	DO (mg/L) 0,2 0.2	
Depth (m) 0 1 2 3 4	Temp (°C) 21.2 21.2 21.2 21.1 20.7 20.7	Cond (µS/cm) 786 786 785 786 786 780	pH (units) 8,13 8,13 8,11 7,84 7,72	DO (mg/L) 8.7 8.6 8.2 4.5 5.9	Depth (m) 12 13 14 15 16	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) (0[67 (669	pH (units) 6.76 6.72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5	Temp (°C) 21.2 21.2 21.1 20.7 20.7 20.4 20.3	5p: Cond (µS/cm) 786 786 785 786 786 790 787	pH (units) 8,13 8,13 8,11 7,84 7,72 7,62	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2	Depth (m) 12 13 14 15 16 17	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) (0[67 669	pH (units) 6.75 6.72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5 6	Temp (°C) 21.2 21.2 21.2 20.7 20.7 20.3	Cond (µS/cm) 786 786 785 786 786 786 790 787 786	pH (units) 8,13 8,13 8,11 7,84 7,72 7,62 7,50	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2 0.4	Depth (m) 12 13 14 15 16 17 18	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) (0[67 (669	pH (units) 6,75 (6.72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5 6 7	Temp (°C) 21.2 21.2 21.2 21.2 20.7 20.7 20.7 20.3 19.0	Cond (uS/cm) 786 786 785 786 786 780 787 786 786 786 757	pH (units) 8,13 8,13 8,13 7,13 7,13 7,13 7,13 7,13 7,50 7,50 7,00	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2 0.4 0.3	Depth (m) 12 13 14 15 16 17 18 19	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) (0507 (069	pH (units) 6,75 (6,72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5 6 7 8	Temp (°C) 21.2 21.2 21.2 21.1 20.7 20.7 20.3 19.0 16.3	Cond (µS/cm) 786 786 785 786 786 786 790 787 786 786 757 668	pH (units) 8,13 8,13 8,13 8,11 7,84 7,84 7,72 7,62 7,50 7,00 6,83	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2 0.4 0.3 0.3	Depth (m) 12 13 14 15 16 17 18 19 20	Temp (°C) 13,9 13,8	Sp. Cond (µS/cm) 667 669	pH (units) 6.75 10.72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5 6 7 8 9	Temp (°C) 21.2 21.2 21.2 21.2 20.7 20.7 20.7 20.3 19.0 16.3 19.0	Cond (µS/cm) 786 786 785 786 785 786 790 787 786 790 787 786 790 787 668 656	pH (units) 8,13 8,13 8,13 8,13 7,84 7,84 7,72 7,62 7,62 7,50 7,00 6,83 6,82	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2 5.9 3.2 0.4 0.3 0.3	Depth (m) 12 13 14 15 16 17 18 19 20 21	Temp (°C) 13.9 13.8	Sp. Cond (µS/cm) (µS/cm) (µS/cm)	pH (units) 6,75 6,72	DO (mg/L) 0.2	
Depth (m) 0 1 2 3 4 5 6 7 8 9 10	Temp (°C) 21.2 21.2 21.2 21.2 20.7 20.7 20.7 20.3 19.0 16.3 19.0 16.3 14.5	Cond (µS/cm) 786 786 785 786 785 786 786 790 787 786 786 790 787 668 657 656 (052	pH (units) 8,13 8,13 8,13 8,11 7,84 7,72 7,62 7,50 7,00 6,83 6,82 6,82 6,82	DO (mg/L) 8.7 8.6 8.2 4.5 5.9 3.2 5.9 3.2 0.3 0.3 0.3 0.3	Depth (m) 12 13 14 15 16 17 18 19 20 21 22	Temp (°C) 13.9 13.8	Sp. Cond (µS/cm) (µS/cm) (µS/cm)	pH (units) 6,75 6,72	DO (mg/L) 0.2	

# FIELD DATASHEET

Date: $0/17/9$ Location (C	ircle): Lake Elsinor (Canyon Lake Station: CU08
Time on Station: (000	Time off Station: 1020
Weather Conditions: Suppy, Orean	Wind (mph & direction): Omph-
Lat: ON-twoget	Long: ON-tanget
Water Depth (m): $7.4$	Secchi Depth (m): 1.3
Water Chemistry Sample? YN SAMPLE TIME: 1005	Chl-a Sample?: Y/N Surface volume filtered (ml): 500
	Depth-Integrated volume filtered (ml): 500
Comments	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)
0	21.1	615	8.24	8.8	12				<u>_</u>
1	21.1	783	8.24	8.8	13			<b></b>	· · · · · · · · · · · · · · · · · · ·
2	10.9	784	8.23	8.6	14				
3	20.6	786	7.96	3.3	15				
4	20.4	787	7.44	2.1	16	·			
5	20.4	784	7.38	1.5	17				
6	20.2	781	7.31	1.1.	18				
7	18.2	763	6,95	0.3	19				
8					20				
9					21				
10					22		· · · ·		
11					23				

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## FIELD DATASHEET

· · · · ·		
Date: $10 17 19$ Location (C	Circle): Lake Elsinore/Canyon Lake	Station: $\underline{\mathcal{MS}}$
Time on Station: $1439$	Time off Station: 1446	
Weather Conditions: <u>SMMM</u> , M	Mdy Wind (mph & direct	tion):
Lat: ON HWARA	Long: ON HAM	her
Water Depth (m): $7.4$ .	Secchi Depth (m):	3
Water Chemistry Sample?: Y / 🔊	Chl-a Sample?: Y / 🕥	Plankton Sample?: Y 🔊
SAMPLE TIME:	Surface volume filtered (ml):	
	Depth-Integrated volume filtered (	ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> (~500 mL fill volume preferred). I full (after first 250 mL are filtered	when filtering chlorophyll Discard lower chamber when ).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	21.6	781	8.30	9.65	12				
1	21.5	784	8.29	9.50	13				
2	21.3	784	8.18	Ð-11	14			. ·	
3	20.4	785	7.58	3.87	15				
4	20.3	784	7,39	2.70	16	1			
5	20.3	784	7.35	2.38	17				
6	20.2	783	7.27	0,78	18				
7	19.9	781	7.18	0.28	19				
8					20				
9					21				
10.					22				
11					23				

Wood Environment and Infrastructure Solutions, Inc.
# FIELD DATASHEET

Date: 10 17 2019 Location (C	Sircle): Lake Elsinore Canyon Lake Station: <u>CLO9</u>
Time on Station: 0917-	Time off Station: 0930
Weather Conditions: Selliny, clear.	Wind (mph & direction): 0-2mph E
Lat: ON target	Long: ON tampt
Water Depth (m): 5.95	Secchi Depth (m): 0.7
Water Chemistry Sample?: Y / N SAMPLE TIME: <u>D925</u>	Chl-a Sample?: Y / N Plankton Sample?: Y / N Surface volume filtered (ml): <u>360</u>
	Depth-Integrated volume filtered (ml): 500m
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	рН (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	20.4	9916	8.73	9.4	12				
1	20.4	996	8.39	9.4	13				
2	10.3	994	8.39	9.1	14				
3	20.1	991	7-79	4.2	15				
4	20.0	996	7.47	1.6	16				······································
5	19.9	1010	7.28	0.3	17				
105.5	19.6	1020	7.02	0.3	18				
7					19				
8					20	,			
9					21				
10		· .		-	22				
11					23				

FIELD I	DATASHEET
Date: $10  \mathcal{X}  \mathcal{Q}$ Location (Circle): Lak	e Elsinore Canyon Lake Station: (11)
Time on Station: 1415 Time off	Station: 1421
Weather Conditions: SUNW, brecz	Wind (mph & direction): 5-8 MM
Lat: ON tanget L	ong: ON tavaet
Water Depth (m): 595 S	ecchi Depth (m): $D, \overline{7}$
Water Chemistry Sample?: Y / X   Chl-a Sa     SAMPLE TIME:   Surface     Depth-In	mple?: Y / S Plankton Sample?: Y / B Plankton Sample?:
*Do not e (~500 r full (aft	xceed 7 PSI or 14 in. Hg when filtering chlorophyll MISSCA nL fill volume preferred). Discard lower chamber when er first 250 mL are filtered).

plankton sample collection

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	21.5	977	8,5D	11.29	12				
	1	21.3	983	8.49	11,40	13				
	2	20.4	985	8.34	9.06	14	_			
·	3	20.1	988	7.84	3.68	15				
	4	20.0	996	7.48	1.30	16				
	5	19.9	1013	7.37	0,42	17				
6.	58	19.9	1016	7.30	0.36	18				
- )	7					19				
i	8					20				
	9					21				
	10					22			•	
	11					23				

### FIELD DATASHEET

Date: $10/17/2019$ Location (Ci	rcle): Lake Elsinore/Canyon Lake Station: C10
Time on Station: 0828	Time off Station: 0905
Weather Conditions: Sunny, Clea	Wind (mph & direction): 0-2 mph
Lat: ON FANget	Long: / ON tavaet
Water Depth (m): 2.25	Secchi Depth (m): 0.62
Water Chemistry Sample? (Y) N SAMPLE TIME: 0650	Chl-a Sample? (V) N Plankton Sample? (V) N Surface volume filtered (ml): 200 M
	Depth-Integrated volume filtered (ml): <u>936Dm</u>
Comments:	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	20.5	1055	8.25	8.4	12				
1	20.60	1060	8.28	8.4	13				
2	W.5	1072	7.93	8.4	14				
3					15				
4					16				
5			·		17 -				
6					18				
7					19				
8					20			· · ·	
9					21				
10			i		22				
11					23				·

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### FIELD DATASHEET

Date: 10 (17/19 Locatio	on (Circle): Lake Elsinore/Canyon Lake Station: (1/10
Time on Station: 1400	Time off Station: 1405
Weather Conditions: SUNNY	breezy Wind (mph & direction): 5-8mph 6
Lat: ON TAMPT	Long: On tanget
Water Depth (m): $2.25_{\rm M}$	Secchi Depth (m): $0$ , $(\ell V)$
Water Chemistry Sample?: Y SAMPLE TIME:	Chl-a Sample?: Y N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	22,0	1008	3.05	12.0	12				
1	21.6	1045	8.39	11.5	13				
2	20.8	1053	8,35	7:26	14				
3					15				
4					16				
5					17				
6					18				
7					19				
8					20				
9					21				
10					22				
11					23				

### FIELD DATASHEET

Date: 10/17/19_ Location (Circle): Lake Elsinore/Ganyon Lake Station: N.SKI APEA
Time on Station: 1545 Time off Station: 1550
Weather Conditions: SUNNY, Calm Wind (mph & direction): 5-BmphE
Lat: ON taward Long: ON tavard
7.2 Water Depth (m): <u>5.2</u> Secchi Depth (m): <u>0.8</u>
Water Chemistry Sample?: Y /N   Chl-a Sample?: Y /N   Plankton Sample?: Y /N     SAMPLE TIME:
Depth-Integrated volume filtered (ml):
*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	20.4	715	7.82	7.51	12				
1	19.9	7-04	7.87	7.56	13				
2	19.7	706	7.82	6.91	14				
3	9.6	714	7.77	6.55	15				
4	19.6	717	7.73	6.18	16				
5	19.4	719	7.66	5.48	17	,			
6					18				
7					19				
8					20				
9					21				
10					22				
11					23				

December 20, 2019 Field Datasheets

# Lake Elsinore TNTP Offset Monitoring 2019-20

12/20/19	FIELD DATASHEET
Date: Location (Ci	ircle): Lake Elsinore Station: (702
Time on Station: $08:20$	Time off Station: 10°
Weather Conditions: SUNNY CAL	Wind (mph & direction): 0-2mph
Lat: On target	Long: ON target
Water Depth (m): 6.5	Secchi Depth (m): 0.45
Water Chemistry Sample Times:	<u>Chl-a Sample</u> s? (Y) N <u>Algae Taxonomy Sample</u> ?: (Y) N (0930)
Surface: 0845 Surface DUP: 0935 Depth Int: 0930 Depth Int. DUP: 0900 Bottom: 0905 Bottom DUP: 0950	Surface volume filtered (ml): 500 mL Surface DUP volume filtered (ml): 350 mL Depth Int. volume filtered (ml): 500 mL (TMDL) **Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL filter volume).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	рН≭	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0	11.9	38.40	7.17	.89	112.6	11.08
0.5	11.9	3840	7.18	1071	112.6	000
1	11.9	3840	7017	1067	112.6	1009
2	11.9	3840	7.16	1.58	112.5	10.08
3	11.9	3840	7.15	1.59	112.5	11.00
4	11.9	3840	7.15	. 1.65	12.4	11.00
5	11.9	3841	7014	1.54	12.3	11.10
6	11.9	3840	7.13	1.54	112.3	11.10
. 7	•				-	
8						
9						
10		-				
11						

\* ptt readings are enroneous, do not use

### Lake Elsinore TNTP Offset Monitoring 2019-20

1-		2019-20
.551	NG	FIELD DATASHEET
AFANIC	Date: 12 20 19 Location	n (Circle): Lake Elsinore Station: 1502
5/	Time on Station: 18 20	Time off Station: 1030
	Weather Conditions: <u>SUMM</u>	(AIM Wind (mph & direction): 0-2-
	Lat: ON tavajet	Long: Ontanget
	Water Depth (m):	Secchi Depth (m): 0, 45
	Water Chemistry Sample Times:	<u>Chl-a Sample</u> s?: Y / N <u>Algae Taxonomy Sample</u> ?: Y / N
	Surface: Surface DUP: Depth Int: Depth Int. DUP: Bottom: Bottom DUP:	PEE SAMPLING DATA SHEET Surface volume filtered (ml): Surface DUP volume filtered (ml): Depth Int. volume filtered (ml): Depth Int. DUP volume filtered (ml): **Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250mL filter volume).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH	DO (mg/L)	ORP (mV)	Turbidity (NTU)
0	12.6	3844	7.477	1.42	97.9	105
0.5	12.3	3848	7.45	2.21	935	
1	12.0	.3842	129	1.93	941	
2	11.9	3840	722		95 (1	11.20
3	11.9	3840	7.16	1.57	Q10 D	10.00
4	11.9	2940	7.12	1.48	91.5	10.15
5	11.9	3840	7.11	142	970	ID BC
6	11.9	3840	7.10	142	911	10.00
7	1		1110		17.0	10.72
8						
9						
10			-			
11					4	
		2	* pff rea	dings are.	erroneous, d	le not use.

### **FIELD DATASHEET**

Date: 12/20/19 Location (C	ircle): Lake Elsinore/Canyon Lake Station: LEO						
Time on Station: $\underline{07}$	Time off Station: $07.50$						
Weather Conditions: SUNNY, CALL	Wind (mph & direction): 0-2mph						
Lat:ON target	Long: ONTANGET						
Water Depth (m): 5,5	Secchi Depth (m): DM5						
Water Chemistry Sample?: Y /N SAMPLE TIME:	Chl-a Sample?: Y / N Plankton Sample?: Y / N Surface volume filtered (ml): A						
	Depth-Integrated volume filtered (ml): h						
	*Do not exceed <b>7 PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).						

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH <sup>≭</sup> (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	11.6	3844	7.65	2.38	12				
1	11.6	3844	7.4	2.13	13				
2	11.6	3844	7.37	2.07	14				
3	11.6	3844	7.34	2.01	15				
4	11.6	3844	7.33	1.97	16				
5	11.6	3844	7.33	1.95	17	-		H	
6			2		18				5 
7					19				
8					20				
9					21				
10					22				
11					23				

\* pH readings are errineaus, do not use

### **FIELD DATASHEET**

Date: 2/20/19 Location (Circ	le): Lake Elsinore/Canyon Lake Station: LEOZ
Time on Station: $08.20$ T	ime off Station: 0°.10
Weather Conditions: Sunny Calm	Wind (mph & direction): 0-2 mph
Lat: ON Taget	Long: ON Target
Water Depth (m): 6.5	Secchi Depth (m): 045
Water Chemistry Sample? Y N SAMPLE TIME: 0900	Chl-a Sample? Y/N Plankton Sample? Y N Surface volume filtered (ml): <u>http://w</u>
- I	Depth-Integrated volume filtered (ml): 500 M
*[	Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH <sup>≉</sup> (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	11.9	3840	7.17	1.89	12				
1	11.9	3840	7.17	1.67	13				
2	169	3840	7.16	1.58	14				
3	11.9	3840	7.15	1.59	15				
4	11.9	3840	7.15	1.55	16				
5	11.9	3841	7.14	1.54	17				
6	11.9	3840	7.13	1.54	18				
7					19				
8					20				
9	121				21				
10					22				
11					23				

\*pH readings are envoyeous, do not use.

## FIELD DATASHEET

Date: $\frac{2}{20}$ Location (C	Circle): Lake Elsinore Canyon Lake Station: 1603
Time on Station:755	Time off Station: 0810
Weather Conditions: SUMMY	alm Wind (mph & direction): 0-2mph
Lat: <u>on target</u>	Long: On target
Water Depth (m): $4,7$	Secchi Depth (m): 0,45
Water Chemistry Sample?: Y /N SAMPLE TIME:	Chl-a Sample?: Y /N Plankton Sample?: Y /N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml): <u>N/a</u>
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH★ (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)
0	12.0	3827	7.33	4.00	12				
1	12,0	3826	7.25	3.91	13				
2	12.0	3826	7.28	3.86	14				
3	12.0	3827	7.30	3.77	15				
4	12.0	3829	7.30	3.59	16				
4,5,5	12.0	3843	7.35	3,41	17				
6					18				
7					19				
8					20				
9					21				
10					22				
11					23				

\* pH readings are erroneous, do not use

# FIELD DATASHEET

Date: 22019 Location (C	Circle): Lake Elsinore/Canyon Lake	Station: LEO
Time on Station: 530	Time off Station: 540	
Weather Conditions: party cho	Wind (mph & direction	on): 0-2mph
Lat: On target	Long:On targe	Ame
Water Depth (m): $5$ , $5$	Secchi Depth (m):	5m
Water Chemistry Sample?: Y /N SAMPLE TIME:	Chl-a Sample?: Y / N Surface volume filtered (ml):	Plankton Sample?: Y / N
	Depth-Integrated volume filtered (ml	$): n   \alpha$
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> wh (~500 mL fill volume preferred). Dis full (after first 250 mL are filtered).	en filtering chlorophyll scard lower chamber when

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH <sup>≉</sup> (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)
0	13.4	3849	7.53	4 810	12		(µ0)/0111)		
1	12.2	3853	772	4.72	13				
2	11.8	3838	7.40	2.14	14				
3	11.7	3842	7.30	1.88	15				
4	11.5	3845	7.24	1.36	16				
5	11.3	3844	7.19	1.27	17				
6					18				
7					19				
8					20				
9					21				
10					22				
11					23				

\* p# readings are erroneous, do not use.

### **FIELD DATASHEET**

Date: 12/20/19 Lo	cation (Circle): Lake Elsinore/Canyon Lake Station: <u>(</u> <u>+</u> <u>-</u>
Time on Station: 1435	Time off Station: 1445
Weather Conditions:	Wind (mph & direction): <u>b-2mph55</u> W
Lat: On target	Long: on tavaet
Water Depth (m): 6.5	Secchi Depth (m):45
Water Chemistry Sample?: Y /	N   Chl-a Sample?: Y / N   Plankton Sample?: Y / N     Surface volume filtered (ml): $h$ / $h$
	Depth-Integrated volume filtered (ml): /
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).
Comments: Aeration line	's minning earlier in am

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH¥ (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	14,5	3847	7.63	3.90	12				
1	12.1	3847	7,48	3.26	13				
2	11,9	3839	7.57	1.56	14				
3	11,9	3839	7.52	1.35	15				
4	11.9	3839	7.46	1,29	16				
5	11,9	3840	7.42	1.30	17				
6	11.9	3840	7.40	1.30	18				
7					19				
8					20				
9					21				
10					22				
11					23				

\* pH readings are erroneous, do not use.

Wood Environment and Infrastructure Solutions, Inc.

## FIELD DATASHEET

Date: 2/20/19 Location	(Circle): Lake Elsinore/Canyon Lake	Station: 1503
Time on Station: 1415	Time off Station: 1430	
Weather Conditions:	Wind (mph & direction	on): 2-4 mph SSV
Lat: On target	Long: on tara	Kt_
Water Depth (m): $4.7$	Secchi Depth (m): D. 44	SM
Water Chemistry Sample?: Y /N SAMPLE TIME:/	Chl-a Sample?: Y / N Surface volume filtered (ml): //	Plankton Sample?: Y (N)
	Depth-Integrated volume filtered (ml	1):_n/a_
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> wh (~500 mL fill volume preferred). Di full (after first 250 mL are filtered)	nen filtering chlorophyll scard lower chamber when

Comments:

pH meter-vostown, in consident, value theady

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH <sup>★</sup> (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	14.6	3827	8,46	6.19	12				
	1	12.3	3824	7,92	5.1.3	13				
\$	2	12.1	3821	7.83	4,20	14				
	3	12.0	3821	7.79	4.05	15				
	4	11.9	3827	7.76	3.66	16				
4.5	15	11.8	3814	7.72	3.57	17				
	6					18				
	7					19				
	8					20	2			
	9					21				
	10					22				
L	11					23				

\* pH readings are enronzous, do not use.

### FIELD DATASHEET

Date: 12/20/19 Location (Circle) Lake Elsinore/Canyon Lake Station: LakeShope
Time on Station: 4:50 Time off Station: 15:25
Weather Conditions: <u>PARTY CLOUDY</u> , CALM Wind (mph & direction): <u>O-Z WPM</u>
Lat: <u>Intarget</u> Long: <u>On target</u>
Water Depth (m): 6.9 Secchi Depth (m): 045
Water Chemistry Sample?: Y / N   Chl-a Sample?: Y / N   Plankton Sample?: Y / N     SAMPLE TIME:    Image: Amount of the system of the syste
*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).
Comments: Installed New Surface DO logger

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH¥ (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	14.4	3842	7.28	3.69	12				
	1	12.1	3887	1.80	1.43	13				
	2	1109	3840	7.45	1.28	14				
	3	11.8	3840	7.33	1.24	15				
	4	11.8	3839	7.28	1.23	16				
	5	11.8	3039	7.23	624	17				
	6	11.7	3834	7.19	1.81	18				
6.5	7	1.7	3834	7.17	1.8Z	19				
GV -	8					20				
	9					21				
	10					22				
	11					23				
		1		*pH .	reading	ps an	e eno	neous,	do no	of use

### **FIELD DATASHEET**

Date: 12/20/19 Locatio	n (Circle): Lake Elsinore Canyon Lake Station:
Time on Station: $10:46$	Time off Station: 1:000 AVE.
Weather Conditions: <u>Senny</u>	ColM Wind (mph & direction): 0-Z MPM
Lat: ON target	Long: ON target
Water Depth (m):	Secchi Depth (m): 045
Water Chemistry Sample?: Y / N SAMPLE TIME:	Chl-a Sample?: Y (N) Plankton Sample?: Y (N) Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH <sup>⊀</sup> (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	1202	3841	7.13	3.53	12				9
	1	12.1	3837	7.16	3004	13				
	2	12.0	3840	7.13	2.27	14	_			
	3	11.9	3839	7.08	2.08	15				
	4	11.9	3839	7.06	2.06	16				
	5	1,9	3839	7.05	2.03	17				
9.9	6	11.9	3839	7.04	200	18				
/	7					19				
	8					20				•
	9					21				
	10					22				
	11					23				

\*pH readings are enoneary, do not use.

### FIELD DATASHEET

Date: <u>12.20.19</u> Location (	Circle): Lake Elsinore/Canyon Lake Station: <u>CLO</u> 7
Time on Station: 1010	Time off Station:
Weather Conditions: <u>JUNNU</u>	Wind (mph & direction):
Lat: ON tanget	Long: Ontavart
Water Depth (m): $15 \text{ M}$	Secchi Depth (m):, O
Water Chemistry Sample? Y/ N SAMPLE TIME:	Chl-a Sample? (Y)/ N Plankton Sample? (Y) N Surface volume filtered (ml): <u>1570</u> Depth-Integrated volume filtered (ml): 570
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	12.7	748	10.65	4.59	12	12.4	756	7,44	4.34
1	12.10	755	6.81	4.53	13	12.4	7510	7.45	4.32
2	12.5	767	6,95	4,41	14	2.5	757	7,45	4.27
3	12.5	758	7.04	4,43	18145	12.4	767	7.44	4.25
4	12.6	758	7.13	4,48	16				
5	12.5	758	7.10	4.43	17				 
6	12.5	7.01	7.26	4.33	18				· · · .
7	12.5	762	7.30	4.33	19		-		
8	12.6	762	7.35	4:33	20				
9	12.5	760	7.38	436	21				
10	12.4	7-58	7.39	4.36	22		1		
-11	2.4	753	7,43	4.37	23				

.

# FIELD DATASHEET

Date: $\frac{12}{20}/19$ Location (C	Circle): Lake Elsinore/Canyon Lake Station: CLOS
Time on Station: 0930	Time off Station:
Weather Conditions: - Clear	Wind (mph & direction):
Lat: ON tanget	Long: ONTANGRA
Water Depth (m): $7,8$	Secchi Depth (m): $0, 9$
Water Chemistry Sample?(Y)N SAMPLE TIME: 0945	Chl-a Sample?: (Y) N Plankton Sample? (Y) N Surface volume filtered (ml): 500 ML
	Depth-Integrated volume filtered (ml):
Comments:	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)
0	12.4	746	6.73	5.35	12				
1	12.4	748	(0,Q)	5.34	13				
2	12.3	748	7:02	6.23	14				
3	12,3	747	7.19	5.23	15				
4	12.3	7-48	7.25	5.18	16				
5	12.3	748	7.30	5,10	17				
6	12.3	748	7.34	5.010	18				
7.	12.3	747	7.37	5.00	19				· · · · · · · · · · · · · · · · · · ·
\$7.5	12.3	748	7.38	4.98	20				
9					21			··	
10					22		· · ·		
11					23				

### FIELD DATASHEET

Date: $\frac{12}{20/19}$ Location (C	ircle): Lake Elsinore/Canyon Lake Station: <u>CL09</u>
Time on Station: $0845$	Time off Station:
Weather Conditions: <u>Clear</u>	Wind (mph & direction):
Lat: ON target	Long: ON tanget
Water Depth (m): $6.7$	Secchi Depth (m): 0.9
Water Chemistry Sample?: Y/N SAMPLE TIME: <u>0</u> <b>9</b> 00	Chl-a Sample? $V/N$ Plankton Sample? $V/N$ Surface volume filtered (ml): <u>440</u> ML
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
0	11.6	923	6.47	6.89	12				,
1	11.4	929	7.14	6.82	13				
2	11.4	928	7.42	6.77	14				
3	11.6	918	7.50	6,08	15				
4	11.0	929	7.70	6.03	16				
5	11,7	976	7.58	D.B	17		-		
6	11.5	1164	7.110	0.29	18				
X65	11.5	181	7.04	0.25	19				
8		•			20				
9					21				
10					22.		1		
11					23				

Wood Environment and Infrastructure Solutions, Inc.

 $\langle \hat{} \rangle$ 

### FIELD DATASHEET

Date: $\frac{17}{20/19}$ Location (C	ircle): Lake Elsinore/Canyon Lake Station; CLI 13
Time on Station: 0752	Time off Station:
Weather Conditions: Clear	Wind (mph & direction):
Lat: ON target	Long: ON tavajet
Water Depth (m): $3, \tilde{9}$	Secchi Depth (m): 0.7
Water Chemistry Sample? Y N SAMPLE TIME: <u>0810</u>	Chl-a Sample?: (Y)N Plankton Sample?: (Y)N Surface volume filtered (ml): <u>440</u>
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0 .	11.6	947	7.32	8.02	12		•		
1	11.4	942	8.04	8.04	13				
2	11.4	941	8,17	798	14			· · · · · · · · · · · · · · · · · · ·	
3	11.0	941	8.23	7,99	15				
¥3.5	11,7	946	8.25	7.81	16				
5					17	-		1 - E	
6					18				1. A.L.
7					19				
8					20				
9					21			· · ·	
10					22				
11					23		··***	2	

### FIELD DATASHEET

Date: 12.20.19 Location (C	Fircle): Lake Elsinore/Canyon Lake Station: <u>CL07</u>
Time on Station: 1415	Time off Station:
Weather Conditions: Uccr	Wind (mph & direction):
Lat: ON tavalt	Long: on tanget
Water Depth (m): 150	Secchi Depth (m):
Water Chemistry Sample?: Y (N) SAMPLE TIME:	Chl-a Sample?: Y/N Plankton Sample?: Y/N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	14.1	742	7.78	5,88	12	12,4	756	7.64	4,17
1	13.1	770	7.75	5.20	13	12,4	756	7.65	4.07
2	12,7	702	7.707	4.00	14	12.4	757	7.65	4.10
3	125	7112	7.63	4.50	1/5145	12,4	758	7.54	4:02
4	12.5	762	7.61	4.33	16				
5	12.5	762	7.59	4.32	17		· ·		
6	12.5	761	7,59	4.33	18			· .	
7	12,4	740	7.58	4.31	19				
8	12.4	757	7.58	4.33	20				
9	12.4	7-65	7.84	4.32	21				
10	12.4	754	7.67	4,28	22	-			
11	12.4	765	7.60	4.22	23		r		

### FIELD DATASHEET

Date: 12.20.19 Location (C	ircle): Lake Elsinore/Canyon Lake Station: <u>CLO8</u>
Time on Station: 140Z	Time off Station:
Weather Conditions: <u>Clew</u>	Wind (mph & direction): <u>SNE</u>
Lat: ON TAVACT	Long: ON tavaget
Water Depth (m): 78	Secchi Depth (m):, 9
Water Chemistry Sample?: Y N SAMPLE TIME:	Chl-a Sample?: Y N Plankton Sample?: Y N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
0	13.5	732	7.61	6.41	12				
1	13.0	747	7,69	6.25	13			l	
2	12.5	747	7.68	5728	14				
3	12.4	751	7.65	5.10	15				
4	12.3	749	7.64	Jiar	16				· · · · · · · · · · · · · · · · · · ·
5	12.3	749	7.61	5.10	17				
6	12,3	748	7,61	4.80	18				
7	12.2	747	7.59	4.68	19				
\$ 7,5	12.2	748	7.59	4.63	20				
9					21				
10					22				
11					23				

### FIELD DATASHEET

Date: 12.2() 19 Location	(Circle): Lake Elsinore/Canyon Lake Station: <u>CLO</u>
Time on Station: 1343	Time off Station:
Weather Conditions: <u>JUNNU</u>	Wind (mph & direction):
Lat: ON target	Long: ON tavaret
Water Depth (m): $6.7$	Secchi Depth (m): 0.9
Water Chemistry Sample?: Y (N) SAMPLE TIME:	Chl-a Sample?: Y(N) Plankton Sample?: Y(N)
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	12,9	900	8.19	7.18	12			-	
1	12.4	925	8.23	7.36	- 13				
2	11.8	933	8.23	6.88	14		<u> </u>		
3	11.6	932	8.14	6.41	15		-		
4	11.6	935	8,12	6.32	16				
5	11.6	944	8.10	6.05	17				
6	115	1171	7.61	0.07	18				
165					19				
8					20				
9					21				
10					22				
11					23		,		

### FIELD DATASHEET

Date: $12 \cdot 20 \cdot 19$ Location (C	Circle): Lake Elsinore/Canyon Lake Station: 0210
Time on Station: <u>1330</u>	Time off Station:
Weather Conditions: <u>SUNNY</u>	Wind (mph & direction):
Lat: On tavget	Long: On target
Water Depth (m):	Secchi Depth (m):
Water Chemistry Sample?: Y /N SAMPLE TIME:	Chl-a Sample?: Y/N Plankton Sample?: Y/N Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	13.6	947	8.60	9.07	12			. <u> </u>	
1	12.6	939	8.63	9.31	13				
2	11.8	943	8.49	8.06	14				
3	11.7	946	8.44	7.6.6	15	-			
435	11.7	950	8.41	7.56	16				
5		-			17				
6					18				· · ·
7					19				•
8					20				
9					21	-			
10					22				<u>.</u>
11					23		1 .		

QUARTER 3 – FEBRUARY AND APRIL 2020

# Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring 2019-2020 Quarter 3 Report FINAL



Prepared for: Lake Elsinore & San Jacinto Watershed Project Authority 11615 Sterling Avenue Riverside, California 92503

Prepared by: Wood Environment and Infrastructure Solutions, Inc. 9210 Sky Park Court Suite 200 San Diego, CA 92123 May 29, 2020



## Lake Elsinore

### Monitoring Dates

February 18, 2020 and April 13, 2020. The lake levels during the sampling events were 1240.28 feet and 1244.73 feet, respectively. Sampling is conducted monthly in Lake Elsinore during summer (June – September) and bi-monthly during the remainder of the year (October – May).

### Monitoring Locations

Five locations were monitored in Lake Elsinore: Sites LE01, LE02, LE03 and the two in-lake data sondes maintained by Elsinore Valley Municipal Water District (EVMWD): Lakeshore Sonde and Grand Avenue Sonde. These sites are depicted in Figure 1.

### <u>Weather</u>

February – Partly cloudy and calm, 0-5 mph W wind, with a morning low of  $54^{\circ}F$  and a high of  $61^{\circ}F$ 

April – Overcast with a slight breeze, 0-5 mph WSW wind in the morning. Winds accelerated in the afternoon and prevented the field staff from collecting afternoon water quality readings on the lake. Lows around 43°F, warming to 79°F.

### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the project specific Work Plan, with no equipment failures or delays. Field monitoring included the following activities at each location or where noted:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen (all sites);
- Depth-integrated water chemistry sample for Total Dissolved Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus (LE02 only);
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples (LE02 only);
- Secchi disk measurements (LE01, LE02, and LE03);
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed (LE02 only);
- Visual observations and photos of lake conditions.

A summary of water quality profile data is presented in Tables 1 and 2. Results of the water chemistry analyses are presented in Tables 3 and 4.

Aerial imagery of chlorophyll-a, turbidity, and cyanobacterial bloom risk based on remote sensing satellite data are presented in Figures 2 through 11.

Copies of field datasheets are provided in Appendix A.

Wood Environment & Infrastructure Solutions, Inc. 2019-20 Lake Elsinore and Canyon Lake Nutrient TMDL In-Lake Monitoring Quarter 3 Report May 2020



Figure 1. Lake Elsinore Sampling Locations

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	Water Column Mean
			14.6	13.5	12.6	12.1	11 9	11 7				12.7
		Sn Cond (uS/cm)	3574	3577	3576	3575	3578	3577				3576
	11:25	nH*	9.16	9 17	8 99	8 94	8 91	8.86				9.01
		DO (ma/L)	16.2	15.9	11 4	10.0	9.6	7.0				11 7
LE01 <sup>a</sup>		Temp (°C)	14.9	14.8	14.0	13.0	12.4	12.1	12.1			13.3
		Sp. Cond (uS/cm)	3569	3569	3580	3580	3575	3574	3574			3574
	16:15	рН*	9.28	9.28	9.18	9.05	9.02	8.95	8.92			9.10
		DO (ma/L)	20.2	19.9	17.0	12.9	11.9	10.1	9.39			14.5
		Temp (°C)	13.4	13.3	13.3	12.2	11.6	11.5	11.4	11.4		12.3
	00.00	Sp. Cond (µS/cm)	3569	3569	3570	3581	3588	3581	3583	3582		3578
	08:30		9.14	9.12	9.11	8.93	8.85	8.81	8.81	8.81		8.95
. — h		DO (mg/L)	16.0	14.9	14.6	9.8	7.7	6.9	6.7	6.6		10.4
LE02 <sup>°</sup>		Temp (°C)	14.9	14.2	12.6	11.9	11.7	11.6	11.4	11.4		12.5
	45.40	Sp. Cond (µS/cm)	3560	3553	3588	3579	3579	3579	3581	3581		3575
	15:40	pH*	9.24	9.20	8.98	8.91	8.85	8.83	8.78	8.78		8.95
		DO (mg/L)	18.1	16.7	11.2	9.3	7.6	7.1	5.8	5.78		10.2
		Temp (°C)	13.6	13.6	12.8	12.2	11.9	11.7				12.6
	07.55	Sp. Cond (µS/cm)	3564	3562	3574	3580	3584	3583				3575
	07.55	pH*	9.15	9.15	8.98	8.92	8.89	8.81				8.98
		DO (mg/L)	15.3	15.5	10.4	9.7	8.9	6.8				11.1
LE03		Temp (°C)	14.8	13.9	13.3	12.2	11.7	11.7				13.3
	14.50	Sp. Cond (µS/cm)	3568	3568	3574	3580	3581	3577				3575
	14.50	pH*	9.27	9.20	8.95	8.82	8.78	8.78				8.97
		DO (mg/L)	21.9	16.9	12.0	7.3	6.7	6.6				11.9
		Temp (°C)	14.7	14.5	13.3	12.4	11.8	11.5	11.4	11.3	11.3	12.5
Lakeshore	15:55	Sp. Cond (µS/cm)	3561	3569	3569	3576	3579	3581	3581	3580	3580	3575
Sonde <sup>a</sup>		pH*	9.26	9.23	9.13	8.95	8.85	8.80	8.79	8.79	8.78	8.95
		DO (mg/L)	18.6	18.0	12.8	10.2	7.8	6.1	6.0	5.8	5.8	10.1
		Temp (°C)	15.5	13.7	12.5	12.0	11.6	11.6	11.5			12.6
Grand Ave	15:15	Sp. Cond (µS/cm)	3559	3566	3574	3577	3580	3579	3579			3573
Sonde		pH*	9.24	9.12	8.98	8.92	8.83	8.79	8.81			8.96
		DO (mg/L)	118.2	15.8	11.8	9.8	7.3	6.4	6.6			25.1

Table 1.	Lake Elsinore	In-situ Water	<b>Column Profile</b>	-February 18	, 2020
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Note: No stratification observed during this event, therfore epilimnion and hypolimnion mean values are not reported.

\*pH measurements may not have accurately reflected true values. Meter/probe were investigated after sampling event.

a- Afternoon bottom depth measurement taken at 5.5m

c- Bottom depth measurement taken at 4.5m

b- Bottom depth measurement taken at 6.5m

d- Bottom depth measurement taken at 7.5m

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	Water Column Mean
LE01 <sup>a</sup>		Temp (°C)	16.3	15.6	15.3	15.3	15.3	15.2	15.2	15.2		15.5
	10:20	Sp. Cond (µS/cm)	2816	2904	2934	2931	2946	2953	3016	3023		2914
		pH	9.30	9.26	9.25	9.22	9.16	9.14	9.09	9.09		9.22
		DO (mg/L)	11.1	9.9	8.9	7.6	6.8	6.4	4.6	4.6		7.5
		Temp (°C)										
		Sp. Cond (µS/cm)										
		pН										
		DO (mg/L)										
LE02	08:20	Temp (°C)	15.7	15.7	15.7	15.6	15.5	15.4	15.4	15.4	15.2	15.6
		Sp. Cond (µS/cm)	2794	2793	2796	2841	2921	2932	2975	3035	3021	2886
		pН	9.26	9.26	9.25	9.21	9.20	9.20	9.20	9.19	9.17	9.22
		DO (mg/L)	9.5	9.5	9.3	8.4	7.8	7.7	7.6	7.3	6.82	8.4
2202		Temp (°C)										
		Sp. Cond (µS/cm)										
		рН										
		DO (mg/L)										
	08:00	Temp (°C)	15.7	15.7	15.7	15.7	15.6	15.5	15.4			15.7
		Sp. Cond (µS/cm)	2738	2740	2777	2854	2961	2970	2971			2840
1 503		рН	9.25	9.25	9.23	9.21	9.19	9.17	9.17			9.22
		DO (mg/L)	9.7	9.7	9.2	8.3	7.7	7.3	7.3			8.6
LLUU		Temp (°C)										
		Sp. Cond (µS/cm)										
		рН										
		DO (mg/L)										
Lakeshore Sonde		Temp (°C)										
		Sp. Cond (µS/cm)										
		pН										
		DO (mg/L)										
Grand Ave Sonde		Temp (°C)										
		Sp. Cond (µS/cm)										
		рН										
		DO (mg/L)										

Table 2. Lake Elsinore In-situ Water Column Profile – April 13, 2020

No measurements taken in the afternoon or from the Sondes due to elevated afternoon winds

a- Bottom depth measurement taken at 6.5m

Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02			
SM 2540C	Total Dissolved Solids	mg/L	40	2000 <sup>3</sup> Depth Integrated		2100			
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND			
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	0.23			
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND			
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.1	NA	Depth Integrated	0.97			
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	1.2			
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.43 <sup>c1</sup> CCC: 0.52 <sup>c1</sup>	Depth Integrated	0.073 J			
EPA 300.0	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	ND			
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.182			
	Chlorophyllia	µg/L	1.0	25d1 40d2	Surface (0-2m)	77.6			
EFA 10200 H	Спюторнун-а			25~, 40**	Depth Integrated	56.8			

Table 3. Water Chemistry for Lake Elsinore – February 18, 2020

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature recorded at each location

<sup>d</sup> – Summer average

NA – Not applicable/ available ND – Not detected

J – value between MDL and RL

<sup>1</sup> - 2020 TMDL Target, based on Table 5-9n of 2004 TMDL
<sup>2</sup> - 2015 TMDL Target, based on Table 5-9n of 2004 TMDL
<sup>3</sup> - Santa Ana Region Basin Plan Objective

Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	LE02			
SM 2540C	Total Dissolved Solids	mg/L	40	2000 <sup>3</sup>	Depth Integrated	1700			
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND			
EPA 300.0	Nitrate as N	mg/L	0.2	NA	Depth Integrated	ND			
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND			
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.05	NA	Depth Integrated	3.9			
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	3.9			
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 0.965 <sup>c1</sup> CCC: 0.338 <sup>c1</sup>	Depth Integrated	ND			
EPA 300.0	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	ND			
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup> Depth Integrated		0.174			
	Chlorophyllia	µg/L	1.0	<b>25</b> d1 <b>40</b> d <sup>2</sup>	Surface (0-2m)	105			
EFA 10200 H	Chiorophyli-a			20 <sup>41</sup> , 40 <sup>42</sup>	Depth Integrated	99.5			

Table 4. Water Chemistry for Lake Elsinore – April 13, 2020

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature

recorded at each location

<sup>d</sup> – Summer average NA – Not applicable/ available

ND – Not detected

J - value between MDL and RL

 $^1$  – 2020 TMDL Target, based on Table 5-9n of 2004 TMDL  $^2$  – 2015 TMDL Target, based on Table 5-9n of 2004 TMDL  $^3$  – Santa Ana Region Basin Plan Objective



Figure 2. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations February 18, 2020



Figure 3. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations based on TMDL Targets February 18, 2020



Figure 4. Satellite Imagery of Lake Elsinore Turbidity Measurements February 18, 2020



Figure 5. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood February 18, 2020 Data gaps mid-lake are due to large surface cyanobacterial slicks


Figure 6. Lake Elsinore Unprocessed Raw Satellite Image from February 18, 2020



Figure 7. Satellite Imagery of Lake Elsinore Chlorophyll-a Concentrations April 13, 2020







Figure 9. Satellite Imagery of Lake Elsinore Turbidity Measurements April 13, 2020



Figure 10. Satellite Imagery of Lake Elsinore HAB Indicator Likelihood April 13, 2020



Figure 11. Lake Elsinore Unprocessed Raw Satellite Image from April 13, 2020

# Canyon Lake

#### Monitoring Dates

February 18, 2020 and April 13, 2020. Year-round bi-monthly monitoring is required for Canyon Lake. The lake level on the days of sampling were 1381.66 feet and 1382.08 feet, respectively.

#### Locations

Four locations were sampled in Canyon Lake: Sites CL07, CL08, CL09, and CL10. These sites are depicted in Figure 12.

#### <u>Weather</u>

February – Partly cloudy and calm, 0-5 mph W wind, with a morning low of 54°F and a high of  $61^{\circ}F$ 

April – Overcast with a slight breeze in the morning (0-5 mph WSW wind), which accelerated to 5-10mph W wind in the afternoon. Lows around 43°F, warming to 79°F.

#### Water Quality Monitoring Activities

Water quality monitoring was successfully performed in accordance with the TMDL Work Plan and there were no equipment failures or delays. Field monitoring included the following activities at each location:

- Vertical water column profile measurements of temperature, conductivity, pH, and dissolved oxygen;
- Depth-integrated water chemistry sample for Total Dissolved Solids, Total Suspended Solids, Sulfide, Nitrate as N, Nitrite as N, Kjeldahl Nitrogen, Total Nitrogen, Ammonia-Nitrogen, Ortho Phosphate Phosphorus, Total Phosphorus, Total and Dissolved Aluminum;
- Chlorophyll-a surface (0-2 m) and full depth-integrated samples;
- Secchi disk measurements;
- Full water column vertical plankton tows with samples preserved and archived for potential assessment in the future as needed;
- Visual observations and photos of lake conditions.

A summary of water quality profile data are presented in Tables 5 and 6. Results of the water chemistry analyses are presented in Tables 7 and 8.

Satellite imagery of chlorophyll-a, turbidity, and cyanobacterial bloom risk based on remote sensing data are presented in Figures 13 through 22. Satellite chlorophyll-a concentrations in portions of the eastern arm of Canyon Lake are likely impacted by the narrowness of the water body, resulting in an "edge-effect" of the nearby land mass, the consequence of which can be artificially elevated chlorophyll-a concentrations.

Copies of field datasheets are provided in Appendix A.



Figure 12. Canyon Lake Sampling Locations

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	14 m	15 m	Water Column Mean - All
		Temp (°C)	13.9	13.6	12.6	12.5	11.9	11.6	11.6	11.5	11.5	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.9
CL 07	10.07	Sp. Cond (µS/cm)	700	703	544	714	720	722	721	721	720	721	722	724	722	722	722	722	708
CLOT	10.07	pН	9.44	9.37	8.84	8.80	8.09	8.02	7.91	7.85	7.75	7.70	7.69	7.68	7.68	7.68	7.67	7.67	8.12
		DO (mg/L)	17.6	16.7	12.0	12.2	7.2	6.3	5.8	4.8	4.1	4.1	4.0	4.0	3.9	3.9	3.9	3.9	7.2
		Temp (°C)	17.2	14.6	13.6	12.4	11.9	11.8	11.6	11.6	11.6	11.5	11.5	11.5	11.5	11.5	11.5	11.5	12.3
CL 07	14.50	Sp. Cond (µS/cm)	703	700	705	717	722	723	722	723	722	723	723	723	723	723	724	723	719
CL07	14.56	pН	9.51	9.50	9.30	8.48	8.07	7.95	7.88	7.80	7.75	7.69	7.68	7.67	7.67	7.67	7.67	7.67	8.12
		DO (mg/L)	19.2	18.8	15.6	8.6	6.6	6.0	5.5	4.9	4.3	4.0	3.9	3.9	3.9	3.9	3.8	3.8	7.3
		Temp (°C)	14.2	13.8	13.4	12.6	11.8	11.8	11.7	11.7	11.6	11.6							12.4
CL 08	00.20	Sp. Cond (µS/cm)	697	699	706	723	720	719	719	720	720	725							715
CLUO	09.30	pН	9.44	9.40	9.21	8.52	8.02	7.84	7.80	7.79	7.76	7.7							8.35
		DO (mg/L)	17.9	17.4	17.0	10.0	6.0	5.2	5.4	5.3	4.8	3.4							9.2
		Temp (°C)	15.1	14.1	12.8	12.4	12.0	11.8	11.7	11.7	11.6	11.6							12.5
CL 08	14.45	Sp. Cond (µS/cm)	698	694	716	721	721	720	721	722	722	725							716
CLUO	14.45	pН	9.55	9.58	8.83	8.39	7.83	7.78	7.77	7.81	7.74	7.69							8.30
		DO (mg/L)	20.2	20.7	11.4	8.9	5.6	5.1	5.1	5.5	4.5	3.6							9.1
		Temp (°C)	14.1	14.0	13.4	12.5	12.4	12.1	11.7	11.3	11.2								12.5
01.008	00.44	Sp. Cond (µS/cm)	803	805	835	877	912	907	938	1019	1040								904
CL09-	00.41	pН	9.19	9.19	8.96	8.32	8.15	7.83	7.42	7.24	7.2								8.17
		DO (mg/L)	14.7	14.6	13.4	7.8	5.9	2.9	0.1	0.0	0.0								6.6
		Temp (°C)	15.8	14.6	13.6	12.7	12.4	12.1	11.7	11.5	11.3								12.9
CL 00 <sup>a</sup>	14:00	Sp. Cond (µS/cm)	805	806	833	859	912	913	906	1017	1039								899
CLU9	14.20	рН	9.25	9.25	9.08	8.46	8.09	7.82	7.50	7.23	7.21								8.21
		DO (mg/L)	15.8	15.6	13.8	9.0	5.5	3.4	0.0	0.0	0.0								7.0
		Temp (°C)	13.9	13.9	13.9	13.0	12.9												13.5
OL 40 <sup>b</sup>	07.55	Sp. Cond (µS/cm)	841	842	858	980	982												901
CL10	07.55	pН	9.22	9.22	9.14	8.26	8.14												8.80
		DO (mg/L)	14.3	14.4	13.8	7.0	5.5												11.0
		Temp (°C)	16.3	14.9	13.7	13.1	12.9												14.2
OL 40 <sup>b</sup>	14:00	Sp. Cond (µS/cm)	839	849	863	922	961												887
CL10 <sup>5</sup>	14:00	pН	9.19	9.23	9.10	8.71	8.20												8.89
		DO (mg/L)	15.3	15.6	13.3	10.2	5.2												11.9

Table 5. Canyon Lake In-situ Water Column Profile – February 18, 2020

Note: No stratification observed during this event, therfore epilimnion and hypolimnion mean values are not reported.

a- Bottom measurement taken at 7.5m

b- Bottom measurement taken at 3.5m

Site	Time	Measure	Surface	1 m	2 m	3 m	4 m	5 m	6 m	7 m	8 m	9 m	10 m	11 m	12 m	13 m	14 m	15 m	Water Column Mean - All
		Temp (°C)	15.0	14.9	14.9	14.9	14.9	14.9	14.8	14.8	14.9	14.8	14.8	14.6	14.5	14.3	13.9	13.9	14.7
CL 07	08.35	Sp. Cond (µS/cm)	452	369	473	475	485	483	503	513	575	588	597	602	608	612	632	635	538
CLOT	00.55	pН	7.90	7.88	7.87	7.86	7.84	7.81	7.80	7.81	7.80	7.78	7.75	7.69	7.63	7.58	7.56	7.50	7.75
		DO (mg/L)	4.8	4.6	4.5	4.5	4.3	4.0	4.0	4.0	3.4	3.1	2.4	1.4	0.5	0.0	0.0	0.0	2.8
		Temp (°C)	16.4	15.5	15.1	15.0	14.9	14.9	14.9	14.8	14.8	14.9	14.9	14.7	14.7	14.6	14.5	14.5	14.9
CL 07	13.35	Sp. Cond (µS/cm)	463	463	469	464	477	476	500	518	553	580	597	587	615	624	702	735	551
CLOT	15.55	pH	7.90	7.80	7.77	7.75	7.77	7.77	7.76	7.76	7.75	7.73	7.71	7.61	7.65	7.61	7.60	7.42	7.71
		DO (mg/L)	5.4	5.1	4.7	4.7	4.6	4.5	4.3	4.1	3.9	3.9	2.8	2.1	2.3	0.0	0.0	0.0	3.3
		Temp (°C)	15.5	15.3	15.3	15.1	15.0	14.7	14.6	14.7	14.7	14.7	14.6	14.5					14.9
CL 08	09.10	Sp. Cond (µS/cm)	444	445	447	445	452	430	488	551	595	609	610.2	618.5					511
OLOO	00.10	pH	7.66	7.58	7.39	7.49	7.77	7.72	7.71	7.76	7.74	7.71	7.68	7.65					7.66
		DO (mg/L)	5.2	5.1	5.0	4.7	4.5	3.8	3.4	3.6	3.1	2.8	2.6	2.2					3.8
		Temp (°C)	16.2	15.9	15.5	15.2	15.0	14.8	14.7	14.7	14.8	14.7	14.6	14.7					15.1
CL 08	14.02	Sp. Cond (µS/cm)	435	440	445	444	435	423	523	566	606	613	613	604					512
CLUO	14.02	pH	6.94	7.11	7.46	7.68	7.68	7.68	7.66	7.67	7.66	7.50	7.42	7.48					7.50
		DO (mg/L)	6.7	6.5	6.1	5.4	5.2	5.0	4.3	4.1	3.1	0.4	0.1	0.0					3.9
		Temp (°C)	15.6	15.2	14.9	14.1	13.8	13.1	12.9	12.7	12.7								13.9
CL 09	09.55	Sp. Cond (µS/cm)	625	640	631	640	629	565	559.3	566	903								640
CL03	03.55	pH	8.48	8.29	8.14	7.79	7.73	7.68	7.62	7.59	7.38								7.86
		DO (mg/L)	8.1	7.3	6.4	4.3	4.2	4.0	3.7	3.5	0.0								4.6
		Temp (°C)	16.5	16.3	15.3	14.1	13.9	13.0	12.7	12.9	12.8								14.2
	14.25	Sp. Cond (µS/cm)	620	709	675	671	620	558	568	897	835								684
CLU9	14.25	pH	8.93	8.87	8.42	7.90	7.76	7.64	7.56	7.80	7.43								8.03
		DO (mg/L)	12.2	11.6	8.3	5.4	4.9	4.7	4.2	0.5	0.1								5.8
		Temp (°C)	15.8	15.3	14.8	13.4													14.8
CI 10	10.35	Sp. Cond (µS/cm)	611	605	604	582.1													601
OLIO	10.00	pH	8.18	7.92	7.88	7.75													7.93
		DO (mg/L)	6.6	6.1	5.6	4.4													5.7
		Temp (°C)	16.2	16.1	15.5	14.5	13.5												15.2
CI 10	14.42	Sp. Cond (µS/cm)	609	608	605	661	637												624
GLIU	14.42	pH	8.28	8.14	7.90	7.79	7.69												7.96
		DO (mg/L)	9.4	9.0	7.1	5.8	2.5												6.8

Table 6. Canyon Lake In-situ Water Column Profile – April 9, 2019

Note: No stratification observed during this event, therfore epilimnion and hypolimnion mean values are not reported.

a- Bottom measurement taken at 7.5

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	I	able 1. Ca	inyon Lar		y – February 10, 2	020			
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface	CL07	CL08	CL09	CL10
SM 2540C	Total Dissolved Solids	mg/L	10	700	Depth Integrated	390	390	510	510
SM 2540D	Total Suspended Solids	mg/L	2	NA	Depth Integrated	6	8	5	10
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND	ND	1.3	ND
EPA 300.0	Nitrate as N	mg/L	0.2	10	Depth Integrated	ND	ND	ND	ND
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND	ND	ND	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.1	NA	Depth Integrated	0.93	1.1	0.86	1.4
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	0.93	1.1	0.86	1.4
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 1.85-6.89 <sup>c1</sup> CCC: 0.661-2.03 <sup>c1</sup>	Depth Integrated	0.25	0.14	0.86	0.067 J
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	ND	ND	0.19	ND
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.064	0.056	0.203	0.076
EPA 200.7	Total Aluminum	µg/L	100	NA	Depth Integrated	68 J	71 J	ND	71 J
EPA 200.7	Dissolved Aluminum	µg/L	200	NA	Depth Integrated	ND	ND	ND	ND
EPA 10200 H	Chlorophyll-a	µg/L	1.0	25 <sup>b1</sup> , 40 <sup>b2</sup>	Surface (0-2m)	40.6	30.7	9.58	16.7
				1		G. 1 I	20.3	13.Z	17.1

Table 7 Canvon Lake Water Chemistry - February 18 2020

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific; dependent upon pH and temperature
<sup>1</sup> - 2020 TMDL Target, based on Table 5-9n of 2004 TMDL
<sup>2</sup> - 2015 TMDL Target, based on Table 5-9n of 2004 TMDL

NA – Not applicable/available

ND – Not detected

J – value between MDL and RL

2019-20 Lake Elsinore and Canyon Lake Nutrient TMDL In-Lake Monitoring Quarter 3 Report May 2020

	i da		yon Lan		<b>y</b> , (p) 11 10, 2020				
Method	Compound	Units	RL	Basin Plan or TMDL Target	Depth Integrated or Surface Sample	CL07	CL08	CL09	CL10
SM 2540C	Total Dissolved Solids	mg/L	10	700	Depth Integrated	330	310	380	360
SM 2540D	Total Suspended Solids	mg/L	2	NA	Depth Integrated	4	6	16	13
SM 4500S2 D	Sulfide	mg/L	0.1	NA	Depth Integrated	ND	ND	0.50	ND
EPA 300.0	Nitrate as N	mg/L	0.2	10	Depth Integrated	ND	ND	0.19	0.27
EPA 300.0	Nitrite as N	mg/L	0.1	NA	Depth Integrated	ND	ND	ND	ND
EPA 351.2	Total Kjeldahl Nitrogen	mg/L	0.1	NA	Depth Integrated	1.1	0.93	1.6	1.3
Calculation	Total Nitrogen <sup>a</sup>	mg/L		0.75 <sup>b1</sup>	Depth Integrated	1.1	0.93	1.79	1.57
SM4500NH3H	Ammonia-Nitrogen	mg/L	0.1	CMC: 9.59-15.4 <sup>c1</sup> CCC: 2.64-3.65 <sup>c1</sup>	Depth Integrated	0.35	0.24	0.40	0.073
SM 4500P E	Ortho Phosphate Phosphorus	mg/L	0.05	NA	Depth Integrated	0.21	0.17	0.43	0.44
EPA 365.1	Total Phosphorus	mg/L	0.01	0.1 <sup>b1</sup>	Depth Integrated	0.211	0.223	0.448	0.432
EPA 200.7	Total Aluminum	µg/L	200	NA	Depth Integrated	210	720	960	1000
EPA 200.7	Dissolved Aluminum	µg/L	100	NA	Depth Integrated	ND	ND	ND	ND
	Chlorophyll o		1.0	25b1 40b2	Surface (0-2m)	6.65	5.53	28.5	17.6
EFA 10200 H	Chiorophyli-a	µg/L	1.0	25°, 40°2	Depth Integrated	4.64	4.33	9.00	8.85

Table 8 Canyon Lake Water Chemistry – April 13, 2020

Notes:

<sup>a</sup> - Total Nitrogen = TKN+NO2+NO3

<sup>b</sup> - Annual average

<sup>c</sup> - Values are site specific dependent upon pH and temperature

NA – Not applicable/available ND – Not detected

 $^1-2020$  TMDL Target, based on Table 5-9n of 2004 TMDL  $^2-2015$  TMDL Target, based on Table 5-9n of 2004 TMDL

J – concentration between MDL and RL



Figure 13. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations February 18, 2020

Wood Environment & Infrastructure Solutions, Inc. 2019-20 Lake Elsinore and Canyon Lake Nutrient TMDL In-Lake Monitoring Quarter 3 Report May 2020



Figure 14. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations based on TMDL Targets February 18, 2020



Figure 15. Satellite Imagery of Canyon Lake Turbidity Measurements February 18, 2020



Figure 16. Satellite Imagery of Canyon Lake HAB Indicator Likelihood February 18, 2020

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Figure 17. Canyon Lake Unprocessed Raw Satellite Image from February 18, 2020



Figure 18. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations April 13, 2020



Figure 19. Satellite Imagery of Canyon Lake Chlorophyll-a Concentrations based on TMDL Targets April 13, 2020



Figure 20. Satellite Imagery of Canyon Lake Turbidity Measurements April 13, 2020



Figure 21. Satellite Imagery of Canyon Lake HAB Indicator Likelihood April 13, 2020



Figure 22. Canyon Lake Unprocessed Raw Satellite Image from April 13, 2020

Appendix A Field Datasheets February 18, 2020 Field Datasheets

# FIELD DATASHEET

Date: $\mathcal{O}_{\mathcal{I}}$	2/18/20	<u>)</u> Loc	ation (Circ	cley: Lake I	Elsinore	anyon Lak	e S	tation: <u> </u>	E01
Time on S	Station:	1:15	1	Time off St	ation:				
Weather	Conditions	· Partly (	loody	Calm	Wind	(mph & d	irection):	Vone	2
Lat:	n Tange	4		Lor	ig: On	Targe	+		
Water De	pth (m):	5.6	· .	Sec	chi Depth	(m):	25		
Water Ch SAMPLE	emistry Sa CTIME:	mple?: Y /(1	D -	Chl-a Sam Surface vo	ple?: Y (N lume filter	) red (ml):	Plan	kton Sam	ple?(Y)/N
•				Depth-Inte	grated vol	ume filtere	ed (ml):		
			*	Do not exc (~500 mL full (after	eed 7 <b>PSI</b> fill volum first 250 n	or <b>14 in. I</b> le preferre nL are filte	<b>Ig</b> when filt d). Discard ered).	tering chlo lower char	rophyll nber when
Phyton Zoo Ph	s: plankte ankto	n Samp n Sam	rle Colli Ple Co	ected(		میں بور کر			
Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (uS/cm)	pH (units)	DO (mg/L)
′	14.00	· · ·					( and a start of the start of t		· · · /
	3	3574	9.16	16.Z4	12		(uoreni)		
1	13.5	3574 3577	9.16	16.24 15.9	12 13				
1 2	13.5	3574 3577 3576	9.16 9.17 8.99	16.24 15.9 11.43	12 13 14				
1 2 3	13.5 12.6 12.1	3574 3577 3576 3575	9.16 9.17 8.99 8.94	16.24 15.9 11.43 9.99	12 13 14 15				
1 2 3 4	13.5 12.6 12.1 11.9	3574 3577 3576 3576 3578	9.16 9.17 8.99 8.94 8.94	16.24 15.9 11.43 9.99 9.57	12 13 14 15 16				
1 2 3 4 5	13.5 12.6 12.1 11.9 11.97	3574 3577 3576 3575 3578 3577	9.16 9.17 8.99 8.94 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12 13 14 15 16 17				
0 1 2 3 4 5 6	13.5 12.6 12.1 11.9 11.97	3574 3576 3576 3575 3578 3577	9.16 9.17 8.99 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12 13 14 15 16 17 18				
0       1       2       3       4       5       6       7	13.5 12.6 12.1 11.9 11.7	3574 3576 3576 3575 3578 3577	9.16 9.17 8.99 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12 13 14 15 16 17 18 19			j.	
0       1       2       3       4       5       6       7       8	13.5 12.6 12.1 11.9 11.7	3574 3576 3576 3575 3578 3577	9.16 9.17 8.99 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12     13     14     15     16     17     18     19     20			j.	
0       1       2       3       4       5       6       7       8       9	13.5 12.6 12.1 11.9 11.87	3574 3576 3576 3578 3578	9.16 9.17 8.99 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12     13     14     15     16     17     18     19     20     21			ц	
0       1       2       3       4       5       6       7       8       9       10	13.5 12.6 12.1 11.9 11.7	3574 3576 3576 3575 3578 3577	9.16 9.17 8.99 8.94 8.91 8.86	16.24 15.9 11.43 9.99 9.57 7.01	12     13     14     15     16     17     18     19     20     21     22			×	

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### FIELD DATASHEET

Date: 02/18/20 Locat	ion (Circle): Lake Elsinore/Canyon Lake Station: LFOZ
Time on Station: 08:30	Time off Station: <u>\\`OO</u>
Weather Conditions: Partly C	wind (mph & direction): None
Lat: ON Target	Long: ON Targes
Water Depth (m): 609	Secchi Depth (m):
Water Chemistry Sample?: Ø/N SAMPLE TIME:	Chl-a Sample?: (S/N Plankton Sample) / N Surface volume filtered (ml): 250mL
	Depth-Integrated volume filtered (ml): <u>200</u> ML
	(~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	13.4	3569	9.14	15.95	12				
	1	13.3	3569	9.12	14.90	13				
	2	13.3	3970	9.1	14.61	14				
	3	12.2	358(	8.93	9.18	15				
	4	11.6	3588	8.86	7.72	16				
	5.	11.9	3581	8.81	6.85	. 17				
	6	11.4	3583	8.81	6.71	18		· .		
6.0	4	11.4	3582	8.8	6.62	19				
-	8	,,				20				
	9					21				
	10					22				
	11					23				

# FIELD DATASHEET

•	Date: 1	18/1020	) Loca	ntion (Circ	le) Lake E	ElsinoreCa	inyon Lake	e St	ation:	53	
. ,	Time on St	tation: <u>O</u>	1:55	T	ime off Sta	ition: 09	3:25	_			
	Weather C	onditions:	Senn	y, Cal	lm_	Wind	(mph & di	rection):	Voie	2 <sup>2511</sup>	
	Lat: <u>0</u> w	<u>. Tas</u>	.get	1 +	Lon	g: <u>0v</u>	Karge	8			
	Water Dep	oth (m):	1.9m		Seco	chi Depth (	(m): <u>ø</u>	25			
	Water Che SAMPLE	mistry Sar TIME:	nple?: Y /(	) -	Chl-a Sam Surface vol	ole?: Y / N lume filter	) ed (ml):	Plan	kton Sam	ole? (Y) N	· · ·
				]	Depth-Inte	grated volu	ume filtere	d (ml):			
	•			*]	Do not exc (~500 mL full (after	eed 7 <b>PSI</b> fill volum first 250 n	or <b>14 in. H</b> e preferred 1L are filte	<b>Ig</b> when filt d). Discard l red).	ering chlo ower char	rophyll nber when	
	<u>Comments</u> RW Z0	<u>:</u> ytopla bplan	nkten Kten	Colle Colle	cted		NAMNA 18:20	A 11:10	) - V 709	chorn Site t Less	ed male se
-	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Seconder
	0	13.6	3564	9.15	16.27	12					Willer
	1	13.6	Contraction of the second	9.15	16.93	13					boy .
	2	12.8	3574	8.98	16.44	14		-			and the second
	3	12.2	3680	8.92	9.72	15					xeller
	4	书言	2584	8.89	8-91	16					
d,	15	11.7	3583	8.81	6.5	17	*				
	6					18	·		. '		
	7					19					
•	8					20					
	9					21					
	10					22					
	11					23					

Wood Environment and Infrastructure Solutions, Inc.

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### FIELD DATASHEET

Date: 02/18/20 Location (0	Circle) (Lake Elsinore Canyon Lake	Station: LEOI
Time on Station: 16:16	Time off Station: 16:30	
Weather Conditions: Sonny, Lic	NHWind (mph & direc	tion): SMPH, West
Lat: On Target	Long: On Farge	+
Water Depth (m): $5.7 \text{ M}$	Secchi Depth (m): 2	6
Water Chemistry Sample?: Y / N SAMPLE TIME:	Chl-a Sample?: Y N Surface volume filtered (ml):	Plankton Sample?: Y (N)
	Depth-Integrated volume filtered (	ml):
	*Do not exceed 7 PSI or 14 in. Hg	when filtering chlorophyll

(~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

6

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	14.9	3569	9.28	20.18	12				
	1	14.8	3569	9.28	19,888	13				
	2	14.0	3580	9.18	17.02	14				
Į	3	13.0	3580	9.05	12.92	15				
	4	12.4	3575	9.02	11.86	16				
	5	12.2	3674	8.95	10.10	17				
.6	8	12.2	3574	8.92	9.39	18				
9	7					19				
	8					20				
	9					21				
	10					22				
	11					23				

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# FIELD DATASHEET

Date: 02/18/20 Location (C	ircle): Lake Elsir	nore/Qanyon Lake	Station: LEOZ
Time on Station: 16:40	Time off Station	n: 15:50	
Weather Conditions: Sunny Light	Wind	Wind (mph & direction	): SMPH, West
Lat: On Larget	Long:	On Target	
Water Depth (m): $6.8$	Secchi	Depth (m): .25	5
Water Chemistry Sample?: Y (N) SAMPLE TIME:	Chl-a Sample? Surface volum	e filtered (ml):	Plankton Sample?: Y (N)
	Depth-Integrat	ted volume filtered (ml)	· •
<b>₽</b>	*Do not exceed	7 <b>PSI</b> or <b>14 in. Hg</b> whe	en filtering chlorophyll card lower chamber when

 $(\sim 500 \text{ mL till volume preferred})$ . Discard lower full (after first 250 mL are filtered).

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	14.9	3660	9.24	18.05	12				-
	1	14.2	3653	9.20	16.66	13				
	2	12.6	3588	8.98	11.2Z	14				
	3	11.9	3579	8.91	9.29	15				
	4	11.7	3579	68.8	7.66	16				
	5	11.6	3579	8.83	7.16	17				
	6	11.4	3581	8.78	6.78	18				
6.6	$\checkmark$	11.1	3581	8.78	5.78	19				
	8				•	20				
:	9					21				
	10					22				
	11 -					23				

#### FIELD DATASHEET

Date: 2/18/20 Location	(Circle): Lake Elsinore/Canyon Lake Station: <u>LEO</u>
Time on Station: (0. 14.50)	Time off Station: 13.10
Weather Conditions: Danney	Light wind Wind (mph & direction): Smph W
Lat: On taget	Long: On Taget
Water Depth (m): $\mathcal{V}_{\mathcal{A}}$	Secchi Depth (m): 25
Water Chemistry Sample?: Y / (N) SAMPLE TIME:	Chl-a Sample?: Y / N Plankton Sample?: Y / N
	Depth-Integrated volume filtered (ml):
· · · · · · · · · · · · · · · · · · ·	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll

\*Do not exceed 7 **PSI** or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

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	Om=	16.8	3668	9.27	21.92	)	-			
	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
		+++-8-	3548	9.21	20.42	. 12				
	1	13.9	3568	9.20	16.94	13		· · · · ·		
•	2	13.3	3674	8.95	12.02	- 14				
	3	12.2	3580	8.82	7.33	15		-	, 	
	4	11.07	3581	8.78	6.69	16				
8	_5	11.7	3577	8.78	6.58	17				• • •
	6					18				
	7		· · · · · · · · · · · · · · · · · · ·			19				
	8					20				
	9				-	21				
	10					22				
	11					23				
	11					23				

# FIELD DATASHEET

Date:	2/18/2	) Loca	ation (Circ	le) (Lake E	Elsinore)Ca	anyon Lak	e St	tation:	and f	the	
Time on S	tation: 16	5:16	Т	ime off Sta	ation: 16	0.35			• ;		
Weather C	Conditions:	Sanna	, Light	wind	Wind	(mph & di	rection):	SM5H	West	<del>}</del>	
Lat:	L'Axge	£	· ·	Lon	g:\	Karge.	+.				
Water Der	oth (m):	2, Gol		Seco	chi Depth	(m):	25				
Water Chemistry Sample?: Y /N   Chl-a Sample?: Y /N   Plankton Sample?: Y /N     SAMPLE TIME:											
		4	• ]	Depth-Inte	grated vol	ume filtere	ed (ml):				
*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered). <u>Comments:</u> Soude Secial • 20190780 H •											
$\overline{\nabla}$	0 688 6	girginderge 1.	2/20	[19]	Doc	ape	XP: 4	1261	20, Ī	uticlized,	
		Sn				·	~	1	, v	- m lin 1 him	
Depth (m)	Temp (°C)	Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09/26/19	
Depth (m) 0	Temp (°C)	<b>5</b> μ. Cond (μS/cm) 3559	pH (units)	DO (mg/L)	Depth (m) 12	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1	Temp       (°С)       \b.S       \b.S	5p. Cond (μS/cm) 3559 3966	pH (units) 9.14 9.12	DO (mg/L) \ <u>8.1</u> 2 \5.78	Depth (m) 12 13	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2	Temp   (°C)   \b.\$   13.7   12.5	5p. Cond (µS/cm) 3559 3966 3574	pH (units) 9.14 9.12 8.98	DO (mg/L) \8.17 \5.78  \.82	Depth (m) 12 13 14	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3	Temp (°С)     13.9     13.0     12.0	5p. Cond (µS/cm) 3559 3966 3574 3577	pH (units) 9.12 9.12 9.98 8.92	DO (mg/L) 18.17 15.78 11.87 9.84	Depth (m) 12 13 14 15	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4	Temp (°C)     13.9     13.0     17.0     12.0     11.6	sp. Cond (µS/cm) 3559 3576 3577 35377 3580	pH (units) 9.14 9.12 9.98 8.92 8.83	DO (mg/L) \8.12 \5.78 \.82 9.84 7.84	Depth (m) 12 13 14 15 16	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5	Temp (°C)     \G.S     \G.S	5p. Cond (μS/cm) 3559 3574 3577 3580 3579	pH (units) 9.12 9.98 8.92 8.83 8.79	DO (mg/L) 18.12 15.78 11.82 9.84 9.84 6.36	Depth (m) 12 13 14 15 16 17	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5 6	Temp (°C)     13.9     13.9     13.9     12.0     12.0     11.6     1.0     1.0     1.0	sp. Cond (µS/cm) 3559 3576 3577 3580 3579 3579	pH (units) 9.14 9.12 9.98 8.92 8.83 8.79 8.81	DO (mg/L) 18.12 15.78 11.82 9.84 6.35 6.63	Depth (m) 12 13 14 15 16 17 18	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5 6 7	Temp (°C)     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     13.0     14.0     1.0     1.0     1.0     1.0     1.0     1.0     1.0	sp. Cond (µS/cm) 3559 3574 3577 3580 3579 3579	pH (units) 9.14 9.12 9.98 8.92 8.83 8.79 8.8]	DO (mg/L) 18.12 15.78 11.82 9.84 6.36 6.63	Depth (m) 12 13 14 15 16 17 18 19	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5 6 7 8	Temp (°C)     13.9     13.0     13.0     12.0     12.0     12.0     12.0     1.6     1.6     1.6	5p. Cond (µS/cm) 3659 3966 3574 3577 3580 3579 3579	pH (units) 9.14 9.12 9.98 8.92 8.83 8.79 8.81	DO (mg/L) 18.12 15.78 11.82 9.84 6.36 6.63	Depth (m) 12 13 14 15 16 17 18 19 20	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5 6 7 8 9	Temp (°C) 13.9 13.9 12.0 11.6 11.6 11.6	5p. Cond (µS/cm) 3559 3574 3577 3580 3579 3579	pH (units) 9.14 9.12 9.98 8.92 8.83 8.79 8.83	DO (mg/L) 18.12 15.78 11.82 7.84 7.84 6.35 6.63	Depth (m) 12 13 14 15 16 17 18 19 20 21	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	
Depth (m) 0 1 2 3 4 5 6 7 8 9 10	Temp (°C) 13.0 13.0 12.0 11.6 11.6 11.6	5p. Cond (µS/cm) 3559 3574 3577 3580 3579 3579	pH (units) 9.14 9.12 9.98 8.92 8.83 8.79 8.83	DO (mg/L) 18.12 15.78 11.82 9.84 7.84 6.35 6.63	Depth (m) 12 13 14 15 16 17 18 19 20 21 22	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	09.126/19	

# FIELD DATASHEET

	FIELD DATASHEET								1.	ALPSV	DP.		
	Date: <u>OZ</u>	118/20	) Loca	ation (Circ	le): Lake F	Elsinore/Ca	nyon Lak	e St	tation:	Ketill	5 S		
	Time on S	tation: 16	5:65	_ т	ime off Sta	ation:6	:10				•		
	Weather C	Conditions:	Sunny	Light	-Wind	Wind	(mph & di	rection):	SMPH,	West			
	Lat: On -	Target	1	• 	Lon	g:N	Target	<b>-</b>	·····				
	Water Dep	oth (m):	707	-	Seco	chi Depth	(m): <u>1</u>	6			•		
	Water Che SAMPLE	emistry Sar TIME:	nple?: Y /		Chl-a Sam Surface vo	ple?: Y /	2 D ed (ml):	Plan	kton Samj	ple?: Y / X	)		
	Depth-Integrated volume filtered (ml):												
	Comments	5:		*]	Do not exc (~500 mL full (after	eed 7 <b>PSI</b> fill volum first 250 n	or 14 in. H e preferred 1L are filte	<b>Ig</b> when filt d). Discard l pred).	ering chlo lower char	rophyll nber when			
	Serial	+. 2019	0778	$\mathcal{D}^{\mathfrak{d}}$	te -livi	tialize	1:121	19/19	Date	ín: 07	119/19		
			00	Matric	actued:	10/251	19	Soude	Set 1	σIn	lin, Szer		
	Depth (m)	Temp (°C)	Sp <sub>3</sub> Cond (µS/cm)	) pH )(units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	its full, Changed		
	0	1437	356	9.26	18.56	12					to		
	1	14.5	3569	9.23	18.00	13	: 				evaq		
	2	13.43	3569	9.13	12.81	14	* <u>.</u> .				noc		
	3	12.4	3576	8.95	10.20	15	N.						
	4	11.8	3579	8.86	7.80	16							
	5	11.5	3581	08.8	6.08	<b>41</b> 7							
	6	11.4	3681	8.79	6.0Z	18	• • •						
	7	11.3	3580	8.79	5.81	19							
7.5	18	11.3	3580	8.78	5.76	20							
	9					21							
	10					22							
	11		-			23		   					
									:				

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### FIELD DATASHEET

Date: 2/18/20	Location (Circle): Lake Elsinore/Canyon Lake Station: CLO7	
Time on Station: 1007	Time off Station: 1945	
Weather Conditions: Sur	my & party cloudy. Wind (mph & direction): Omph	_
Lat: ON targe	t Long: ontavact	
Water Depth (m): $\frac{12}{12}$	= 15, 2 Secchi Depth (m): 0.6	
Water Chemistry Sample?: SAMPLE TIME:	N   Chl-a Sample?: N   Plankton Sample?: N     Surface volume filtered (ml):   μ50 μ     Depth-Integrated volume filtered (ml):   500 μ	' N
	*Do not exceed <b>7 PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber wh full (after first 250 mL are filtered).	en

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	13.9	700	9.44	17.6	12	11.4	722	7.68	3,9
1	13.6	703	9.37	16.7	13	11.4	722	7.68	3.9
2	12.6.	544	8.84	12.0	14	11.4	722	7.67	3.9
3	12.5	714	8,80	12.2	15	11.4	722	7.67	3.9
4	11.9	720	8.99	7.2	16				· · ·
5	11.6	722	8.02	6.3	17				
6	11.6	721	7.91	GX 5.8	18				
7	11.5	721	7.85	4.8	19				
8	11.5	720	7.75	4.1	20			· ·	
9	11.4	721	7,70	4.1	21			-	
10	11.4	722	7.69	4.0	22				
11	11.4	724	7.68	4.0	23				

## FIELD DATASHEET

Date: 2/18/2020 Location (	Circle): Lake Elsinore/Canyon Lake	Station: <u>CL08</u>
Time on Station: 0930	Time off Station: 1000	
Weather Conditions: party cla	Wind (mph & direct	ion): 0 mph.
Lat: ON target	Long: ON TAVA	ret
Water Depth (m): 9-3	Secchi Depth (m):0, 6	
Water Chemistry Sample? Y N SAMPLE TIME: <u>0945</u>	Chl-a Sample? N Surface volume filtered (ml): <u>50</u> Depth-Integrated volume filtered (m *Do not exceed 7 PSI or 14 in. Hg w (~500 mL fill volume preferred) D	Plankton Sample? $D \times N$ $D \times S \times S \times N$ $D \times S \times $
	full (after first 250 mL are filtered)	,

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	14.2	697	9.44	17.9	12				
1	13.8	699	9.40	17.4	13				
2	13.4	706	9.21	17.0	14				
3	12.6	723	8.5z	10.0	15		· •		
4	(1.8	720	8.02	6.0	16				
5	11.8	719	7.84	5.2	17				
6	11.7	7-19	7.80	5.4	18				
7	11.7	720	7.79	5.3	19				
8	11.6	720	7.76	4.8	20				
9	11.6	725	7.69	3.4	21				
IJ					22				
11					23		-		

### FIELD DATASHEET

Date: 2/18 2020 Location	(Circle): Lake Elsinore/Canyon Lake	Station: CL09
Time on Station: 0841	Time off Station: 0910	
Weather Conditions: Sunny & par	rty Cloudy Wind (mph & direct	ion): 0 april
Lat: On tanget	Long: ON Farmy	+
Water Depth (m): 7 9	Secchi Depth (m): 0.7	<b></b>
Water Chemistry Sample?: Y/ N SAMPLE TIME: 0855	Chl-a Sample?: Y / N Surface volume filtered (ml): <u>50</u> Depth-Integrated volume filtered (n	Plankton Sample?: (Y) N D M nl): 500 M
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> w (~500 mL fill volume preferred). D full (after first 250 mL are filtered)	hen filtering chlorophyll Discard lower chamber when

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	14.1	803	9.19	14.7	12				
1	14.0	805	919	14.6	13				
2	13.4	835	8.96	13.4	14				
. 3	12.5	877	8.32	7.8	15				
4	12.4	912	8.15	5.9	16				
5	12.1	907	7.83	2.9	17				
6	11.7	938	7.42	0.1	18				
7	11.3	1019	7.24	0.0	19				
\$7.5	(1.2	1040	7,22	0.0	20				
9					21				
10		-			22				
11					23				

### FIELD DATASHEET

Date: $\frac{2}{18}$ $\frac{18}{2020}$ Location (C	Circle): Lake Elsinore/Canyon Lake Station: CL10
Time on Station: 0755	Time off Station: 08.30
Weather Conditions: Sunny G partly	cloudy. Wind (mph & direction): 0-2 mph W
Lat: On target	Long: Ontanget
Water Depth (m): <u>4</u> .D	Secchi Depth (m): 07-
Water Chemistry Sample? Y/ N SAMPLE TIME: <u>つきto</u>	Chl-a Sample? (V/N Plankton Sample? V)N Surface volume filtered (ml): <u>425mL</u> Depth-Integrated volume filtered (ml): <u>385mL</u>
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	13.9	841	9.22	14.3	12				
1	13.9	842	9.22	14.4	13				
2	13.9	858	9.)4	13.8	14				
3	13.0	980	(G) - 44	7.0	15				
13.5	12.9	982	8.14	5.5	16				
5					17				
6					18				
7					19				
8					20		-		
9					21				
10					22				
11					23				
# FIELD DATASHEET

Date: $\frac{\mathcal{D}}{\mathcal{D}}$ $\frac{\mathcal{D}}{\mathcal{D}}$ $\frac{\mathcal{D}}{\mathcal{D}}$ Location (Ci	ircle): Lake Elsinore/Canyon Lake Station: CLO7-
Time on Station: 1458	Time off Station: 1510
Weather Conditions: <u>SIMMILAPL.</u>	Und (mph & direction): 25mph WSW
Lat: ON HWAYE	Long: ON tanget
Water Depth (m): $15.2$	Secchi Depth (m): 0 . 0
Water Chemistry Sample?: Y / 🕅 SAMPLE TIME:N   N	Chl-a Sample?: Y / N Plankton Sample?: Y / N Surface volume filtered (ml): N A Depth-Integrated volume filtered (ml): N A
Comments:	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	17,2	703	9.51	19.2	12	11.5	723	7.67	3.9
1.	14.6	700	9.50	18.8	13	11.5	723	7.67	3.9
2	13.6	705	9.30	15.6	14	11.5	724	7.67	3.8
3	12.4	717	8.48	8.6	15	11.5	723	7.67	3.8
4	11.9	722	8.07	6.6	16				
5	11.8	723	7.95	6.0	17				
6	11.6	722	7.88	5.5	18				
7	11.6	723	7.8D	4.9	19				
8	11.6	722	7.75	4.3	20				
9	11.5	723	7.69	4.0	21				
10	11.5	723	7.68	3.9	22				
11	11.5	723	7.67	3.9	23		·		

# FIELD DATASHEET

Date: 2/18/20 Location (C	ircle): Lake Elsinore/Canyon Lake Station: <u>CDB</u>
Time on Station: 1445	Time off Station: 1455
Weather Conditions: pHy Clouby	Warm Wind (mph & direction): 2-5mph WSW
Lat: On target	Long: ON DWgt
Water Depth (m): <u>1.3</u>	Secchi Depth (m):O. (/
Water Chemistry Sample?: Y / 🕅 SAMPLE TIME: <u>N/A</u>	Chl-a Sample?: Y/N Plankton Sample?: YN Surface volume filtered (ml): NA
	Depth-Integrated volume filtered (ml): <u>N/A-</u>
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll

(~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	15.1	698	955	20.2	12		1		
1	14,1	694	9.58	20.7	13		<u>··</u> _·		
2	12.8	716	8.83	11.4	14				
3	12.4	721	8.39	8.9	15				
4	12.0	721	7,83	5.6	16			 	
5	11.3	720	7.78	5.13	17				
6	11.7	721	7.77	5.05	18				<u></u>
7	11.7	722	7.81	5.46	19				
8	$\left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \left[ \right] \left[ \left[ \right] \left[ \right] \left[ \left[ \left[ \right] \left[ \left[ \right] \left[ \left[ \left[ \left[ \right] \left[ \left[ \left[ \right] \left[ $	722	7.74	4,5	20				
9	11.10	725	7.69	3.6	21				
10					22				
11					23				

## FIELD DATASHEET

Date: $2/18/20$ Location (	Circle): Lake Elsinore/Canyon Lake Station: <u>CL09</u>
Time on Station: 1420	Time off Station: $142\%$
Weather Conditions: phy Cloudy	1. Warm Wind (mph & direction): 0-2mph WSW
Lat: ONTAvaet	Long: ON tavayca
Water Depth (m): 7	Secchi Depth (m):0.7
Water Chemistry Sample?: Y /(N) SAMPLE TIME: <u>N/ A</u>	Chl-a Sample?: Y / N Plankton Sample?: Y / N Surface volume filtered (ml): / / A
. 1	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

]	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
	0	15.8	805	9.25	15:8	12		,		
	1	14,6	806	9.25	15.6	13				·
	2	13.6	833	9.08	13.8	14				
	3	12.7	859	8.46	9.00	15				·
	4	12.4	912	8.09	5,5	16				
	5	12.1	913	7.82	3:4	17				
	6	11.7	906	7.50	0.03	18				
	7	11.5	1017	7.23	0.0	19				
2	,8	11.3	1039	7.21	0.0	20				
	9					21	-	1		
	10					22		1		
	11					23				

\_\_\_\_\_

# FIELD DATASHEET

Date: 2/18/20 Location (	Circle): Lake Elsinore/Canyon Lake Station:
Time on Station: 1400	Time off Station: 1410
Weather Conditions: pty cloudy	WARM Wind (mph & direction): 0-2mp WSW
Lat: ON target	Long: ON tampet
Water Depth (m): $\mathcal{U}_{i} O$	Secchi Depth (m):
Water Chemistry Sample?: Y / 🔊 SAMPLE TIME:/A	Chl-a Sample?: Y / N Plankton Sample?: Y / N Surface volume filtered (ml): <u>N/ A</u>
	Depth-Integrated volume filtered (ml): N/A
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when

full (after first 250 mL are filtered).

Comments:

3

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	16.3	839	9.19	15.26	12				;
	1	14.9	849	9.23	15,55	13	-			
	2	13.7	863	9.10	13,3	14				
	3	13. i	922	8.71	10:15	15				
5	A	12.9	961	8.20	5.21	16				
	5					17				
	6					18				
	7					19				
	8					20	,			
	9					21				
	10					22			,	
	11					23				

## FIELD DATASHEET

	FILLID DATASHILLI	1 A A A
Date: 2118120 Location (C	ircle): Lake Elsinore/Canyon Lake	Station: N. SKI ATEN
Time on Station: 546	Time off Station: 1555	,
Weather Conditions: pHy Cloud	Mark Wind (mph & direction)	5-8 mph WSW
Lat: [dock]	Long: Colock]	
Water Depth (m): 23.4 Ft.	Secchi Depth (m): 0105	
Water Chemistry Sample?: Y (N) SAMPLE TIME: (P	Chl-a Sample?: Y / N Surface volume filtered (ml): <u>N/A</u>	Plankton Sample?: Y 🔊
	Depth-Integrated volume filtered (ml):	NA
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when (~500 mL fill volume preferred). Disc full (after first 250 mL are filtered).	n filtering chlorophyll ard lower chamber when
Comments: breezy		

Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	рН (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	15.1	365	9.52	17.1	12				
1	13.8	374	9.40	15.8	13		÷ .	· .	· .
2	12.8	392	9.19	13.3	14				
3	10.0	432	8.45	9.5	15				
4	11.5	423	7.83	7.5	16		·	· · · · ·	
5	11.2	43D	7.74	6.4	17				
6	11.2	436	7.67	5.6	18				
7	11.2	440	7.21	0.1	19				
· 8					20				
9					21				
10					22				
11					23				

April 13, 2020 Field Datasheets

# FIELD DATASHEET

Date: 04/13/2020 Locatio	on (Circle): (Lake Elsinore/Canyon Lake Station: LEO)
Time on Station: 1020	Time off Station: 1030
Weather Conditions: <u>mostly</u>	Sung Wind (mph & direction): 0 -var
Lat: onstation	Long: on ctation
Water Depth (m): 7,0	Secchi Depth (m): 0.35
Water Chemistry Sample?: Y /(N) SAMPLE TIME:	Chl-a Sample?: Y / D       Plankton Sample?: Y / D         Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
0	10.3	2816	9.30	11,10	12				
1	15.6	2904	9.26	9.89	13				
2	15.3	2934	9.25	8.94	14				
3	15.3	2931	9.22	7.58	15	-			
4	15.3	2946	9.16	6.76	16				
5	15.2	2953	9.14	6.38	17				
6	15.2	3016	9.09	4.57	18				
76.5	15.2	3023	9.09	4.55	19				
- 8					20				
9					21				
10					22				
11					23	-			

# FIELD DATASHEET

4	
Date: 4 13 20 20 Location (Circ	le): Lake Elsinore/Canyon Lake Station: [ED2-
Time on Station: 08 20 T	ime off Station: 1010
Weather Conditions: <u>DVCMASt Slight</u>	Wind (mph & direction): 0-5mph
Lat: <u>ON Station</u>	Long: ON Station
Water Depth (m): <u>B</u> . <u>B</u>	Secchi Depth (m):
Water Chemistry Sample? $\%/N$ SAMPLE TIME: $1915$	Chl-a Sample?: $\cancel{N}$ / N Plankton Sample?: Y / $\cancel{N}$ Surface volume filtered (ml): $225$
	Depth-Integrated volume filtered (ml): <u>240</u>
*	Do not exceed 7 PSI or 14 in. Hg when filtering chlorophyll

\*Do not exceed 7 **PSI** or **14 in. Hg** when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments: MISSING PLANKTON bottle, NOT able to collect

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
0	15.7	2794	9,26	9,50	12				
1	15.7	2793	9.26	9.53	13		· ·	· · · · · · · · · · · · · · · · · · ·	
2	15.7	2796	9.25	9.31	14				
3	15.10	2841	9.21	8.37	15				
4	15.5	7921	9.20	7.78	16				
5	15.4	2932	9.20	7.74	17			<u> </u>	- 
6	15.4	2975	9.20	7.57	18			· · · · · · · · · · · · · · · · · · ·	
7	15,4	3035	9.19	7.34	19				
8	15.2	3021	9.17	6.82	20				
9	1 0 1 -		Ì		21				
10		· · · · · · · · · · · · · · · · · · ·			22				
11					23				

## FIELD DATASHEET

Date: 04/13/2020 Location (	Circle): Lake Elsinore Canyon Lake	Station: LE03
Time on Station: 0800	Time off Station: 0815	· · · ·
Weather Conditions: over cast ,	light breeze, Wind (mph & dire	ection):
Lat: on station	Long: Ohstation	
Water Depth (m): 6.4	Secchi Depth (m): 0,4	
Water Chemistry Sample?: Y / 🕅 SAMPLE TIME:	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y / 🕅
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 <b>PSI</b> or <b>14 in. H</b> (~500 mL fill volume preferred)	g when filtering chlorophyll Discard lower chamber when

full (after first 250 mL are filtered).

#### Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	15.7	2738	9.25	9.66	12				
1	15.7	2740	9.25	9.65	13				
2	15.7	2777	9.23	9.22	14				
3	15.7	2854	9.21	8:30	15				
4	15.6	2961	9.19	7.66	16				
5	15.5	2970	9.17	7.29	17		·		
6	15.4	2971	9.17	7.30	18				
7		-			19				
8					20				
9					21				
10					22				
11					23				

# FIELD DATASHEET

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	Date: 0	4/13/2	2 <u>0</u> Lo	ocation (C	Circle): Lak	e Elsinore	/Canyon L	ake	Station: (	CLO	7
	Time on	Station:	08:36	)	Time off	Station:(	09:00				<u> </u>
	Weather Conditions: <u>OVESCAST</u> CalM Wind (mph & direction): Main -										
	Lat:	) M Tal	get		L	ong: 🦯	M -	Tasae-	-	0	
	Water D	epth (m):_	15.3		Se	ecchi Dent	h (m)∙ Ô	. 95			
Water Chemistry Sample?: Y/N       SAMPLE TIME:       Sample?: Y/N       Surface volume filtered (ml):       900									N		
			0	-	Depth-In	tegrated vo	olume filte	red (ml):	375		
	Comment	-s			(~500 m full (afte	L fill volu r first 250	f or 14 in. me preferr mL are fil	<b>Hg</b> when fired). Discarc tered).	ltering chl l lower cha	orophyll mber whe	n
(	MAR 10	100 r	eddingi	$\mathcal{N}$	_						
	Need	to V	res-v	the met	el ma	99		2			
ſ	Depth	Temp	Sp.	nu	<u>ec</u>			Sn		1	-
	(m)	(°C)	Cond (µS/cm)	(units)	(mg/L)	Depth (m)	Temp (°C)	Cond	pH (units)	DO (mg/L)	
	0	15	451.9	7.9	529	12	14.5	(µs/em)	763	116	
	1	14.9	368.5	7.88	4.62	13	143	610	7.68	040	(-03)
	2	14.9	473.0	7.87	4.50	14	13.9	631.6	7.66	()	1 00
-	3	4.9	474.6	7.86	4.51	15	13.9	635.4	7.50	0	()
┝	4	4.9	484.9	7.84	4.28	16	1			0	(09)
	5	409	483	7.81	4.01	17					3
$\vdash$	6	4.0	502.9	7.80	3.97	18					
	7	4.8	512.7	1.8	3.95	19					
	8	4.91	575.4	1.80	3.42	20					
	9	14.8	587.5	1.78	3.13	21					
	10	4.8	297.4	1.75	2.44	22					
	11	4.00	00.7	7.69	1.42	23					

# FIELD DATASHEET

			20
Date: 04/13/20 Location (Circ	le): Lake Elsino	re/Canyon Lake	Station: CLOB
Time on Station: $\frac{9:10}{10}$	ime off Station:	09:35	
Weather Conditions: Sand (211)	1 v	Vind (mph & direction)	): Done
Lat: On Togget	Long:	In Target	
Water Depth (m): 1.2	Secchi De	epth (m): 0.0	
Water Chemistry Sample?: Y / N	Chl-a Sample?:	ŶN	Plankton Sample?: (Y) N
SAMPLE TIME: 9:20 DERMA	Surface volume	filtered (ml): 325	7
In Legia the	2	(). <u></u>	
(I' a la contraction of I	Depth-Integrated	d volume filtered (ml):	500
1.25 SUR *1	Do not exceed 7	PSI or 14 in Ho when	n filtering chlorophyll
1	(-500  mL filly)	aluma proformed) Diag	and lower chambon when
		orume preferred). Disc	and lower chamber when
	Tull (after first 2	250 mL are filtered).	

Comments:

	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
	0	15.5	443.7	7.66	5:20	12				
COND TIT	1	15.3	期间。万	7.58	5.12	- 13				
yuu.	2	15.3	L1472	7.39	4:99	14	×			
	3	16.1	444.9	7.49	4.67	15	a 4		1	
2	4	16.0	452.3.	7-158	4.60	16				
	5	4.6	430.3	7.72	3.84	17	×			
	6	14.6	488.Z	7.70	3:39	18		а. С		
	7	14.7	551.0	7.76	3.57	19				
	8	14.7	595.0	7:74	3014	20		•		÷
	9	14.7	608.8	7.71	2:79	21				
	10	14.6	60.2	7.68 -	2.60	22			-	
	11	14.5	618.5	7.65	2020	23				

# FIELD DATASHEET

Date: $OL/13/20$ Location (C	Circle): Lake Elsinore/Canyon Lake	Station: CL09
Time on Station: 09355	Time off Station: 10°25	-
Weather Conditions: Data Zattly Son	ANG CELM Wind (mph & dir	ection):
Lat: On Toget	Long: On Tagg	et
Water Depth (m): $\underline{\mathcal{G}} \circ \backslash \mathcal{O}$	Secchi Depth (m):	.3
Water Chemistry Sample?: ()/ N SAMPLE TIME: (0:05 WA	Chl-a Sample?: Y N Surface volume filtered (ml):	Plankton Sample?: $\sqrt{N}$
10:10 Suck	Depth-Integrated volume filtered	(ml): 300
Comments:	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> (~500 mL fill volume preferred) full (after first 250 mL are filtered)	g when filtering chlorophyll . Discard lower chamber when ed).
20 molisle Damas		.7

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	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
	0	15.6	625	8.48	8.09	12				
	1	15.2	640	8.29	7.31	13				
	2	14.9	631	8.14	6.39	14				
	3	14.1	640	7.79	4.28	15				5
	4 (	13.8	629	7.73	4.18	16				
	5	13.1	565	7.68	3.98	17				
	6	12.9	559.3	7.62	3.74	18				
	7	12.7	566.2	7.59	3.47	19				
7	8	12.7	903	7.38	.03	20				
F	.9	1.2	DST	1.79		21				
	10		1			22				
	11					23				

. I	FIELD DATASHEET
Date: 413120 Location (Cir	rcle): Lake Elsinore Canyon Lake Station: CLIO
Time on Station: $16^{6} \times 35$	Time off Station: 0:35
Weather Conditions: ONER (aSt Cal	M Wind (mph & direction): ON
Lat: ON TUNGEt	Long: On Target
Water Depth (m): $\underline{\mathcal{U}}$	Secchi Depth (m): 0, 4
Water Chemistry Sample? $(Y)/N$ SAMPLE TIME: $0:45$ $n$	Chl-a Sample?: (Y)/ N Plankton Sample?: (Y)/ N Surface volume filtered (ml): <u>325</u>
10:30 Surt	Depth-Integrated volume filtered (ml): 325
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (μS/cm)	pH (units)	DO (mg/L)
. 0	15.8	611	8.18	6.67	12				
1	15:3	609.2	7.92	6006	13				
2	14.8	603.9	7.88	5.61	14				
3	Bol	582.	1.75	4.40	15				
4		8			16				
5					17				
6	· ·				18				
7					19				
8					20				
9					21				
10					22				· ·
11					23				

#### **FIELD DATASHEET**

Date: 4/13/20 Location	n (Circle): Lake Elsinore/Canyon Lake	Station: CLO7
Time on Station: $1335$	Time off Station: 1355	
Weather Conditions:	Wind (mph & direction):	
Lat:	Long:	
Water Depth (m): <u><u></u><u></u><u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u></u>	Secchi Depth (m): 0,95	
Water Chemistry Sample?: Y (N) SAMPLE TIME:	Chl-a Sample?: Y (N) Pla Surface volume filtered (ml):	nkton Sample?: Y (N)
	Depth-Integrated volume filtered (ml):	
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when fi (~500 mL fill volume preferred). Discard full (after first 250 mL are filtered).	Itering chlorophyll lower chamber when

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	
0	16.4	463	7.9	5.38	12	14.56	615.3	7.65	231	5
1	16.5	463	7.8	5.10	13	14.6	623.5	7.61	Ø.	(03
2	15.1	469	7.77	4.74	14	14.5	702-	7.60	0	(-04)
3	15.D	464	7.75	4.67	15	14.5	735	7.4Z	0	(-05
4	14.9	476.9	7.77	4.58	16					
5	14.9	476	7.77	4.49	17					-
6	14.9	500	7.76	434	18					
7	14.8	517.5	7.76	4.05	19		-			
8	4.8	5525	7.76	3.92	20					-
9	14.9	580	7.73	3.87	21					Company of the second sec
10	14.9	597	7.71	Z.84	22					
_ 11	14.7	587	7.61	ZO	23					·

1	FIELD DATASHEET	
Date: 4/13/20 Location	(Circle): Lake Elsinore/Canyon Lake	Station: CL08
Time on Station: 1402	Time off Station: 1407	·
Weather Conditions: <u>Cloudy</u>	Wind (mph & direction	on): 5-10 mph W
Lat:	Long:	
Water Depth (m): $1.2$	Secchi Depth (m): 0.8	<u> </u>
Water Chemistry Sample?: Y N SAMPLE TIME:	Chl-a Sample?: Y (N) Surface volume filtered (ml):	Plankton Sample?: Y N
	Depth-Integrated volume filtered (ml	):
	*Do not exceed <b>7 PSI</b> or <b>14 in. Hg</b> wh (~500 mL fill volume preferred). Di full (after first 250 mL are filtered).	en filtering chlorophyll scard lower chamber when

Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	16.2	435.2	6.94	6.7	12				
1	159	439.9	7.11	6.5	13				
2	15.5	444.7	7.46	6.1	14				
3	15.2	441.1	7.68	5.4	15				
4	15.D	435.0	7.68	5.2	16				
5	14.8	423.2	7.68	5.0	17		_		
6	14.7	523.10	7. 59.16	4.3	18				
7	14.7	566.1	7.67	4.1	19				
8	14.8	606.2	766	3.1	20				
9	14.7	613.1	1.SD	0.4	21				
10	14.6	613.2	-7.42	D.)	22				
11	14.7	603.8	7.48	$\mathbf{Q}\cdot\mathbf{Q}$	23				

#### FIELD DATASHEET

Date: $4/13/26$ Location	(Circle): Lake Elsinore/Canyon Lake Station: CL09
Time on Station: 1425	Time off Station:
Weather Conditions: <u>Cloudy</u>	Wind (mph & direction): $\frac{1}{2} - 5 n p h w$
Lat:	Long:
Water Depth (m):	Secchi Depth (m): $O \cdot 3$
Water Chemistry Sample?: Y (N) SAMPLE TIME:	Chl-a Sample?: Y / N       Plankton Sample?: Y / N         Surface volume filtered (ml):
	Depth-Integrated volume filtered (ml):
• •	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophyll (~500 mL fill volume preferred). Discard lower chamber when full (after first 250 mL are filtered).

Comments:

ĺ

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	16.5	620	8.93	12.2	12				
1	16.76.3	709	8.87	11.6	13				
2	15.3	675	8.42	8.3	14				
3	14.1	671	7.90	5.4	15				
4	13.9	620	7.76	4.9	16				
5	13.0	55%	7.64	4.7	17				
6	12.7	568	7.56	4.2	18				
7	12.9 4	25897	7.80	0.5	19		;		
-81.5	12.8	835	7.43	0.1	20				
* 9		· .			21				
10					22				
11					23				

# FIELD DATASHEET

Date: 4/13/20 Location (	Circle): Lake Elsinore Canyon Lake Station: CLO	<b>P</b>
Time on Station: 1442	Time off Station: 1445	
Weather Conditions: <u>Cloudy</u>	Wind (mph & direction): 2-5 nph N	JW 
Lat:	Long:	
Water Depth (m): <u>4</u> . <u>L</u>	Secchi Depth (m): 0.4	
Water Chemistry Sample?: Y / N SAMPLE TIME:	Chl-a Sample?: Y (N) Plankton Sample?: Y Surface volume filtered (ml):	Y / 🕅
	Depth-Integrated volume filtered (ml):	
	*Do not exceed 7 <b>PSI</b> or <b>14 in. Hg</b> when filtering chlorophy (~500 mL fill volume preferred). Discard lower chamber v full (after first 250 mL are filtered).	'll when

#### Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	16.2	609	8.28	9.4	12		,		
1	16.1	608	8.14	9.0	13				
2	15.5	605	7.90	7.1	14				
3	14.5	661	1.19	5.8	15				
4	13.5	637	7.69	2.5	16				
5		*			17				
6					18				
7					19				
8					20				
9					21				
10					22				
11					23				

#### FIELD DATASHEET

Date: $\frac{4}{13}$ location (0	Circle): Lake Elsinore/Canyon Lake	Station: North Ski
Time on Station: 1540	Time off Station:	
Weather Conditions: <u>Cloudy</u> .	Wind (mph & dire	ection): 0-5mph W
Lat:	Long:	·
Water Depth (m): 7.	Secchi Depth (m):3	
Water Chemistry Sample?: Y N SAMPLE TIME:	Chl-a Sample?: Y /N Surface volume filtered (ml):	Plankton Sample?: Y
	Depth-Integrated volume filtered	(ml):
	*Do not exceed 7 PSI or 14 in. Hg (~500 mL fill volume preferred) full (after first 250 mL are filtered)	g when filtering chlorophyll . Discard lower chamber when ed).

#### Comments:

Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)	Depth (m)	Temp (°C)	Sp. Cond (µS/cm)	pH (units)	DO (mg/L)
0	16.2	243	8.23	8.6	12				
1	16.1	242	8.23	8.1	13				
2	14.1	227	8.13	6.6	14				
3	13.3	225	8.12	62	15				
4	13.2	226	8.08	5.9	16				
5	12.5	229.7	8.04	5.0	17				
: 6	12.5	230.4	7.98	5.4	18				
6.51	12.5	231.6	7.94	5.3	19				
8					20				
9					21				
10					22				
11					23				

APPENDIX C - LAKE MONITORING ANALYTICAL REPORTS



Client Name: V	Vood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 8	3	
Contact: J	lohn Rudolph	Project Name:	Amec Fost	er Wheeler-Lake Elsinore	
Address: 9	210 Sky Park Court #200	Project Number:	Lake Elsinore TMDL Monitoring		
S	San Diego, CA 92123	Work Order Number:	B9G3771		
Report Date: 2	1-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C	

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9G3771-01	LE02	Liquid	07/26/19 09:00	John R.	07/26/19 13:51	Courier (Hector N.) -DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 21-Aug-2019

Analytical Report: Page 2 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore TMDL Monitoring

#### Work Order Number: B9G3771

Received on Ice (Y/N): Yes 7

Temp: 10 °C

#### Laboratory Reference Number B9G3771-01

Sample Description LE02	<u>Ma</u> Lic	MatrixSampled Date/TimeLiquid07/26/19 09:00		Received Date/Time 07/26/19 13:51				
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	07/27/19 06:25	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	07/27/19 06:25	KBS	
Solids								
Total Dissolved Solids	2100	40	40	mg/L	SM 2540C	08/01/19 19:25	KAA	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	08/02/19 20:20	KAA	
Nutrients								
Ammonia-Nitrogen	0.11	0.10	0.044	mg/L	SM4500NH3H G	08/02/19 11:06	ATR	
Kjeldahl Nitrogen	4.3	0.40	0.37	mg/L	EPA 351.2	07/31/19 14:54	SLL	
Ortho Phosphate Phosphorus	0.019	0.050	0.016	mg/L	SM 4500P E	07/26/19 22:40	MWM	J
Total Phosphorus	0.22	0.05	0.02	mg/L	SM 4500P B E	08/06/19 12:47	ATR	

*mailing* P.O Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster \	Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

**Anions - Batch Quality Control** 

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag	
Batch 9G26066 - Analyzed as Re	Batch 9G26066 - Analyzed as Received IC											
Blank (9G26066-BLK1)				F	repared	& Analyzed	d: 07/27/1	9				
Nitrite as N	ND	0.10	0.091	mg/L								
Nitrate as N	ND	0.20	0.16	mg/L								
LCS (9G26066-BS1)				F	Prepared	& Analyzed	d: 07/27/1	9				
Nitrite as N	2.56	0.10	0.091	mg/L	2.50		102	90-110				
Nitrate as N	5.87	0.20	0.16	mg/L	5.65		104	90-110				
Matrix Spike (9G26066-MS1)		Source	: B9G3709-0 <sup>-</sup>	1 F	Prepared	& Analyzed	d: 07/27/1	9				
Nitrite as N	2.40	0.10	0.091	mg/L	2.50	ND	95.8	80-120				
Nitrate as N	5.87	0.20	0.16	mg/L	5.65	ND	104	75-131				
Matrix Spike (9G26066-MS2)		Source	: B9G3773-04	<b>4</b> F	Prepared	& Analyzed	d: 07/27/1	9				
Nitrite as N	2.19	0.10	0.091	mg/L	2.50	ND	87.8	80-120				
Nitrate as N	6.05	0.20	0.16	mg/L	5.65	ND	107	75-131				
Matrix Spike Dup (9G26066-MSD1)		Source	: B9G3709-0	1 F	Prepared	& Analyzed	d: 07/27/1	9				
Nitrite as N	2.44	0.10	0.091	mg/L	2.50	ND	97.5	80-120	1.74	20		
Nitrate as N	6.03	0.20	0.16	mg/L	5.65	ND	107	75-131	2.67	20		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

#### **Solids - Batch Quality Control**

Analyte(s)	Result	RDI		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
, indigite(0)	rteoun	RDE		Onito	2010	liooun	/01.120				19
Batch 9H01039 - Analyzed as re	ceived										
Blank (9H01039-BLK1)				I	Prepared	& Analyze	d: 08/01/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
LCS (9H01039-BS1)				I	Prepared	& Analyze	d: 08/01/1	9			
Total Dissolved Solids	730	10	10	mg/L	746		97.9	90-110			
Duplicate (9H01039-DUP1)		Source: E	39G3948-(	01 l	Prepared	& Analyze	d: 08/01/1	9			
Total Dissolved Solids	554	20	20	mg/L		564			1.79	20	
Duplicate (9H01039-DUP2)		Source: E	39G3948-(	<b>05</b> l	Prepared	& Analyze	d: 08/01/1	9			
Total Dissolved Solids	330	10	10	mg/L		339			2.69	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

#### **General Inorganics - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9H02083 - Analyzed as ree	ceived										
Blank (9H02083-BLK1)					Prepared	& Analyze	d: 08/02/1	9			
Sulfide	ND	0.10	0.10	mg/L							
LCS (9H02083-BS1)				[	Prepared	& Analyze	d: 08/02/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400		100	50-150			
Matrix Spike (9H02083-MS1)		Source:	B9G3771-0	1	Prepared	& Analyze	d: 08/02/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150			
Matrix Spike Dup (9H02083-MSD1) Source: B9G3771-01				1	Prepared	& Analyze	d: 08/02/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150	0.00	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster \	Nheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9G26078 - Filter if turbid.											
LCS (9G26078-BS1)				F	Prepared	& Analyze	d: 07/26/1	9			
Ortho Phosphate Phosphorus	0.544	0.050	0.016	mg/L	0.500		109	90-110			
Matrix Spike (9G26078-MS1)		Source	: B9G3764-0	1 F	Prepared	& Analyze	d: 07/26/1	9			
Ortho Phosphate Phosphorus	0.551	0.050	0.016	mg/L	0.500	ND	110	80-120			
Matrix Spike Dup (9G26078-MSD1)		Source	: B9G3764-0	1 F	Prepared	& Analyze	d: 07/26/1	9			
Ortho Phosphate Phosphorus	0.539	0.050	0.016	mg/L	0.500	ND	108	80-120	2.26	20	
Batch 9G31070 - Acid Digest											
Blank (9G31070-BLK1)				F	Prepared	& Analyze	d: 07/31/1	9			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (9G31070-BS1)				F	Prepared	& Analyze	d: 07/31/1	9			
Kjeldahl Nitrogen	1.11	0.10	0.093	mg/L	1.00		111	80-120			
Matrix Spike (9G31070-MS1)		Source	: B9G3709-0	1 F	Prepared	& Analyze	d: 07/31/1	9			
Kjeldahl Nitrogen	165	8.0	7.4	mg/L	80.0	83.8	101	42-154			
Matrix Spike (9G31070-MS2)		Source	: B9G3941-0	1 F	Prepared	& Analyze	d: 07/31/1	9			
Kjeldahl Nitrogen	1.98	0.10	0.093	mg/L	1.00	0.971	101	42-154			
Batch 9H02011 - Analyzed as rec	eived										
Blank (9H02011-BLK1)				F	Prepared	& Analyze	d: 08/02/1	9			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 7 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster \	Nheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9H02011 - Analyzed as rec	eived										
LCS (9H02011-BS1)				I	Prepared	& Analyze	d: 08/02/1	9			
Ammonia-Nitrogen	0.944	0.10	0.044	mg/L	1.00		94.4	90-110			
Matrix Spike (9H02011-MS1)		Source:	B9G3771-0	01	Prepared	& Analyze	d: 08/02/1	9			
Ammonia-Nitrogen	1.07	0.10	0.044	mg/L	1.00	0.111	96.1	80-120			
Matrix Spike Dup (9H02011-MSD1) Source: B9G3771-01 Prepared & Analyzed: 08/02/19											
Ammonia-Nitrogen	1.16	0.10	0.044	mg/L	1.00	0.111	105	80-120	7.88	20	
Batch 9H06060 - Acid Digest											
LCS (9H06060-BS1)				I	Prepared	& Analyze	d: 08/06/1	9			
Total Phosphorus	0.554	0.05	0.02	mg/L	0.500		111	85-115			
Matrix Spike (9H06060-MS1)		Source:	B9G3632-0	)5 I	Prepared	& Analyze	d: 08/06/1	9			
Total Phosphorus	0.617	0.05	0.02	mg/L	0.500	0.0833	107	80-120			
Matrix Spike Dup (9H06060-MSD1)		Source:	B9G3632-0	)5 I	Prepared	& Analyze	d: 08/06/1	9			
Total Phosphorus	0.617	0.05	0.02	mg/L	0.500	0.0833	107	80-120	0.00	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 8 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore TMDL Monitoring

#### Work Order Number: B9G3771

Received on Ice (Y/N): Yes

Temp: 10 °C

#### Notes and Definitions

Report Date: 21-Aug-2019

J	Estimated value
ND:	Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit

\* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

llesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 1	
Contact:	John Rudolph	Project Name:	Amec Foster	r Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinor	e TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9G3771	
Report Date:	21-Aug-2019	Received on Ice (Y/N):	Yes	Temp: 10 °C

E.S. Babcock & Sons, Inc.	<b>Environmental Laboratories</b>
(951) 653-3351 FAX (951) 653-1662	
www.babcocklabs.com	

Chain of Custody & Sample Information Record

Client: Wood Environment and Infrastructure Solutions, Inc.	Contact: John Rudolph Phone No.	858-243-8158
EAX No.	Email: inthe rudolph@woodplc.com	Additional Reporting Requests
Project Name: <u>Lake Elsinore Type Monitoring</u> Project Location: Lake Elsinore	Turn Around Time:         Routine         *3-5 Day         *48 Hour         *24 Hour           *Lab TAT Approval:         By:         *Additional Charges May Apply	FAX Results:ves No FAX Results:ves No Email Results:ves No State EDT:ves No (Include Source Number in Notes)
Sampler Information	# of Containers Sample & Preservatives Type Analysis Requested Matrix	Notes
Name: John Kudalph	S S S S S S S S S S S S S S S S S S S	
Employer: VV000 E&I SOlutions, Inc.	preserved 03 03 03 03 03 04 04 04 05 05 06 04 04 04 05 05 06 04 04 04 04 04 05 05 06 04 04 04 05 06 06 06 06 07 06 07 06 06 06 06 07 06 06 06 07 06 06 06 06 06 06 06 06 07 06 06 06 06 06 06 06 06 06 06	
Sample ID Date Time		
LE02 07/26/19 09 00		
Relinguished By (sign) Print Name / Con Do ho Rudolph / John Rudolph / I	pany Date / Time Received By (Sign) Pr Mod 7/726/19 1238 Welt Mury Mary	int Name / Company
pleased any Anany	$p_{3}$ $\gamma_{20}$ $\gamma_{9}$ $p_{51}$ $p_{120}$ $\gamma_{120}$	4(65)
(For Lab Use Only) Sample Integrity Upon Receip Sample(s) Submitted on Ice? (Yes) No Custody Seal(s) Intact? Yes No Sample(s) Intact? Yes No	Lab Notes       Temperature       ○○ °C       □○ °C       □ Cooler Blank   B9G3 Rc'd: 07/26/	<b>771</b> 2019 13:51

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 1		
Contact:	John Rudolph	Project Name:	AMEC-Lake Elsinore		
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore TMDL Monito		
	San Diego, CA, 92123	Work Order Number:	B9G3798		
Report Date:	22-Aug-2019	Received on Ice (Y/N	Yes Temp:10 °C		

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

	Sample Identification											
Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By						
B9G3798-01	LE02 - Int	Solid	7/26/19 9:00	John Rudolph	7/26/19 13:51	Courier (Hector N.)-DE						
B9G3798-02	LE02 - Surf	Solid	7/26/19 9:00	John Rudolph	7/26/19 13:51	Courier (Hector N.)-DE						

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is not in writing. There is no other warranty expressed or implied.

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Analytical Report: Page 1 of 1

Client Name: Wood Environment&Infrastructure Sc

Contact: Address:	Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA, 92123							Project Name: AMEC-Lake Elsinore Project Number: Lake Elsinore TMDL Work Order Number: B9G3798						e Elsinore re TMDL I	Monito									
Report Date:	22-Aug-2019																Re	ece	eiv€	ed on Ice (Y/N	١	Yes	Temp:10	°C
E.S. B (951) 65 www.ba	abcock & Sons, 3-3351 FAX (951) 653- bcocklabs.com	Inc. E	Enviro	onm	nen	tal	La	bor	ate	ori	es		C	Cha	ain	of	С	ust	od	ly & Sample In	nfoi	rmation Rec	ord	7
Client: Wood Envir	onment and Infrastructure Solu	itions, Inc	2	Co	ntac	t: J	ohn	Rud	olpł	1				-				-		Phone No.	858	3-243-8158 Additional Reportin	a Requests	
FAX No. Project Name: Project Location	FAX No.     Email:     john.rudolph@woodplc.com       Project Name:     Lake Elsinore TMDL Monitering     Turn Around Time:     Routine       Project Location:     Lake Elsinore     *Lab TAT Approval:     By:					ne	*3-5 Day *48 Hour *24 Hour Email Results: Yes Rush Rush Rush *44 Kour *24 Hour (Include Source Number in Notes) *44 Kour *24 Hour (Include Source Number in Notes)						age: Ves No ults: Ves No ults: Yes No DT: Yes No ber in Notes)											
	# of Containers Sampler Information & Preservatives			Sa T	imple ype	4	Analy	/sis l	Requ	leste	ed	Matrix		Notes										
Nam Employe Signatur	n: <u>John Rudolph</u> r: Wood E&I Solutions,	Inc.	-	npreserved	2004 CI	NO3	aoH	aUH/∠nAcetate H4CI	CAA	.ozen	otal # of Container	Routine	tesample tuecial	pectar stal Sulfide	trate - Nitrite DS	N	mmonia otal Phosphorus	RP/Ortho-P	not optight-a	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Sludge L = Liquid	c	hl-a samples on 0.7 u	m GFF, Frozen	
	Sample ID	Date	Time	5	ĨĬ	Ĩ	z	źŻ	ž	<u>ت</u>	F	RX	R N	<u>, 5</u>	žĽ	È.	1 A	5 0	5	M = Miscellaneous	Filt	er Volume:		
	E02 - Surf	07/26/19	0900	)														,	x		Filte Filte Filte	er Volume: 200m er Volume: er Volume: er Volume:		
				+		-	+	-	$\square$	-	-	-		-	+	-	_		-		Filte	er Volume:		
																					Filte	er Volume: er Volume:		
		<u> </u>				_															Filte	er Volume:		
Relinquishe Murt C	ed By (sign) F Toh, Toh, H	rint Nar Rvdo Mar	ne / Cor /p5/ 	mpan boo DS	d		<b>7/2</b> 7/1	Date 6/1 2.6/	9 10	ime 1 <sup>°</sup> 7 1 <sup>°</sup>	<b>3</b> 51	1		Reco	eivec EX	By	(Sig	n)	)	Anary Dice	int N	ame / Company D = 7 ( C & Y )	)	
<u>(For Lab Use Onl</u> San	y Sample Integri ple(s) Submitted on Ice? Custody Seal(s) Intact? Sample(s) Intact?	ty Upon Yes Yes	Receip	t o o (	N/A	)		Tei Co	npe \C	erat	ure °C nk		•	T:	Lal	b No	tes	7		<b>B9G37</b> Rc'd: 07/26/20 nsg Tem	79 019 p Gi	8 13:51 In Id:62		

mailing P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

#### Page 1 of 1



ALS - Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 19G0478 Printed: 08/08/2019

Attention: Cindy A. Waddell Project Name: Chlorophyll Project Number: B9G3798

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
B9G3798-01	19G0478-01	Filter		07/26/2019 09:00	07/30/2019 10:10
B9G3798-02	19G0478-02	Filter		07/26/2019 09:00	07/30/2019 10:10

#### DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit
ND RL	Not Detected Reporting Limit

#### Respectfully yours,

ena

Tiana Vo Project Manager

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Laboratori	es, Inc.		Projec	t Name:		Chlorophyll				
			Projec	t Numbe	er:	B9G3798			Printed: 08/	′08/2019
			B9	G3798-0	)1					
			19G04	178-01 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	61.4	1.00	1.00	mg/m³	1	1907724 (	08/07/2019 18	3:18 EGV	EPA 10200	Н
			B9	G3798-0	)2					
			19G04	178-02 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	63.5	1.00	1.00	mg/m³	1	1907724 (	8/07/2019 18	3:18 EGV	EPA 10200	H

# SUBCONTRACT ORDER Printe

Printed: 7/29/2019 10:56

**Babcock** Laboratories, Inc.

B9G3798

# SENDING LABORATORY:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Waddell

# **RECEIVING LABORATORY:**

Truesdail Laboratories - Subcontract 3337 Michelson Drive Suite CN750 Irvine, CA 92614 Phone :(714) 730-6239 Fax: (714) 730-6462

# Please include J-flags and EXCEL EDD.

Employed by: Wood Environ. & Infrastructure Solutions Inc Sampled by: John Rudolph

Analysis	E Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	× '\$
Sample ID: B9G3798-01 Solid		Sampled: 07/26/19 09:00	LE02 - Int		Proj.No.:Lake Elsinore TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	08/21/19 23:59	08/05/19 09:00	Report Chlorophy	ll a / Filter Volume = 200m	1
Sample ID: B9G3798-02 Solid		Sampled: 07/26/19 09:00	LE02 - Surf		Proj.No.:Lake Elsinore TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	08/21/19 23:59	08/05/19 09:00	Report Chlorophyl	ll a / Filter Volume = 200m	1

1	All Containers I	ntact:	Yes	No	Samples Preserved Properly:	YesNo
Samples Received at oC	Sample Labels / COC	Agree:	Yes	No	Custody Seals Present:	YesNo
Please forward all acknowledg NO HARDCOPHES PLEASE. Released By	ements of sample receip	ot, final rep	Received By	voices to ul an	<u>data@babcocklabs.com</u> <u>NOTI30119</u> Date	10:10 Am
Released By	Date	j	Received By		Date	



# Calscience

# **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

# Laboratory Job ID: 570-3187-1

Client Project/Site: B9G3799 Revision: 1

#### For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/19/2020 2:04:54 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary	10
Chain of Custody	11
Receipt Checklists	13

3

#### Qualifiers

#### **General Chemistry** alifier ^ Qualifier Description

Q	u	a	I	11	h
-		-	-	-	

TEF

TEQ

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

F1	MS and/or MSD Recovery is outside acceptance limits.	_
Glossary		
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	_
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
### Job ID: 570-3187-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-3187-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The sample was received on 7/30/2019 9:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.8° C.

#### **General Chemistry**

Method(s) 365.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-9429 and analytical batch 570-9491 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Page 4 of 13

Job ID: 570-3187-1

# **Client Sample Results**

Client: Babcock Laboratories,	Inc.
Project/Site: B9G3799	

		Client	t Sample	Results	5					
Client: Babcock Laboratories, Inc. Project/Site: B9G3799								Job ID: 57	0-3187-1	2
General Chemistry										
Client Sample ID: B9G3799-01 Date Collected: 07/26/19 09:00							Lab	Sample ID: 57 Matri	0-3187-1 x: Water	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	5
Phosphorus, Total	0.116		0.0100	0.00281	mg/L		08/01/19 14:22	08/01/19 16:12	1	6
										8
										9

# Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-9429/1-A Matrix: Water Analysis Batch: 9491												Client S	ample ID: Prep <sup>-</sup> Pre	Method Type: To ep Batch	Blank tal/NA : 9429
-		ΜВ	MB												
Analyte	Re	sult	Qualifier		RL		MDL	Unit		D	Р	repared	Analy	zed	Dil Fac
Phosphorus, Total		ND			0.0100	0.0	0281	mg/L			08/0	1/19 14:22	08/01/19	15:33	1
Lab Sample ID: LCS 570-9429/2-A										c	lient	Sample	ID: Lab C	ontrol S	ample
Matrix: Water													Prep <sup>-</sup>	Гуре: То	tal/NA
Analysis Batch: 9491													Pre	p Batch	: 9429
				Spike		LCS	LCS						%Rec.		
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Phosphorus, Total				0.200		0.2115			mg/L			106	90 - 110		
_ Lab Sample ID: LCSD 570-9429/3-A									CI	lient	Sam	ple ID: L	ab Contro	ol Sampl	le Dup
Matrix: Water													Prep <sup>-</sup>	Гуре: То	tal/NA
Analysis Batch: 9491													Pre	p Batch	: 9429
-				Spike		LCSD	LCS	D					%Rec.		RPD
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total				0.200		0.2092			mg/L			105	90 - 110	1	20
_ Lab Sample ID: 570-3187-1 MS												Client	Sample II	D: B9G3	799-01
Matrix: Water													Prep	Гуре: То	tal/NA
Analysis Batch: 9491													Pre	p Batch	: 9429
-	Sample	Sam	ple	Spike		MS	MS						%Rec.		
Analyte	Result	Qual	ifier	Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Phosphorus, Total	0.116			0.200		0.2859	F1		mg/L			85	90 - 110		
- Lab Sample ID: 570-3187-1 MSD												Client	Sample II	D: B9G3	799-01
Matrix: Water													Prep <sup>1</sup>	Гуре: То	tal/NA
Analysis Batch: 9491													Pre	p Batch	: 9429
-	Sample	Sam	ple	Spike		MSD	MSD	)					%Rec.	-	RPD
Analyte	Result	Qual	ifier	Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.116			0.200		0.2722	F1		mg/L			78	90 - 110	5	25

Job ID: 570-3187-1

Matrix: Water

Lab Sample ID: 570-3187-1

# Client Sample ID: B9G3799-01 Date Collected: 07/26/19 09:00

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	9429	08/01/19 14:22	UXCH	ECL 1
Total/NA	Analysis	365.1		1			9491	08/01/19 16:12	ED6R	ECL 1
	Instrument	ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Accreditation/Certification Summary

Client: Babcock Laboratories, Inc. Project/Site: B9G3799

Job ID: 570-3187-1

# Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-19
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	Flotocol	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

#### Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: B9G3799

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-3187-1	B9G3799-01	Water	07/26/19 09:00	07/30/19 09:50	

			3187
	SUBCON	TRACT ORDER Printe	ed: 7/29/2019 10:55
	Babcock L B!	aboratories, Inc. 9G3799	
SENDING LABORATORY:		RECEIVING LABORATORY:	<b>*</b> • • •
Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Wa	addell	Eurofins Calscience, Inc. 7440 Lincoln Way Garden Grove, CA 92841-142 Phone :(714) 895-5494 Fax: (714) 894-7501	7 570-3187 Chain of Custody
System Name: Wood Environment	&Infrastructure Solutions, Inc		
Analysis	Expires Regulatory Day Due Past Date Sampled	s Laboratory ID Com	ments
Sample ID: B9G3799-01 Liquid	Sampled: 07/26/19 09:00	LE02	Proj.No.:Lake Elsinore TMDL Monitoring
Subout_02 08 Containers Supplied: 500 mL Poly H2SO4 (A)	08/05/19 09:00	Low Level Total Phosphorus	
A	Are A	7 29 19	
amples Received at oC	All Containers Intact:	Yes No Custody	Preserved Properly:YesNo
lease forward all acknowledge O HARDCOPIES PLEASE.	ements of sample receipt, final re 7/29/19	eports and invoices to <u>data@ba</u> <u>M</u> <u></u> Received By	bcocklabs.com 7/30/19 09170 Date

Released By (Fedex)

Received By

Date

Page 1 of 1

Page 11 of 13

2/19/2020 (Rev. 1)

Date

506

4.6/4.8



5

11

¢ `\ Client: Babcock Laboratories, Inc.

#### Login Number: 3187 List Number: 1

Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-3187-1



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 14	
Contact:	John Rudolph	Project Name:	Amec Foster \	Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL N	<i>I</i> onitoring
	San Diego, CA 92123	Work Order Number:	B9H3684	
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp: 6 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification											
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	<u>By</u>					
B9H3684-01	CL07	Liquid	08/27/19 10:15	Kevin Stolzenba	08/27/19 14:12	Courier (Jason J.) - DE					
B9H3684-02	CL08	Liquid	08/27/19 09:30	Kevin Stolzenba	08/27/19 14:12	Courier (Jason J.) - DE					
B9H3684-03	CL09	Liquid	08/27/19 08:45	Kevin Stolzenba	08/27/19 14:12	Courier (Jason J.) - DE					
B9H3684-04	CL10	Liquid	08/27/19 07:45	Kevin Stolzenba	08/27/19 14:12	Courier (Jason J.) - DE					
B9H3684-05	LE02	Liquid	08/27/19 08:30	Kevin Stolzenba	08/27/19 14:12	Courier (Jason J.) -					

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119

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Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 11-Sep-2019

Analytical Report: Page 2 of 14 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: LECL TMDL Monitoring

## Work Order Number: B9H3684

Received on Ice (Y/N): Yes Temp: 6 °C

# Laboratory Reference Number B9H3684-01

Sample Description CL07	<u>Matrix</u> Liquid		<u>Sar</u> 0	npled Date/Time 8/27/19 10:15	Received Date/Time 08/27/19 14:12			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	08/28/19 03:15	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	08/28/19 03:15	KBS	
Solids								
Total Dissolved Solids	370	10	10	mg/L	SM 2540C	09/03/19 17:30	JGZ	
Total Suspended Solids	2	2	2	mg/L	SM 2540D	09/03/19 10:29	BBR	
General Inorganics								
Sulfide	3.4	0.10	0.10	mg/L	SM 4500S2 D	08/27/19 22:35	CMR	
Nutrients								
Ammonia-Nitrogen	1.3	0.10	0.044	mg/L	SM4500NH3H G	08/29/19 10:03	ATR	
Kjeldahl Nitrogen	2.1	0.10	0.093	mg/L	EPA 351.2	08/28/19 14:29	SLL	
Organic Nitrogen	0.8	0.1	0.02	mg/L	Calculation			
Total Nitrogen	2.1	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.23	0.050	0.016	mg/L	SM 4500P E	08/28/19 21:45	MWM	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	08/30/19 00:48	KRV	N_pFilt
Aluminum	ND	100	33	ug/L	EPA 200.7	08/30/19 20:11	KRV	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 14	4	
Contact:	John Rudolph	Project Name:	Amec Foste	er Wheeler-l	Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL	_ Monitoring	g
	San Diego, CA 92123	Work Order Number:	B9H3684		
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp:	6 °C

# B9H3684-02

Sample Description	<u>Matrix</u> Liquid		Sampled Date/Time 08/27/19 09:30		Received Date/Time			
0200		LIQ	ulu	Ū	0/21/18 08.00	00/21	113 14.1	2
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	08/28/19 03:28	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	08/28/19 03:28	KBS	
Solids								
Total Dissolved Solids	420	10	10	mg/L	SM 2540C	09/03/19 17:30	JGZ	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	09/03/19 10:29	BBR	
General Inorganics								
Sulfide	1.3	0.10	0.10	mg/L	SM 4500S2 D	08/27/19 22:35	CMR	
Nutrients								
Ammonia-Nitrogen	0.18	0.10	0.044	mg/L	SM4500NH3H G	08/29/19 10:09	ATR	
Kjeldahl Nitrogen	0.97	0.10	0.093	mg/L	EPA 351.2	08/28/19 14:30	SLL	
Organic Nitrogen	0.8	0.1	0.02	mg/L	Calculation			
Total Nitrogen	1.0	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.016	0.050	0.016	mg/L	SM 4500P E	08/28/19 21:45	MWM	J
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	08/30/19 00:50	KRV	N_pFilt
Aluminum	34	100	33	ug/L	EPA 200.7	08/30/19 20:13	KRV	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 14	4	
Contact:	John Rudolph	Project Name:	Amec Foste	r Wheeler-l	_ake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL	Monitoring	]
	San Diego, CA 92123	Work Order Number:	B9H3684		
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp:	6 °C

# B9H3684-03

Sample Description	<u>Matrix</u> Liquid		Sampled Date/Time 08/27/19 08:45		Received Date/Time			
0200		LIQ		Ū	0/21/10 00.40	00/21	10 14.1	2
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	08/28/19 03:42	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	08/28/19 03:42	KBS	
Solids								
Total Dissolved Solids	560	10	10	mg/L	SM 2540C	09/03/19 17:30	JGZ	
Total Suspended Solids	8	2	2	mg/L	SM 2540D	09/03/19 10:29	BBR	
General Inorganics								
Sulfide	10	0.10	0.10	mg/L	SM 4500S2 D	08/27/19 22:35	CMR	
Nutrients								
Ammonia-Nitrogen	1.9	0.10	0.044	mg/L	SM4500NH3H G	08/29/19 10:11	ATR	
Kjeldahl Nitrogen	2.9	0.10	0.093	mg/L	EPA 351.2	08/28/19 14:32	SLL	
Organic Nitrogen	1.0	0.1	0.02	mg/L	Calculation			
Total Nitrogen	2.9	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.025	0.050	0.016	mg/L	SM 4500P E	08/28/19 21:45	MWM	J
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	08/30/19 00:53	KRV	N_pFilt
Aluminum	75	100	33	ug/L	EPA 200.7	08/30/19 20:15	KRV	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 14		
Contact:	John Rudolph	Project Name:	Amec Foster	Wheeler-l	_ake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	er: LECL TMDL Monitoring		]
	San Diego, CA 92123	Work Order Number:	B9H3684		
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp:	6 °C

# B9H3684-04

Sample Description CL10	<u>Matrix</u> Liquid		Sampled Date/Time 08/27/19 07:45		Received Date/Time 08/27/19 14:12			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	08/28/19 03:55	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	08/28/19 03:55	KBS	
Solids								
Total Dissolved Solids	600	10	10	mg/L	SM 2540C	09/03/19 17:30	JGZ	
Total Suspended Solids	9	2	2	mg/L	SM 2540D	09/03/19 10:29	BBR	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	08/27/19 22:35	CMR	
Nutrients								
Ammonia-Nitrogen	ND	0.10	0.044	mg/L	SM4500NH3H G	08/29/19 10:12	ATR	
Kjeldahl Nitrogen	1.2	0.20	0.19	mg/L	EPA 351.2	08/30/19 14:12	SLL	
Organic Nitrogen	1.2	0.2	0.02	mg/L	Calculation			
Total Nitrogen	1.2	0.2	0.19	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	08/28/19 21:45	MWM	
Metals and Metalloids								
Aluminum-Dissolved	47	100	33	ug/L	EPA 200.7	08/30/19 00:55	KRV	N_pFilt, J
Aluminum	230	100	33	ug/L	EPA 200.7	08/30/19 20:24	KRV	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 14
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9H3684
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes Temp: 6 °C

# B9H3684-05

Sample Description LE02	<u>Matrix</u> Liquid		Sampled Date/Time 08/27/19 08:30		Received Date/Time 08/27/19 14:12			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	08/28/19 04:08	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	08/28/19 04:08	KBS	
Solids								
Total Dissolved Solids	2200	20	20	mg/L	SM 2540C	09/03/19 17:30	JGZ	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	08/27/19 22:35	CMR	
Nutrients								
Ammonia-Nitrogen	0.12	0.10	0.044	mg/L	SM4500NH3H G	08/29/19 10:14	ATR	
Kjeldahl Nitrogen	4.2	0.40	0.37	mg/L	EPA 351.2	08/30/19 14:13	SLL	
Organic Nitrogen	4.1	0.4	0.02	mg/L	Calculation			
Total Nitrogen	4.2	0.4	0.37	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	08/28/19 21:45	MWM	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Analytical Report: Page 7 of 14 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: LECL TMDL Monitoring Work Order Number: B9H3684

Yes

Temp: 6 °C

Received on Ice (Y/N):

Report Date: 11-Sep-2019

## **Anions - Batch Quality Control**

Analyta(a)	Deput	וחח		Linita	Spike	Source	% PEC	%REC	חסס	RPD Limit	Flog
Analyte(s)	Result	RDL		Units	Level	Result	///KLC	Linits	NF D	LIIIII	Тау
Batch 9H27171 - Analyzed as Received IC											
Blank (9H27171-BLK1)				F	repared	& Analyzed	d: 08/28/19	9			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (9H27171-BS1)				F	repared	& Analyzed	d: 08/28/1	9			
Nitrite as N	2.46	0.10	0.091	mg/L	2.50		98.3	90-110			
Nitrate as N	5.60	0.20	0.16	mg/L	5.65		99.1	90-110			
Matrix Spike (9H27171-MS1)		Source	: B9H3683-04	4 F	Prepared	& Analyzed	d: 08/28/1	9			
Nitrite as N	1.70	0.10	0.091	mg/L	2.50	ND	67.8	80-120			QFini, QMint
Nitrate as N	5.35	0.20	0.16	mg/L	5.65	ND	94.7	75-131			
Matrix Spike (9H27171-MS2)		Source	: B9H3702-0 <sup>2</sup>	1 F	repared	& Analyzed	d: 08/28/1	9			
Nitrite as N	2.43	0.10	0.091	mg/L	2.50	ND	97.2	80-120			
Nitrate as N	5.46	0.20	0.16	mg/L	5.65	ND	96.7	75-131			
Matrix Spike Dup (9H27171-MSD1)		Source	: B9H3683-04	<b>4</b> F	repared	& Analyzed	d: 08/28/1	9			
Nitrite as N	1.76	0.10	0.091	mg/L	2.50	ND	70.3	80-120	3.59	20	QFini, QMint
Nitrate as N	5.46	0.20	0.16	mg/L	5.65	ND	96.6	75-131	2.03	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



	San Diego, CA 92123	Work Order Number:	B9H3684
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 8 of 14

er: B9H3684 Received on Ice (Y/N): Temp: 6 °C Yes

Report Date: 11-Sep-2019

## **Solids - Batch Quality Control**

	Darult			1.1	Spike	Source		%REC		RPD Limit	Flag
Analyte(s)	Result	RDL		Units	Levei	Result	%REC	Limits	RPD	LIMIL	гад
Batch 9103070 - Analyzed as r	received										
Blank (9103070-BLK1)					Prepared	& Analyze	d: 09/03/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L							
LCS (9103070-BS1)					Prepared	& Analyze	d: 09/03/1	9			
Total Suspended Solids	518	50	50	mg/L	500		104	90-110			
Duplicate (9103070-DUP1)		Source:	B9H3684-0	3	Prepared	& Analyze	d: 09/03/1	9			
Total Suspended Solids	6.50	2	2	mg/L		8.00			20.7	25	
Duplicate (9103070-DUP2)		Source:	B9H3872-0 <sup>.</sup>	1	Prepared	& Analyze	d: 09/03/1	9			
Total Suspended Solids	244	20	20	mg/L		248			1.63	25	
Batch 9103118 - Analyzed as r	eceived										
Blank (9103118-BLK1)					Prepared	& Analyze	d: 09/03/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
LCS (9103118-BS1)					Prepared	& Analyze	d: 09/03/1	9			
Total Dissolved Solids	743	10	10	mg/L	746		99.6	90-110			
Duplicate (9103118-DUP1)		Source:	B9H3647-0	2	Prepared	& Analyze	d: 09/03/1	9			
Total Dissolved Solids	385	10	10	mg/L		332			14.8	20	
Duplicate (9103118-DUP2)		Source:	B9H3647-0	3	Prepared	& Analyze	d: 09/03/1	9			
Total Dissolved Solids	393	10	10	mg/L		375			4.69	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 9 of 14
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9H3684
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes Temp: 6 °C

## **General Inorganics - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9H27166 - Analyzed as rea	ceived										
Blank (9H27166-BLK1)					Prepared	& Analyze	d: 08/27/1	9			
Sulfide	ND	0.10	0.10	mg/L							
LCS (9H27166-BS1)				ļ	Prepared	& Analyze	d: 08/27/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400		100	50-150			
Matrix Spike (9H27166-MS1)		Source:	B9H3684-0	1	Prepared	& Analyze	d: 08/27/1	9			
Sulfide	3.70	0.10	0.10	mg/L	0.400	3.40	75.0	50-150			
Matrix Spike Dup (9H27166-MSD1)		Source:	B9H3684-0	1	Prepared	& Analyze	d: 08/27/1	9			
Sulfide	2.50	0.10	0.10	mg/L	0.400	3.40	NR	50-150	38.7	30	QM-4X

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 10 of 14	4		
Contact:	John Rudolph	Project Name:	Amec Foster	Wheeler-	Lake Elsino	re
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL	Monitoring	9	
	San Diego, CA 92123	Work Order Number:	B9H3684			
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp:	6 °C	

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# **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9H28061 - Acid Digest											
Blank (9H28061-BLK1)				F	Prepared &	& Analyzed	d: 08/28/19	9			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (9H28061-BS1)				F	Prepared &	& Analyzed	d: 08/28/19	9			
Kjeldahl Nitrogen	0.993	0.10	0.093	mg/L	1.00		99.3	80-120			
Matrix Spike (9H28061-MS1)		Source:	B9H3472-0 <sup>-</sup>	<b>1</b> F	Prepared &	& Analyzed	d: 08/28/19	9			
Kjeldahl Nitrogen	2.14	0.10	0.093	mg/L	1.00	1.89	25.7	42-154			QMS(D)
Matrix Spike Dup (9H28061-MSD1)		Source:	B9H3472-0 <sup>-</sup>	<b>1</b> F	Prepared &	& Analyzed	d: 08/28/19	9			
Kjeldahl Nitrogen	2.57	0.10	0.093	mg/L	1.00	1.89	68.3	42-154	18.1	25	
Batch 9H28129 - Filter if turbid.											
LCS (9H28129-BS1)				F	Prepared &	& Analyzed	d: 08/28/19	9			
Ortho Phosphate Phosphorus	0.538	0.050	0.016	mg/L	0.500		108	90-110			
Matrix Spike (9H28129-MS1)		Source:	B9H3683-0 <sup>-</sup>	1 F	Prepared &	& Analyzed	d: 08/28/19	9			
Ortho Phosphate Phosphorus	0.587	0.050	0.016	mg/L	0.500	ND	117	80-120			
Matrix Spike Dup (9H28129-MSD1)		Source:	B9H3683-0	1 F	Prepared &	& Analyzed	d: 08/28/19	9			
Ortho Phosphate Phosphorus	0.581	0.050	0.016	mg/L	0.500	ND	116	80-120	0.937	20	
Batch 9H29009 - Analyzed as rec	eived										
Blank (9H29009-BLK1)				F	Prepared &	& Analyzed	d: 08/29/19	9			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 11 of 14	
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-	Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitorin	g
	San Diego, CA 92123	Work Order Number:	B9H3684	
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes Temp:	6 °C

Report Date: 11-Sep-2019

## **Nutrients - Batch Quality Control**

Analyte(s)	Result	BDI		Unite	Spike Level	Source Result	%REC	%REC	RPD	RPD L imit	Flag
Analyc(3)	rtcourt	NDL		Onito	2010	rtooun	,011E0	Linito		2	r lag
Batch 9H29009 - Analyzed as rec	eived										
LCS (9H29009-BS1)				I	Prepared	& Analyze	d: 08/29/1	9			
Ammonia-Nitrogen	1.01	0.10	0.044	mg/L	1.00		101	90-110			
Matrix Spike (9H29009-MS1)		Source	: B9H3683-0	)3 I	Prepared	& Analyze	d: 08/29/1	9			
Ammonia-Nitrogen	1.01	0.10	0.044	mg/L	1.00	0.0711	93.6	80-120			
Matrix Spike Dup (9H29009-MSD1)		Source	: B9H3683-0	<b>)</b> 3	Prepared	& Analyze	d: 08/29/1	9			
Ammonia-Nitrogen	1.04	0.10	0.044	mg/L	1.00	0.0711	97.3	80-120	3.55	20	
Batch 9H30012 - Acid Digest											
Blank (9H30012-BLK1)				I	Prepared	& Analyze	d: 08/30/1	9			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (9H30012-BS1)				I	Prepared	& Analyze	d: 08/30/1	9			
Kjeldahl Nitrogen	1.06	0.10	0.093	mg/L	1.00		106	80-120			
Matrix Spike (9H30012-MS1)		Source	: B9H3851-0	01	Prepared	& Analyze	d: 08/30/1	9			
Kjeldahl Nitrogen	128	8.0	7.4	mg/L	80.0	58.0	88.0	42-154			
Matrix Spike (9H30012-MS2)		Source	: B9H3851-0	01	Prepared	& Analyze	d: 08/30/1	9			
Kjeldahl Nitrogen	136	8.0	7.4	mg/L	80.0	58.0	97.4	42-154			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com CA ELAP No. 2698 EPA No. CA00102 NELAP No. OR4035 LACSD No. 10119



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytica
Contact:	John Rudolph	Proje
Address:	9210 Sky Park Court #200	Project
	San Diego, CA 92123	Work Order

Analytical Report: Page 12 of 14 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: LECL TMDL Monitoring /ork Order Number: B9H3684

Yes

Temp: 6 °C

Received on Ice (Y/N):

Report Date: 11-Sep-2019

# Metals and Metalloids - Batch Quality Control

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9H29037 - 200.7/ No Diges	st										
Blank (9H29037-BLK1)					Prepared	& Analyze	d: 08/29/19	9			
Aluminum-Dissolved	17.4	100	16	ug/L							QBfil, J
Blank (9H29037-BLK2)					Prepared	& Analyze	d: 08/29/19	9			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (9H29037-BLK3)					Prepared	& Analyze	d: 08/29/19	9			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (9H29037-BLK4)					Prepared	& Analyzed	d: 08/29/19	9			
Aluminum-Dissolved	ND	100	16	ug/L							
Blank (9H29037-BLK5)					Prepared	& Analyzed	d: 08/29/19	9			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
LCS (9H29037-BS1)					Prepared	& Analyzed	d: 08/29/19	9			
Aluminum-Dissolved	317	100	16	ug/L	334		94.9	85-115			
LCS Dup (9H29037-BSD1)					Prepared	& Analyzed	d: 08/29/19	9			
Aluminum-Dissolved	314	100	16	ug/L	334		94.1	85-115	0.862	20	
Matrix Spike (9H29037-MS1)		Source:	B9H3559-0 <sup>-</sup>	1	Prepared	& Analyze	d: 08/29/19	9			
Aluminum-Dissolved	15600	5100	840	ug/L	16700	ND	NR	70-130			
Matrix Spike (9H29037-MS2)		Source:	B9H3684-04	4	Prepared	& Analyzed	d: 08/29/19	9			
Aluminum-Dissolved	676	200	34	ug/L	668	47.0	94.2	70-130			
Batch 9H30043 - EPA 200.2											
Blank (9H30043-BLK1)					Prepared	& Analyze	d: 08/30/19	9			
Aluminum	ND	100	16	ug/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 13 of 14		
Contact:	John Rudolph	Project Name:	Amec Foster W	heeler-l	_ake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Mo	onitoring	3
	San Diego, CA 92123	Work Order Number:	B9H3684		
Report Date:	11-Sep-2019	Received on Ice (Y/N):	Yes	Temp:	6 °C

## Metals and Metalloids - Batch Quality Control

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9H30043 - EPA 200.2											
LCS (9H30043-BS1)				I	Prepared	& Analyze	d: 08/30/1	9			
Aluminum	1010	100	16	ug/L	1170		86.3	85-115			
LCS Dup (9H30043-BSD1)				I	Prepared	& Analyze	d: 08/30/1	9			
Aluminum	1020	100	16	ug/L	1170		87.8	85-115	1.69	20	
Matrix Spike (9H30043-MS1)		Source: I	B9H3683-0	1	Prepared	& Analyze	d: 08/30/1	9			
Aluminum	1000	200	33	ug/L	1170	ND	86.1	70-130			
Matrix Spike (9H30043-MS2)		Source: I	B9H3838-0	2	Prepared	& Analyze	d: 08/30/1	9			
Aluminum	1000	100	16	ug/L	1170	ND	85.9	70-130			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 14 of 14 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: LECL TMDL Monitoring

#### Work Order Number: B9H3684

Received on Ice (Y/N): Yes Temp: 6 °C

Report Date: 11-Sep-2019

#### **Notes and Definitions**

J Estimated value

- N\_pFilt Sample filtered and preserved upon receipt to the laboratory.
- QBfil Method blank was filtered prior to processing.
- QFini Follow-up result also did not meet laboratory acceptance criteria.
- QM-4X Due to analyte concentration greater than or equal to 4 times the spike concentration, recoveries for the MS and/or MSD did not meet laboratory acceptance criteria.
- QMint Due to matrix interference, the MS and/or MSD did not meet laboratory acceptance criteria.
- QMS(D) Matrix spike recovery was out of acceptance criteria. Precision and accuracy demonstrated by remaining matrix spike results.
- Qrnd The precision and/or accuracy criteria has been met when rounded to the nearest whole percentage value.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 1	
John Rudolph	Project Name:	Amec Foste	r Wheeler-Lake Elsinore
9210 Sky Park Court #200	Project Number:	LECL TMDL	. Monitoring
San Diego, CA 92123	Work Order Number:	B9H3684	
11-Sep-2019	Received on Ice (Y/N):	Yes	Temp: 6 °C
	Wood Environment&Infrastructure Solutions, Inc John Rudolph 9210 Sky Park Court #200 San Diego, CA 92123 11-Sep-2019	Wood Environment&Infrastructure Solutions, IncAnalytical Report: Project Name:John RudolphProject Name:9210 Sky Park Court #200Project Number:San Diego, CA 92123Work Order Number:11-Sep-2019Received on Ice (Y/N):	Wood Environment&Infrastructure Solutions, IncAnalytical Report:Page 1 of 1John RudolphProject Name:Amec Foste9210 Sky Park Court #200Project Number:LECL TMDLSan Diego, CA 92123Work Order Number:B9H368411-Sep-2019Received on Ice (Y/N):Yes

#### E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662 www.babcocklabs.com

# Chain of Custody & Sample Information Record

Client: Wood E&I Solutions, Inc.	Contact:	John Rudolph		Phone No. 858-243-8158
FAX No.	Email:	iohn rudolph@wood	Inle com	Additional Reporting Requests
Project Name: LECL TMDL Monitoring Project Number: 1915100402	Turn Arou	und Time: pproval:	Routine *3-5 Day *48 Hour Rush Rush	*24 Hour     FAX Results: □ Yes □ No     FAX Results: □ Yes □ No     Rush     State EDT: □ Yes □ No     ditional Charges May Apply     (Include Source Number in Notes)
Sampler Information	# of & Pr	Containers reservatives	Sample Type Analysis Requested	Matrix Notes
Name: Kern Shizubad Employer: Wood E&I Solutions, Inc. Signature:	served 4	203 IZIAcetate	n of contant of contan	DW = Drinking Water     Ortho-P has <u>NOT</u> been field filtered.       WW = Wastewater     Total Phosphorus - Sub to Eurofins Calscience and RUSH 5-day TAT (8/27/19 sample only)       S = Soil     Dissolved Metals, are <u>NOT</u> field filtered.
Sample ID Date Time	HCI HN03	Va2S Va0H Va0H Va0H VA0CA/ MCA/ MCA/	Rou Resc Spess Spess Spess Spess Cotal SRP/G Cotal	L = Liquid +** 8/27/19 Total Phosphorus - RUSH (5) M = Miscellaneous AC day) TAT
CL07 &12719 1015				
CL08 0930			x x x x x x x x x x x	and
CL09 0845			x x x x x x x x x x x	Cottinu
CL10 0745			x x x x x x x x x x x	
LE02 U 0830	4-4-4-4		x x x x x x x x	
	+++++			
	+++++			
Polinguiched Pu (sign) Print Name / Co		Data / Time	Pagaived By (Sign)	Brint Nome / Company
Min Ator Vine Spiriture	Weed	8177/1	Received by (Sigh)	(TASE) TOUGHT
July 8/27/19 JASON JUDIN	NDE	8/22/19 2:12/2	Delg	Esteph TESB
(For Lab Use Only) Sample Integrity Upon Receip	ot		Lab Notes	
Sample(s) Submitted on Ice? (Yes) N Custody Seal(s) Intact? Yes N Sample(s) Intact? (Yes) N	0 NA	Temperature (ℊ°C □ Cooler Blank	7#62	B9H3684 Rc'd: 08/27/2019 14:12 AJG Temp Gun Id: T#62
		÷		

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 2					
Contact:	John Rudolph	Project Name: AMEC-Lake E						
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring					
	San Diego, CA, 92123	Work Order Number:	B9H3689					
Report Date:	25-Sep-2019	Received on Ice (Y/N	Yes Temp: 6 °C					

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

		Sample Iu	Entineation			
Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
B9H3689-01	CL07-Int	Solid	8/27/19 10:15	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-02	CL07-Surf	Solid	8/27/19 10:15	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-03	CL08-Int	Solid	8/27/19 9:30	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-04	CL08-Surf	Solid	8/27/19 9:30	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-05	CL09-Int	Solid	8/27/19 8:45	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-06	CL09-Surf	Solid	8/27/19 8:45	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-07	CL10-Int	Solid	8/27/19 7:45	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-08	CL10-Surf	Solid	8/27/19 7:45	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-09	LE02-Int	Solid	8/27/19 8:30	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE
B9H3689-10	LE02-Surf	Solid	8/27/19 8:40	Kevin Stolzenbach	8/27/19 14:12	Courier (Jason J.) - DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

#### Page 1 of 2 CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 2 of 2		
Contact:	John Rudolph	Project Name:	AMEC-Lake Elsinore		
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring		
	San Diego, CA, 92123	Work Order Number:	B9H3689		
Report Date:	25-Sep-2019	Received on Ice (Y/N	Yes Temp: 6 °C		

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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location 6100 Quail Valley Court Riverside, CA 92507-0704

P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 2 of 2



Client Name: Contact: Address:	Wood Environment&Infrastructure So John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: <b>Work Order Number:</b>	Page 1 of 1 AMEC-Lake LECL TMD <b>B9H3689</b>	e Elsinore L Monitoring	
Report Date:	25-Sep-2019	Received on Ice (Y/N	Yes	Temp: 6°(	С

#### E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662 www.babcocklabs.com

Chain of Custody & Sample Information Record

chent. Wood Ear Solutions, in	<b>U.</b>		COI	laci			Ruc	10ipi					-		_		-	-	Filone No.	Additional Reporting Requests
FAX No.  Project Name: LECL TMDL Monitoring  Project Number: 1915100402			Email:         john,rudolph@woodplc.com           Turn Around Time:         Routine         *3-5 Day         *48 Hour         *24 Hour           *Lab TAT Approval:         By:         *3-5 Day         *48 Hour         *24 Hour								*24 Hour Rush dditional Charges May Apply	Include QC Data Package: U ves U FAX Results: U ves U Email Results: U ves U State EDT: U ves U (Include Source Number in Notes)								
Sampler Informa	tion			#0	of C	onta	iner	S		S		Sample Analysis Pag						stad	Matrix	Notes
Name: <u>Keun</u> Du la Employer: Wood E&I Solut Signature: <u>Jan</u> <u>A</u> Sample ID	tions, Inc.	Time	Unpreserved H2SO4	HCI	Na2S203	NaOH	NH4CI	MCAA	Frozen	Total # of Containers	Routine	Special	Total Sulfide	TDS	TKN	Ammonia Total Phosphorus	SRP/Ortho-P	Chlorophyll-a	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Sludge L = Liquid M = Miscellaneous	Chi-a samples on 0.7 um GFF Subout
CL07 - Int	8127/19	1015																x		Filter Volume: 250mL
CL07 - Surf	1	1015																x		Filter Volume: 250 L
CL08 - Int		5930										Τ						x		Filter Volume: Jone
CL08 - Surf	6	2930																x		Filter Volume: 250-L
CL09 - Int		18YS																x		Filter Volume: 250-L
CL09 - Surf		2845																x		Filter Volume: ZSOn L
CL10 - Int		3745																x		Filter Volume: 250 L
CL10 - Surf		2745																x		Filter Volume: 250- C
LE02 - Int		2830																x		Filter Volume: 250mC
LE02 - Surf	V	2840																x		Filter Volume: 250 - C
Relinquished By (sign)	Print Name	e / Com	pany	,			Date	/ Ti	me			R	ece	iveo	B	r(Si	gn)		Pri	nt Name / Company
Não fte	Hum Sol	celm)	1	loci	1	812	7/	19	120	00		L	/	-	8	127	10	1	JAGN JUDIUN	1/ DE
\$1/18/21/19	JASON JU	nuiws		5	8	12	19	2:	1200		0	2	A	el	2	>			Esteph 18	ESB
For Lab Use Only) Sample In	ntegrity Upon R	leceipt	_	_	_		_		_			T	_	Lai	o Ne	otes		_	ROUS	
Sample(s) Submitted o Custody Seal(s) I Sample(s) I	n Ice? (Yes) ntact? Yes ntact? (Yes)	No No No	(	(A)		t	Tei	mpe	Blan	ure 2°C nk			Γ#	6	Z				Rc'd: 08/27/2	0009 H:12 H:12 Gun Id :T#62

mailing P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

# Page 1 of 1



ALS – Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

# Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 19H0498 Printed: 09/10/2019

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
B9H3689-01	19H0498-01	Filter		08/27/2019 10:15	08/29/2019 10:30
B9H3689-02	19H0498-02	Filter		08/27/2019 10:15	08/29/2019 10:30
B9H3689-03	19H0498-03	Filter		08/27/2019 09:30	08/29/2019 10:30
B9H3689-04	19H0498-04	Filter		08/27/2019 09:30	08/29/2019 10:30
B9H3689-05	19H0498-05	Filter		08/27/2019 08:45	08/29/2019 10:30
B9H3689-06	19H0498-06	Filter		08/27/2019 08:45	08/29/2019 10:30
B9H3689-07	19H0498-07	Filter		08/27/2019 07:45	08/29/2019 10:30
B9H3689-08	19H0498-08	Filter		08/27/2019 07:45	08/29/2019 10:30
B9H3689-09	19H0498-09	Filter		08/27/2019 08:30	08/29/2019 10:30
B9H3689-10	19H0498-10	Filter		08/27/2019 08:40	08/29/2019 10:30

#### DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Dead

Shelly Brady Customer Service Manager



Client: Babcock Labora	tories, Inc.		Project Name	::	Chlorophyl	1		Printed: 09/1	0/2019
			B9H3689	-01 (Filtor)					
Γ			1910-98-01	(Filler)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Trues	dail					
Microbiology									
Chlorophyll a	33.3	1.00	1.00 mg/m	3 ]	1908671	09/09/2019 17	7:49 EGV	EPA 10200 H	
			B9H3689	<b>-02</b>					
			19H0498-02	(Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Trues	dail					
Microbiology									
Chlorophyll a	6.66	1.00	1.00 mg/m	3 ]	1908671	09/09/2019 17	':49 EGV	EPA 10200 H	
			B9H3689	-03					
			19H0498-03	(Filter)	l				
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Trues	dail					
Microbiology									
Chlorophyll a	36.3	1.00	1.00 mg/m	3]	1908671	09/09/2019 17	7:49 EGV	EPA 10200 H	
			B9H3689	-04					
			19H0498-04	(Filter)	I				
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Trues	dail					
Microbiology									
Chlorophyll a	6.66	1.00	1.00 mg/m	3]	1908671	09/09/2019 17	7:49 EGV	EPA 10200 H	
			B9H3689	-05					
			19H0498-05	(Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
L			ALS Trues	dail					



Client: Babcock Laboratories, Inc. Project Name: Chlorophyll Printed: 09/10/2019 B9H3689-05 (Continued) 19H0498-05 (Filter) (Continued) MDL Analyte Result RL Units DF Batch Analyzed Analyst Method Notes ALS Truesdail Microbiology Chlorophyll a 64.5 1908671 09/09/2019 17:49 EGV 1.00 1.00 mg/m<sup>3</sup> EPA 10200 H 1 B9H3689-06 19H0498-06 (Filter) MDL Analyte Result RL Units Analyzed Analyst Method Notes DF Batch ALS Truesdail Microbiology 1.00 mg/m<sup>3</sup> Chlorophyll a 13.8 1.00 1908671 09/09/2019 17:49 EGV EPA 10200 H 1 B9H3689-07 19H0498-07 (Filter) Analyte Result MDL **RL** Units DF Analyzed Analyst Method Notes Batch **ALS Truesdail** Microbiology Chlorophyll a 19.5 1908671 09/09/2019 17:49 EGV EPA 10200 H 1.00 1.00 mg/m<sup>3</sup> 1 B9H3689-08 19H0498-08 (Filter) MDL Analyte Result **RL** Units DF Batch Analyzed Analyst Method Notes ALS Truesdail Microbiology Chlorophyll a 19.9 1908671 09/09/2019 17:49 EGV EPA 10200 H 1.00 mg/m<sup>3</sup> 1.00 1 B9H3689-09 19H0498-09 (Filter) Analyte Result MDL RL Units Batch Analyzed Analyst Method Notes DF

ALS Truesdail



Client: Babcock Laboratories, Inc.

									Printed: 09/	10/2019
		E	89H3689	9-09 (Co	ntinue	ed)				
		19H	0498-09	) (Filter)	(Conti	inued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	5 Truesd	ail					
Microbiology										
Chlorophyll a	99.1	1.00	1.00	mg/m³	1	1908671	09/09/2019 17	7:49 EGV	EPA 10200 H	1
			BS	H3689-1	0					
			19H04	498-10 (	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	5 Truesd	ail					
Microbiology										
Chlorophyll a	81.9	1.00	1.00	mg/m³	1	1908671	09/09/2019 17	7:49 EGV	EPA 10200 H	ł

Project Name:

Chlorophyll



Printed: 8/28/2019 10:18

# **Babcock Laboratories, Inc.**

B9H3689

Analysis	E Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: B9H3689-06 Solid		Sampled: 08/27/19 08:45	CL09-Surf		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	09/23/19 23:59	09/06/19 08:45	Report Chlorophy	ll a / Filter Volume = 250	mL
Sample ID: B9H3689-07 Solid		Sampled: 08/27/19 07:45	CL10-Int		Proj.No.:LECL TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 07:45	Report Chlorophy	ll a / Filter Volume = 250	mL
Sample ID: B9H3689-08 Solid	9	Sampled: 08/27/19 07:45	CL10-Surf		Proj.No.:LECL TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 07:45	Report Chlorophy	ll a / Filter Volume = 250	mL
Sample ID: B9H3689-09 Solid		Sampled: 08/27/19 08:30	LE02-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	09/23/19 23:59	09/06/19 08:30	Report Chlorophy	ll a / Filter Volume = 250	mL
Sample ID: B9H3689-10 Solid		Sampled: 08/27/19 08:40	LE02-Surf	×.	Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	09/23/19 23:59	09/06/19 08:40	Report Chlorophyl	ll a / Filter Volume = 250	mL
: Date: Late: Mgt: 1 DV: Syds: PRIORITY OV TRCK: 1192 /	28Aug19 0.00 LBS 0.00 ERNIGHT 4906 2705	SHIPPING: 20.38 SPECIAL: 1.43 HANDLING: 0.00 TOTAL: 21.81			
	All	Containers Intact:	YesNo	Samples Preserved Proj	perly:YesNo
amples Received at $\frac{3.4}{}$	oC Sample I	Labels / COC Agree:	YesNo	Custody Seals Present:	YesNo
lease forward all acknow O HARDCOPIES PLEA Released By	ledgements of sa SE SE Date	mple receipt, final rep 8/19	orts and invoices to Defma Received By	data@babcocklabs.cc 8/29/19 Date	0 <u>0</u> 030 e
Released By	Dat	e	Received By	Date	e
3.					Page 5 o



**RECEIVING LABORATORY:** 

Brinted: 8/28/2019 10:18

Babcock Laboratories, Inc.

# B9H3689

SENDING LABORATORY:

Babcock Laboratories, Inc 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A	A. Waddell		Truesdail Laboratories 3337 Michelson Drive Irvine, CA 92614 Phone :(714) 730-6239 Fax: (714) 730-6462	- Subcontract Suite CN750		1 > _1
System Name: Wood Enviror Sampler: Kevin Stolzenbach Analysis	nmental&Infrastruct E: Due	ure Solutions, Inc xpires Regulatory Days Past Date Sampled	please in d	EXCel Comments	mp file	i's
Sample ID: B9H3689-01 Solid		Sampled: 08/27/19 10:15	CL07-Int		J N	Proj.No.: <u>LECL TMDL</u> <u>Aonitoring</u>
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 10:15	Report Chlorophyll a	a / Filter Volume =	= 250mL	4
Sample ID: B9H3689-02 Solid		Sampled: 08/27/19 10:15	CL07-Surf		I N	Proj.No.: <u>LECL TMDL</u> Ionitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 10:15	Report Chlorophyll a	a / Filter Volume =	= 250mL	8
Sample ID: B9H3689-03 Solid		Sampled: 08/27/19 09:30	CL08-Int			roj.No.:LECL TMDL Ionitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 09:30	Report Chlorophyll a	a / Filter Volume =	= 250mL	
Sample ID: B9H3689-04 Solid		Sampled: 08/27/19 09:30	CL08-Surf		H N	roj.No.: <u>LECL TMDL</u> Ionitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 09:30	Report Chlorophyll a	a / Filter Volume =	250mL	
Sample ID: B9H3689-05 Solid		Sampled: 08/27/19 08:45	CL09-Int		F N	roj.No.:LECL TMDL Ionitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	09/23/19 23:59	09/06/19 08:45	Report Chlorophyll a	a / Filter Volume =	250mL	

1.

Page 1 of 2 Page 6 of 6



# Calscience

# **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

# Laboratory Job ID: 570-5938-1

Client Project/Site: B9H3584 Revision: 1

# For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/19/2020 2:06:17 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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3

#### Qualifiers

#### **General Chemistry** alifier ^ Qualifier Description

Q	u	a	I	IŤ	1
=		_		_	

F1	MS and/or MSD Recovery is outside acceptance limits.	
Glossary		— 5
Glossaly		
Abbreviation	These commonly used abbreviations may or may not be present in this report.	6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	0
DER	Duplicate Error Ratio (normalized absolute difference)	0
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	9
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	

- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

#### Job ID: 570-5938-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-5938-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 8/28/2019 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

**General Chemistry** 

5

Client Sample ID: B9H3584-01 Date Collected: 08/27/19 10:15 Date Received: 08/28/19 10:15							Lab	Sample ID: 570 Matrix	)-5938-1 c: Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.239		0.0100	0.00281	mg/L		09/03/19 11:45	09/04/19 11:49	1
Client Sample ID: B9H3584-02							Lab	Sample ID: 570	-5938-2
Date Collected: 08/27/19 09:30								Matrix	c: Water
Date Received: 08/28/19 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0444		0.0100	0.00281	mg/L		09/03/19 11:45	09/04/19 11:50	1
Client Sample ID: B9H3584-03							Lab	Sample ID: 570	-5938-3
Date Collected: 08/27/19 08:45								Matrix	c: Water
Date Received: 08/28/19 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0853		0.0100	0.00281	mg/L		09/03/19 11:45	09/04/19 11:52	1
Client Sample ID: B9H3584-04							Lab	Sample ID: 570	)-5938-4
Date Collected: 08/27/19 07:45								Matrix	c: Water
Date Received: 08/28/19 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0392	F1	0.0100	0.00281	mg/L		09/03/19 11:45	09/04/19 11:53	1
Client Sample ID: B9H3584-05							Lab	Sample ID: 570	)-5938-5
Date Collected: 08/27/19 08:30								Matrix	c: Water
Date Received: 08/28/19 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.104		0.0100	0.00281	mg/L		09/03/19 11:45	09/04/19 11:55	1

#### Method: 365.1 - Phosphorus, Total

Lab Sample ID: 570-5938-4 MS											Client	Sample I	): B9H38	584-04
Matrix: Water												Prep 1	уре: То	tal/NA
Analysis Batch: 16938		-										Prep	Batch:	16667
	Sample	Sam	ple	Spike		MS	MS			_		%Rec.		
Analyte	Result	Qua	lifier	Added		Result	Qualifier	Unit		D	%Rec	Limits		
Phosphorus, Total	0.0392	F1		0.200		0.2502		mg/L			106	90 - 110		
Lab Sample ID: 570-5938-4 MSD											Client	t Sample II	): B9H35	584-04
Matrix: Water												Prep T	ype: To	tal/NA
Analysis Batch: 16938												Prep	Batch:	16667
	Sample	Sam	ple	Spike		MSD	MSD					%Rec.		RPD
Analyte	Result	Qua	lifier	Added		Result	Qualifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.0392	F1		0.200		0.2909	F1	mg/L		_	126	90 - 110	15	25
_ Lab Sample ID: MB 570-16938/38											Client S	ample ID:	Method	Blank
Matrix: Water												Prep 1	vpe: To	tal/NA
Analysis Batch: 16938													,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
		мв	МВ											
Analyte	R	esult	Qualifier		RL		MDL Unit		D	Р	repared	Analyz	zed	Dil Fac
Phosphorus, Total		ND			0.100	0.0	0281 mg/L					09/04/19	11:29	1
 Lab Sample ID: LCS 570-16938/42									CI	ient	Sample	ID: Lab C	ontrol S	ample
Matrix: Water												Prep T	vpe: To	tal/NA
Analysis Batch: 16938														
				Spike		LCS	LCS					%Rec.		
Analyte				Added		Result	Qualifier	Unit		D	%Rec	Limits		
Phosphorus, Total				0.200		0.2011		mg/L		_	101	90 - 110		
- Lab Sample ID: LCSD 570-16938/43	3							с	lient	Sam	ple ID: I	Lab Contro	ol Sampl	e Dup
Matrix: Water												Prep 1	vpe: To	tal/NA
Analysis Batch: 16938														
				Spike		LCSD	LCSD					%Rec.		RPD
Analyte				Added		Result	Qualifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total				0.200		0.2003		mg/L		-	100	90 - 110	0	20

Job ID: 570-5938-1

Client Sample ID: B9H3584-01

#### Lab Sample ID: 570-5938-1 Matrix: Water

Lab Sample ID: 570-5938-2

Lab Sample ID: 570-5938-3

Matrix: Water

Matrix: Water

Date Collected: 08/27/19 10:15 Date Received: 08/28/19 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	16667	09/03/19 11:45	ED6R	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	16938	09/04/19 11:49	ED6R	ECL 1
	Instrume	nt ID: ACA1								

#### Client Sample ID: B9H3584-02

Date Collected: 08/27/19 09:30 Date Received: 08/28/19 10:15

	Batch	Batch	Dura	Dil	Initial	Final	Batch	Prepared	<b>A</b>	Lab
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	16667	09/03/19 11:45	ED6R	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	16938	09/04/19 11:50	ED6R	ECL 1
	Instrumer	nt ID: ACA1								

#### Client Sample ID: B9H3584-03

Date Collected: 08/27/19 08:45 Date Received: 08/28/19 10:15

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	16667	09/03/19 11:45	ED6R	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	16938	09/04/19 11:52	ED6R	ECL 1
	Instrume	nt ID: ACA1								

#### Client Sample ID: B9H3584-04

Date Collected: 08/27/19 07:45

Lab Sample ID: 570-5938-4 Matrix: Water

Lab Sample ID: 570-5938-5

Matrix: Water

## Date Received: 08/28/19 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	16667	09/03/19 11:45	ED6R	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	16938	09/04/19 11:53	ED6R	ECL 1
	Instrume	nt ID: ACA1								

#### Client Sample ID: B9H3584-05

#### Date Collected: 08/27/19 08:30

Date Received: 08/28/19 10:15

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	16667	09/03/19 11:45	ED6R	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	16938	09/04/19 11:55	ED6R	ECL 1
	Instrume	nt ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Accreditation/Certification Summary

Client: Babcock Laboratories, Inc. Project/Site: B9H3584

Job ID: 570-5938-1

# Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-19
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	EPA	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

#### Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: B9H3584

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-5938-1	B9H3584-01	Water	08/27/19 10:15	08/28/19 10:15	
570-5938-2	B9H3584-02	Water	08/27/19 09:30	08/28/19 10:15	
570-5938-3	B9H3584-03	Water	08/27/19 08:45	08/28/19 10:15	
570-5938-4	B9H3584-04	Water	08/27/19 07:45	08/28/19 10:15	
570-5938-5	B9H3584-05	Water	08/27/19 08:30	08/28/19 10:15	



DV: Svcs: PRIORITY OVERNIGHT TRCK: 1192 4906 2337

Page 1 of 2

21.81

0.00

TOTAL:



# **Babcock Laboratories, Inc. B9H3584**

SUBCONTRACT ORDER

All Containers Intact: \_Yes \_\_\_\_No Samples Preserved Properly: \_\_\_Yes \_\_\_\_ \_No Samples Received at \_\_\_\_\_ oC \_\_\_\_Yes \_\_\_\_No Sample Labels / COC Agree: Custody Seals Present: \_Yes \_\_\_\_No Please forward all acknowledgements of sample receipt, final reports and invoices to data@babcocklabs.com NO HARDCOPIES PLEASE. 10:15 08 119 8 Received By Date Date Released By Released By Date Received By Date 3.0/3.2 506 Page 2 of 2 2/19/2020 (Rev. 1) Page 12 of 13

Client: Babcock Laboratories, Inc.

# Login Number: 5938

List Number: 1 Creator: Patel, Jayesh

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-5938-1

List Source: Eurofins Calscience



Client Name: Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of a	8
Contact: John Rudolph	Project Name:	Amec Fost	ter Wheeler-Lake Elsinore
Address: 9210 Sky Park Court #200	Project Number:	Lake Elsin	ore TMDL Monitoring
San Diego, CA 92123	Work Order Number:	B9I3666	
Report Date: 10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### **Sample Identification**

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9I3666-01	LE02	Liquid	09/26/19 08:30	Tyler Huff/Lark	09/26/19 14:20	Courier (Jason J.) -DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123

Report Date: 10-Oct-2019

Analytical Report: Page 2 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore TMDL Monitoring

#### Work Order Number: B9I3666

Received on Ice (Y/N): Yes Temp: 12 °C

#### Laboratory Reference Number B9I3666-01

Sample Description LE02	<u>Matrix</u> Liquid		<u>Sar</u> 0	npled Date/Time 9/26/19 08:30	Received Date/Time 09/26/19 14:20			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	09/27/19 00:52	MCM	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	09/27/19 00:52	MCM	
Solids								
Total Dissolved Solids	2200	40	40	mg/L	SM 2540C	10/02/19 21:50	CMR	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	10/03/19 12:00	KAA	
Nutrients								
Ammonia-Nitrogen	ND	0.10	0.044	mg/L	SM4500NH3H G	10/04/19 09:39	SLL	
Kjeldahl Nitrogen	5.1	0.20	0.19	mg/L	EPA 351.2	10/07/19 15:12	SLL	
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	09/26/19 22:27	MWM	

*mailing* P.O Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 3 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster \	Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9I3666	
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C

#### **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9I26055 - Analyzed as Rec	eived IC										
Blank (9I26055-BLK1)				F	Prepared	& Analyze	d: 09/26/1	9			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (9I26055-BS1)				F	Prepared	& Analyze	d: 09/26/1	9			
Nitrite as N	2.60	0.10	0.091	mg/L	2.50		104	90-110			
Nitrate as N	5.45	0.20	0.16	mg/L	5.65		96.4	90-110			
Matrix Spike (9I26055-MS1)		Source	: B9I3538-01	I F	Prepared & Analyzed: 09/26/19						
Nitrite as N	2.66	0.10	0.091	mg/L	2.50	ND	106	80-120			
Nitrate as N	6.00	0.20	0.16	mg/L	5.65	0.290	101	75-131			
Matrix Spike (9I26055-MS2)		Source	: B9I3669-05	5 F	Prepared	& Analyze	d: 09/27/1	9			
Nitrite as N	1.25	0.10	0.091	mg/L	2.50	ND	50.1	80-120			QFpas, QMout
Nitrate as N	5.94	0.20	0.16	mg/L	5.65	ND	105	75-131			
Matrix Spike Dup (9I26055-MSD1)		Source	: B9I3538-01	I F	Prepared & Analyzed: 09/26/19			9			
Nitrite as N	2.61	0.10	0.091	mg/L	2.50	ND	105	80-120	1.67	20	
Nitrate as N	5.97	0.20	0.16	mg/L	5.65	0.290	101	75-131	0.526	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 4 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster	Wheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9I3666	
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C

#### **Solids - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9J02107 - Analyzed as ree	ceived										
Blank (9J02107-BLK1)				F	Prepared	& Analyze	d: 10/02/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
LCS (9J02107-BS1)				F	Prepared	& Analyze	d: 10/02/1	9			
Total Dissolved Solids	750	10	10	mg/L	746		101	90-110			
Duplicate (9J02107-DUP1)		Source: E	<b>3913617-0</b> 1	I F	Prepared & Analyzed: 10/02/19			9			
Total Dissolved Solids	401	10	10	mg/L		402			0.249	20	
Duplicate (9J02107-DUP2)		Source: E	3913659-02	2 F	Prepared & Analyzed: 10/02/19			9			
Total Dissolved Solids	228	10	10	mg/L		218			4.48	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 5 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9I3666	
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C

#### **General Inorganics - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9J03029 - Analyzed as red	ceived										
Blank (9J03029-BLK1)					Prepared	& Analyze	d: 10/03/1	9			
Sulfide	ND	0.10	0.10	mg/L							
LCS (9J03029-BS1)					Prepared	& Analyze	d: 10/03/1	9			
Sulfide	0.300	0.10	0.10	mg/L	0.400		75.0	50-150			
Matrix Spike (9J03029-MS1)		Source:	B9J0407-01		Prepared	& Analyze	d: 10/03/1	9			
Sulfide	0.300	0.10	0.10	mg/L	0.400	ND	75.0	50-150			
Matrix Spike Dup (9J03029-MSD1) Source: B9J0407-01			I	Prepared	& Analyze	d: 10/03/1	9				
Sulfide	0.300	0.10	0.10	mg/L	0.400	ND	75.0	50-150	0.00	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 6 of 8	
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore	TMDL Monitoring
	San Diego, CA 92123	Work Order Number:	B9I3666	
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C

#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9126052 - Filter if turbid.											
LCS (9I26052-BS1)				F	Prepared a	& Analyze	d: 09/26/1	9			
Ortho Phosphate Phosphorus	0.525	0.050	0.016	mg/L	0.500		105	90-110			
Matrix Spike (9I26052-MS1)		Source:	B913499-03	8 F	Prepared a	& Analyze	d: 09/26/1	9			
Ortho Phosphate Phosphorus	0.607	0.050	0.016	mg/L	0.500	0.0616	109	80-120			
Matrix Spike Dup (9I26052-MSD1)		Source:	B913499-03	8 F	Prepared a	& Analyze	d: 09/26/1	9			
Ortho Phosphate Phosphorus	0.621	0.050	0.016	mg/L	0.500	0.0616	112	80-120	2.23	20	
Batch 9J04016 - Analyzed as received											
Blank (9J04016-BLK1)				F	Prepared a	& Analyze	d: 10/04/1	9			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							
LCS (9J04016-BS1)				F	Prepared a	& Analyzed	d: 10/04/1	9			
Ammonia-Nitrogen	1.01	0.10	0.044	mg/L	1.00		101	90-110			
Matrix Spike (9J04016-MS1)		Source:	: B9J0428-0	<b>2</b> F	Prepared a	& Analyzed	d: 10/04/1	9			
Ammonia-Nitrogen	1.11	0.10	0.044	mg/L	1.00	0.154	95.6	80-120			
Matrix Spike Dup (9J04016-MSD1)		Source:	: B9J0428-0	<b>2</b> F	Prepared a	& Analyze	d: 10/04/19	9			
Ammonia-Nitrogen	1.04	0.10	0.044	mg/L	1.00	0.154	88.4	80-120	6.66	20	
Batch 9J07085 - Acid Digest											
Blank (9J07085-BLK1)				F	Prepared a	& Analyze	d: 10/07/19	9			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 7 of 8		
Contact:	John Rudolph	Project Name:	Amec Foster V	Vheeler-Lake Elsinore	
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore TMDL Monitoring		
	San Diego, CA 92123	Work Order Number:	B9I3666		
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C	

#### **Nutrients - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9J07085 - Acid Digest											
LCS (9J07085-BS1)				F	repared	& Analyze	d: 10/07/1	9			
Kjeldahl Nitrogen	1.15	0.10	0.093	mg/L	1.00		115	80-120			
Matrix Spike (9J07085-MS1)		Source:	: B9J0411-01	F	Prepared & Analyzed: 10/07/19						
Kjeldahl Nitrogen	136	8.0	7.4	mg/L	80.0	61.8	92.3	42-154			
Matrix Spike Dup (9J07085-MSD1) Source: B9J0411-01					repared	& Analyze	d: 10/07/1	9			
Kjeldahl Nitrogen	139	8.0	7.4	mg/L	80.0	61.8	97.0	42-154	2.73	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name: Wood Environment&Infrastructure Solutions, Inc Contact: John Rudolph Address: 9210 Sky Park Court #200 San Diego, CA 92123 Analytical Report: Page 8 of 8 Project Name: Amec Foster Wheeler-Lake Elsinore Project Number: Lake Elsinore TMDL Monitoring

Yes

#### Work Order Number: B9I3666

Received on Ice (Y/N):

Temp: 12 °C

Report Date: 10-Oct-2019

#### **Notes and Definitions**

- J Estimated value
- QFpas Follow-up result within laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / "": NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-MDL\_No Alias.rpt

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Client Name:	Wood Environment&Infrastructure Solutions, Inc	Analytical Report:	Page 1 of 1		
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsinore		
Address:	9210 Sky Park Court #200	Project Number:	Lake Elsinore TMDL Monitoring		
	San Diego, CA 92123	Work Order Number:	B913666		
Report Date:	10-Oct-2019	Received on Ice (Y/N):	Yes	Temp: 12 °C	

E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662 www.babcocklabs.com Chain of Custody & Sample Information Record

Client: Wood E&I Solutions, Inc.			Cor	ntact	: Jo	hn F	Rudo	olph	1			_									Phone No.	858-243-8158
AX No.			Em	ail:		john.	.rudo	lph(	@w(	odpl	c.co	m						_				Additional Reporting Requests Include QC Data Package: Yes
Project Name: LE TMDL Monitoring			Tur	n Ar	ound	d Ti	me:			R	outi	ne	1	3-5 Ri	Day Ish		*48 R	Ho	ur 1	*	24 Hour Rush	FAX Results: Yes Email Results: Yes State EDT: Yes
Project Number: 1915100402			Lab	TAT	App	rova	1:			By:			r -	320	2225		- 25	01100.0	1	Add	fitional Charges May Apply	(Include Source Number in Notes)
Sampler Information				# ( &	of Co Pres	erva	iners	5	- 111 -		Sar Ty	mple /pe		An	alysi	is R	lequ	lest	ed		Matrix	Notes
Name: Jules Huser Ly Employer: Wood E&I Solutions, I	rK ekaly nc.	iey	ved			Acetate	nimonu			of Containers		Die		Vitrite			sphorus	ide		IAL	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil	Ortho-P has <u>NOT</u> been field filtered. Total Phosphorus - Sub to Eurofins Calscience Dissolved Metals are <b>NOT</b> field filtered
Signature:		-	preser SO4	_ 5	25203	HO H/Zh	4CI	AA	1197	tal #	outine	pecial	5	rate - h	z	monia	P/Orth	al Sulf	al AL	solved	SG = Sludge L = Liquid	n haan kan manan ka a <del>n n</del> a ka kanaka k
Sample ID	Date	Time	Un H2:	HCH	Na	Na	Ŧ	NON	2	4	ŭ,	N N	TS		1¥	Am	SR SR	Tot	Tot	DIS	M = Miscellaneous	
LE02	9/26	0830												x	< x	x	x	( x				
	2010	1																				31
	EVS	_																				
Relinquished By (sign) Pr	int Nam	ne / Con		/	74	15	ate	/ Tir	ne 7	et.	4		Rec	eiv	ed E	By (S	Sigr	1)			H-FIDI	nt Name / Company
ALL 7		105	10	-00	9/	10	in /	11	2i	0	-6	4	<u>g</u> -	1						1	The Tone	and per
pro The	N JUD	uins/s	75		9/1	26/	ig	21	20/	n	2	7	E	Tes	to	2					Esteph	
For Lab Use Only) Sample Integrit	y Upon	Receipt												La	b No	otes	3		(	-		
Sample(s) Submitted on Ice? Custody Seal(s) Intact? Sample(s) Intact?	Yes Yes Yes	No No No	¢	N/A	2		Ten	npe     	ratı Z <sup>Blan</sup>	re °C k		-	T#	-6	2				ł	E Ro	<b>391366</b> c'd: 09/26/2019	14:20

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 1
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LE TMDL Monitoring
	San Diego, CA, 92123	Work Order Number:	B9I3847
Report Date:	24-Oct-2019	Received on Ice (Y/N	Yes Temp:12 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### **Sample Identification**

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	<u>By</u>
B9I3847-01	LE02 - Int	Solid	9/26/19 8:30	Tyler Huff/Lark Starkey	9/26/19 14:20	Courier (Jason J.) - DE
B9I3847-02	LE02 - Surf	Solid	9/26/19 8:40	Tyler Huff/Lark Starkey	9/26/19 14:20	Courier (Jason J.) - DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is not in writing. There is no other warranty expressed or implied.

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Client Name: Contact: Address:	Wood Environment&In John Rudolph 9210 Sky Park Court # San Diego, CA, 92123	nfrastructure Sc #200 3	Ana Pi <b>Work O</b>	alytical Report: Project Name: roject Number: rder Number:	Page 1 of 1 Amec Foster Wheeler-Lak LE TMDL Monitoring <b>B9I3847</b>		
Report Date:	24-Oct-2019		Receiv	ed on Ice (Y/N	Yes Temp:12 °C		
E.S. Ba (951) 653 www.bat	abcock & Sons, Inc. Enviro 3-3351 FAX (951) 653-1662 bcocklabs.com	onmental Laboratories	Chain of Custoc	ly & Sample Inf	ormation Record		
Client: Wood	E&I Solutions, Inc.	Contact: John Rudolph		Phone No. 8	58-243-8158		
FAX No.		Email: john.rudolph@woodplc	.com		Additional Reporting Requests		
Project Name: Project Number:	LE TMDL Monitoring	Turn Around Time: <u>Rou</u>	tine *3-5 Day *48 Hour Rush Rush	*24 Hour Rush dditional Charges May Apply	FAX Results: Uves D No Email Results: Uves D No State DDT: Uves D No (Include Source Number in Notec)		
s	Sampler Information	# of Containers S & Preservatives	ample Type Analysis Requested	Matrix	Notes		
Name: Employer: Signature:	Wood E&I Solutions, Inc.	npreserved 2504 2504 003 aoHiZnAcetate aoHiZnAcetate aoHiZnAcetate action action can	tesample Special Special Suit Suffide Itrate - Nitrite SS Nutrite SS Sal Phosphorus Stal Phosphorus Introphyli-a	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soli SG = Sludge L = Liquid	Subout Chi-a samples on 0.7 um GFF		
Sa	imple ID Date Time		Y O Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	M = Miscellaneous	ilter Volume: 500		
LEC	02 - Surf 9126 0840		× ·	F	ilter Volume: 500		
Relinguished	I By (sign) Print Name / Com	npany / Date / Time	, Received By (Sign)	Print	Print Name / Company		
1ds N	tylerthe F/L	100 926/67245	ALL	H. Porcas	d)		
ADL	500715 /25	9/10/19/350	M	JAIN JUNIL	s 125		
1º47	JAR Monine/i	20 1/20/ 9 220pm	Esotos	Esteph ,	IESB		
USer Lab Line Only							
(For Lab Ose Only) Samp	Sample Integrity Opin Receipt ole(s) Submitted on Ice? (Tes No Custody Seal(s) Intact? Yes No Sample(s) Intact? (Tes No	De Temperature De NA /Z °C De ⊡ Cooler Blank	T#62	<b>B9138</b> 4 Rc'd: 09/26/20 AJG Temp G	17 019 14:20 Sun Id :T#62		

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#### Page 1 of 1



ALS - Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 19J0052 Printed: 10/11/2019

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
B9I3847-01	19J0052-01	Fi <b>l</b> ter		09/26/2019 08:30	10/01/2019 16:45
B9I3847-02	19J0052-02	Filter		09/26/2019 08:40	10/01/2019 16:45

#### DEFINITIONS

Symbol Definition	
DF Dilution Factor	
MDL Method Detection Limit	
ND Not Detected	
RL Reporting Limit	

Respectfully yours,

Joseph Bryan Harding For Shelly Brady Customer Service Manager

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Laboratories, Inc.		Project Nam	ie:	Chlorophy	11				
								Printed: 10,	/11/2019
			B91384	7-01					
			19J0052-0	(Filter	)				
Analyte	Result	MDL	RL Unit	s DF	Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail					
Microbiology									
Chlorophyll a	128	1.00	1.00 mg/	n³ l	1910034	10/11/20191	5:53 EGV	EPA 10200	Н
			B9 384	7-02					
			19J0052-02	? (Filter	)				
Analyte	Result	MDL	RL Unit	s DF	Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail					
Microbiology									
Chlorophyll a	165	1.00	1.00 mg/	n³ l	1910034	10/11/2019 1	5:53 EGV	EPA 10200	Н

# 19J0052

#### SUBCONTRACT ORDER

**Babcock** Laboratories, Inc.

**B9I3847** 

SENDING LABORATORY:			RECEIVING LABO	RATORY:		
Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662	Waddall		Truesdail Laborator 3337 Michelson Dri Irvine, CA 92614 Phone :(714) 730-62 Fax: (714) 730-646	ies - Subcontract ive Suite CN750 239 2		
Project Manager: Cindy A.	Waddell	2			est <sup>191</sup>	
System Name: Wood Environn Sampler: Tyler Huff and Lark S Please include MDLs and an E	nent&Infrastructur Starkey XCEL EDD E:	e Solutions, Inc xpires Regulatory Days				
Analysis	Due	Past Date Sampled	Laboratory ID	Comments	7	
Sample ID: B9I3847-01 Solid		Sampled: 09/26/19 08:30	LE02 - Int		Proj.No.: <u>LE</u> Monitoring	TMDL_
Subout • Containers Supplied: Whirl-Pak (A)	10/22/19 23:59	10/06/19 08:30	Filter Volume 50	0 / Chlorophyll	đ	,
Sample ID: B9I3847-02 Solid	Ξ.	Sampled: 09/26/19 08:40	LE02 - Surf		Proj.No.: <u>LE</u> Monitoring	TMDL
Subout Containers Supplied: Whirl-Pak (A)	10/22/19 23:59	10/06/19 08:40	Filter Volume 50	0 / Chlorophyll		
		4		~		
				s		
					ł	
<i>x</i>						
	Ąll	Containers Intact:	YesNo	Samples Preserved Pr	operly:Yes	No
amples Received at $3.9$ o	C Sample	Labels / COC Agree:	YesNo	Custody Seals Present	t:Yes	No
lease forward all acknowle O HARDCOPIES PLEAS Released By	edgements of sa $\frac{1}{2}$	mple receipt, final rep	Received By	$\frac{\text{data}@\text{babcocklabs.}}{2} = \frac{10}{2}$	zig (	6:45
Released By	Dat	e	Received By	Di	ate I	Page 1 of 1
						and 0 of 0



# Calscience

# **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

#### Laboratory Job ID: 570-8855-1

Client Project/Site: B9I3850 Revision: 1

#### For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/19/2020 2:00:00 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# **Table of Contents**

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Sample Summary	10
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# **Definitions/Glossary**

#### Client: Babcock Laboratories, Inc. Project/Site: B9I3850

Glossary		2
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	5
CNF	Contains No Free Liquid	3
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	0
DL	Detection Limit (DoD/DOE)	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	8
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	9
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	

- RL Reporting Limit or Requested Limit (Radiochemistry)
- RPD Relative Percent Difference, a measure of the relative difference between two points
- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

#### Job ID: 570-8855-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-8855-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The sample was received on 10/1/2019 9:45 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.1° C.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# **Client Sample Results**

Client: Babcock Laboratories, Inc. Project/Site: B9I3850

## General Chemistry

Client Sample ID: B9I3850-01 Date Collected: 09/26/19 08:30							Lab Sample ID: 570-8855-1 Matrix: Wate			
Date Received: 10/01/19 09:45										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Phosphorus, Total	0.108		0.0100	0.00281	mg/L		10/03/19 12:51	10/03/19 17:10	1	

# **QC Sample Results**

Job ID: 570-8855-1

5 6

## Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-234 Matrix: Water Analysis Batch: 23758	499/13-A	MB MB							Cli	ent Sar	nple ID: M Prep Ty Prep E	ethod pe: Tof Batch: :	Blank tal/NA 23499
Analyte	Res	sult Qualif	ier	RL		MDL L	Jnit		DI	Prepared	Analy	zed	Dil Fac
Phosphorus, Total				0.0100	0.0	0281 n	na/L		- 10/	03/19 12:	51 10/03/19	16:46	1
			-										-
Lab Sample ID: LCS 570-23 Matrix: Water Analysis Batch: 23758	3 <b>499/14-A</b>							Clie	ent Sa	mple II	D: Lab Cor Prep Ty Prep E	ntrol Sa pe: Tot Batch: :	ample tal/NA 23499
			Spike		LCS	LCS					%Rec.		
Analyte			Added		Result	Qualif	fier	Unit	D	%Rec	Limits		
Phosphorus, Total			0.200		0.2003			mg/L		100	90 - 110		
Lab Sample ID: LCSD 570- Matrix: Water Analysis Batch: 23758	23499/15-A						С	lient S	ample	e ID: La	b Control Prep Ty Prep E	Sample pe: Tot Batch: :	e Dup tal/NA 23499
			Spike		LCSD	LCSD	)		_		%Rec.		RPD
Analyte			Added		Result	Qualit	fier	Unit	D	%Rec	Limits	RPD	Limit
Phosphorus, Total			0.200		0.2024			mg/L		101	90 - 110	1	20
Lab Sample ID: 570-8174-E Matrix: Water Analysis Batch: 23758	-1-D MS								C	lient Sa	ample ID:   Prep Ty Prep E	Matrix pe: Tot Batch: :	Spike tal/NA 23499
	Sample	Sample	Spike		MS	MS			_	~-	%Rec.		
Analyte	Result	Qualifier	Added		Result	Qualit	tier	Unit	D	%Rec			
Phosphorus, Total	0.235		0.200		0.4360			mg/L		101	90 - 110		
Lab Sample ID: 570-8174-E Matrix: Water Analysis Batch: 23758	-1-E MSD							Client	: Samj	ole ID: I	Matrix Spil Prep Ty Prep E	ke Dup pe: Tot Batch: ∄	licate tal/NA 23499
	Sample	Sample	Spike		MSD	MSD	~		_	~ -	%Rec.		RPD
Analyte	Result	Qualifier	Added		Result	Qualif	tier	Unit	D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.235		0.200		0.4396			mg/L		102	90 - 110	1	25

Matrix: Water

Lab Sample ID: 570-8855-1

## Client Sample ID: B9I3850-01 Date Collected: 09/26/19 08:30 Date Received: 10/01/19 09:45

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	23499	10/03/19 12:51	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	23758	10/03/19 17:10	UXCH	ECL 1
	Instrumen	t ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Client: Babcock Laboratories, Inc. Project/Site: B9I3850

#### Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation	10109	09-29-20
California	Districts SCAQMD LAP	17LA0919	11-29-19
California	State	2944	09-29-20
Guam	State	20-003R	10-31-19
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20

# **Method Summary**

#### Client: Babcock Laboratories, Inc. Project/Site: B9I3850

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	EPA	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

#### **Protocol References:**

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: B9I3850

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-8855-1	B9I3850-01	Water	09/26/19 08:30	10/01/19 09:45	

#### 8855 Printed: 9/30/2019 9:29 SUBCONTRACT ORDER **Babcock Laboratories, Inc. B9I3850 SENDING LABORATORY: RECEIVING LABORATORY:** Babcock Laboratories, Inc. Eurofins Calscience, Inc. 6100 Quail Valley Court 7440 Lincoln Way Riverside, CA 92507-0704 Garden Grove, CA 92841-1427 Phone: (951) 653-3351 Phone :(714) 895-5494 Fax: (951) 653-1662 Fax: (714) 894-7501 Project Manager: Cindy A. Waddell System Name: Wood Environment&Infrastructure Solutions, Inc Sampler: Tyler Huff and Lark Starkey Please include MDLs and an EXCEL EDD **Expires Regulatory Days Past Date Sampled** Analysis Due Comments Laboratory ID 11 (I)Sample ID: B9I3850-01 Sampled: **LE02** Proj.No.:LE TMDL

Low Level Total Phosphorus

09/26/19 08:30

10/06/19 08:30

10/22/19 23:59

Liquid

Subout\_02

Containers Supplied: 500 mL Poly H2SO4 (A)



Monitoring

Loc: 570

570-8855 Chain of Custody

	Ref: Dep:	Date: 30Sep19 Wgt: 13.00 LBS DV: 0.	SHIPPING: SPECIAL: HANDLING: 00 TOTAL:	20.38 1.58 0.00 21.96	
	Svca	:: PRIORITY OVERNIGHT TRCK: 1246 6435 6384			
	All Containers Intact:	Yes	No Samples Pres	erved Properly:	YesNo
Samples Received at oC	Sample Labels / COC Agr	ee:YesN	No Custody Seal	s Present:	YesNo
Please forward all acknowledgeme	ents of sample receipt, fi	nal reports and invoic	es to <u>data@babco</u>	cklabs.com	
NO HANDCOFIES FLEASE.	9/30/19	Preux.	/ R	10/01/19	0445
Reléased By	Date	J Received By		Date	
Released By (Fedex)	Date	Received By		Date	Page 1 of 1
( ]	F	Page 11 of 13		2 - 9/32	/19/2020(Bev. 1)


2 . . . .

Client: Babcock Laboratories, Inc.

## Login Number: 8855 List Number: 1 Creator: Castro, Joy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-8855-1

List Source: Eurofins Calscience



Analytical Report: Page 1 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number:B9J2719Received on Ice (Y/N):YesTemp: 6 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

## **Sample Identification**

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	By
B9J2719-01	CL07	Liquid	10/17/19 10:40	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2719-02	CL08	Liquid	10/17/19 10:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2719-03	CL09	Liquid	10/17/19 9:25	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2719-04	CL10	Liquid	10/17/19 9:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2719-05	LE02	Liquid	10/17/19 10:00	Client	10/17/19 14:30	Courier (Jason J.) - DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number: B9J2719

Received on Ice (Y/N): Yes Te

#### Temp: 6 °C

## Laboratory Reference Number B9J2719-01

Sample Description CL07		<u>Ma</u> Lio	<u>Matrix</u> Liquid		npled Date/Time 0/17/19 10:40	Received Date/Time 10/17/19 14:30		
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	10/18/19 08:29	MCM	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	10/18/19 08:29	MCM	
Solids								
Total Dissolved Solids	380	10	10	mg/L	SM 2540C	10/24/19 13:57	EGV	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	10/23/19 23:19	MWM	
General Inorganics								
Sulfide	6.7	0.10	0.10	mg/L	SM 4500S2 D	10/24/19 22:00	KAA	
Nutrients								
Ammonia-Nitrogen	1.7	0.10	0.044	mg/L	SM4500NH3H G	10/24/19 12:35	SLL	
Kjeldahl Nitrogen	2.7	0.10	0.093	mg/L	EPA 351.2	10/24/19 11:15	SLL	
Organic Nitrogen	1.0	0.1	0.02	mg/L	Calculation			
Total Nitrogen	2.7	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.23	0.050	0.016	mg/L	SM 4500P E	10/17/19 22:20	MWM	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	10/25/19 02:06	KRV	N_pFilt
Aluminum	ND	100	33	ug/L	EPA 200.7	10/28/19 17:16	KRV	

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

°C

Report Date: 31-Oct-2019

Work Order Number:	B9J2719		
Received on Ice (Y/N):	Yes	Temp:	6

## Laboratory Reference Number B9J2719-02

Sample Description CL08		<u>Ma</u> Liq	<u>Matrix</u> Liquid		npled Date/Time 0/17/19 10:05	Received Date/Time 10/17/19 14:30		
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	10/18/19 07:01	MCM	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	10/18/19 07:01	MCM	
Solids								
Total Dissolved Solids	420	10	10	mg/L	SM 2540C	10/24/19 13:57	EGV	
Total Suspended Solids	ND	2	2	mg/L	SM 2540D	10/23/19 23:19	MWM	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	10/24/19 22:00	KAA	
Nutrients								
Ammonia-Nitrogen	0.57	0.10	0.044	mg/L	SM4500NH3H G	10/24/19 12:37	SLL	
Kjeldahl Nitrogen	0.71	0.10	0.093	mg/L	EPA 351.2	10/24/19 11:16	SLL	
Organic Nitrogen	0.1	0.1	0.02	mg/L	Calculation			
Total Nitrogen	0.7	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	10/17/19 22:20	MWM	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	10/25/19 02:08	KRV	N_pFilt
Aluminum	36	100	33	ug/L	EPA 200.7	10/28/19 17:18	KRV	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

°C

Report Date: 31-Oct-2019

Work Order Number:	B9J2719		
Received on Ice (Y/N):	Yes	Temp:	6

## Laboratory Reference Number B9J2719-03

Sample Description CL09		<u>Ma</u> Liq	<u>Matrix</u> Liquid		npled Date/Time 0/17/19 09:25	Received Date/Time 10/17/19 14:30		
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	10/18/19 03:38	MCM	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	10/18/19 03:38	MCM	
Solids								
Total Dissolved Solids	560	10	10	mg/L	SM 2540C	10/24/19 13:57	EGV	
Total Suspended Solids	10	2	2	mg/L	SM 2540D	10/23/19 23:19	MWM	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	10/24/19 22:00	KAA	
Nutrients								
Ammonia-Nitrogen	ND	0.10	0.044	mg/L	SM4500NH3H G	10/24/19 12:39	SLL	
Kjeldahl Nitrogen	1.2	0.10	0.093	mg/L	EPA 351.2	10/24/19 11:18	SLL	
Organic Nitrogen	1.2	0.1	0.02	mg/L	Calculation			
Total Nitrogen	1.2	0.2	0.16	mg/L	Calculation			
Ortho Phosphate Phosphorus	ND	0.050	0.016	mg/L	SM 4500P E	10/17/19 22:20	MWM	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	10/25/19 02:10	KRV	N_pFilt
Aluminum	120	100	33	ug/L	EPA 200.7	10/28/19 17:20	KRV	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 5 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number: B9J2719 Received on Ice (Y/N): Yes

#### Temp: 6 °C

# Laboratory Reference Number

B9J2719-04

Sample Description		Matrix		Sar	npled Date/Time	Received Date/Time			
CL10		Liquid		1	0/17/19 09:05	10/17/19 14:30			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	10/18/19 04:16	MCM		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	10/18/19 04:16	MCM		
Solids									
Total Dissolved Solids	590	10	10	mg/L	SM 2540C	10/24/19 13:57	EGV		
Total Suspended Solids	12	2	2	mg/L	SM 2540D	10/23/19 23:19	MWM		
General Inorganics									
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	10/24/19 22:00	KAA		
Nutrients									
Ammonia-Nitrogen	ND	0.10	0.044	mg/L	SM4500NH3H G	10/24/19 12:41	SLL		
Kjeldahl Nitrogen	1.1	0.10	0.093	mg/L	EPA 351.2	10/24/19 11:19	SLL		
Organic Nitrogen	1.1	0.1	0.02	mg/L	Calculation				
Total Nitrogen	1.1	0.2	0.16	mg/L	Calculation				
Ortho Phosphate Phosphorus	0.027	0.050	0.016	mg/L	SM 4500P E	10/17/19 22:20	MWM	J	
Metals and Metalloids									
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	10/25/19 02:12	KRV	N_pFilt	
Aluminum	280	100	33	ug/L	EPA 200.7	10/28/19 17:22	KRV		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

°C

Report Date: 31-Oct-2019

Work Order Number:	B9J2719		
Received on Ice (Y/N):	Yes	Temp:	6

# Laboratory Reference Number B9J2719-05

Sample Description LE02		<u>Matrix</u> Liquid		<u>San</u> 1	npled Date/Time 0/17/19 10:00	Received Date/Time 10/17/19 14:30		
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	10/18/19 07:13	MCM	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	10/18/19 07:13	MCM	
Solids								
Total Dissolved Solids	1800	40	40	mg/L	SM 2540C	10/24/19 13:57	EGV	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	10/24/19 22:00	KAA	
Nutrients								
Ammonia-Nitrogen	0.045	0.10	0.044	mg/L	SM4500NH3H G	10/24/19 12:43	SLL J	
Kjeldahl Nitrogen	5.5	0.50	0.46	mg/L	EPA 351.2	10/24/19 11:48	SLL	
Organic Nitrogen	5.5	0.5	0.02	mg/L	Calculation			
Total Nitrogen	5.5	0.5	0.46	mg/L	Calculation			
Ortho Phosphate Phosphorus	0.048	0.050	0.016	mg/L	SM 4500P E	10/17/19 22:20	MWM J	

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 7 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number:	B9J2719
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Received on Ice (Y/N):	Yes	Temp:	6°0	2
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## **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J17089 - Analyzed as Re	ceived IC										
Blank (9J17089-BLK1)				F	Prepared	& Analyze	d: 10/18/1	9			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (9J17089-BS1)				F	repared	& Analyze	d: 10/18/1	9			
Nitrite as N	2.33	0.10	0.091	mg/L	2.50		93.0	90-110			
Nitrate as N	5.36	0.20	0.16	mg/L	5.65		94.9	90-110			
Matrix Spike (9J17089-MS1) Source: B9J2681-02			<b>2</b> F	Prepared	& Analyze	d: 10/18/1	9				
Nitrite as N	2.39	0.10	0.091	mg/L	2.50	ND	95.6	80-120			
Nitrate as N	12.4	0.20	0.16	mg/L	5.65	6.52	103	75-131			
Matrix Spike (9J17089-MS2)		Source	: B9J2719-04	<b>4</b> F	Prepared & Analyzed: 10/18/19			9			
Nitrite as N	2.38	0.10	0.091	mg/L	2.50	ND	95.3	80-120			
Nitrate as N	5.55	0.20	0.16	mg/L	5.65	ND	98.2	75-131			
Matrix Spike Dup (9J17089-MSD1)		Source	: B9J2681-02	<b>2</b> F	repared	& Analyze	d: 10/18/1	9			
Nitrite as N	2.44	0.10	0.091	mg/L	2.50	ND	97.5	80-120	1.96	20	
Nitrate as N	12.5	0.20	0.16	mg/L	5.65	6.52	105	75-131	0.916	20	
Batch 9J17090 - Analyzed as Re	ceived IC										
Blank (9J17090-BLK1)				F	Prepared	& Analyze	d: 10/18/1	9			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (9J17090-BS1)				F	repared	& Analyze	d: 10/18/1	9			
Nitrite as N	2.34	0.10	0.091	mg/L	2.50		93.5	90-110			
Nitrate as N	5.38	0.20	0.16	mg/L	5.65		95.2	90-110			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 8 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Received on Ice (Y/N):	Yes	Temp:	6	°C
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## **Anions - Batch Quality Control**

					Spike	Source		%RFC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J17090 - Analyzed as Re	ceived IC										
Matrix Spike (9J17090-MS1)		Source	: B9J2716-0 <sup>,</sup>	1 F	Prepared	& Analyze	ed: 10/18/1	9			
Nitrite as N	2.38	0.10	0.091	mg/L	2.50	ND	95.1	80-120			
Nitrate as N	10.8	0.20	0.16	mg/L	5.65	4.96	103	75-131			
Matrix Spike (9J17090-MS2)	atrix Spike (9J17090-MS2) Source: B9J2724-06		6 F	Prepared	& Analyze	d: 10/18/1	9				
Nitrite as N	2.33	0.10	0.091	mg/L	2.50	ND	93.2	80-120			
Nitrate as N	6.91	0.20	0.16	mg/L	5.65	1.24	100	75-131			
Matrix Spike Dup (9J17090-MSD1) Source: B9J2716-01		1 F	Prepared	& Analyze	d: 10/18/1	9					
Nitrite as N	2.43	0.10	0.091	mg/L	2.50	ND	97.0	80-120	1.97	20	
Nitrate as N	10.8	0.20	0.16	mg/L	5.65	4.96	104	75-131	0.651	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 9 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Received on Ice (Y/N):	Yes	Temp:	6	°C

## **Solids - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J23155 - Analyzed as re	eceived										
Blank (9J23155-BLK1)					Prepared	& Analyze	d: 10/23/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L							
Duplicate (9J23155-DUP1)		Source: B9J2361-02		2	Prepared & Analyzed: 10/23/19		9				
Total Suspended Solids	ND	2	2	mg/L		ND				25	
Duplicate (9J23155-DUP2)		Source:	ļ.	Prepared & Analyzed: 10/23/19			9				
Total Suspended Solids	ND	2	2	mg/L		ND				25	
Batch 9J24033 - Analyzed as re	eceived										
Blank (9J24033-BLK1)					Prepared	& Analyze	d: 10/24/1	9			
Total Dissolved Solids	ND	10	10	mg/L							
Duplicate (9J24033-DUP1)		Source:	B9J2724-06	i	Prepared	& Analyze	d: 10/24/1	9			
Total Dissolved Solids	574	10	10	mg/L		557			3.01	20	
Duplicate (9J24033-DUP2)		Source:	B9J2724-07	,	Prepared	& Analyze	d: 10/24/1	9			
Total Dissolved Solids	561	10	10	mg/L		562			0.178	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Received on Ice (Y/N):	Yes	Temp:	6	°C
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## **General Inorganics - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J24096 - Analyzed as rec	ceived										
Blank (9J24096-BLK1)					Prepared	& Analyze	d: 10/24/1	9			
Sulfide	ND	0.10	0.10	mg/L							
LCS (9J24096-BS1)					Prepared	& Analyze	d: 10/24/1	9			
Sulfide	0.300	0.10	0.10	mg/L	0.400		75.0	50-150			
Matrix Spike (9J24096-MS1)		Source:	B9J2719-01		Prepared	& Analyze	d: 10/24/1	9			
Sulfide	6.80	0.10	0.10	mg/L	0.400	6.70	25.0	50-150			QM-4X
Matrix Spike Dup (9J24096-MSD1)		Source:	B9J2719-01		Prepared	& Analyze	d: 10/24/1	9			
Sulfide	6.60	0.10	0.10	mg/L	0.400	6.70	NR	50-150	2.99	30	QM-4X

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 11 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work	Order	Number:	B9J2719
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Received on Ice (Y/N):	Yes	Temp:	6	°C
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## **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J17058 - Filter if turbid.											
LCS (9J17058-BS1)				F	Prepared	& Analyze	ed: 10/17/1	9			
Ortho Phosphate Phosphorus	0.536	0.050	0.016	mg/L	0.500		107	90-110			
Matrix Spike (9J17058-MS1)		Source	B9J2538-03	<b>3</b>	Prepared	& Analyze	ed: 10/17/1	9			
Ortho Phosphate Phosphorus	0.625	0.050	0.016	mg/L	0.500	0.0849	108	80-120			
Matrix Spike Dup (9J17058-MSD1)		Source	B9J2538-03	<b>3</b>	Prepared	& Analyze	ed: 10/17/1	9			
Ortho Phosphate Phosphorus	0.639	0.050	0.016	mg/L	0.500	0.0849	111	80-120	2.16	20	
Batch 9J22156 - Acid Digest											
Blank (9J22156-BLK1)				F	Prepared:	10/23/19	Analyzed:	10/24/19			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (9J22156-BS1)				F	Prepared:	10/23/19	Analyzed:	10/24/19			
Kjeldahl Nitrogen	1.05	0.10	0.093	mg/L	1.00		105	80-120			
Matrix Spike (9J22156-MS1)		Source	B9J2565-0 <sup>2</sup>	1 F	Prepared:	10/23/19	Analyzed:	10/24/19			
Kjeldahl Nitrogen	131	8.0	7.4	mg/L	80.0	55.0	95.2	42-154			
Matrix Spike Dup (9J22156-MSD1)		Source	B9J2565-0 <sup>2</sup>	1 F	Prepared:	10/23/19	Analyzed:	10/24/19			
Kjeldahl Nitrogen	138	8.0	7.4	mg/L	80.0	55.0	104	42-154	5.11	25	
Batch 9J24046 - Analyzed as rec	eived										
Blank (9J24046-BLK1)				F	Prepared	& Analyze	ed: 10/24/1	9			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

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Analytical Report: Page 12 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work	Order	Number:	B9J2719
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Received on Ice (Y/N):	Yes	Temp:	6	°C
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## **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD		
Analyte(s)	Result	RDL	ι	Jnits	Level	Result	%REC	Limits	RPD	Limit	Flag	
Batch 9J24046 - Analyzed as received												
LCS (9J24046-BS1)				F	repared	& Analyze	d: 10/24/1	9				
Ammonia-Nitrogen	1.02	0.10	0.044	mg/L	1.00		102	90-110				
Matrix Spike (9J24046-MS1)		Source	: B9J2543-01	F	repared	& Analyze	d: 10/24/1	9				
Ammonia-Nitrogen	1.37	0.10	0.044	mg/L	1.00	0.331	104	80-120				
Matrix Spike Dup (9J24046-MSD1)		Source	: B9J2543-01	F	Prepared	& Analyze	d: 10/24/1	9				
Ammonia-Nitrogen	1.34	0.10	0.044	mg/L	1.00	0.331	101	80-120	2.44	20		

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Analytical Report: Page 13 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number:	B9J2719
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Received	on Ice	(Y/N)	: Yes	Temp:	6	°C

## Metals and Metalloids - Batch Quality Control

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9J24101 - 200.7/ No Diges	t										
Blank (9J24101-BLK1)					Prepared:	10/24/19	Analyzed:	10/25/19			
Aluminum-Dissolved	ND	100	16	ug/L	-						QBfil
LCS (9J24101-BS1)					Prepared:	10/24/19	Analyzed:	10/25/19			
Aluminum-Dissolved	325	100	16	ug/L	334		97.2	85-115			
Matrix Spike (9J24101-MS1)		Source:	B9J2719-0 <sup>.</sup>	1	Prepared:	10/24/19	Analyzed:	10/25/19			
Aluminum-Dissolved	629	200	34	ug/L	668	ND	94.2	70-130			
Matrix Spike Dup (9J24101-MSD1)		Source:	B9J2719-0 <sup>.</sup>	1	Prepared:	10/24/19	Analyzed:	10/25/19			
Aluminum-Dissolved	635	200	34	ug/L	668	ND	95.1	70-130	0.911	20	
Batch 9J28081 - EPA 200.2											
Blank (9J28081-BLK1)					Prepared	& Analyze	ed: 10/28/1	9			
Aluminum	ND	100	16	ug/L	_						
LCS (9J28081-BS1)					Prepared	& Analyze	ed: 10/28/1	9			
Aluminum	1070	100	16	ug/L	1170		91.8	85-115			
Matrix Spike (9J28081-MS1)		Source:	B9J2823-0	2	Prepared	& Analyze	ed: 10/28/1	9			
Aluminum	1050	200	33	ug/L	1170	ND	89.9	70-130			
Matrix Spike Dup (9J28081-MSD1)		Source:	B9J2823-0	2	Prepared	& Analyze	ed: 10/28/1	9			
Aluminum	1090	200	33	ua/L	_ 1170	ND	93.5	70-130	3.87	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 14 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 31-Oct-2019

Work Order Number:B9J2719Received on Ice (Y/N):YesTemp: 6 °C

## **Notes and Definitions**

- N\_pFilt Sample filtered and preserved upon receipt to the laboratory.
- QBfil Method blank was filtered prior to processing.
- QM-4X Due to analyte concentration greater than or equal to 4 times the spike concentration, recoveries for the MS and/or MSD did not meet laboratory acceptance criteria.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

## Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Standard No Alias.rpt

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Analytical Report: Page 15 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Yes

Report Date: 31-Oct-2019

Work Order Number: B9J2719

Received on Ice (Y/N):

Temp: 6 °C

# E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662

Chain of Custody & Sample Information Record

		5. CA 19. CA 19. CA 29. CA 19.
www.	babcockla	bs.com

Client: Wood E&I Solutions, Inc.			Co	nta	ct:	Joh	n R	udc	lph	Ĩ												Phone No.	858-243-8158
FAX No.			Em	nail		in	hn r	udo	lph/	อิพด	odpl	0.00	om								<u> </u>		Additional Reporting Requests
Project Name: <u>LECL TMDL Monito</u> Project Number: 1915100402	6	Tu	Turn Around Time:						Re By:	outi	ine		*3-{ R	5 Da ush	iy	*/	*48 Hour *24 Hour Rush Rush *Additional Charges May Apply			*24 Hour Rush ddilional Charges May Apply	FAX Results: Ves No Email Results: Ves No State EDT: Ves No (Include Source Number in Notes)		
Sampler Information			# of Containers							Sample Type Analysis R						cic	Ro	<u>ano</u>	eto	4	Matrix	Notes	
Name		_	П	T	ĨĪ	030		VCa	,	T	ers	Ť	ype	┢		laly	515	Re	que	sie		Width X	Ortho-P has NOT been field filtered.
Employer: Wood E&I Solutions	, Inc	_					etate				Contain				ite			horus				WW = Wastewater GW = Groundwater	Total Phosphorus - Sub to Eurofins Calscience
Signature:		-	reserved	04	03	S203	H/ZnAce	Ū	AA		al # of	utine	sample		ate - Nitri		nonia	I Phospi	/Ortho-P	I Sulfide	II AL	S = Soil SG = Sludge	Dissolved Metals are <u>NOT</u> field filtered
Sample ID	Cate	Time	Unp	HCI	HN	Na2	NaO	NHN	Froz		Tot	Ro	Re	TSS	Nitre	TDS	Amr	Tota	SRP	Tota	Diss	M = Miscellaneous	
CL07	10/17/	191040												x	x	x	xx	x	x	x	xx		
CL08		1005												x	x	x	xx	x	x	x	xx		
CL09		0925									_			x	x	x	xx	x	x	x	xx		
CL10	1	0905												x	x	x	xx	x	x	x	xx		
LE02	V	1000											_		x	x	xx	x	x	x			
						t					_		+	-		+	1			-			
									-														
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Relinquished By (sign)	Print Nar	ne / Con	npan	iy		_	Da	te /	Tin	ne				Re	cei	ved	Ву	(Si	ign)			Pr	int Name / Company
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JAKO	J JUD	uns/1	TE		/	0/17	19	2	:3.	opr	5	-6	H	_				C	-	_	-	1 rathun (	2716
(For Las Use Only) Sample Integ	a Cy	Receipt				-	-	om	ne	ratu	-	4	1	1	L	ab l	Vot	es		-			
Custody Seal(s) Intact	? Yes	NO No	2	NA	6		4	en	led		°C			1	96	0	jų	30	)			<b>B9.127</b> 1	
Sample(s) Intact	? (Yes	No		9	,			Cod	ler l	Blan	k							1.7				Rc'd: 10/17/20	19 14:30 <b>H</b>
		_	Π	TO	0								_									JMG Temp G	un ld :T#62

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA, 92123	Work Order Number:	B9J2890
Report Date:	18-Dec-2019	Received on Ice (Y/N	Yes Temp: 7 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

	Sa	ample Ide	entification			
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	<u>By</u>
B9J2890-01	CL07-Int	Solid	10/17/19 10:40	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-02	CL07-Surf	Solid	10/17/19 10:40	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-03	CL08-Int	Solid	10/17/19 10:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-04	CL08-Surf	Solid	10/17/19 10:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-05	CL09-Int	Solid	10/17/19 9:25	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-06	CL09-Surf	Solid	10/17/19 9:25	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-07	CL10-Int	Solid	10/17/19 9:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-08	CL10-Surf	Solid	10/17/19 9:05	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-09	LE02-Int	Solid	10/17/19 10:00	Client	10/17/19 14:30	Courier (Jason J.) - DE
B9J2890-10	LE02-Surf	Solid	10/17/19 9:20	Client	10/17/19 14:30	Courier (Jason J.) - DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 1 of 2 CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 2 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA, 92123	Work Order Number:	B9J2890
Report Date:	18-Dec-2019	Received on Ice (Y/N	Yes Temp: 7 °C

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

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location 6100 Quail Valley Court Riverside, CA 92507-0704

P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 2 of 2



Client Name: Contact: Address:	Wood Environment&Infrastructure So John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: <b>Work Order Number:</b>	Page 1 of 1 Amec Foster Wheeler-Lak LECL TMDL Monitoring <b>B9J2890</b>
Report Date:	18-Dec-2019	Received on Ice (Y/N	Yes Temp: 7 °C

Client: Wood E&I Solutions, I	nc.		Con	tact	Joh	n R	udol	oh			_	_						Phone No.	858-243-8158	
FAX No.			Ema	ail:	joh	nn.ru	dolp	h@w	vood	olc.c	com								Additional Reporting Requests Include QC Data Package: Yes IN	
Project Name: LECL TMDL Monitoring			Turi	n Arc	ound	Tim	ie:		R	outi	ne		3-5	Day		*48	Hour	*24 Hour	FAX Results:  Yes  FAX Results: Yes  FAX Results: Yes  FAX Results:  FAX	
Project Number: 1915100402			*Lab	*I ah TAT Approval:					By:		Rush				R	ush *A	Rush dditional Charges May Apply	State EDT: Yes (Include Source Number in Notes)		
Sampler Informa	ation			# 0	of Col	ntain	ers		1	Sar	nple		had	voie	Do		tod	Matrix	Notes	
Name	ation		T		lese	a val	ves	Π	ers		/pe	ń	Anar	ysis	Re	ques	sted	Widerix	Notes	
Haine.		-							tain							35		WW = Wastewater	Chl-a samples on 0.7 um GFF	
Employer: Wood E&I Solu	utions, Inc.					tate			Con				9			orus		GW = Groundwater	SUDDUT	
Simolum			rved			Ace			of		pie I	Ifide	Nitri			d-on	hyll-a	S = Soil		
Signature.		•	orese SO4	- 60	S20	H/Z/HO	AA EC	zen	tal #	utin	ecia	al Su	ate -		moni	al Ph	orop	L = Liquid		
Sample ID	Date	Time	Ung H25	H	Na	Nac	MC	Fro	٩	Å (	Sp	Tot	TD.	TX	Am	SR	GH	M = Miscellaneous		
CL07 - Int	10(17)19	1040							-								x		Filter Volume: SDD WL	
CL07 - Surf		1040					-						_				x	×	Filter Volume: SDD ML	
CL08 - Int		1005					-						-				x	1. A.	Filter Volume: 500 ML	
CL08 - Surf		1005								$\square$			_			_	x		Filter Volume: 500 ML	
CL09 - Int		0925			$\square$		_										x		Filter Volume: 52000	
CL09 - Surf		0925															x		Filter Volume: HOM	
CL10 - Int		0905															x		Filter Volume: 350M	
CL10 - Surf		0905															x		Filter Volume: 300ML	
LE02 - Int		4000															x		Filter Volume: 39DmL	
LE02 - Surf	1	0920															x		Filter Volume: 38 SML	
Relinquished By (sign)	Print Nar	ne / Com	pany			Da	te / 1	Time	_		R	ece	eive	d By	/ (Si	ign)		Pr	int Name / Company	
Som Ann	Lank St	ashe	4			10	17	120	10											
	Wood Environ	Men t	+			13	:2	0	10/m	119/	1	_	2					JASON JUDIC	aus Ine	
N N	NAROSKUCKUR	Solu	HICI	^S						V.	1		_	-	ai.				1 :	
Al .	JASON JOAK	wil pe	8.9.9		10/	17/19	2	30p,	5	-	10	T	C	_		_	_	Satturon	FGB	
For Lab Use Only) Sample I	Integrity Upon	Receipt	_		-	-		10000	10 mail	-	1	-	La	b No	otes	,	-			
Sample(s) Submitted o	on Ice? Yes	) No	6			T	emp	erat	ure °C									R0128		
Custody Seal(s)	Intact? Yes	NO		B		m	Carl	1										D7J20	90174A	

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## Page 1 of 1



ALS – Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

# Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 19J0397 Printed: 11/05/2019

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
B9J2890-01	19J0397-01	Filter		10/17/2019 10:40	10/21/2019 12:05
B9J2890-02	19J0397-02	Filter		10/17/2019 10:40	10/21/2019 12:05
B9J2890-03	19J0397-03	Filter		10/17/2019 10:05	10/21/2019 12:05
B9J2890-04	19J0397-04	Filter		10/17/2019 10:05	10/21/2019 12:05
B9J2890-05	19J0397-05	Filter		10/17/2019 09:25	10/21/2019 12:05
B9J2890-06	19J0397-06	Filter		10/17/2019 09:25	10/21/2019 12:05
B9J2890-07	19J0397-07	Filter		10/17/2019 09:05	10/21/2019 12:05
B9J2890-08	19J0397-08	Filter		10/17/2019 09:05	10/21/2019 12:05
B9J2890-09	19J0397-09	Filter		10/17/2019 10:00	10/21/2019 12:05
B9J2890-10	19J0397-10	Filter		10/17/2019 09:20	10/21/2019 12:05

## DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Joseph Bryan Harding For Shelly Brady Customer Service Manager

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Labora	tories, Inc.		Projec	t Name:	(	Chlorophyl	I		Printed: 11/0	)5/2019
			RC	12890-0	1					
			19J03	97-01 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	33.7	1.00	1.00	mg/m³	1	1910468	11/04/2019 17	7:50 EGV	EPA 10200 H	
			BS	J2890-0	2					
			19J03	97-02 (F	ilter)					
	Decult	MDI	D	11	55	Detel	A	A I +	Masha al	Neter
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	14.5	1.00	1.00	mg/m³	1	1910468	11/04/2019 17	2:50 EGV	EPA 10200 H	
			B9	J2890-0	3					
			19J03	97-03 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
,			ALS	Truesd	ail					
Mi										
Chlorophyll a	14.7	1.00	1.00	ma/m³	1	1910468	11/04/2019 17	7:50 EGV	EPA 10200 H	
.,							, - ,			
			10102	)J2890-0 07-04 (E	)4 :iltor)					
			1905	57-0 <del>4</del> (r	inter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	13.5	1.00	1.00	mg/m³	1	1910468	11/04/2019 17	7:50 EGV	EPA 10200 H	
			RO	12800-0	15					
			19J03	97-05 (F	ilter)					
Analyte	Decult	MDI		Unita		Datah	Analyzad	Applyst	Mathad	Netas
Analyte	Kesult	NIDL	KL			DALCH	Analyzed	Analyst	Method	notes
			ALS	Iruesd	ail					

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Client: Babcock Laboratories, Inc. Project Name: Printed: 11/05/2019 B9J2890-05 (Continued) 19J0397-05 (Filter) (Continued) Analyte Result MDL RL Units DF Batch Analyzed Analyst Method Notes ALS Truesdail Microbiology Chlorophyll a 17.9 1910468 11/04/2019 17:50 EGV 1.00 1.00 mg/m<sup>3</sup> EPA 10200 H 1 B9J2890-06 19J0397-06 (Filter) MDL Analyte Result RL Units Analyzed Analyst Method Notes DF Batch ALS Truesdail Microbiology Chlorophyll a 31.8 1.00 1.00 mg/m<sup>3</sup> 1910468 11/04/2019 17:50 EGV EPA 10200 H 1 B9J2890-07 19J0397-07 (Filter) Analyte Result MDL **RL** Units DF Analyzed Analyst Method Notes Batch **ALS Truesdail** Microbiology Chlorophyll a 27.9 1910468 11/04/2019 17:50 EGV EPA 10200 H 1.00 1.00 mg/m<sup>3</sup> 1 B9J2890-08 19J0397-08 (Filter) MDL Analyte Result **RL** Units DF Batch Analyzed Analyst Method Notes ALS Truesdail Microbiology Chlorophyll a 40.3 1910468 11/04/2019 17:50 EGV EPA 10200 H 1.00 mg/m<sup>3</sup> 1.00 1 B912890-09 19J0397-09 (Filter) Analyte Result MDL RL Units Batch Analyzed Analyst Method Notes DF

Chlorophyll

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Client: Babcock Laboratories, Inc.

									Printed: 11/0	5/2019
		E	9J2890	-09 (Cor	itinue	d)				
		19J0	397-09	(Filter) (	Conti	nued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	153	1.00	1.00	mg∕m³	1	1910468	11/04/201917	7:50 EGV	EPA 10200 H	
			BS	J2890-1	0					
			19J03	97-10 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	139	1.00	1.00	mg/m³	1	1910468	11/04/2019 17	7:50 EGV	EPA 10200 H	

Project Name:

Chlorophyll

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Printed: 10/21/2019 9:11

# **Babcock Laboratories, Inc.**

B9J2890

Analysis	E: Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: B9J2890-06 Solid		Sampled: 10/17/19 09:25	CL09-Surf		Proj.No.:LECL IMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	10/29/19 23:59	10/27/19 09:25	Report Chlorophy	/ll a / Filter Volume = 36	0mL
Sample ID: B9J2890-07 Solid		Sampled: 10/17/19 09:05	CL10-Int		Proj.No.:LECL TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	10/29/19 23:59	10/27/19 09:05	Report Chlorophy	yll a / Filter Volume = 35	0mL '
Sample ID: B9J2890-08 Solid		Sampled: 10/17/19 09:05	CL10-Surf		Proj.No.:LECL TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	10/29/19 23:59	10/27/19 09:05	Report Chlorophy	yll a / Filter Volume = 30	0mL
Sample ID: B9J2890-09 Solid	•	Sampled: 10/17/19 10:00	LE02-Int	,	Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	10/29/19 23:59	10/27/19 10:00	Report Chlorophy	yll a / Filter Volume = 35	0mL
Sample ID: B9J2890-10 Solid		Sampled: 10/17/19 09:20	LE02-Surf	×	Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	10/29/19 23:59	10/27/19 09:20	Report Chlorophy	yll a / Filter Volume = 38	5mL
ŝ					
		,× *		Nor sta dia subarra	
Samples Received at $3.1$	All _ oC Sample	Containers Intact: Labels / COC Agree:	YesNo YesNo	Samples Preserved Pr Custody Seals Present	operly: <u>Yes</u> No t: <u>Yes</u> No
Please forward all-ackno NO HARDCOPIES PLE Released By	wledgements of sa ASE.	mple receipt, final rep	Received By	data@babcocklabs.	<u>com</u> - <i>Z</i> /-/ 4 ate
Released By	10/2 Dat	1/19 e	Received By	<u>ellore 10/2</u>	119 12=05 ate
					Page 2 of

# UJJJ397 SUBCONTRACT ORDER

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**Babcock Laboratories**, Inc.

# B9J2890

			and the second s		
SENDING LABORATORY	<u>′:</u>		RECEIVING LABORA	ATORY:	
Babcock Laboratories, Inc 6100 Quail Valley Court Riverside, CA 92507-0704	i. 1		Truesdail Laboratories 3337 Michelson Drive Irvine, CA 92614	- Subcontract Suite CN750	
Phone: (951) 653-3351	2		Phone :(714) 730-6239	•	
Fax: (951) 653-1662		10.7	Fax: (714) 730-6462		
Project Manager: Cindy	A. Waddell	*			
System Name: Wood Enviror Sampler: Client	nmental&Infrastruct	ure Solutions, Inc			
Please include MDLs and EX	CEL EDD				· · · 2
	E	pires Regulatory Days		<b>a</b>	
Analysis	Due	Past Date Sampleu	Laboratory ID	Comments	
Sample ID: B9J2890-01 Solid	e.	Sampled: 10/17/19 10:40	CL07-Int		Proj.No.:LECL TMD Monitoring
Subout	10/29/19 23:59	10/27/19 10:40	Report Chlorophyll	a / Filter Volume = 500	mL
Containers Supplied: Whirl-Pak (A)		10/2/112 10/10	2		
Sample ID: B9J2890-02 Solid	•	Sampled: 10/17/19 10:40	CL07-Surf		Proj.No.:LECL TMD Monitoring
Subout	10/29/19 23:59	10/27/19 10:40	Report Chlorophyll	a / Filter Volume = 500	mL
Containers Supplied: Whirl-Pak (A)					
Sample ID: B9J2890-03 Solid		Sampled: 10/17/19 10:05	CL08-Int	1	Proj.No.:LECL TMD Monitoring
Subout Containers Supplied: Whirl-Pak (A)	10/29/19 23:59	10/27/19 10:05	Report Chlorophyll	a / Filter Volume = 500	mL
Sample ID: B9J2890-04 Solid		Sampled: 10/17/19 10:05	CL08-Surf		Proj.No.:LECL TMD Monitoring
Subout Containers Supplied: Whirl-Pak (A)	10/29/19 23:59	10/27/19 10:05	Report Chlorophyll	a / Filter Volume = 500	mL
Sample ID: B9J2890-05 Solid	8	Sampled: 10/17/19 09:25	CL09-Int		Proj.No.:LECL TMD Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	10/29/19 23:59	10/27/19 09:25	Report Chlorophyll	a / Filter Volume = 500	mL

\*

Page 1 of 2 Page 6 of 6



# Calscience

# **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

# Laboratory Job ID: 570-10779-1

Client Project/Site: B9J2877 Revision: 1

# For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/18/2020 3:54:50 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# **Table of Contents**

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# Qualifiers

# **General Chemistry**

	3
nistry Qualifier Description	4
MS and/or MSD Recovery is outside acceptance limits.	
	5
These commonly used abbreviations may or may not be present in this report.	
Listed under the "D" column to designate that the result is reported on a dry weight basis	
Percent Recovery	
Contains Free Liquid	
Contains No Free Liquid	
Duplicate Error Ratio (normalized absolute difference)	ð
Dilution Factor	
Detection Limit (DoD/DOE)	9
Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
Decision Level Concentration (Radiochemistry)	
Estimated Detection Limit (Dioxin)	
Limit of Detection (DoD/DOE)	
Limit of Quantitation (DoD/DOE)	
Minimum Detectable Activity (Radiochemistry)	
Minimum Detectable Concentration (Radiochemistry)	
Method Detection Limit	
Minimum Level (Dioxin)	
Not Calculated	
Not Detected at the reporting limit (or MDL or EDL if shown)	
Practical Quantitation Limit	
Quality Control	
Relative Error Ratio (Radiochemistry)	
Reporting Limit or Requested Limit (Radiochemistry)	
	Inistry Qualifier Description         MS and/or MSD Recovery is outside acceptance limits.         These commonly used abbreviations may or may not be present in this report.         Listed under the "D" column to designate that the result is reported on a dry weight basis Percent Recovery         Contains Free Liquid         Outains No Free Liquid         Opticate Error Ratio (normalized absolute difference)         Dilution Factor         Detection Limit (DoD/DOE)         Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample         Decision Level Concentration (Radiochemistry)         Estimated Detection Limit (Dioxin)         Limit of Detection (DoD/DOE)         Minimum Detectable Activity (Radiochemistry)         Minimum Detectable Concentration (Radiochemistry)         Method Detection Limit         Minimum Level (Dioxin)         Not Detected at the reporting limit (or MDL or EDL if shown)         Practical Quantitation Limit         Quality Control         Relative Error Ratio (Radiochemistry)         Relative Error Ratio (Radiochemistry)         Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

# Job ID: 570-10779-1

## Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-10779-1

**Case Narrative** 

## Comments

No additional comments.

## Receipt

The samples were received on 10/22/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.1° C.

## **General Chemistry**

Method 365.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-29264 and analytical batch 570-29299 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 570-10779-1

5

# **General Chemistry**

Client Sample ID: B9J2877-01 Date Collected: 10/17/19 10:40 Date Received: 10/22/19 10:00							Lab San	nple ID: 570-1 Matrix:	0779-1 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.243		0.0100	0.00281	mg/L		10/28/19 10:54	10/29/19 11:29	1
Client Sample ID: B9J2877-02 Date Collected: 10/17/19 10:05 Date Received: 10/22/19 10:00							Lab San	nple ID: 570-1 Matrix:	0779-2 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0237		0.0100	0.00281	mg/L		10/28/19 10:54	10/29/19 11:30	1
Client Sample ID: B9J2877-03 Date Collected: 10/17/19 09:25 Date Received: 10/22/19 10:00							Lab San	nple ID: 570-1 Matrix:	0779-3 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0434		0.0100	0.00281	mg/L		10/28/19 10:54	10/29/19 11:32	1
Client Sample ID: B9J2877-04 Date Collected: 10/17/19 09:05 Date Received: 10/22/19 10:00							Lab San	nple ID: 570-1 Matrix:	0779-4 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0622		0.0100	0.00281	mg/L		10/28/19 10:54	10/29/19 11:33	1
Client Sample ID: B9J2877-05 Date Collected: 10/17/19 10:00 Date Received: 10/22/19 10:00							Lab San	nple ID: 570-1 Matrix:	0779-5 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.218		0.0100	0.00281	mg/L		10/28/19 10:54	10/29/19 11:35	1

Page 5 of 13

# **QC Sample Results**

Job ID: 570-10779-1

# Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-29264/1 Matrix: Water Analysis Batch: 29299	1-A								Cli	ent Sam	ple ID: M Prep Ty Prep E	ethod   pe: Tot Batch: 2	Blank al/NA 29264
Analyte	Ro	wid wid sult Oualif	or	RI		мпі	Unit			ronarod	Analy	zod	Dil Fac
Phosphorus Total	1.0.			0.0100	0.0	0281	ma/l		$\frac{1}{10/2}$	28/19 10:5	4 10/29/19	10.52	1
				0.0100	0.0	0201	mg/E		10/1		10/20/10	10.02	
Lab Sample ID: LCS 570-29264 Matrix: Water Analysis Batch: 29299	/ <b>2-A</b>							Clie	ent Sa	mple ID	: Lab Cor Prep Ty Prep E	ntrol Sa pe: Tot Batch: 2	ample al/NA 29264
			Spik	е	LCS	LCS					%Rec.		
Analyte			Adde	d	Result	Qual	lifier	Unit	D	%Rec	Limits		
Phosphorus, Total			0.20	0	0.1928			mg/L		96	90 - 110		
Lab Sample ID: LCSD 570-2926 Matrix: Water Analysis Batch: 29299	64/3-A						C	lient S	ample	ID: Lab	Control Prep Ty Prep E	Sample pe: Tot Batch: 2	e Dup al/NA 29264
			Spik	е	LCSD	LCS	D				%Rec.		RPD
Analyte			Adde	d	Result	Qual	lifier	Unit	D	%Rec	Limits	RPD	Limit
Phosphorus, Total			0.20	0	0.1959			mg/L		98	90 - 110	2	20
Lab Sample ID: 570-10930-A-1- Matrix: Water Analysis Batch: 29299	B MS	Sample	Snik	e	MS	MS			С	lient Sa	mple ID:   Prep Ty Prep E %Rec	Matrix pe: Tot Batch: 2	Spike al/NA 29264
Analyte	Result	Qualifier	Adde	d	Result	Qual	lifier	Unit	D	%Rec	Limits		
Phosphorus, Total	0.673	F1	0.20	0	0.8272	F1		mg/L		77	90 - 110		
				-									
Lab Sample ID: 570-10930-A-1- Matrix: Water Analysis Batch: 29299	C MSD							Client	Samp	ole ID: M	latrix Spil Prep Ty Prep E	ke Dup pe: Tot Batch: 2	licate al/NA 29264
	Sample	Sample	Spik	е	MSD	MSD	)				%Rec.		RPD
Analyte	Result	Qualifier	Adde	d	Result	Qual	lifier	Unit	D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.673	F1	0.20	0	0.8376	F1		mg/L		82	90 - 110	1	25

# Client Sample ID: B9J2877-01 Date Collected: 10/17/19 10:40 Date Received: 10/22/19 10:00

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	29264	10/28/19 10:54	PB5X	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	29299	10/29/19 11:29	UXCH	ECL 1
	Instrumer	t ID: ACA1								

## Client Sample ID: B9J2877-02 Date Collected: 10/17/19 10:05 Date Received: 10/22/19 10:00

Γ	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	29264	10/28/19 10:54	PB5X	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	29299	10/29/19 11:30	UXCH	ECL 1
	Instrumen	t ID: ACA1								

## Client Sample ID: B9J2877-03 Date Collected: 10/17/19 09:25 Date Received: 10/22/19 10:00

- 	Batch	Batch	-	Dil	Initial	Final	Batch	Prepared	<b>A</b>	1 - 1
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	29264	10/28/19 10:54	PB5X	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	29299	10/29/19 11:32	UXCH	ECL 1
	Instrumen	t ID: ACA1								

## Client Sample ID: B9J2877-04 Date Collected: 10/17/19 09:05 Date Received: 10/22/19 10:00

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	29264	10/28/19 10:54	PB5X	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	29299	10/29/19 11:33	UXCH	ECL 1
	Instrumen	t ID: ACA1								

## Client Sample ID: B9J2877-05 Date Collected: 10/17/19 10:00 Date Received: 10/22/19 10:00

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	29264	10/28/19 10:54	PB5X	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	29299	10/29/19 11:35	UXCH	ECL 1
	Instrumen	t ID: ACA1								

## Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Job ID: 570-10779-1

**Matrix: Water** 

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 570-10779-1

Lab Sample ID: 570-10779-3

Lab Sample ID: 570-10779-4

Lab Sample ID: 570-10779-5

# Prepared Analyst Lab 5 10/28/19 10:54 PB5X ECL 1 6 10/29/19 11:29 UXCH ECL 1 6 Lab Sample ID: 570-10779-2 Matrix: Water 7

Client: Babcock Laboratories, Inc. Project/Site: B9J2877

# Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-29-19
California	State	2944	09-29-20
Guam	State	20-003R	10-31-19
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20
Washington	State	C916-18	10-11-20

Job ID: 570-10779-1

# **Method Summary**

## Client: Babcock Laboratories, Inc. Project/Site: B9J2877

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	EPA	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

### **Protocol References:**

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

## Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: B9J2877

Client Sample ID	Matrix	Collected	Received	Ass
B9J2877-01	Water	10/17/19 10:40	10/22/19 10:00	
B9J2877-02	Water	10/17/19 10:05	10/22/19 10:00	
B9J2877-03	Water	10/17/19 09:25	10/22/19 10:00	
B9J2877-04	Water	10/17/19 09:05	10/22/19 10:00	
B9J2877-05	Water	10/17/19 10:00	10/22/19 10:00	
	Client Sample ID B9J2877-01 B9J2877-02 B9J2877-03 B9J2877-04 B9J2877-05	Client Sample ID         Matrix           B9J2877-01         Water           B9J2877-02         Water           B9J2877-03         Water           B9J2877-04         Water           B9J2877-05         Water	Client Sample ID         Matrix         Collected           B9J2877-01         Water         10/17/19 10:40           B9J2877-02         Water         10/17/19 10:05           B9J2877-03         Water         10/17/19 09:25           B9J2877-04         Water         10/17/19 09:05           B9J2877-05         Water         10/17/19 10:00	Client Sample IDMatrixCollectedReceivedB9J2877-01Water10/17/19 10:4010/22/19 10:00B9J2877-02Water10/17/19 10:0510/22/19 10:00B9J2877-03Water10/17/19 09:2510/22/19 10:00B9J2877-04Water10/17/19 09:0510/22/19 10:00B9J2877-05Water10/17/19 09:0510/22/19 10:00
#### SUBCONTRACT ORDER

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#### Printed: 10/21/2019 9:11

**Babcock Laboratories, Inc.** 

### B9J2877

SENDING LABORATORY	<u>.</u>		<b>RECEIVING LABORATORY:</b>	
Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Waddell			Eurofins Calscience, Inc. 7440 Lincoln Way Garden Grove, CA 92841-1427 Phone :(714) 895-5494 Fax: (714) 894-7501	570-10779 Chain of Custody
System Name: Wood Environ Sampler: Client	iment & Infrastructi	are Solutions, Inc		
Please include MDLs and EX	CEL EDD			
Analysis	E: Due	xpires Regulatory Days Past Date Sampled	Laboratory ID Commen	ts
Sample ID: B9J2877-01 Liquid		Sampled: 10/17/19 10:40	CL07	<i>Proj.No.:<u>Lake</u> Elsinore/Canyon Lake</i>
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	11/12/19 23:59	10/27/19 10:40	Low Level Total Phosphorus	
Sample ID: B9J2877-02 Liquid		Sampled: 10/17/19 10:05	CL08	Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	11/12/19 23:59	10/27/19 10:05	Low Level Total Phosphorus	
Sample ID: B9J2877-03 Liquid	nanga makan kanan manana kata na pang dan dan kata na manana man	Sampled: 10/17/19 09:25	CL09	Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	11/12/19 23:59	10/27/19 09:25	Low Level Total Phosphorus	
Sample ID: B9J2877-04 Liquid		Sampled: 10/17/19 09:05	CL10	Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	11/12/19 23:59	10/27/19 09:05	Low Level Total Phosphorus	
Sample ID: B9J2877-05 Liquid		Sampled: 10/17/19 10:00	LE02	Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	11/12/19 23:59	10/27/19 10:00	Low Level Total Phosphorus	

3.6 U.1 SCG

Page 1 of 2 2/18/2020 (Rev. 1)

Loc: 570 **10779** 

-

## SUBCONTRACT ORDER

Babcock Laboratories, Inc. B9J2877

		All Containers Intact:	Yes	No	Samples Preserved Properly:	YesNo
Samples Received at	_ oC	Sample Labels / COC Agree:	Yes	No	Custody Seals Present:	YesNo
Please forward all acknown of HARDCOPIES PLE	wledgenn ASE.	ents of sample receipt, fina	l reports and inv	oices to <u>d</u>	ata@babcocklabs.com	
Released By		Date 9	Received By	a. [ a[	Date	(a. 10a)
Released By		Date	Received By	MADLY	<u>GC (5/22/ (9</u> Date	(0:00
,		(Sed of )				Page 2 of 2
		P	age 12 of 13			2/18/2020 (Rev. 1)

Client: Babcock Laboratories, Inc.

#### Login Number: 10779 List Number: 1 Creator: Castro, Joy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-10779-1

List Source: Eurofins Calscience



Analytical Report: Page 1 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:B9L2979Received on Ice (Y/N):YesTemp: 6 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### **Sample Identification**

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
B9L2979-01	CL07	Liquid	12/20/19 10:30	Kate Buckley	12/20/19 14:10	Courier (Jason J.) - DE
B9L2979-02	CL08	Liquid	12/20/19 9:45	Kate Buckley	12/20/19 14:10	Courier (Jason J.) - DE
B9L2979-03	CL09	Liquid	12/20/19 9:00	Kate Buckley	12/20/19 14:10	Courier (Jason J.) - DE
B9L2979-04	CL10	Liquid	12/20/19 8:10	Kate Buckley	12/20/19 14:10	Courier (Jason J.) - DE
B9L2979-05	LE02	Liquid	12/20/19 9:00	Kate Buckley	12/20/19 14:10	Courier (Jason J.) - DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

#### Laboratory Reference Number B9L2979-01

Sample Description CL07		<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid12/20/19 10:30		Received Date/Time 12/20/19 14:10			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	12/21/19 07:50	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	12/21/19 07:50	ATR	
Solids								
Total Dissolved Solids	440	10	10	mg/L	SM 2540C	12/24/19 19:30	JGZ	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	12/26/19 13:32	DSS	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	12/23/19 17:50	DSS	
Nutrients								
Ammonia-Nitrogen	0.34	0.10	0.044	mg/L	SM4500NH3H G	12/30/19 11:12	AJH	
Kjeldahl Nitrogen	1.2	0.10	0.093	mg/L	EPA 351.2	12/24/19 13:20	SLL	
Ortho Phosphate Phosphorus	0.018	0.050	0.016	mg/L	SM 4500P E	12/20/19 19:05	MWM	J
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	12/31/19 12:09	MEL	N_pFilt
Aluminum	81	100	33	ug/L	EPA 200.7	12/27/19 15:03	MEL .	J

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

# Laboratory Reference Number

B9L2979-02

Sample Description CL08		<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid12/20/19 09:45		Received Date/Time 12/20/19 14:10			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	12/20/19 22:33	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	12/20/19 22:33	ATR	
Solids								
Total Dissolved Solids	420	10	10	mg/L	SM 2540C	12/24/19 19:30	JGZ	
Total Suspended Solids	6	2	2	mg/L	SM 2540D	12/26/19 13:32	DSS	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	12/23/19 17:50	DSS	
Nutrients								
Ammonia-Nitrogen	0.31	0.10	0.044	mg/L	SM4500NH3H G	12/30/19 11:14	AJH	
Kjeldahl Nitrogen	1.2	0.10	0.093	mg/L	EPA 351.2	12/24/19 13:22	SLL	
Ortho Phosphate Phosphorus	0.019	0.050	0.016	mg/L	SM 4500P E	12/20/19 19:05	MWM 、	J
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	12/31/19 12:15	MEL I	N_pFilt
Aluminum	87	100	33	ug/L	EPA 200.7	12/27/19 15:15	MEL 、	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

# Laboratory Reference Number

B9L2979-03

Sample Description CL09		<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid12/20/19 09:00		Received Date/Time 12/20/19 14:10			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	12/20/19 22:45	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	12/20/19 22:45	ATR	
Solids								
Total Dissolved Solids	540	10	10	mg/L	SM 2540C	12/24/19 19:30	JGZ	
Total Suspended Solids	8	2	2	mg/L	SM 2540D	12/26/19 11:50	DSS	
General Inorganics								
Sulfide	0.20	0.10	0.10	mg/L	SM 4500S2 D	12/23/19 17:50	DSS	
Nutrients								
Ammonia-Nitrogen	0.24	0.10	0.044	mg/L	SM4500NH3H G	12/30/19 11:16	AJH	
Kjeldahl Nitrogen	1.5	0.10	0.093	mg/L	EPA 351.2	12/24/19 13:23	SLL	
Ortho Phosphate Phosphorus	0.052	0.050	0.016	mg/L	SM 4500P E	12/20/19 19:05	MWM	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	12/31/19 12:17	MEL	N_pFilt
Aluminum	120	100	33	ug/L	EPA 200.7	12/27/19 15:17	MEL	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 5 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

# Laboratory Reference Number

B9L2979-04

Sample Description CL10		<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid12/20/19 08:10		Received Date/Time 12/20/19 14:10			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	12/20/19 22:58	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	12/20/19 22:58	ATR	
Solids								
Total Dissolved Solids	540	10	10	mg/L	SM 2540C	12/24/19 19:30	JGZ	
Total Suspended Solids	12	2	2	mg/L	SM 2540D	12/26/19 11:50	DSS	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	12/23/19 17:50	DSS	
Nutrients								
Ammonia-Nitrogen	0.085	0.10	0.044	mg/L	SM4500NH3H G	12/30/19 11:21	AJH	J
Kjeldahl Nitrogen	1.7	0.10	0.093	mg/L	EPA 351.2	12/24/19 11:25	SLL	
Ortho Phosphate Phosphorus	0.021	0.050	0.016	mg/L	SM 4500P E	12/20/19 19:05	MWM	J
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	12/31/19 12:19	MEL	N_pFilt
Aluminum	180	100	33	ug/L	EPA 200.7	12/27/19 15:19	MEL	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

## Laboratory Reference Number B9L2979-05

Sample Description LE02		<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid12/20/19 09:00			Received Date/Time 12/20/19 14:10				
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag		
Anions										
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	12/20/19 23:11	ATR			
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	12/20/19 23:11	ATR			
Solids										
Total Dissolved Solids	2200	20	20	mg/L	SM 2540C	12/24/19 19:30	JGZ			
General Inorganics										
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	12/23/19 17:50	DSS			
Nutrients										
Ammonia-Nitrogen	1.3	0.10	0.044	mg/L	SM4500NH3H G	12/30/19 11:23	AJH	Nconf		
Kjeldahl Nitrogen	6.7	0.40	0.37	mg/L	EPA 351.2	12/24/19 11:26	SLL			
Ortho Phosphate Phosphorus	0.13	0.050	0.016	mg/L	SM 4500P E	12/20/19 19:05	MWM			

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 7 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work	Order	Number:	B9L2979
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Received on Ice	(Y/N):	Yes	Temp:	6	°C

#### **Anions - Batch Quality Control**

					Calles	Courses					
• • • • • •					Бріке	Source		%REC	000	RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9L20077 - Analyzed as Received IC											
Blank (9L20077-BLK1)				F	Prepared	& Analyze	d: 12/20/1	9			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (9L20077-BS1)		Prepared & Analyzed: 12/20/19									
Nitrite as N	2.29	0.10	0.091	mg/L	2.50		91.7	90-110			
Nitrate as N	5.34	0.20	0.16	mg/L	5.65		94.6	90-110			
Matrix Spike (9L20077-MS1)		Source	: B9L2979-0 <sup>-</sup>	1 F	Prepared	& Analyze	d: 12/20/1	9			
Nitrite as N	2.22	0.10	0.091	mg/L	2.50	ND	88.7	80-120			
Nitrate as N	5.38	0.20	0.16	mg/L	5.65	ND	95.2	75-131			
Matrix Spike (9L20077-MS2)		Source	: B9L2982-0 <sup>,</sup>	1 F	Prepared	& Analyze	d: 12/21/1	9			
Nitrite as N	1.95	0.10	0.091	mg/L	2.50	ND	77.9	80-120			QFpas, QMout
Nitrate as N	7.06	0.20	0.16	mg/L	5.65	1.20	104	75-131			
Matrix Spike Dup (9L20077-MSD1)		Source	: B9L2979-0 <sup>-</sup>	1 F	Prepared	& Analyze	d: 12/20/1	9			
Nitrite as N	2.31	0.10	0.091	mg/L	2.50	ND	92.4	80-120	4.17	20	
Nitrate as N	5.57	0.20	0.16	mg/L	5.65	ND	98.5	75-131	3.42	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 8 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order	Number:	B9L2979
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Received on ree (1/R). Tes Temp. 6 C	Received on Ice (Y/N):	Yes	Temp:	6	°C
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#### **Solids - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9L24044 - Analyzed as	received										
Blank (9L24044-BLK1)					Prepared	& Analyze	d: 12/24/1	9			
Total Dissolved Solids	ND	10	10	mg/L	-						
Duplicate (9L24044-DUP1)		Source:	B9L3061-0	2	Prepared	& Analyze	d: 12/24/1	9			
Total Dissolved Solids	513	10	10	mg/L	-	502			2.17	20	
Duplicate (9L24044-DUP2)		Source:	Source: B9L3062-02 Prepared & Analyzed: 12/24/19					9			
Total Dissolved Solids	466	10	10	mg/L	-	436			6.65	20	
Batch 9L26023 - Analyzed as	received										
Blank (9L26023-BLK1)					Prepared	& Analyze	d: 12/26/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L	-						
Duplicate (9L26023-DUP1)		Source:	B9L2778-0	1	Prepared & Analyzed: 12/26/19		9				
Total Suspended Solids	420	25	25	mg/L	-	460			9.09	25	
Duplicate (9L26023-DUP2)		Source:	B9L2878-0	3RE1	Prepared & Analyzed: 12/26/19			9			
Total Suspended Solids	1430	50	50	mg/L	-	1580			9.97	25	
Batch 9L26024 - Analyzed as	received										
Blank (9L26024-BLK1)					Prepared	& Analyze	d: 12/26/1	9			
Total Suspended Solids	ND	0.5	0.5	mg/L	-						
Duplicate (9L26024-DUP1)		Source:	B9L2926-0	1	Prepared	& Analyze	d: 12/26/1	9			
Total Suspended Solids	280	10	10	mg/L	-	300			6.90	25	

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 9 of 17
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsir
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA 92123		

Report Date: 07-Jan-2020

Work Order Number: B9L2979	
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#### **Solids - Batch Quality Control**

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 9L26024 - Analyzed as	received									
Duplicate (9L26024-DUP2)		Source:	B9L2927-01	Prepared	& Analyze	ed: 12/26/1	9			
Total Suspended Solids	266	10	10 mg	J/L	266			0.00	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work	Order	Number:	B9L2979
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Received on	Ice $(Y/N)$ :	Yes	Temp:	6	°C

#### **General Inorganics - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9L23148 - Analyzed as re	ceived										
Blank (9L23148-BLK1)					Prepared	& Analyze	d: 12/23/1	9			
Sulfide	ND	0.10	0.10	mg/L							
LCS (9L23148-BS1)					Prepared	& Analyze	d: 12/23/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400		100	50-150			
Matrix Spike (9L23148-MS1)		Source:	B9L2975-02	2	Prepared	& Analyze	d: 12/23/1	9			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150			
Matrix Spike Dup (9L23148-MSD1)		Source:	B9L2975-02	2	Prepared	& Analyze	d: 12/23/1	9			
Sulfide	0.300	0.10	0.10	mg/L	0.400	ND	75.0	50-150	28.6	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 11 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Received on Ice (Y/N):	Yes	Temp:	6	°C
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#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9L20074 - Filter if turbid.											
LCS (9L20074-BS1)					Prepared	& Analyze	d: 12/20/1	9			
Ortho Phosphate Phosphorus	0.532	0.050	0.016	mg/L	0.500		106	90-110			
Matrix Spike (9L20074-MS1)		Source	B9L2979-0	1	Prepared	& Analyze	d: 12/20/1	9			
Ortho Phosphate Phosphorus	0.539	0.050	0.016	mg/L	0.500	0.0178	104	80-120			
Matrix Spike Dup (9L20074-MSD1)		Source	B9L2979-0	1	Prepared	& Analyze	d: 12/20/1	9			
Ortho Phosphate Phosphorus	0.543	0.050	0.016	mg/L	0.500	0.0178	105	80-120	0.758	20	
Batch 9L23104 - Acid Digest											
Blank (9L23104-BLK1)				I	Prepared	& Analyze	d: 12/24/1	9			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (9L23104-BS1)				I	Prepared	& Analyze	d: 12/24/1	9			
Kjeldahl Nitrogen	0.985	0.10	0.093	mg/L	1.00		98.5	80-120			
Matrix Spike (9L23104-MS1)		Source	B9L2565-0	1	Prepared	& Analyze	d: 12/24/1	9			
Kjeldahl Nitrogen	140	8.0	7.4	mg/L	80.0	60.6	98.8	42-154			
Matrix Spike Dup (9L23104-MSD1)		Source	B9L2565-0	1	Prepared	& Analyze	d: 12/24/1	9			
Kjeldahl Nitrogen	138	8.0	7.4	mg/L	80.0	60.6	96.8	42-154	1.15	25	
Batch 9L30078 - Analyzed as rec	eived										
Blank (9L30078-BLK1)				I	Prepared	& Analyze	d: 12/30/1	9			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 12 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order	· Number:	B9L2979
------------	-----------	---------

Received on Ice (Y/N):	Yes	Temp:	6	°C
------------------------	-----	-------	---	----

#### **Nutrients - Batch Quality Control**

Analyte(s)	Result	RDL	l	Jnits	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Patch 01 20070 Analyzad as r	i										
Batch 9L30078 - Analyzed as received											
LCS (9L30078-BS1)		Prepared & Analyzed: 12/30/19									
Ammonia-Nitrogen	1.02	0.10	0.044	mg/L	1.00		102	90-110			
Matrix Spike (9L30078-MS1)		Source	: B9L2998-02	F	Prepared	& Analyze	d: 12/30/1	9			
Ammonia-Nitrogen	1.07	0.10	0.044	mg/L	1.00	0.0741	99.6	80-120			
Matrix Spike Dup (9L30078-MSD1)	Matrix Spike Dup (9L30078-MSD1) Source: B9L2998-02 Prepared & Analyzed: 12/30/19										
Ammonia-Nitrogen	1.10	0.10	0.044	mg/L	1.00	0.0741	103	80-120	2.95	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 13 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979	
Received on Ice (Y/N):	Yes	

leceived	on Ice	(Y/N)	):	Yes	Temp:	6	°C	

#### Metals and Metalloids - Batch Quality Control

	Desult			Linite	Spike	Source	% PEC	%REC	חסס	RPD Limit	Flag
Analyte(S)	Result	RDL		Units	Level	Result	/0KLC	Linits	NF D	LIIIII	Tiag
Batch 9L23132 - EPA 200.2											
Blank (9L23132-BLK1)					Prepared:	12/24/19	Analyzed	: 12/27/19			
Aluminum	ND	100	16	ug/L							
LCS (9L23132-BS1)					Prepared:	12/24/19	Analyzed	: 12/27/19			
Aluminum	1140	100	16	ug/L	. 1170		98.2	85-115			
Matrix Spike (9L23132-MS1)		Source:	B9L2979-0	2	Prepared:	12/24/19	Analyzed	: 12/27/19			
Aluminum	1320	100	16	ug/L	. 1170	87.1	105	70-130			
Matrix Spike Dup (9L23132-MSD1)		Source:	B9L2979-0	2	Prepared:	12/24/19	Analyzed	: 12/27/19			
Aluminum	1290	100	16	ug/L	. 1170	87.1	103	70-130	1.85	20	
Batch 9L31080 - 200.7/ No Dige	est										
Blank (9L31080-BLK1)					Prepared	& Analyze	ed: 12/31/1	9			
Aluminum-Dissolved	ND	100	16	ug/L							
Blank (9L31080-BLK2)					Prepared	& Analyze	ed: 12/31/1	9			
Aluminum-Dissolved	339	100	16	ug/L							QBfil, QBLKf
Blank (9L31080-BLK4)					Prepared	& Analyze	ed: 12/31/1	9			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (9L31080-BLK5)					Prepared	& Analyze	ed: 12/31/1	9			
Aluminum-Dissolved	ND	100	16	ug/L	-						
Blank (9L31080-BLK6)					Prepared	& Analyze	ed: 12/31/1	9			
Aluminum-Dissolved	ND	100	16	ug/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 14 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:	B9L2979			
Received on Ice (Y/N):	Yes	Temp:	6	°C

Metals and Metalloids - Batch Quality Control	

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 9L31080 - 200.7/ No Dige	st										
LCS (9L31080-BS1)					Prepared	& Analyze	d: 12/31/1	9			
Aluminum-Dissolved	342	100	16	ug/L	334		103	85-115			
Matrix Spike (9L31080-MS1)		Source:	B9L3442-01	l	Prepared	& Analyze	d: 12/31/1	9			
Aluminum-Dissolved	2040	510	84	ug/L	1670	381	99.1	70-130			
Matrix Spike Dup (9L31080-MSD1)		Source:	B9L3442-01	l	Prepared	& Analyze	d: 12/31/1	9			
Aluminum-Dissolved	2040	510	84	ug/L	1670	381	99.2	70-130	0.0749	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 15 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number:B9L2979Received on Ice (Y/N):YesTemp: 6 °C

#### **Notes and Definitions**

J	Estimated value
0	

- N\_pFilt Sample filtered and preserved upon receipt to the laboratory.
- Nconf Result(s) confirmed by re-analysis.
- QBfil Method blank was filtered prior to processing.
- QBLKf The filtered method blank did not meet laboratory acceptance criteria.
- QFpas Follow-up result within laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit
- \* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Standard No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Analytical Report: Page 16 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 07-Jan-2020

Work Order Number: B9L2979 Received on Ice (Y/N): Yes Temp: 6 °C

## E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662

Chain of Custody & Sample Information Record

www.babcocklabs.com

Client: Wood E&I Solutions, I	Inc.			Cont	tact:	Joh	n Rı	lobu	ph													Phone No.	858-243-8158
FAX No.			1.0.00000000000000000000000000000000000	Ema	il:	jo	hn.ru	Idoli	oh@v	wood	Iplc.	com	ı										Additional Reporting Requests
Project Name: LECL TMDL N	Ionitoring			Turn	Aro	und	Tim	e:		- - 	Roi	utine	<u>e</u>	*3	3-5 Ru	Day		*48 F	Ho	ur	*	24 Hour Bush	FAX Results: Yes No Email Results: Yes No State EDT: Yes No
Project Number: 1915100402				Lab T	TAT A	ppro	oval:			Ву	r:					011			1001	•	Add	litional Charges May Apply	(Include Source Number in Notes)
Sampler Inform	ation				# of & P	f Cor rese	rvati	ers ves			l	Samı Typ	ple be		Ana	alysi	is R	lequ	iest	ed		Matrix	Notes
Name: KATCBUC	xler									and r												DW = Drinking Water	Ortho-P has seen field filtered.
Employer: Wood E&I Sol	utions, Inc.						ite			ichto	A III A				4			orus				WW = Wastewater GW = Groundwater	Total Phosphorus - Sub to Eurofins Calscience
				ved			Aceta			0 y c	5	ole		I tautes	NICLICE			ondso o	fide		TAL	S = Soil	Dissolved Metals are NOT field filtered
Signature: KAACK	Juli	¥		npreser 2SO4	CI NO3	a2S203	aOH/Zn	H4CI	uazo.	h loto	OLAI #	Resam	special	SS	ncale - r	NY NY	mmonia	Plorth	otal Sul	otal AL	issolve	SG = Sludge L = Liquid	COUVIER 34
Sample ID	Da	ate 1	Time	5 I	ΞI	ZZ	z	zΣ		╟		-	0,	H 2	ZF	F	A	FU	0 F	F (		M = Miscellaneous	
CL07	12	1001.1	030					-			-	+		XX	X )	X	X	XX	XX	X	X		
CL08		00	145					_		_	_	_		X	x >	< X	X	x >	x x	X	Х		
CL09		D	900											x	x	< x	x	x )	x x	x	х		- 1
CL10		0	810											x	x	( x	x	x	x x	x	х		
LE02		V O	900											,	x)	< x	x	x >	x x				
																						B9L29'	79
										-	_	-		_							R	c'd: 12/20/201	19 14:10
							-	-		_				_	_	-		-	-		J	LH Temp G	Sun Id :T62
Relinquished By (sign)	Print	Name	/ Com	pany			Da	te /	Time	 ;				Rec	eiv	ed E	Ц   Зу (	Sigr	n)			Pri	nt Name / Company
Nathulin	Mood	- 11	alle	)A	les	12	201	19	13	:20	2		ij.	1						Ť		JARON JU	DUNS /DE
The	JASON	Fran	1.35	D3	1	2	1201	19	14	1/0		v		i Ng	L	E	4	Ĺ				Willio L	, IESB
													6	_									
(For Lab Use Only) Sample	Integrity U	pon Re	eceipt												La	b N	otes	s					- 2
Sample(s) Submitted	on Ice?	Yes	No				Т	em	pera	ture	è											Lab No.	. 53

(For Lab Use Only) Sample Integrity	Upon Receipt			Lab Notes	
Sample(s) Submitted on Ice?	Yes No		Temperature		Lab No. 53
Custody Seal(s) Intact?	Yes No	N/A	(~ °C	T62	
Sample(s) Intact?	Yes No		Cooler Blank		Page of

mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Report Date: 07-Jan-2020

Analytical Report: Page 17 of 17 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Yes

#### Work Order Number: B9L2979

Received on Ice (Y/N):

Temp: 6 °C

53 TAG # : Client Name: Nood Et | solutions Sample # Received Container Type -01 -03 -02 -04 -05 -06 -08 -09 -10 -07 100mL Sterile Bacti Bottle PLASTIC Half Gallon Unp. Quart Unp. ٦ 0 HNO3 Pint ٢ H2SO4 Pint 7 NaOH Pint **Unpreserved** Pint Perchlorate Pint 125mL Cr-6 KITS GP Kit(240mLglass/50mL) Low Level Perchlorate GLASS 500mL Amber H2SO4 1L Amber Unp. 1L Amber HCL 1L Amber H2SO4 1L Amber Na2S2O3 VIALS: HCL Vial H2SO4 Vial Na2S2O3 Vial Unpreserved Vial NH4Cl Vial Other Container 250 mc Poly Other: 500 ml (scalum Hydroine) × 1 ٩ × Total Number of Containers: 29 ICey: 1B-travel blank, 1MH5= too much head space, Brkn=broken, MIss=missing, NS=need split, HCL=hydrochloric Acid, HI 2504=Sulfuric Acid

	Temp Gun #: 67		Custody Seals?	YES	(NO)
-	One Ice: YES	NO	Acceptable Criteria	YES	NO
	Samples Arrived Intact: YES	NO	Permission to Continu	e? YES	NO
T wavel Blank Received?	Via	s Have He	ad Space?	YES	NO
NI otes:		D	D		
P IN Notified of issues?	YES / NO Initials :	F-0	PAGE	OF	



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Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA, 92123	Work Order Number:	B9L3018
Report Date:	22-Jan-2020	Received on Ice (Y/N	Yes Temp: 6 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Common Internetification

	58	ample lue	entification			
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	By
B9L3018-01	CL07-Int	Solid	12/20/19 10:30	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-02	CL07-Surf	Solid	12/20/19 10:40	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-03	CL08-Int	Solid	12/20/19 9:45	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-04	CL08-Surf	Solid	12/20/19 9:55	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-05	CL09-Int	Solid	12/20/19 9:00	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-06	CL09-Surf	Solid	12/20/19 9:10	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-07	CL10-Int	Solid	12/20/19 8:10	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-08	CL10-Surf	Solid	12/20/19 8:20	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-09	LE02-Int	Solid	12/20/19 9:00	Client	12/20/19 14:10	Courier (Jason J.) - DE
B9L3018-10	LE02-Surf	Solid	12/20/19 9:35	Client	12/20/19 14:10	Courier (Jason J.) - DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

Note from Truesdail: Sample '09 LE02- INT' was lost during the extraction process – The bottle shattered while the analyst was using the glass tissue grinder. The rest of the samples were analyzed successfully.

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 1 of 2 CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 2 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
Client Name: N Contact: Address: S Report Date: 2	San Diego, CA, 92123	Work Order Number:	B9L3018
Report Date:	22-Jan-2020	Received on Ice (Y/N	Yes Temp: 6 °C

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

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location 6100 Quail Valley Court Riverside, CA 92507-0704

P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 2 of 2



Client Name: Contact: Address:	Wood Environment&Infrastructure Sc John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: <b>Work Order Number:</b>	Page 1 of 2 Amec Foster Wheeler-Lake LECL TMDL Monitoring <b>B9L3018</b>
Report Date:	22-Jan-2020	Received on Ice (Y/N	Yes Temp: 6 °C

Client: Wood E&I Solutions, In	nc.		Conta	ict: J	John I	Rudol	ph								Phone No.	858-243-8158
FAX No.			Email		iohn.r	udolo	h@wo	oodo	lc.com	1						Additional Reporting Requests
Project Name: LECL TMDL M	onitoring	•	Turn /	Arou	nd Ti	me:		Ro	outine	. *	3-5 Da Rush	ay I	*48 H Ru	our sh	*24 Hour Rush	FAX Results: □ ves □ Email Results: □ ves □ State EDT: □ ves □
Project Number: 1915100402		_	*Lab T	AT Ap	pprova Contai	al: ners	_	By:	Sample		_			•Ac	Iditional Charges May Apply	(Include Source Number in Notes)
Sampler Informa	ation			& Pre	serva	tives		w	Туре	A	nalysi	is Re	eques	ed	Matrix	Notes
Name: KAFE BUCI Employer: Wood E&I Solu Signature: KAC Sample ID	Hey itions, Inc. Butte	J	Japreserved H2SO4 HCI	HNO3 Va2S203	VaOH VaOH VaOH/ZnAcetate	NH4CI MCAA	Frozen	Total # of Containe	Routine Resample Social	Total Sulfide	TDS	Ammonia	Fotal Phosphorus SRP/Ortho-P	chiorophyli-a	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Sludge L = Liquid M = Miscellaneous	Chi-a samples on 0.7 um GFF Here Kate Un 12.96.19
CL07 - Int	2/20/19	1020		T	11		T	·						x	m - mocenaneous	Filter Volume: 570M/
CL07 - Surf		1040					T		++					x		Filter Volume: 500m
CL08 - Int		0945		T						T	T			x		Filter Volume: 500 mL
CL08 - Surf		0955												x		Filter Volume: 500 mL
CL09 - Int		0900		T						T	Π			x		Filter Volume: 500 ml
CL09 - Surf		0910												x		Filter Volume: 440 mC
CL10 - Int		0810												x		Filter Volume: 410 ml
CL10 - Surf		0820		T							П			x		Filter Volume: 440 ml
LE02 - Int	1990	09.00		T			T				T			x	*	Filter Volume: 500 ml
LE02 - Surf	05	0935		T						T				x		Filter Volume: 5DOm L
Relinquished By (sign)	Print Nam	e / Com	pany	-	D	ate / 1	Time		_	Recei	ived E	3v (S	lian)		Pri	nt Name / Company
Wall Parille	MOOD	-YA	K KU	n	12/2	alla	1 shi	20	14	1			4.4		TATION JU	DUNI / DE
Magunary	TANIT	in cul	la	7	12 /12	la	14	10	11	2	2	-		2	N NGC PAN	CCor
man	LINSIV VI	(1/43/4)	100	-	16/10	μ.	11.	//	af	2			_	-	10 TO CH	00
							_	_						-		+
(For Lab Use Only) Sample I	ntegrity Upon I	Receipt									Lab	Note	s 🤇			
Sample(s) Submitted o Custody Seal(s) I Sample(s) I	intact? Yes	) No No	CNIA	)	2	Temp (	eratu Q	re °C						]	B9L30	

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#### Page 1 of 2



John Rudolph 9210 Sky Park Court #200	Analytical Report: Project Name: Project Number:	Page 2 of 2 Amec Foster Wheeler-Lake
San Diego, CA, 92123	Work Order Number:	B9L3018
22-Jan-2020	Received on Ice (Y/N	Yes Temp: 6 °C
	Wood Environment&Infrastructure Sc John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123 22-Jan-2020	Wood Environment&Infrastructure ScAnalytical Report: Project Name: Project Number: San Diego, CA, 92123Analytical Report: Project Number: Work Order Number:22-Jan-2020Received on Ice (Y/N

Clien	$t$ Name: $W(0) \cap E \otimes I S \cap I$	VHION	S			Sau	nole#						
Receive	ed Container Type	-01	-02	-03	-04	-05	-06	-07	-08	-09	-10	1	
L	100mL Sterile Bacti Bottle								1	1	1		
	PLASTIC	· · · ·					-		-			1	
	Half Gallon Unp.	-										-	
	Quart Unp.			_	_						_		
	HNO3 Pint				_						1		
	H2SO4 Pint												
	NaOH Pint			-									
	Unpreserved Pint												
	Perchlorate Pint												
	125mL Cr-6												
	KITS												
	GP KIT(240mLglass/50mL)	_										-	
	ILOW LEVEL Perchlorate												
	500ml Amber H2SO4												
· · ·	11 Amber Upp												
	11 Amber HCI												
	11 Amber H2SO4	-			-								
	11 Amber Ne26202	_											
	VIALS:												
· · · ·	HCL Vial											-	
	H2SO4 Vial	-										{	
	Na2S2O3 Vial												- 48
	Unpreserved Vial										·		
	NHACIVial										ļ		
X	Other Container	-	- 1	,									
. /	I dicke			- 1			1.	(		ł	-		
		1						-					57 (M
10	tal Number of Containers;												
2504=S	ulfuric Acid	brkn=brc	iken, iv	llss=m	issing	. MS=ni	ed spl	it, HCL	=hydro	chlori	c Acid,		9-1 1
	A Temp Gun #	:100	5		.	Custod	y Seals	;?	YES		NO)		
	C One Ice	YES		NO	Accer	table (	riteria	Ċ	YES		NO		
	Samples Arrived Intact	YES		NO	Pern	nission	to Con	tinue?	YES		NO		
∎avel B	lank Received?		VialeH	avo H	and S.	22007			1000			_	
otes:			- 1413 11			acer			TES		NO		
							T	-	0.1	0	1	1973	
∎ VI Notif	IEd of issues? YES / NO	Initials	:		_	R2	7 L	131	UI	8		257	
						Rc'd	: 12	/20/:	2019	14:	10	40.00	Qué:
						EVS		Tei	np G	un Id	:60		

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### Page 2 of 2



ALS - Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 19L0497 Printed: 01/22/2020

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
CL07-Int	19L0497-01	Filter		12/20/2019 10:30	12/27/2019 10:18
CL07-Surf	19L0497-02	Filter		12/20/2019 10:40	12/27/2019 10:18
CL08-Int	19L0497-03	Filter		12/20/2019 09:45	12/27/2019 10:18
CL08-Surf	19L0497-04	Filter		12/20/2019 09:55	12/27/2019 10:18
CL09 - Int	19L0497-05	Filter		12/20/2019 09:00	12/27/2019 10:18
CL09 - Surf	19L0497-06	Filter		12/20/2019 09:10	12/27/2019 10:18
CL10-Int	19L0497-07	Filter		12/20/2019 08:10	12/27/2019 10:18
CL10-Surf	19L0497-08	Filter		12/20/2019 08:20	12/27/2019 10:18
LE02 - Surf	19L0497-10	Filter		12/20/2019 09:35	12/27/2019 10:18

#### DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Mon

Aldo B. Minano For Joseph Bryan Harding Project Manager



Client: Babcock Labora	tories, Inc.		Project Name:		Chlorophy <b>ll</b>			Printed: 01/2	22/2020
			CL07-Int	t					
			19L0497-01 (	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	lail					
Microbiology									
Chlorophyll a	20.7	1.00	1.00 mg/m³	1	1912672 (	01/07/2020 19	5:33 EGV	EPA 10200 H	
			CL07-Sur	f					
			19L0497-02 (	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	lail					
Microbiology									
Chlorophyll a	16.4	1.00	1.00 mg/m <sup>3</sup>	1	1912672 (	01/07/2020 15	5:33 EGV	EPA 10200 H	
			CL08-Int	t					
			19L0497-03 (	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	lail					
Microbiology									
Chlorophyll a	21.9	1.00	1.00 mg/m³	1	1912672 (	01/07/2020 1	5:33 EGV	EPA 10200 H	
			CL08-Sur	ſ					
			19L0497-04 (	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	lail					
Microbiology									
Chlorophyll a	29.7	1.00	1.00 mg/m <sup>3</sup>	1	1912672 (	01/07/2020 1	5:33 EGV	EPA 10200 H	
			CI 09 - In	ıt					
			19L0497-05 (	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
-							•		



Client: Babcock Labora	tories, Inc.		Projec	t Name:	(	Chlorophyll			Printed: 01/2	2/2020
			CL09 - I	nt (Con	tinued	)				
		19L	0497-05	(Filter)	(Conti	nued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	19.0	1.00	1.00	mg/m³	1	1912672 (	01/07/2020 19	5:33 EGV	EPA 10200 H	
			CI	L09 - Su	rf					
			19L04	97-06 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	23.7	1.00	1.00	mg/m³	1	1912672 (	01/07/2020 15	5:33 EGV	EPA 10200 H	
			C	CL10-Int						
			19L04	97-07 (1	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	55.4	1.00	1.00	mg/m³	1	1912672 (	01/07/2020 15	5:33 EGV	EPA 10200 H	
			С	L10-Sur	f					
			19L04	·97-08 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	46.7	1.00	1.00	mg/m³	1	1912672 (	01/07/2020 15	5:33 EGV	EPA 10200 H	
			LE	E02 - Sui	rf					
			19L04	97-10 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					



Client: Babcock Laboratories, In	с.	Project Name:			(	Chlorophyll					
									Printed: 01	/22/2020	
		L	E02 - Sı	urf (Con	tinue	d)					
19L0497-10 (Filter) (Continued)											
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes	
			ALS	Truesd	ail						
Microbiology											
Chlorophyll a	37.2	1.00	1.00	mg/m³	1	1912672 (	01/07/2020 15	5:33 EGV	EPA 10200	H H	

19L

## SUBCONTRACT ORDER

Printed: 12/26/2019 11:26

#### Babcock Laboratories, Inc.

## B9L3018

SENDING LABORATOR	Y:		RECEIVING LABOR	ATORY:				
Babcock Laboratories, In 6100 Quail Valley Court Riverside, CA 92507-070 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy	c. 14 A. Waddell		Truesdail Laboratories - Subcontract 3337 Michelson Drive Suite CN750 Irvine, CA 92614 Phone :(714) 730-6239 Fax: (714) 730-6462					
Copy/Relog from B9J2890. Sampler: Kate Buckley	System Name: Woo	d Environmental&Infras	tructure Solutions, Inc					
Please include MDLs and E.	XCEL EDD	uning Bandatan Da	_		<b>x</b>			
Analysis	Due	Past Date Sampled	s Laboratory ID	Comments				
Sample ID: B9L3018-01 Solid		Sampled: 12/20/19 10:30	CL07-Int		Proj.No.:LECL TMDL Monitoring			
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 10:30	Report Chlorophyl	l a / Filter Volume = 50	0mL			
Sample ID: B9L3018-02 Solid	•	Sampled: 12/20/19 10:40	CL07-Surf		Proj.No.:LECL TMDL Monitoring			
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 10:40	Report Chlorophyl	l a / Filter Volume = 50	0mL /			
Sample ID: B9L3018-03 Solid	99	Sampled: 12/20/19 09:45	CL08-Int	, * · · ·	Proj.No.:LECL TMDL Monitoring			
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:45	Report Chlorophyl	a / Filter Volume = 50	0mL			
Sample ID: B9L3018-04 Solid	A	Sampled: 12/20/19 09:55	CL08-Surf		Proj.No.:LECL TMDL Monitoring			
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:55	Report Chlorophyl	a / Filter Volume = 50	DmL			
Sample ID: B9L3018-05 Solid		Sampled: 12/20/19 09:00	CL09-Int		Proj.No.; <u>LECL TMDL</u> Monitoring			
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:00	Report Chlorophyll	a / Filter Volume = 500	DmL			

.

Page 1 of 2

## SUBCONTRACT ORDER

Printed: 12/26/2019 11:26

## **Babcock Laboratories, Inc.**

B9L3018

Analysis	E Due	xpires Regulatory Day Past Date Sampled	ys Laboratory ID	Comments	
Sample ID: B9L3018-06 Solid		Sampled: 12/20/19 09:10	CL09-Surf		Proj.No.:LECL TMDL Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:10	Report Chloroph	yll a / Filter Volume = 44	0mL
Sample ID: B9L3018-07 Solid	NAB <u>AAN AAN AAN AAN AAN AAN</u> AAN AAN AAN AAN	Sampled: 12/20/19 08:10	CL10-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 08:10	Report Chloroph	yll a / Filter Volume = 41	OmL
Sample ID: B9L3018-08 Solid		Sampled: 12/20/19 08:20	CL10-Surf		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	01/03/20 23:59	12/30/19 08:20	Report Chlorophy	yll a / Filter Volume = 44	0mL
Sample ID: B9L3018-09 Solid	— — — — — — — — — — — — — — — — — — —	Sampled: 12/20/19 09:00	LE02-Int		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:00	Report Chlorophy	/ll a / Filter Volume = 50	OmL
Sample ID: B9L3018-10		Sampled: 12/20/19 09:35	LE02-Surf	Annan an an Annan an Annan an Annan an Annan	Proj.No.:LECL TMDL Monitoring
Solid					
Solid Subout Containers Supplied: Whirl-Pak (A)	01/03/20 23:59	12/30/19 09:35	Report Chlorophy	ll a / Filter Volume = 500	DmL
Solid Subout Containers Supplied: Whirl-Pak (A) Date: Wgt: 6 DV: Svos: PRIORITY OU THEM: 1000	01/03/20 23:59 26Dec19 3.20 LBS 0.00 /ERNIGHT	12/30/19 09:35 SHIPPING: 15. SPECIAL: 1. HANDLING: 0. TOTAL: 16.	Report Chlorophy 43 12 00 55	ll a / Filter Volume = 500	)mL
Solid Subout Containers Supplied: Whirl-Pak (A) Date: Wgt: 6 DV: Svos: PRIORITY OU TRAVISION	01/03/20 23:59 26Dec19 3.20 LBS 0.00 /ERNIGHT 2014 EEON All (	12/30/19 09:35 SHIPPING: 15. SPECIAL: 1. HANDLING: 0. TOTAL: 16. Containers Intact:	Report Chlorophy	Il a / Filter Volume = 500	DmL
Solid Subout Containers Supplied: Whirl-Pak (A) Date: Wgt: E DV: SVDB: PRIORITY OU TROV. 1000 Unples Received at	01/03/20 23:59 26Dec 19 5.20 LBS 0.00 /ERNIGHT All ( oC Sample L	12/30/19 09:35 SHIPPING: 15. SPECIAL: 1. HANDLING: 0. TOTAL: 16. Containers Intact: abels / COC Agree:	Report Chlorophy         .43         .12         .00         .55        YesNo        YesNo	ll a / Filter Volume = 500 Samples Preserved Pro Custody Scals Present:	DmL Dperly:YesNoYesNo
Solid Subout Containers Supplied: Whirl-Pak (A) Date: Wgt: E DV: SVDB: PRIORITY OU PROV. 4000 umples Received at S(0) ease forward all acknow O HARDCOPIES PLEA	01/03/20 23:59 26Dec 19 5.20 LBS 0.00 /ERNIGHT All ( oC Sample L ledgements of sar SE.	12/30/19 09:35	Report Chlorophy	ll a / Filter Volume = 500 Samples Preserved Pro Custody Seals Present: data@babcocklabs.c	DmL Dperly:YesNo YesNo OM
Solid Subout Containers Supplied: Whirl-Pak (A) Date: Wgt: E DV: Svos: PRIORITY OU rnov. toos umples Received at ease forward all acknow O HARDCOPIES PLEA teleased By	01/03/20 23:59 26Dec19 3.20 LBS 0.00 /ERNIGHT All C oC Sample L ledgements of sar SE.	12/30/19 09:35         SHIPPING:       15.         SPECIAL:       1.         HANDLING:       0.         TOTAL:       16.         Containers Intact:       abels / COC Agree:         nple receipt, final receipt,	Report Chlorophy	Il a / Filter Volume = 500 Samples Preserved Pro Custody Scals Present: <u>data@babcocklabs.c</u> 2 Dat	DmL Dperly:YesNoYesNo OmYesNo OmYesNo



# Calscience

# **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

## Laboratory Job ID: 570-16743-1

Client Project/Site: B9L3020 Revision: 1

## For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/18/2020 3:59:05 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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3

## Qualifiers

## General Chemistry

Qualifier	Qualifier Description	
F1	MS and/or MSD Recovery is outside acceptance limits.	
Glossary		5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	0
DER	Duplicate Error Ratio (normalized absolute difference)	ð
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	9
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
	Deletive Free Detie (Dedieshemistry)	

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

## Job ID: 570-16743-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-16743-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The samples were received on 12/27/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

#### **General Chemistry**

Method 365.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-41896 and analytical batch 570-42382 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 570-16743-1

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## **General Chemistry**

Client Sample ID: B9L3020-01 Date Collected: 12/20/19 10:30 Date Received: 12/27/19 09:30							Lab San	nple ID: 570-1 Matrix:	6743-1 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0467		0.0100	0.00281	mg/L		01/02/20 08:00	01/02/20 12:02	1
Client Sample ID: B9L3020-02							Lab San	nple ID: 570-1	6743-2
Date Collected: 12/20/19 09:45								Matrix:	Water
Date Received: 12/27/19 09:30		o				_	<u> </u>		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DIIFac
Phosphorus, Total	0.0535		0.0100	0.00281	mg/L		01/02/20 08:00	01/02/20 12:03	1
Client Sample ID: B9L3020-03 Date Collected: 12/20/19 09:00							Lab San	nple ID: 570-1 Matrix:	6743-3 Water
Date Received: 12/27/19 09:30	Decult	Qualifier	ы	MDI	11:4:4	<b>_</b>	Drenered	Analyzad	
	Result	Quaimer	RL -		Unit	U	Prepared	Analyzed	
Phosphorus, Total	0.0954		0.0100	0.00281	mg/L		01/02/20 08:00	01/02/20 12:05	1
Client Sample ID: B9L3020-04							Lab San	nple ID: 570-1	6743-4
Date Collected: 12/20/19 08:10								Matrix	Water
Date Received: 12/27/19 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0855		0.0100	0.00281	mg/L		01/02/20 08:00	01/02/20 12:06	1
Client Sample ID: B9L3020-05							Lab San	nole ID: 570-1	6743-5
Date Collected: 12/20/19 09:00								Matrix	Water
Date Received: 12/27/19 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.278	F1	0.0100	0.00281	mg/L		01/02/20 08:00	01/02/20 12:08	1

Page 5 of 13

## **QC Sample Results**

Job ID: 570-16743-1

## Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-418 Matrix: Water Analysis Batch: 42382	896/5-A						Clie	ent Sam	ple ID: Me Prep Typ Prep B	ethod   be: Tot atch: 4	Blank al/NA 41896
Awalista	De	MB MB	D.			-			A a l		
Analyte December up, Total	Kes					L	• • • •			ea	
Phosphorus, Total		ND	0.0100	0.0	JZOT IIIY/L		01/0	2/20 00.00	01/02/20	11.44	I
Lab Sample ID: LCS 570-41896/6-A Matrix: Water Analysis Batch: 42382						Clier	nt Sai	mple ID:	Lab Con Prep Typ Prep B	trol Sa be: Tot atch: 4	ample al/NA 41896
			Spike	LCS	LCS				%Rec.		
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits		
Phosphorus, Total			0.200	0.1934		mg/L		97	90 - 110		
Lab Sample ID: LCSD 570-4 Matrix: Water Analysis Batch: 42382			C	Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA Prep Batch: 41896							
			Spike	LCSD	LCSD				%Rec.		RPD
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Phosphorus, Iotal			0.200	0.2010		mg/L		101	90 - 110	4	20
Lab Sample ID: 570-16743-5 MS Matrix: Water Analysis Batch: 42382			Sniko	ме	MS		C	lient Sa	mple ID: Prep Typ Prep B	B9L30 be: Tot atch: 4	20-05 al/NA 41896
Analyte	Result	Qualifier		Result	Qualifier	Unit	р	%Rec	l imits		
Phosphorus. Total	0.278	F1	0.200	0.4426	F1	ma/L		82	90 - 110		
						5					
Lab Sample ID: 570-16743- Matrix: Water Analysis Batch: 42382					Client Sample ID: B9L3020-05 Prep Type: Total/NA Prep Batch: 41896						
Analyta	Sample	Sample	Spike	MSD	MSD	l lait	~	0/ D	%Rec.	000	
Analyte	Result		Added	Result		Unit	<u>ם</u>	%Rec		<u>Д</u> ду	
Phosphorus, Total	0.278	ГІ	0.200	0.4457	E I	ing/L		84	90 - 110	1	25

**Eurofins Calscience LLC**
#### Client Sample ID: B9L3020-01 Date Collected: 12/20/19 10:30 Date Received: 12/27/19 09:30

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	41896	01/02/20 08:00	YR9U	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	42382	01/02/20 12:02	YR9U	ECL 1
	Instrumer	t ID: ACA1								

#### Client Sample ID: B9L3020-02 Date Collected: 12/20/19 09:45 Date Received: 12/27/19 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	41896	01/02/20 08:00	YR9U	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	42382	01/02/20 12:03	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Client Sample ID: B9L3020-03 Date Collected: 12/20/19 09:00 Date Received: 12/27/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	41896	01/02/20 08:00	YR9U	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	42382	01/02/20 12:05	YR9U	ECL 1
	Instrumer	nt ID: ACA1								

## Client Sample ID: B9L3020-04

#### Date Collected: 12/20/19 08:10 Date Received: 12/27/19 09:30

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	41896	01/02/20 08:00	YR9U	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	42382	01/02/20 12:06	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Client Sample ID: B9L3020-05 Date Collected: 12/20/19 09:00 Date Received: 12/27/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365	·		50 mL	50 mL	41896	01/02/20 08:00	YR9U	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	42382	01/02/20 12:08	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Job ID: 570-16743-1

**Matrix: Water** 

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 570-16743-1

Lab Sample ID: 570-16743-2

Lab Sample ID: 570-16743-3

Lab Sample ID: 570-16743-4

Lab Sample ID: 570-16743-5

# 2 3 4 5 6 7 8

Client: Babcock Laboratories, Inc. Project/Site: B9L3020

## Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20
Washington	State	C916-18	10-11-20

Job ID: 570-16743-1 2 3 4 5 ..... 6 7

**Eurofins Calscience LLC** 

## **Method Summary**

#### Client: Babcock Laboratories, Inc. Project/Site: B9L3020

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	EPA	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

#### **Protocol References:**

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

**Eurofins Calscience LLC** 

## Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: B9L3020

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Ass
570-16743-1	B9L3020-01	Water	12/20/19 10:30	12/27/19 09:30	
570-16743-2	B9L3020-02	Water	12/20/19 09:45	12/27/19 09:30	
570-16743-3	B9L3020-03	Water	12/20/19 09:00	12/27/19 09:30	
570-16743-4	B9L3020-04	Water	12/20/19 08:10	12/27/19 09:30	
570-16743-5	B9L3020-05	Water	12/20/19 09:00	12/27/19 09:30	

		SUBCON	FRACT ORDER	Printed: 12/26/2	019 11:27
		Babcock L	aboratories, Inc.		
		D			
SENDING LABORATORY: Babcock Laboratories Inc.			Eurofine Calscience	ATORY:	
6100 Quail Valley Court			7440 Lincoln Way	no.	
Riverside, CA 92507-0704 Phone: (951) 653-3351			Garden Grove, CA 928 Phone (714) 895-5494	841-1427 4	
Fax: (951) 653-1662			Fax: (714) 894-7501		
Project Manager: Cindy A	. Waddell				
Copy/Relog from B9J2877. Sy Sampler: Kate Buckley	vstem Name: Wood	Environment & Infras	tructure Solutions, Inc	570-16743 9	Chain of Custody
Please include MDLs and EX0	CEL EDD	mines Damit-4 P	-		an a
Analysis	Ex Due	Past Date Sampled	's Laboratory ID	Comments	
Sample ID: B9L3020-01 Liquid		Sampled: 12/20/19 10:30	CL07		Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	01/17/20 23:59	12/30/19 10:30	Low Level Total Ph	osphorus	
Sample ID: B9L3020-02 Liquid		Sampled: 12/20/19 09:45	CL08	gegen blev til fikken en men en men en fikken en fi	<i>Proj.No.:<u>Lake</u> Elsinore/Canyon Lake</i>
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	01/17/20 23:59	12/30/19 09:45	Low Level Total Ph	osphorus	
Sample ID: B9L3020-03 Liquid		Sampled: 12/20/19 09:00	CL09		Proj.No.:Lake Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	01/17/20 23:59	12/30/19 09:00	Low Level Total Ph	nosphorus	
Sample ID: B9L3020-04 Liquid		Sampled: 12/20/19 08:10	CL10		Proj.No.: <u>Lake</u> Elsinore/Canyon Lake
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	01/17/20 23:59	12/30/19 08:10	Low Level Total Pl	hosphorus	
Sample ID: B9L3020-05 Liquid		Sampled: 12/20/19 09:00	LE02	49000 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	<i>Proj.No.:<mark>Lake</mark> Elsinore/Canyon Lak</i>
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	01/17/20 23:59	12/30/19 09:00	Low Level Total P	hosphorus	

Page 1 of 2

16743

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2/18/2020 (Rev. 1)

SUBCONTRACT ORDER Babcock Laboratories, Inc. B9L3020 Printed: 12/26/2019 11:27

 All Containers Intact:
 Yes
 No
 Samples Preserved Properly:
 Yes
 No

 Samples Received at \_\_\_\_\_oC
 Sample Labels / COC Agree:
 Yes
 No
 Custody Seals Present:
 Yes
 No

 Please forward all acknowledgements of sample receipt, final reports and invoices to data@babcocklabs.com
 No
 No

 NO HARDCOPIES PLEASE.
 Date
 Received By
 Date
 Date

Released By	Date	Received By	Date	0930
Released By	Date	Received/By	Date	Page 2 of 2
			2	2-513-0 546
		Page 12 of 13		2/18/2020 (Rev. 1)

Client: Babcock Laboratories, Inc.

#### Login Number: 16743 List Number: 1 Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

#### Job Number: 570-16743-1

List Source: Eurofins Calscience



Analytical Report: Page 1 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number:C0B2047Received on Ice (Y/N):YesTemp: 7 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
C0B2047-01	CL07	Liquid	02/18/20 10:25	Kate Buckley	02/18/20 14:57	Courier (Victor Diaz)-DE
C0B2047-02	CL08	Liquid	02/18/20 9:45	Kate Buckley	02/18/20 14:57	Courier (Victor Diaz)-DE
C0B2047-03	CL09	Liquid	02/18/20 8:55	Kate Buckley	02/18/20 14:57	Courier (Victor Diaz)-DE
C0B2047-04	CL10	Liquid	02/18/20 8:10	Kate Buckley	02/18/20 14:57	Courier (Victor Diaz)-DE
C0B2047-05	LE02	Liquid	02/18/20 8:45	Kate Buckley	02/18/20 14:57	Courier (Victor Diaz)-DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N): Yes Temp: 7 °C

#### Laboratory Reference Number C0B2047-01

Sample Description CL07	<u>Ma</u> Liq	<u>itrix</u> juid	<u>San</u> 0	npled Date/Time 2/18/20 10:25	Received Date/Time 02/18/20 14:57			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	02/18/20 18:38	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	02/18/20 18:38	ATR	
Solids								
Total Dissolved Solids	390	10	10	mg/L	SM 2540C	02/21/20 13:35	KAA	
Total Suspended Solids	6	2	2	mg/L	SM 2540D	02/19/20 11:00	DSS	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	02/19/20 13:45	DSS	
Nutrients								
Ammonia-Nitrogen	0.25	0.10	0.044	mg/L	SM4500NH3H G	02/24/20 11:56	AJH	
Kjeldahl Nitrogen	0.93	0.10	0.093	mg/L	EPA 351.2	02/20/20 09:19	SLL	
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	02/19/20 14:27	ATR	
Metals and Metalloids								
Aluminum-Dissolved	ND	200	33	ug/L	EPA 200.7	02/20/20 19:43	KRV	N_pFilt
Aluminum	68	100	33	ug/L	EPA 200.7	02/20/20 23:39	KRV .	J

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N): Yes Temp: 7 °C

## Laboratory Reference Number

### C0B2047-02

Sample Description CL08	<u>Ma</u> Liq	<u>itrix</u> uid	<u>Sar</u> 0	npled Date/Time 2/18/20 09:45	Received Date/Time 02/18/20 14:57			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	02/18/20 19:16	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	02/18/20 19:16	ATR	
Solids								
Total Dissolved Solids	390	10	10	mg/L	SM 2540C	02/21/20 13:35	KAA	
Total Suspended Solids	8	2	2	mg/L	SM 2540D	02/19/20 11:00	DSS	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	02/19/20 13:45	DSS	
Nutrients								
Ammonia-Nitrogen	0.14	0.10	0.044	mg/L	SM4500NH3H G	02/24/20 11:58	AJH	
Kjeldahl Nitrogen	1.1	0.10	0.093	mg/L	EPA 351.2	02/20/20 09:20	SLL	
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	02/19/20 15:10	ATR	
Metals and Metalloids								
Aluminum-Dissolved	ND	200	33	ug/L	EPA 200.7	02/20/20 19:45	KRV	N_pFilt
Aluminum	71	100	33	ug/L	EPA 200.7	02/24/20 18:34	KRV	J

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N): Yes Temp: 7 °C

## Laboratory Reference Number

C0B2047-03

Sample Description CL09		<u>Ma</u> Liq	<u>itrix</u> uid	<u>Sar</u> 0	npled Date/Time 2/18/20 08:55	Received Date/Time 02/18/20 14:57			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	02/18/20 19:32	ATR		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	02/18/20 19:32	ATR		
Solids									
Total Dissolved Solids	510	10	10	mg/L	SM 2540C	02/21/20 13:35	KAA		
Total Suspended Solids	5	2	2	mg/L	SM 2540D	02/19/20 11:00	DSS		
General Inorganics									
Sulfide	1.3	0.10	0.10	mg/L	SM 4500S2 D	02/19/20 13:45	DSS		
Nutrients									
Ammonia-Nitrogen	0.86	0.10	0.044	mg/L	SM4500NH3H G	02/24/20 12:04	AJH		
Kjeldahl Nitrogen	0.86	0.10	0.093	mg/L	EPA 351.2	02/20/20 09:22	SLL		
Ortho Phosphate Phosphorus	0.19	0.050	0.050	mg/L	EPA 300.0	02/19/20 15:25	ATR		
Metals and Metalloids									
Aluminum-Dissolved	ND	200	33	ug/L	EPA 200.7	02/20/20 19:47	KRV	N_pFilt	
Aluminum	ND	100	33	ug/L	EPA 200.7	02/25/20 21:44	KRV		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 5 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N): Yes Temp: 7 °C

## Laboratory Reference Number

#### C0B2047-04

Sample Description CL10		<u>Ma</u> Liq	<u>itrix</u> uid	<u>Sar</u> 0	npled Date/Time 2/18/20 08:10	Received Date/Time 02/18/20 14:57			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	02/18/20 19:45	ATR		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	02/18/20 19:45	ATR		
Solids									
Total Dissolved Solids	510	10	10	mg/L	SM 2540C	02/21/20 13:35	KAA		
Total Suspended Solids	10	2	2	mg/L	SM 2540D	02/19/20 11:00	DSS		
General Inorganics									
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	02/19/20 13:45	DSS		
Nutrients									
Ammonia-Nitrogen	0.067	0.10	0.044	mg/L	SM4500NH3H G	02/24/20 12:05	AJH	J	
Kjeldahl Nitrogen	1.4	0.10	0.093	mg/L	EPA 351.2	02/20/20 09:23	SLL		
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	02/19/20 15:39	ATR		
Metals and Metalloids									
Aluminum-Dissolved	ND	200	33	ug/L	EPA 200.7	02/20/20 19:49	KRV	N_pFilt	
Aluminum	71	100	33	ug/L	EPA 200.7	02/25/20 21:46	KRV	J	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number:C0B2047Received on Ice (Y/N):Yes

Temp: 7 °C

## Laboratory Reference Number

#### C0B2047-05

Sample Description LE02	<u>M</u> Li	<u>atrix</u> quid	<u>San</u> 0	npled Date/Time 2/18/20 08:45	Received Date/Time 02/18/20 14:57			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	0.23	0.20	0.16	mg/L	EPA 300.0	02/18/20 19:58	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	02/18/20 19:58	ATR	
Solids								
Total Dissolved Solids	2100	40	40	mg/L	SM 2540C	02/21/20 13:35	KAA	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	02/19/20 13:45	DSS	
Nutrients								
Ammonia-Nitrogen	0.073	0.10	0.044	mg/L	SM4500NH3H G	02/24/20 12:07	AJH J	
Kjeldahl Nitrogen	0.97	0.10	0.093	mg/L	EPA 351.2	02/20/20 09:27	SLL	
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	02/19/20 15:54	ATR	

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 7 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on I	lce (Y/N):	Yes	Temp:	7	°C

#### **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0B18133 - Analyzed as Re	eceived IC										
Blank (0B18133-BLK1)				F	Prepared	& Analyze	d: 02/18/2	0			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (0B18133-BS1)				F	Prepared	& Analyze	d: 02/18/2	0			
Nitrite as N	2.32	0.10	0.091	mg/L	2.50		93.0	90-110			
Nitrate as N	5.47	0.20	0.16	mg/L	5.65		96.8	90-110			
Matrix Spike (0B18133-MS1)		Source	: C0B1956-0 <sup>-</sup>	1 F	Prepared	& Analyze	d: 02/18/2	0			
Nitrite as N	2.31	0.10	0.091	mg/L	2.50	0.118	87.8	80-120			
Nitrate as N	6.60	0.20	0.16	mg/L	5.65	0.934	100	75-131			
Matrix Spike (0B18133-MS2)		Source	: C0B2052-04	4 F	Prepared	& Analyze	d: 02/18/2	0			
Nitrite as N	1.23	0.10	0.091	mg/L	2.50	ND	49.4	80-120			QFpas, QMout
Nitrate as N	5.88	0.20	0.16	mg/L	5.65	0.289	99.0	75-131			
Matrix Spike Dup (0B18133-MSD1)		Source	: C0B1956-0 <sup>-</sup>	<b>1</b> F	Prepared	& Analyze	d: 02/18/2	0			
Nitrite as N	2.38	0.10	0.091	mg/L	2.50	0.118	90.7	80-120	3.09	20	
Nitrate as N	6.74	0.20	0.16	mg/L	5.65	0.934	103	75-131	1.97	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 8 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N):	Yes	Temp:	7	°C

#### **Solids - Batch Quality Control**

					Snike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0B19088 - Analyzed as re	eceived										
Blank (0B19088-BLK1)					Prepared	& Analyze	d: 02/19/2	0			
Total Suspended Solids	ND	0.5	0.5	mg/L							
Duplicate (0B19088-DUP1)		Source:	C0B1972-03	3	Prepared	& Analyze	d: 02/19/2	0			
Total Suspended Solids	144	10	10	mg/L		162			11.8	25	
Duplicate (0B19088-DUP2)		Source:	C0B2004-0	5	Prepared	& Analyze	d: 02/19/2	0			
Total Suspended Solids	468	20	20	mg/L		580			21.4	25	
Batch 0B21045 - Analyzed as re	eceived										
Blank (0B21045-BLK1)					Prepared	& Analyze	d: 02/21/2	0			
Total Dissolved Solids	ND	10	10	mg/L							
Duplicate (0B21045-DUP1)		Source:	C0B1992-0 <sup>2</sup>	1	Prepared	& Analyze	d: 02/21/2	0			
Total Dissolved Solids	528	10	10	mg/L		548			3.72	20	
Duplicate (0B21045-DUP2)		Source:	C0B2042-02	2	Prepared	& Analyze	d: 02/21/2	0			
Total Dissolved Solids	601	10	10	mg/L		593			1.34	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 9 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N): Yes Temp: 7	°C
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#### **General Inorganics - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0B19123 - Analyzed as re	ceived										
Blank (0B19123-BLK1)					Prepared	& Analyze	d: 02/19/2	0			
Sulfide	ND	0.10	0.10	mg/L							
LCS (0B19123-BS1)		Prepared & Analyzed: 02/19/20									
Sulfide	0.300	0.10	0.10	mg/L	0.400		75.0	50-150			
Matrix Spike (0B19123-MS1)		Source:	C0B2171-0 <sup>2</sup>	1	Prepared	& Analyze	d: 02/19/2	0			
Sulfide	0.300	0.10	0.10	mg/L	0.400	ND	75.0	50-150			
Matrix Spike Dup (0B19123-MSD1)		Source:	C0B2171-0	1	Prepared	& Analyze	d: 02/19/2	0			
Sulfide	0.300	0.10	0.10	mg/L	0.400	ND	75.0	50-150	0.00	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Received on Ice (Y/N):	Yes	Temp:	7	°C
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#### **Nutrients - Batch Quality Control**

Analyte(s)	Result	וחפ		Unite	Spike Level	Source Result	%REC	%REC	RPD	RPD Limit	Flag
Analyte(s)	Result	RDL		Units	Level	result	/iiteo	Linito		Linin	Tidg
Batch 0B19121 - Analyzed as Re	eceived IC										
Blank (0B19121-BLK1)				F	Prepared	& Analyze	ed: 02/19/2	20			
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L							
LCS (0B19121-BS1)				F	Prepared	& Analyze	ed: 02/19/2	20			
Ortho Phosphate Phosphorus	0.304	0.050	0.050	mg/L	0.300		101	90-110			
Matrix Spike (0B19121-MS1)		Source	: C0B2047-0	1 F	Prepared	& Analyze	ed: 02/19/2	20			
Ortho Phosphate Phosphorus	0.336	0.050	0.050	mg/L	0.300	ND	112	80-120			
Matrix Spike Dup (0B19121-MSD1)		Source	: C0B2047-0	1 F	Prepared	& Analyze	ed: 02/19/2	20			
Ortho Phosphate Phosphorus	0.367	0.050	0.050	mg/L	0.300	ND	122	80-120	9.02	20	QMS(D)
Batch 0B19127 - Acid Digest											
Blank (0B19127-BLK1)				F	Prepared	: 02/19/20	Analyzed	: 02/20/20			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (0B19127-BS1)				F	Prepared	: 02/19/20	Analyzed	: 02/20/20			
Kjeldahl Nitrogen	0.839	0.10	0.093	mg/L	1.00		83.9	80-120			
Matrix Spike (0B19127-MS1)		Source	: C0B2124-1	<b>0</b> F	Prepared	: 02/19/20	Analyzed	: 02/20/20			
Kjeldahl Nitrogen	116	8.0	7.4	mg/L	80.0	57.7	72.6	42-154			
Matrix Spike Dup (0B19127-MSD1)		Source	: C0B2124-1	<b>0</b> F	Prepared	: 02/19/20	Analyzed	: 02/20/20			
Kjeldahl Nitrogen	111	8.0	7.4	mg/L	80.0	57.7	66.5	42-154	4.31	25	
Batch 0B24081 - Analyzed as re	ceived										
Blank (0B24081-BLK1)				F	Prepared	& Analyze	ed: 02/24/2	20			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 11 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Orde	r Number:	C0B2047
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Received on Ice (Y/N):	Yes	Temp:	7 °C
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#### **Nutrients - Batch Quality Control**

	<b>D</b> "				Spike	Source		%REC	חחח	RPD Limit	
Analyte(s)	Result	RDL	U	Inits	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0B24081 - Analyzed as received											
LCS (0B24081-BS1)				F	repared	& Analyze	d: 02/24/2	0			
Ammonia-Nitrogen	1.02	0.10	0.044	mg/L	1.00		102	90-110			
Matrix Spike (0B24081-MS1)		Source:	C0B2129-03	F	repared	& Analyze	d: 02/24/2	0			
Ammonia-Nitrogen	1.11	0.10	0.044	mg/L	1.00	ND	111	80-120			
Matrix Spike Dup (0B24081-MSD1)		Source	C0B2129-03	F	repared	& Analyze	d: 02/24/2	0			
Ammonia-Nitrogen	1.02	0.10	0.044	mg/L	1.00	ND	102	80-120	8.32	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 12 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number: C0B2047

	Received on Ice (Y/N):	Yes	Temp:	7	°C
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#### Metals and Metalloids - Batch Quality Control

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0B20041 - EPA 200.2											
Blank (0B20041-BLK1)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum	ND	100	16	ug/L							
LCS (0B20041-BS1)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum	1120	100	16	ug/L	1170		96.2	85-115			
Matrix Spike (0B20041-MS1)		Source:	C0B1669-0	<b>1</b> F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum	1270	2000	330	ug/L	1170	ND	NR	70-130			J
Matrix Spike Dup (0B20041-MSD1)		Source:	C0B1669-0	1	Prepared	& Analyze	d: 02/20/2	0			
Aluminum	1230	2000	330	ug/L	1170	ND	NR	70-130	3.28	20	J
Batch 0B20070 - 200.7/ No Dige	est										
Blank (0B20070-BLK1)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	45.2	100	16	ug/L							QBfil, J
Blank (0B20070-BLK2)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (0B20070-BLK3)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							
LCS (0B20070-BS1)				F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	319	100	16	ug/L	334		95.5	85-115			
Matrix Spike (0B20070-MS1)		Source:	C0B2047-0	<b>4</b> [	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	626	200	34	ug/L	668	ND	93.7	70-130			

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 13 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Received on Ice (Y/N):	Yes	Temp:	7	°C
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#### Metals and Metalloids - Batch Quality Control

	Booult	וחפ		Linito	Spike	Source	%REC	%REC	RPD	RPD Limit	Flag
Analyte(s)	Result	RDL		Units	LCVCI	Result	/iiteo	Linita		Linin	Tidg
Batch 0B20070 - 200.7/ No Diges	st										
Matrix Spike Dup (0B20070-MSD1)		Source: (	C0B2047-04	4 F	Prepared	& Analyze	d: 02/20/2	0			
Aluminum-Dissolved	630	200	34	ug/L	668	ND	94.3	70-130	0.629	20	
Batch 0B24110 - EPA 200.2											
Blank (0B24110-BLK1)				F	Prepared	& Analyze	d: 02/24/2	0			
Aluminum	ND	100	16	ug/L							
LCS (0B24110-BS1)				F	Prepared	& Analyze	d: 02/24/2	0			
Aluminum	1100	100	16	ug/L	1170		94.3	85-115			
Matrix Spike (0B24110-MS1)		Source: (	C0B2606-0 <sup>-</sup>	1 F	Prepared	& Analyze	d: 02/24/2	0			
Aluminum	1180	200	33	ug/L	1170	47.3	97.1	70-130			
Matrix Spike Dup (0B24110-MSD1)		Source: (	C0B2606-0 <sup>-</sup>	1 F	Prepared	& Analyze	d: 02/24/2	0			
Aluminum	1160	200	33	ug/L	1170	47.3	95.7	70-130	1.40	20	
Batch 0B25069 - EPA 200.2											
Blank (0B25069-BLK1)				F	Prepared	& Analyze	d: 02/25/2	0			
Aluminum	ND	100	16	ug/L							
LCS (0B25069-BS1)				F	Prepared	& Analyze	d: 02/25/2	0			
Aluminum	1120	100	16	ug/L	1170		96.4	85-115			
Matrix Spike (0B25069-MS1)		Source: (	C0B2216-0	<b>2</b> F	Prepared	& Analyze	d: 02/25/2	0			
Aluminum	1150	500	82	ug/L	1170	ND	98.3	70-130			

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In	Analytical Report:	Page 14 of 16
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsir
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL Monitoring
	San Diego, CA 92123		
		Work Order Number:	C0B2047

Report Date: 03-Mar-2020

Work Order Number:	C0B2047			
Received on Ice (Y/N):	Yes	Temp:	7	°C

Metals and	Metalloids -	Batch	Quality	Control
motalo ana	motanoiao	Baton	quanty	00111101

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 0B25069 - EPA 200.2										
Matrix Spike Dup (0B25069-MSD1)	Matrix Spike Dup (0B25069-MSD1) Source: C0B2216-02									
Aluminum	1120	500 8	32 ug/	L 1170	ND	96.1	70-130	2.18	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 15 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Report Date: 03-Mar-2020

Work Order Number:C0B2047Received on Ice (Y/N):YesTemp:7 °C

#### **Notes and Definitions**

Estimated value
Estimated value

- N\_pFilt Sample filtered and preserved upon receipt to the laboratory.
- QBfil Method blank was filtered prior to processing.
- QFpas Follow-up result within laboratory acceptance criteria.
- QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.
- QMS(D) Matrix spike recovery was out of acceptance criteria. Precision and accuracy demonstrated by remaining matrix spike results.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit

\* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Standard No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Analytical Report: Page 16 of 16 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL Monitoring

Yes

Report Date: 03-Mar-2020

Work Order Number: C0B2047

Received on Ice (Y/N):

Temp: 7 °C

## E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662

Chain of Custody & Sample Information Record

www.babcoc	cklabs.com	
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Client: Wood E&I Solutions Inc.				Con	taat		h. r			\$													
				COIL	lac		nn F	Ruad	oipn					-								Phone No.	858-243-8158
FAX No.				Ema	il:	j	ohn.	rudo	lph@	Dwo	odpl	lc.cc	om										Additional Reporting Requests
Project Name: LECL TMDL Monito	ring			Turr	Ar	ound	d Tir	me:			R	outi	ine		*3_1	5 Da	v	*4	8 11			*24 Hour	Include QC Data Package: Ves No FAX Results: Yes No
Project Number: 1915100402	с. с			lah	гат	Ann	oval								R	lush	3	4	Rus	sh		Rush	Email Results: Ves No State EDT: Ves No
Somploy Information				Lab	# 0	of Co	ntai	ners		T	ву:	Sar	mple								*Ac	Iditional Charges May Apply	(Include Source Number in Notes)
Sampler Information					&	Pres	erva	tives	3		s	Ту	ype		A	naly	sis	Rec	ues	ted		Matrix	Notes
Name: Late Bur	w	F	-								ainer											DW = Drinking Water	No lab filtration required for Ortho-P (field filtered)
Employer: Wood E&I Solutions	, Inc.				1		ate				onte							rus				WW = Wastewater	Total Phosphorus - Sub to Eurofins Calscience. RUSH TAT
Signature: Malon	4.0	/	-	ved			Aceta				of O	. 4	le		litrite			spho	4		AL	S = Soil	Dissolved At is not find the
	n j		· · ·	resei 04	5	\$203	H/Zn	5	e u		# le	itine	cial		te - N		onia	Pho:	Ortho	AL	lved	SG = Sludge	Dissolved Al IS not field filtered
Sample ID	Da	ate	Time	Unp H2S	HUN	Na2	NaO	NH4	Froz		Tot	Rot	Spe	SS	Vitra	S NA	mm	otal	RP/(	otal	isso	L = Liquid	
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CL09			080			$\square$	1				-	-	+	Â	^		X	X	x )		X		
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mailing P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0
	San Diego, CA, 92123	Work Order Number:	C0B2113
Report Date:	13-Apr-2020	Received on Ice (Y/N	Yes Temp: 7 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Common Internetification

Sample Menulcation													
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By							
C0B2113-01	CL07-Int	Solid	2/18/20 10:25	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-02	CL07-Surf	Solid	2/18/20 10:35	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-03	CL08-Int	Solid	2/18/20 9:45	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-04	CL08-Surf	Solid	2/18/20 9:55	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-05	CL09-Int	Solid	2/18/20 8:55	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-06	CL09-Surf	Solid	2/18/20 9:00	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-07	CL10-Int	Solid	2/18/20 8:10	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-08	CL10-Surf	Solid	2/18/20 8:15	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-09	LE02-Int	Solid	2/18/20 8:45	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							
C0B2113-10	LE02-Surf	Solid	2/18/20 9:30	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE							

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

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Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 2 of 2
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0
	San Diego, CA, 92123	Work Order Number:	C0B2113
Report Date:	13-Apr-2020	Received on Ice (Y/N	Yes Temp: 7 °C

Included in this Data Package please find an amended report for the work order referenced below. Work Order: C0B2113

**Reason for Amendment:** 

This work order was amended to appropriately split data into the correct project numbers. This report supersedes the report issued on 07-Apr-2020.

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

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Client Name: Contact: Address:	Wood Environment&Infrastructure Sc John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: <b>Work Order Number:</b>	Page 1 of 2 Amec Foster Wheeler-Lake LECL TMDL 1915100402.0 <b>C0B2113</b>
Report Date:	13-Apr-2020	Received on Ice (Y/N	Yes Temp: 7 °C

Slient: Wood E&I Solutions, Inc	o.		Co	onta	ct: J	ohn	Ru	dolph	1				_						Phone No.	858-243-8158
AX No.			En	nail		ohn	.rud	lolph(	awo	abo	lc.co	om		1				1		Additional Reporting Requests
Project Name: LECL TMDL Mor	nitorina		-			nd T	im			Do		Contraction of the local division of the loc			2		0.11-		12/11	FAX Results: Tyes T
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Project Number: 1915100402			"La	ib T.	AT Ap	ont	val: aine	rs	-1	By:	Sam	nle	_			_	_	*Ac	dditional Charges May Apply	(Include Source Number in Notes)
Sampler Informati	ion		-	-	& Pre	ser	ativ	es	_	0	Typ	pe	A	naly	sis	Requ	ieste	d	Matrix	Notes
Name: Kate BUC Employer: Wood E&I Soluti Signature: Kaded	pley ons, Inc. Suckle	y	preserved	S04	03 25203	НО	0H/ZnAcetate 4CI	AA		otal # of Containe	outine esample	secial	al Sulfide	S	z	monia al Phosphorus	P/Ortho-P orophyll-a		DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Sludge L = Liquid	SUOUUT Chi-a samples on 0.7 um GFF
Sample ID	Date	Tim	5	HOH	HN	Na	NHN	N		P (	X X	SF	Tot	10L	TKI	Tot	SRI		M = Miscellaneous	
CL07 - Int	2/18/2	102	2	+						_			-	1			x			Filter Volume: 500 mL
CL07 - Surf		1034	-	_			-		$\square$	_	_						x			Filter Volume: 450 ML
CL08 - Int		694	2	_					$\square$								x		2 <sup>18</sup>	Filter Volume: 385ML
CL08 - Surf	-	095	2	-	-		-		$\square$								x			Filter Volume: 500mL
CL09 - Int		085	,	1													x			Filter Volume: 500 mL
CL09 - Surf		0900	2							-							x			Filter Volume: 500 ML
CL10 - Int		0810					_			_							x			Filter Volume: 385mL
CL10 - Surf		0815	5						-								x			Filter Volume: 435mL
LE02 - Int		084	5														x			Filter Volume: 300 mL
LE02 - Surf	V	093	0														x			Filter Volume: 250ml
Relinquished By (sign)	Print Na	ime / Co	mpan	у			Date	e / Tin	ne			Re	cei	ved	By (	Sign	1)		Pri	nt Name / Company
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#### Page 1 of 2



ALS – Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

## Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 2080409 Printed: 03/03/2020

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
C0B2113-01	20B0409-01	Fi <b>l</b> ter		02/18/2020 10:25	02/21/2020 09:35
C0B2113-02	20B0409-02	Filter		02/18/2020 10:35	02/21/2020 09:35
C0B2113-03	20B0409-03	Filter		02/18/2020 09:45	02/21/2020 09:35
C0B2113-04	20B0409-04	Filter		02/18/2020 09:55	02/21/2020 09:35
C0B2113-05	20B0409-05	Filter		02/18/2020 08:55	02/21/2020 09:35
C0B2113-06	20B0409-06	Filter		02/18/2020 09:00	02/21/2020 09:35
C0B2113-07	20B0409-07	Filter		02/18/2020 08:10	02/21/2020 09:35
C0B2113-08	20B0409-08	Filter		02/18/2020 08:15	02/21/2020 09:35
C0B2113-09	20B0409-09	Filter		02/18/2020 08:45	02/21/2020 09:35
C0B2113-10	20B0409-10	Filter		02/18/2020 09:30	02/21/2020 09:35

#### DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

her

Aldo B. Minano Project Manager

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Labora	tories, Inc.		Project Name:		Chlorophyll	I		Printed: 03/	′03/2020
			C0B2113-0	)1					
			20B0409-01 (I	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	ail					
Microbiology									
Chlorophyll a	17.5	1.00	1.00 mg/m <sup>3</sup>	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200	Η
			C0B2113-0	)2					
			20B0409-02 (I	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	ail					
Microbiology									
Chlorophyll a	40.6	1.00	1.00 mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200	Н
			C0B2113-0	)3					
			20B0409-03 (I	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	ail					
Microbiology									
Chlorophyll a	25.3	1.00	1.00 mg/m <sup>3</sup>	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200	Н
			C0B2113-0	)4					
			20B0409-04 (I	Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS Truesd	ail					
Microbiology									
Chlorophyll a	30.7	1.00	1.00 mg/m <sup>3</sup>	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200	Н
			C0B2113-0	)5					
			20B0409-05 (I	- Filter)					
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			AISTruesd	ail					

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Laborat	ories, Inc.		Project	: Name:		Chlorophyl	I		Printed: 03/0	3/2020
		(	C0B2113	-05 (Cor	ntinue	ed)				
		20B	0409-05	(Filter) (	(Conti	nued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	13.2	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	
			C0	B2113-0	6					
			20B04	09-06 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	9.58	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	
			C0	B2113-0	)7					
			20B04	09-07 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	16.7	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	
			C0	B2113-0	8					
			20B04	09-08 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microhiology										
Chlorophyll a	17.1	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	
			C0	B2113-0	9					
			20B04	09-09 (F	ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Laboratories, Inc.

									Printed: 03/0	3/2020
		(	COB2113	8-09 (Co	ntinue	ed)				
		2080	0409-09	(Filter)	(Conti	nued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	56.8	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	
			CO	B2113-1	0					
			20B04	109-10 (I	-ilter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	77.6	1.00	1.00	mg/m³	1	2002465	03/03/2020 13	3:28 EGV	EPA 10200 H	

Project Name:

Chlorophyll

SUBCONTRACT ORDER Babcock Laboratories, Inc. C0B2113 Printed: 2/19/2020 12:32

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х. Х	Ref: Dep:	Date: 20Feb20 Wgt: 6.00 LBS		SHIPPING: SPECIAL:	16.56 0.91		
		DV:	0.00	TOTAL	17.47		
	a.	Svcs: PRIORITY OVERNIGHT TRCK: 1520 2088 0229					
0	and the second	All Containers Intact:	Yes	No	Samples Preserved Properly: _	Yes	No
amples Received a	t <u> </u>	Sample Labels / COC Agree: _	Yes	No	Custody Seals Present: _	Yes	No
ease forward all	acknowledgem	ents of sample receipt, final repo	orts and i	invoides to	data@babcocklabs.com		
HARDCOPIE	S PLEASE.	7.70.7020 M	WOIDM	1 della	nun onman	0:24	-
eleased By	STOOL	Date Date	Received B	y with	Date Date	4.5	) Por

# 2080409

#### SUBCONTRACT ORDER

Printed: 2/19/2020 12:32

1

#### Babcock Laboratories, Inc.

#### C0B2113

Analysis	E Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0B2113-07 Solid		Sampled: 02/18/20 08:10	CL10-Int	v	Proj.No.:LECL TMDL 1915100402
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	02/28/20 23:59	02/28/20 08:10	Report Chlorophyll a	a / Filter Volume = 385	ōmL
Sample ID: C0B2113-08 Solid		Sampled: 02/18/20 08:15	CL10-Surf		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 08:15	Report Chlorophyll a	a / Filter Volume = 435	mL
Śample ID: C0B2113-09 Solid		Sampled: 02/18/20 08:45	LE02-Int		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 08:45	Report Chlorophyll a	a / Filter Volume = 300	ImL
Sample ID: C0B2113-10 Solid		Sampled: 02/18/20 09:30	LE02-Surf		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 09:30	Report Chlorophyll a	/ Filter Volume = 250	mL, *

Page 2 of 3

Printed: 2/19/2020 12:32

\$

SUBCONTRACT ORDER Babcock Laboratories, Inc.

#### C0B2113

#### SENDING LABORATORY:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Waddell

#### **RECEIVING LABORATORY:**

Truesdail Laboratories - Subcontract 3337 Michelson Drive Suite CN750 Irvine, CA 92614 Phone :(714) 730-6239 Fax: (714) 730-6462

Copy/Relog from B9L3018. System Name: Wood Environmental&Infrastructure Solutions, Inc Sampler: Kate Buckley

Please include MDLs and EXCEL EDD

Analysis	E Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Şample ID: C0B2113-01 Solid	*	Sampled: 02/18/20 10:25	CL07-Int		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 10:25	Report Chlorophy	rll a / Filter Volume = 500	0mL
Sample ID: C0B2113-02 Solid		Sampled: 02/18/20 10:35	CL07-Surf		Proj.No.: <u>LECL TMDL</u> 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 10:35	Report Chlorophy	/ll a / Filter Volume = 450	OmL
Sample ID: C0B2113-03 Solid		Sampled: 02/18/20 09:45	CL08-Int	4 . 5	Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 09:45	Report Chlorophy	ll a / Filter Volume = 38	5mL
Sample ID: C0B2113-04 Solid		Sampled: 02/18/20 09:55	CL08-Surf		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 09:55	Report Chlorophy	rll a / Filter Volume = 500	DmL
Sample ID: C0B2113-05 Solid		Sampled: 02/18/20 08:55	CL09-Int		Proj.No.: <u>LECL TMDL</u> 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 08:55	Report Chlorophy	ll a / Filter Volume = 500	)mL
Sample ID: C0B2113-06 Solid	E.	Sampled: 02/18/20 09:00	CL09-Surf		Proj.No.:LECL TMDL 1915100402
Subout Containers Supplied: Whirl-Pak (A)	02/28/20 23:59	02/28/20 09:00	Report Chlorophy	ll a / Filter Volume = 500	)mL



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 1
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0
	San Diego, CA, 92123	Work Order Number:	C0B2114
Report Date:	26-Feb-2020	Received on Ice (Y/N	Yes Temp: 7 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

		Sample Ide	entification			
Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
C0B2114-01	CL07	Liquid	2/18/20 10:25	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE
C0B2114-02	CL08	Liquid	2/18/20 9:45	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE
C0B2114-03	CL09	Liquid	2/18/20 8:55	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE
C0B2114-04	CL10	Liquid	2/18/20 8:10	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE
C0B2114-05	LE02	Liquid	2/18/20 8:45	Kate Buckley	2/18/20 14:57	Courier (Victor Diaz)-DE

Note: Requested Low Level Total Phosphorus analysis was subcontracted to Eurofins CalScience.

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is not in writing. There is no other warranty expressed or implied.

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Client Name:	Wood Environment&I	nfrastructure Sc	Analy	tical Report:	Page 1 of 1	
Contact:	John Rudolph		P	roject Name:	Amec Foster Wheeler-La	ake
Address:	9210 Sky Park Court	#200	Proj	ject Number:	LECL TMDL 1915100402	2.0
	San Diego, CA, 9212	3	Work Orc	ler Number:	C0B2114	
Report Date:	26-Feb-2020		Received	d on Ice (Y/N	Yes Temp: 7 °C	2
E.S. (951) www.	Babcock & Sons, Inc. En 653-3351 FAX (951) 653-1662 babcocklabs.com	vironmental Laboratories	Chain of Custo	dy & Sample I	nformation Record	
Client: Wo	ood E&I Solutions, Inc.	Contact: John Rudolph	E.	Phone No.	858-243-8158	
FAX No.		Email: john.rudolph@woodplc.com			Additional Reporting Requests	
Project Name:	LECL TMDL Monitoring	Turn Around Time: <u>Routine</u>	*3-5 Day *48 Hour	*24 Hour	FAX Results: Yes No Email Results: Yes No	

Project Name: LECL TMDL Monitoring Project Number: 1915100402			Turn Around Time:					Ri By:	outin	ne	e *3-5 Day *48 Hour Rush Rush						r	*24 Hour Rush Additional Charges May Apply	FAX Results;Yes Email Results;Yes State EDT;Yes (Include Source Number in Notes)	
Sampler Info	rmation		& Preservatives						Sample Type Analysis Requested					equ	este	d	Matrix	Notes		
Name: Kate Employer: <u>Wood E&amp;I S</u> Signature: Kase Samula ID	Bulling Solutions, Inc. Bully		npreserved 2SO4	NO3	aOH	aOH/ZnAcetate	CAA	ozen	otal # of Containers	Coutine	pecial	S	urate - Nitrite	N	Imonia Al Dhomborio	P/Ortho-P	tal Sulfide	tal AL	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Sludge L = Liquid	No lab filtration required for Ortho-P (field filtered) Total Phosphorus - Sub to Eurofins Calscience. RUSH TAT Dissolved AI is not field filtered
CL07	2/19/	Din16	DII	E I Z	z	22	2	ũ.	4	u u	50	1	ΣH	÷.	AL	SF	4	P C	M = Miscellaneous	
CL08		0945		+		+				+	-	X	XX	X	XX	XX	X	x>		
CL09		020		++		+				+	+	XX	XX	X	X)	XX	X	x>		
CL10		0810		++	+	+	+			+	+	XX	x x	X	x>	< X	x	XX		
1 502		inqui		++	+	+			$\vdash$	+	Η	X	x	x	XX	( X	x	XX		
5			-						_							-				
									1	1								-		
Relinquished By (sign)	Print Nar	ne / Com	pany		1	Date	/ Ti	me			F	Rece	lve	d By	/ (Si	ign)			Prin	t Name / Company
14 9/li VA-Q	Metar Viletar	D/ 5	nd DIG	2	fiste liv/	2020	υ	14 <u>%</u> 14!5	7	Alt	1000	文をし	X	t	-	_			Victor D BROCK Apo	OF, ork (ESB
For Lab Use Only) Sampl Sample(s) Submitted Custody Seal(s	le Integrity Upon d on Ice? Yes a) Intact? Yes	Receipt No No	N/A	Ţ¢	5#	Ter	2 npe	ratur	re °C				Lab	Not	es			*	C0B21 Rc'd: 02/18/20	14 See

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 1 of 1



# Calscience

## **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

#### Laboratory Job ID: 570-21457-1 Client Project/Site: C0B2114

#### For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 2/26/2020 8:22:37 AM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.
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Sample Summary	10
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# **Definitions/Glossary**

### Client: Babcock Laboratories, Inc. Project/Site: C0B2114

Glossary Abbreviation

¤ %R

CFL

CNF

DER

DL

DLC

EDL

LOD

LOQ

MDA

MDC MDL

ML NC

ND

Dil Fac

DL, RA, RE, IN

32114	
	3
These commonly used abbreviations may or may not be present in this report.	
Listed under the "D" column to designate that the result is reported on a dry weight basis	
Percent Recovery	
Contains Free Liquid	5
Contains No Free Liquid	J
Duplicate Error Ratio (normalized absolute difference)	
Dilution Factor	
Detection Limit (DoD/DOE)	
Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
Decision Level Concentration (Radiochemistry)	
Estimated Detection Limit (Dioxin)	ð
Limit of Detection (DoD/DOE)	
Limit of Quantitation (DoD/DOE)	9
Minimum Detectable Activity (Radiochemistry)	
Minimum Detectable Concentration (Radiochemistry)	
Method Detection Limit	
Minimum Level (Dioxin)	
Not Calculated	
Not Detected at the reporting limit (or MDL or EDL if shown)	

- PQL Practical Quantitation Limit QC Quality Control Relative Error Ratio (Radiochemistry) RER RL Reporting Limit or Requested Limit (Radiochemistry)
- Relative Percent Difference, a measure of the relative difference between two points RPD

- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

# Job ID: 570-21457-1

### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-21457-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The samples were received on 2/21/2020 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8° C.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

5

**General Chemistry** 

Client Sample ID: C0B2114-01							Lab S	Sample ID: 570-	21457-1
Date Conected: 02/10/20 10:25								Wath	A. Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0641		0.0100	0.00281	mg/L		02/25/20 10:40	02/25/20 14:56	1
Client Sample ID: C0B2114-02							Labs	Sample ID: 570-	21457-2
Date Collected: 02/18/20 09:45								Matrix	k: Water
Date Received: 02/21/20 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0564		0.0100	0.00281	mg/L		02/25/20 10:40	02/25/20 14:57	1
Client Sample ID: C0B2114-03							Lab S	Sample ID: 570-	21457-3
Date Collected: 02/18/20 08:55								Matrix	k: Water
Date Received: 02/21/20 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.203		0.0100	0.00281	mg/L		02/25/20 10:40	02/25/20 14:59	1
Client Sample ID: C0B2114-04							Lab S	Sample ID: 570-	21457-4
Date Collected: 02/18/20 08:10								Matrix	k: Water
Date Received: 02/21/20 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0758		0.0100	0.00281	mg/L		02/25/20 10:40	02/25/20 15:00	1
Client Sample ID: C0B2114-05							Lab S	Sample ID: 570-	21457-5
Date Collected: 02/18/20 08:45								Matrix	k: Water
Date Received: 02/21/20 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.182		0.0100	0.00281	mg/L		02/25/20 10:40	02/25/20 15:02	1

# **QC Sample Results**

Job ID: 570-21457-1

5 6

Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-53240/5-A Matrix: Water Analysis Batch: 53279												Client S	ample ID: Prep 1 Prep	Method Type: To Batch:	Blank tal/NA 53240
		MB	МВ												
Analyte	R	esult	Qualifier		RL		MDL	Unit		D	Р	repared	Analy	zed	Dil Fac
Phosphorus, Total		ND			0.0100	0.0	0281	mg/L			02/2	5/20 10:40	02/25/20	14:44	1
Lab Sample ID: LCS 570-53240/6-A										С	lient	Sample	ID: Lab C	ontrol S	ample
Matrix: Water													Prep 1	Type: To	tal/NA
Analysis Batch: 53279													Prep	Batch:	53240
				Spike		LCS	LCS						%Rec.		
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Phosphorus, Total				0.200		0.1970			mg/L			98	90 - 110		
Lab Sample ID: LCSD 570-53240/7-	A								CI	ient	Sam	ple ID: L	.ab Contro	ol Sampl	e Dup
Matrix: Water													Prep 1	ype: To	tal/NA
Analysis Batch: 53279													Prep	Batch:	53240
				Spike		LCSD	LCS	D					%Rec.		RPD
Analyte				Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total				0.200		0.2004			mg/L			100	90 - 110	2	20
												Client	Sample II	D: C0B21	114-01
Matrix: Water													Prep 1	Type: To	tal/NA
Analysis Batch: 53279													Prep	Batch:	53240
-	Sample	Sam	ple	Spike		MS	MS						%Rec.		
Analyte	Result	Qual	ifier	Added		Result	Qua	lifier	Unit		D	%Rec	Limits		
Phosphorus, Total	0.0641			0.200		0.2547			mg/L			95	90 - 110		
- Lab Sample ID: 570-21457-1 MSD												Client	Sample II	D: C0B21	114-01
Matrix: Water													Prep 1	Type: To	tal/NA
Analysis Batch: 53279													Prer	Batch:	53240
-	Sample	Sam	ple	Spike		MSD	MSD	)					«Rec.		RPD
Analyte	Result	Qual	ifier	Added		Result	Qua	lifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.0641			0.200		0.2511			mg/L			94	90 - 110	1	25

Job ID: 570-21457-1

Matrix: Water

Matrix: Water

Lab Sample ID: 570-21457-1

Lab Sample ID: 570-21457-2

### Client Sample ID: C0B2114-01 Date Collected: 02/18/20 10:25

Date	conecteu.	02/10/20	10.25
Date	Received:	02/21/20	10:15

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	53240	02/25/20 10:40	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	53279	02/25/20 14:56	UXCH	ECL 1
	Instrume	nt ID: ACA1								

# Client Sample ID: C0B2114-02

Date	Collected:	02/18/20	09:45
Date	<b>Received:</b>	02/21/20	10:15

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	53240	02/25/20 10:40	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	53279	02/25/20 14:57	UXCH	ECL 1
	Instrume	nt ID: ACA1								

### Client Sample ID: C0B2114-03

#### Date Collected: 02/18/20 08:55 Date Received: 02/21/20 10:15

—	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	53240	02/25/20 10:40	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	53279	02/25/20 14:59	UXCH	ECL 1
	Instrume	nt ID: ACA1								

### Client Sample ID: C0B2114-04

Date Collected: 02/18/20 08:10

### Lab Sample ID: 570-21457-4 Matrix: Water

Lab Sample ID: 570-21457-5

Matrix: Water

Date	Received:	02/21/	20	10:1	15

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	53240	02/25/20 10:40	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	53279	02/25/20 15:00	UXCH	ECL 1
	Instrument	ID: ACA1								

# Client Sample ID: C0B2114-05

# Date Collected: 02/18/20 08:45

Date	Received:	02/21/20	10:15	
_				

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	53240	02/25/20 10:40	UXCH	ECL 1
Total/NA	Analysis	365.1		1	50 mL	50 mL	53279	02/25/20 15:02	UXCH	ECL 1
	Instrume	nt ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

### Lab Sample ID: 570-21457-3 Matrix: Water

Client: Babcock Laboratories, Inc. Project/Site: C0B2114

Job ID: 570-21457-1

# Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State	AZ0781	03-13-20
California	Los Angeles County Sanitation Districts	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Hawaii	State	<cert no.=""></cert>	07-02-20
Nevada	State	CA00111	07-31-20
Oregon	NELAP	CA300001	01-29-21
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-20

**Eurofins Calscience LLC** 

Method	Method Description	Protocol	Laboratory
365.1	Phosphorus, Total	EPA	ECL 1
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1

#### Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

# Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: C0B2114

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset I
570-21457-1	C0B2114-01	Water	02/18/20 10:25	02/21/20 10:15	
570-21457-2	C0B2114-02	Water	02/18/20 09:45	02/21/20 10:15	
570-21457-3	C0B2114-03	Water	02/18/20 08:55	02/21/20 10:15	
570-21457-4	C0B2114-04	Water	02/18/20 08:10	02/21/20 10:15	
570-21457-5	C0B2114-05	Water	02/18/20 08:45	02/21/20 10:15	

**Eurofins Calscience LLC** 

		SUBCONT) Babcock La C0	RACT ORDER boratories, Inc. B2114	Printed: 2/19/2020	12:27
SENDING LABORATORY			RECEIVING LABORAT	ORY:	
Babcock Laboratories, Inc 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A	A. Waddell		Eurofins Calscience, Inc 7440 Lincoln Way Garden Grove, CA 9284 Phone :(714) 895-5494 Fax: (714) 894-7501	1-1427	
System Name: Wood Environ Sampler: Kate Buckley	System Name: Wood Environment & Infrastructure Solutions, Inc Sampler: Kate Buckley			570 21457 Chain 9	f Custody
Please include MDLs and EX PLEASE EXPEDITE	CEL EDD	vnires Regulatory Days		570-27407 01	
Analysis	Due	Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0B2114-01 Liquid		Sampled: 02/18/20 10:25	CL07		Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	02/24/20 23:59	02/28/20 10:25	Low Level Total Phos	phorus	
Sample ID: C0B2114-02 Liquid		Sampled: 02/18/20 09:45	CL08		Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	02/24/20 23:59	02/28/20 09:45	Low Level Total Phos	phorus	
Sample ID: C0B2114-03 Liquid		Sampled: 02/18/20 08:55	CL09		Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	02/24/20 23:59	02/28/20 08:55	Low Level Total Phos	sphorus	
Sample ID: C0B2114-04 Liquid		Sampled: 02/18/20 08:10	CL10		Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	02/24/20 23:59	02/28/20 08:10	Low Level Total Pho	sphorus	
Sample ID: C0B2114-05 Liquid		Sampled: 02/18/20 08:45	LE02		Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	02/24/20 23:59	02/28/20 08:45	Low Level Total Pho	sphorus	

21457

Page 1 of 2

Page 11 of 14

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# 2/26/2020

# SUBCONTRACT ORDER Babcock Laboratories, Inc. C0B2114

21457

Ref: Dep: Sycs:	Date: 20Feb20 Wgt. 11.00 LBS DV: PRIORITY OVERNIGHT TRCK: 1520 2088 0240	0.00	SHIPPING: SPECIAL· HANDLING: FOTAL:	21.17 1.16 0.00 22.33						
		All Cor	ntainers Intact:		Yes	_No	Samples Prese	rved Properly:	_Yes	No
Samples Received	atoC S	Sample Lab	els / COC Agree:		Yes	No	Custody Seals	Present:	_Yes	No
Please forward-all	Vacknowledgement	ts of samp	le receipt, final	reports a	und invoi	ices to <u>d</u>	lata@babcoc	klabs.com		
NO HARDCOPI	ES PLEASE.	2.	70.2020	2	Pre	w	· EC	2/21/20	10	15
Réleased By		Date	-	Receiv	ved By	·		'Date '		
Released By		Date		Recei	ved By			Date		
							z, .	7/2.8	Pai SCA	ge 2 of 2



Client: Babcock Laboratories, Inc.

#### Login Number: 21457 List Number: 1

Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-21457-1

List Source: Eurofins Calscience



Analytical Report: Page 1 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number:C0D1622Received on Ice (Y/N):YesTemp: 1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

### **Sample Identification**

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	<u>By</u>
C0D1622-01	CL07	Liquid	04/13/20 8:40	Client	04/13/20 16:08	Courier (Victor Diaz)-DE
C0D1622-02	CL08	Liquid	04/13/20 9:20	Client	04/13/20 16:08	Courier (Victor Diaz)-DE
C0D1622-03	CL09	Liquid	04/13/20 10:05	Client	04/13/20 16:08	Courier (Victor Diaz)-DE
C0D1622-04	CL10	Liquid	04/13/20 10:45	Client	04/13/20 16:08	Courier (Victor Diaz)-DE
C0D1622-05	LE02	Liquid	04/13/20 8:45	Client	04/13/20 16:08	Courier (Victor Diaz)-DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number: C0D1622

Received on Ice (Y/N): Yes Temp: 1 °C

### Laboratory Reference Number C0D1622-01

Sample Description CL07	<u>Matrix</u> Liquid		Sampled Date/Time 04/13/20 08:40		Received Date/Time 04/13/20 16:08			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	04/14/20 04:28	KBS	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	04/14/20 04:28	KBS	
Solids								
Total Dissolved Solids	330	10	10	mg/L	SM 2540C	04/15/20 14:30	KAA	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	04/20/20 07:40	AJH	
General Inorganics								
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	04/14/20 13:25	KAA	
Nutrients								
Ammonia-Nitrogen	0.35	0.10	0.044	mg/L	SM4500NH3H G	04/21/20 12:15	SLL	
Kjeldahl Nitrogen	1.1	0.40	0.37	mg/L	EPA 351.2	04/20/20 11:52	SLL	
Ortho Phosphate Phosphorus	0.21	0.050	0.050	mg/L	EPA 300.0	04/13/20 23:55	ATR	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	04/21/20 17:32	KRV	N_pFilt
Aluminum	210	200	33	ug/L	EPA 200.7	04/20/20 23:05	KRV	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number: C0D1622

Received on Ice (Y/N): Yes Temp: 1 °C

# Laboratory Reference Number

C0D1622-02

Sample Description CL08		<u>Matrix</u> Liquid		Sampled Date/Time 04/13/20 09:20		Received Date/Time 04/13/20 16:08			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	04/14/20 04:43	KBS		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	04/14/20 04:43	KBS		
Solids									
Total Dissolved Solids	310	10	10	mg/L	SM 2540C	04/15/20 14:30	KAA		
Total Suspended Solids	6	2	2	mg/L	SM 2540D	04/20/20 07:40	AJH		
General Inorganics									
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	04/14/20 13:25	KAA		
Nutrients									
Ammonia-Nitrogen	0.24	0.10	0.044	mg/L	SM4500NH3H G	04/21/20 12:17	SLL		
Kjeldahl Nitrogen	0.93	0.10	0.093	mg/L	EPA 351.2	04/19/20 09:36	SLL		
Ortho Phosphate Phosphorus	0.17	0.050	0.050	mg/L	EPA 300.0	04/14/20 00:12	ATR		
Metals and Metalloids									
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	04/21/20 17:34	KRV	N_pFilt	
Aluminum	720	200	33	ug/L	EPA 200.7	04/20/20 23:07	KRV		

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number: C0D1622

Received on Ice (Y/N): Yes Temp: 1 °C

# Laboratory Reference Number

C0D1622-03

Sample Description CL09	<u>Matrix</u> Liquid		Sampled Date/Time 04/13/20 10:05		Received Date/Time 04/13/20 16:08			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	t Flag
Anions								
Nitrate as N	0.19	0.20	0.16	mg/L	EPA 300.0	04/14/20 04:57	KBS	J
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	04/14/20 04:57	KBS	
Solids								
Total Dissolved Solids	380	10	10	mg/L	SM 2540C	04/15/20 14:30	KAA	
Total Suspended Solids	16	2	2	mg/L	SM 2540D	04/20/20 07:40	AJH	
General Inorganics								
Sulfide	0.50	0.10	0.10	mg/L	SM 4500S2 D	04/14/20 13:25	KAA	
Nutrients								
Ammonia-Nitrogen	0.40	0.10	0.044	mg/L	SM4500NH3H G	04/21/20 12:19	SLL	
Kjeldahl Nitrogen	1.6	0.10	0.093	mg/L	EPA 351.2	04/19/20 09:37	SLL	
Ortho Phosphate Phosphorus	0.43	0.050	0.050	mg/L	EPA 300.0	04/14/20 01:01	ATR	
Metals and Metalloids								
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	04/21/20 17:36	KRV	N_pFilt
Aluminum	960	200	33	ug/L	EPA 200.7	04/20/20 23:09	KRV	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 5 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number: C0D1622

Received on Ice (Y/N): Yes Temp: 1 °C

# Laboratory Reference Number

C0D1622-04

Sample Description CL10		<u>Matrix</u> Liquid		Sampled Date/Time 04/13/20 10:45		Received Date/Time 04/13/20 16:08			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analys	t Flag	
Anions									
Nitrate as N	0.27	0.20	0.16	mg/L	EPA 300.0	04/14/20 05:11	KBS		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	04/14/20 05:11	KBS		
Solids									
Total Dissolved Solids	360	10	10	mg/L	SM 2540C	04/15/20 14:30	KAA		
Total Suspended Solids	13	2	2	mg/L	SM 2540D	04/20/20 07:40	AJH		
General Inorganics									
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	04/14/20 13:25	KAA		
Nutrients									
Ammonia-Nitrogen	0.073	0.10	0.044	mg/L	SM4500NH3H G	04/21/20 12:21	SLL	J	
Kjeldahl Nitrogen	1.3	0.10	0.093	mg/L	EPA 351.2	04/19/20 09:39	SLL		
Ortho Phosphate Phosphorus	0.44	0.050	0.050	mg/L	EPA 300.0	04/14/20 01:18	ATR		
Metals and Metalloids									
Aluminum-Dissolved	ND	100	33	ug/L	EPA 200.7	04/21/20 17:38	KRV	N_pFilt	
Aluminum	1000	200	33	ug/L	EPA 200.7	04/20/20 23:11	KRV		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number: C0D1622

Received on Ice (Y/N): Yes Temp: 1 °C

# Laboratory Reference Number

# C0D1622-05

Sample Description LE02		<u>N</u> L	<u>Matrix</u> Liquid		npled Date/Time 4/13/20 08:45	Received Date/Time 04/13/20 16:08			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	04/14/20 05:25	KBS		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	04/14/20 05:25	KBS		
Solids Total Dissolved Solids	1700	40	40	mg/L	SM 2540C	04/15/20 14:30	KAA		
General Inorganics Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	04/14/20 13:25	KAA		
Nutrients Ammonia-Nitrogen	ND	0.10	0.044	mg/L	SM4500NH3H	04/21/20 12:22	SLL		
Kjeldahl Nitrogen	3.9	0.50	0.46	mg/L	EPA 351.2	04/19/20 10:45	SLL		
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	04/14/20 01:35	ATR		

*location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 7 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order	Number:	C0D1622
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Received on Ice (Y/N):	Yes	Temp:	1	°C
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### **Anions - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0D13137 - Analyzed as R											
Blank (0D13137-BLK1)				F	repared	& Analyze	d: 04/14/2	0			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.11	mg/L							
LCS (0D13137-BS1)				F	repared	& Analyze	d: 04/14/2	0			
Nitrite as N	2.42	0.10	0.091	mg/L	2.50		97	90-110			
Nitrate as N	5.50	0.20	0.11	mg/L	5.65		97	90-110			
Matrix Spike (0D13137-MS1)		Source	: C0D1257-0	1 F	Prepared & Analyzed: 04/14/20						
Nitrite as N	2.37	0.10	0.091	mg/L	2.50	ND	95	80-120			
Nitrate as N	12.4	0.20	0.11	mg/L	5.65	5.67	119	80-114			QMS(D)
Matrix Spike (0D13137-MS2)		Source	: C0D1626-0	<b>3</b> F	Prepared & Analyzed: 04/14/20			D			
Nitrite as N	2.34	0.10	0.091	mg/L	2.50	ND	93	80-120			
Nitrate as N	5.26	0.20	0.11	mg/L	5.65	ND	93	80-114			
Matrix Spike Dup (0D13137-MSD1)		Source	: C0D1257-0	1 F	repared	& Analyze	d: 04/14/2	0			
Nitrite as N	2.46	0.10	0.091	mg/L	2.50	ND	98	80-120	3	20	
Nitrate as N	11.8	0.20	0.11	mg/L	5.65	5.67	108	80-114	5	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 8 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Received on Ice (Y/N):	Yes	Temp:	1	°C
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#### **Solids - Batch Quality Control**

					Spilko	Course				חחח	
					Эріке	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0D15110 - Analyzed as r	eceived										
Blank (0D15110-BLK1)					Prepared	& Analyze	d: 04/15/2	0			
Total Dissolved Solids	ND	10	10	mg/L							
Duplicate (0D15110-DUP1)		Source:	C0D1543-0	1	Prepared	& Analyze	d: 04/15/2	0			
Total Dissolved Solids	423	10	10	mg/L		425			0.5	20	
Duplicate (0D15110-DUP2)		Source:	C0D1589-0	1	Prepared	& Analyze	d: 04/15/2	0			
Total Dissolved Solids	320	10	10	mg/L		310			3	20	
Batch 0D20059 - Analyzed as r	eceived										
Blank (0D20059-BLK1)					Prepared	& Analyze	d: 04/20/2	0			
Total Suspended Solids	ND	0.5	0.5	mg/L							
Duplicate (0D20059-DUP1)		Source:	C0D1645-0	1	Prepared	& Analyze	d: 04/20/2	0			
Total Suspended Solids	33.5	2	2	mg/L		36.0			7	25	
Duplicate (0D20059-DUP2)		Source:	C0D1648-0	3RE1	Prepared	& Analyze	d: 04/20/2	0			
Total Suspended Solids	112	10	10	mg/L		126			12	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 9 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order	· Number:	C0D1622
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Received on Ice (Y/N):	Yes	Temp: 1	°C
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### **General Inorganics - Batch Quality Control**

					Spiko	Sourco		% DEC		DDD	
	<b>D</b> "	551			Loval	Deput		/0KLC	חחח	Limit	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	LIMIUS	RPD	LIITIIL	Flag
Batch 0D14131 - Analyzed as re	ceived										
Blank (0D14131-BLK1)					Prepared	& Analyze	d: 04/14/2	0			
Sulfide	ND	0.10	0.10	mg/L							
LCS (0D14131-BS1)					Prepared	& Analyze	d: 04/14/2	0			
Sulfide	0.300	0.10	0.10	mg/L	0.400		75	50-150			
Matrix Spike (0D14131-MS1)		Source:	C0D1438-02	2	Prepared	& Analyze	d: 04/14/2	0			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150			
Matrix Spike Dup (0D14131-MSD1)		Source:	C0D1438-02	2	Prepared	& Analyze	d: 04/14/2	0			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150	0	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work	Order	Number:	C0D1622
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Received on Ice (Y/N): Yes Temp:	1	°C
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#### **Nutrients - Batch Quality Control**

					Spike	Source		%REC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0D13147 - Analyzed as Re	eceived IC										
Blank (0D13147-BLK1)				F	Prepared	& Analyze	d: 04/13/2	0			
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L							
LCS (0D13147-BS1)				F	Prepared	& Analyze	d: 04/13/2	0			
Ortho Phosphate Phosphorus	0.288	0.050	0.050	mg/L	0.300		96	90-110			
Matrix Spike (0D13147-MS1)		Source	: C0D1619-0	1 F	Prepared	& Analyze	d: 04/13/2	0			
Ortho Phosphate Phosphorus	0.321	0.050	0.050	mg/L	0.300	ND	107	80-120			
Matrix Spike Dup (0D13147-MSD1)		Source	: C0D1619-0	1 F	Prepared	& Analyze	d: 04/13/2	0			
Ortho Phosphate Phosphorus	0.311	0.050	0.050	mg/L	0.300	ND	104	80-120	3	20	
Batch 0D16087 - Acid Digest											
Blank (0D16087-BLK1)				F	Prepared	: 04/16/20	Analyzed	: 04/19/20			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (0D16087-BS1)				F	Prepared	: 04/16/20	Analyzed	: 04/19/20			
Kjeldahl Nitrogen	0.952	0.10	0.093	mg/L	1.00		95	80-120			
Matrix Spike (0D16087-MS1)		Source	: C0D1622-0	1 F	Prepared	: 04/16/20	Analyzed	: 04/19/20			
Kjeldahl Nitrogen	2.02	0.10	0.093	mg/L	1.00	1.75	27	42-154			QFpas, QMoRo
Matrix Spike Dup (0D16087-MSD1)		Source	: C0D1622-0	1 F	Prepared	: 04/16/20	Analyzed	: 04/19/20			
Kjeldahl Nitrogen	2.15	0.10	0.093	mg/L	1.00	1.75	40	42-154	6	25	QFpas, QMoRo
Batch 0D19091 - Acid Digest											
Blank (0D19091-BLK1)				F	Prepared	& Analyze	d: 04/20/2	0			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 11 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work C	Order	Number:	C0D1622
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Received on Ice (Y/N):	Yes	Temp:	1	°C
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#### **Nutrients - Batch Quality Control**

Analvte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 0D19091 - Acid Digest											-
LCS (0D19091-BS1)					Prepared	& Analyze	d: 04/20/2	0			
Kjeldahl Nitrogen	1.02	0.10	0.093	mg/L	1.00		102	80-120			
Matrix Spike (0D19091-MS1)		Source:	C0D1622-0	01RE1	Prepared	& Analyze	d: 04/20/2	0			
Kjeldahl Nitrogen	4.86	0.40	0.37	mg/L	4.00	1.14	93	42-154			
Matrix Spike Dup (0D19091-MSD1)		Source:	C0D1622-0	01RE1	Prepared	& Analyze	d: 04/20/2	0			
Kjeldahl Nitrogen	4.74	0.40	0.37	mg/L	4.00	1.14	90	42-154	2	25	
Batch 0D21098 - Analyzed as ree	ceived										
Blank (0D21098-BLK1)					Prepared	& Analyze	d: 04/21/2	0			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							
LCS (0D21098-BS1)					Prepared	& Analyze	d: 04/21/2	0			
Ammonia-Nitrogen	0.978	0.10	0.044	mg/L	1.00		98	90-110			
Matrix Spike (0D21098-MS1)		Source:	C0D1619-0	01	Prepared	& Analyze	d: 04/21/2	0			
Ammonia-Nitrogen	1.08	0.10	0.044	mg/L	1.00	ND	108	80-120			
Matrix Spike Dup (0D21098-MSD1)		Source:	C0D1619-0	01	Prepared	& Analyze	d: 04/21/2	0			
Ammonia-Nitrogen	0.938	0.10	0.044	mg/L	1.00	ND	94	80-120	14	20	

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Analytical Report: Page 12 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work (	Order	Number:	C0D1622
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Received on Ice (Y/N):	Yes	Temp:	1	°C
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#### Metals and Metalloids - Batch Quality Control

Analyte(s)	Result	RDI		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 0D20079 - FPA 200.2	Rooun	THE L		Cinto						-	- 0
					Dranarad	9 Apolyza	4.04/20/2	0			
Blank (0D20079-BLK1)					Prepareu	& Analyze	u. 04/20/2	0			
Aluminum	ND	100	16	ug/L							
LCS (0D20079-BS1)					Prepared	& Analyze	d: 04/20/2	0			
Aluminum	1130	100	16	ug/L	1170		97	85-115			
Matrix Spike (0D20079-MS1)		Source:	C0D1865-	-01	Prepared	& Analyze	d: 04/20/2	0			
Aluminum	1130	200	33	ug/L	1170	ND	97	70-130			
Matrix Spike Dup (0D20079-MSD	1)	Source:	C0D1865-	-01	Prepared	& Analyze	d: 04/20/2	0			
Aluminum	1140	200	33	ug/L	1170	ND	98	70-130	0.7	20	
Batch 0D21126 - 200.7/ No Di	igest										
Blank (0D21126-BLK1)					Prepared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (0D21126-BLK2)					Prepared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (0D21126-BLK3)					Prepared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (0D21126-BLK4)					Prepared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil
Blank (0D21126-BLK5)					Prepared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	ND	100	16	ug/L							QBfil

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 13 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work	Order	Number:	C0D1622
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Received on Ice (Y/N):	Yes	Temp:	1	°C
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### Metals and Metalloids - Batch Quality Control

Apolyto(a)	Deput	DDI		Inito	Spike	Source	%PEC	%REC	PPD	RPD Limit	Flag
Analyte(s)	Result	RDL	U	JIIIIS	Level	Result	/IIIIC	Linits	NI D	Liitiit	Tiag
Batch 0D21126 - 200.7/ No Diges	t										
LCS (0D21126-BS1)				F	repared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	336	100	16	ug/L	334		101	85-115			
Matrix Spike (0D21126-MS1)		Source: 0	C0D1622-01	F	repared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	671	200	34	ug/L	668	ND	100	70-130			
Matrix Spike Dup (0D21126-MSD1)		Source: 0	C0D1622-01	F	repared	& Analyze	d: 04/21/2	0			
Aluminum-Dissolved	654	200	34	ug/L	668	ND	98	70-130	3	20	

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Analytical Report: Page 14 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 27-Apr-2020

Work Order Number:C0D1622Received on Ice (Y/N):YesTemp: 1 °C

#### **Notes and Definitions**

J	Estimated value
N_pFilt	Sample filtered and preserved upon receipt to the laboratory.
QBfil	Method blank was filtered prior to processing.
QFpas	Follow-up result within laboratory acceptance criteria.

- QMoRo MSD recovery and the MS/MSD RPD value did not meet laboratory acceptance criteria.
- QMS(D) Matrix spike recovery was out of acceptance criteria. Precision and accuracy demonstrated by remaining matrix spike results.
- ND: Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
- NR: Not Reported
- RDL: Reportable Detection Limit
- MDL: Method Detection Limit

\* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

llesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Standard\_No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Analytical Report: Page 15 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Yes

### Work Order Number: C0D1622

Received on Ice (Y/N):

Temp: 1 °C

Report Date: 27-Apr-2020

1.1

E.S. Babcock & Sons, Inc. Environmental Laboratories (951) 653-3351 FAX (951) 653-1662 Chain of Custody & Sample Information Record

www.babcocklabs.com																				Phone No.	858-243-8158
lient: Wood E&I Solutions, Ir	1C.	C	onta	act:	Joh	nn R	udol	ph							-						Additional Reporting Requests
		E	mai	l:	j	ohn.i	rudolp	h@w	oodp	C.CC	m										FAX Results: Yes No
Project Name: LECL TMDL M	onitoring	Т	urn	Arc	ounc	l Tir	ne:		R	outi	ne		*3-5 R	Da	y	*4	8 H Ru	our sh	3	24 Hour Rush	Email Results: V V No State EDT: V No No
1015100407		L	Lab TAT Approval:					By:			_							*Ad	ditional Charges May Apply	(Include Source Number III Notes)	
Project Number: 1915100402		-	# of Containers						Sa	mple	Analysis Requested					nue	sted	1	Matrix	Notes	
Sampler Informa	ation	+		8.1	Pres	erva	lives	TT	LS	H	ype	+	TT		T	T		T	Τ	DW = Drinking Water	No lab filtration required for Ortifo-P (field
Name:									taine											WW = Wastewater	Total Phosphorus - Sub to Eurofins Calscience, RUSH TAT
Employer: Wood E&I Solu	utions, Inc.	_				otate			f Con		0		rite			phorus	d	de	AL	GW = Groundwater S = Soil	Dissolved AI is not field filtered
		2074			3	DAC			0 #	ne	Idu	a	- Nit			sould	rtho	Sulfie	lved	SG = Sludge	
Signature:		0004	103	5	2220	HC	4CI	Zen	otal	outi	esal	peci	trate	S	z	otal F	SPIO	otal S	issol	L = Liquid	
Sample ID	Date Tim	e	H2S	HOI	Na	Nach	HN	D L L	Ĕ	R	R	201	ž	H	È e	X F	5	FI	F Q	M = Miscellaneous	
CL07	04/13 084	0										>	X	Х	X	XX	X	X	XX		
CL08	04/3.920	2							_	_		)	X	Х	Х	XX	X	X	XX		
CL 09	04/13/1009	5										-	< X	Х	х	x >	X	X	XX		
CL 10	04/13/101	15											x x	Х	Х	x >	< X	X	XX		
1 = 02	04/13084	15											X	Х	Х	x )	< X	X	_		
LEVZ																_	_				
		1																			
							Data	/ Tim	10			1	Rec	eive	ed E	3v ()	Sig	n)		F	Print Name / Company
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Katchuldes	KATEBICHE	47	MD	00	-	71	310	01	500		2	$\frac{c}{c}$	V	1	_				_	RIZOLA	man
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(For Lab Use Only) Samp	le Integrity Upon Rec	eipt			1	- inter	To	mno	ratu	'e		T								COD	1622 Hm
Sample(s) Submitte	d on Ice? (Yes)	No	f	SIL			16	/	, atur	°C											0/0000 16:08
Custody Soall	e) Intact? Yes	NO	1 1	NIP	4			- 1												Pc'd. ()4/1	3//0/0 10.00

*mailing* P.O Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704

No

Yes

Sample(s) Intact?

Cooler Blank

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**I**G



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 3
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0
	San Diego, CA, 92123	Work Order Number:	C0D1635
Report Date:	11-May-2020	Received on Ice (Y/N	Yes Temp: 1 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Common Internetification

	50	ample loe	entification			
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
C0D1635-01	CL07-Int	Solid	4/13/20 8:40	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-02	CL07-Surf	Solid	4/13/20 8:45	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-03	CL08-Int	Solid	4/13/20 9:20	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-04	CL08-Surf	Solid	4/13/20 9:25	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-05	CL09-Int	Solid	4/13/20 10:05	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-06	CL09-Surf	Solid	4/13/20 10:10	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-07	CL10-Int	Solid	4/13/20 10:45	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-08	CL10-Surf	Solid	4/13/20 10:50	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-09	LE02-Int	Solid	4/13/20 9:15	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1635-10	LE02-Surf	Solid	4/13/20 9:30	Client	4/13/20 16:08	Courier (Victor Diaz)-DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

#### Page 1 of 3 CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 2 of 3
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lak
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0
	San Diego, CA, 92123	Work Order Number:	C0D1635
Report Date:	11-May-2020	Received on Ice (Y/N	Yes Temp: 1 °C

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

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Client Name: Contact: Address:	Wood Environment&Infrastructure Sc John Rudolph 9210 Sky Park Court #200 San Diego, CA, 92123	Analytical Report: Project Name: Project Number: Work Order Number:	Page 3 of 3 Amec Foste LECL TMDL <b>C0D1635</b>	r Wheeler-Lake . 1915100402.0
Report Date:	11-May-2020	Received on Ice (Y/N	Yes	Temp: 1 °C

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Chain of Custody & Sample Information Record

FAX No			Ema	1	ioho	rudolob@	wood	ole r								Additional Reporting Requests
Project Name: LECL TMDL M Project Number: 1915100402	Nonitoring		Turn	Arou TAT A	Ind T	Time: val:	R By:	outi	ine	*3	I-5 D Rus	ay h	*48 F	Hour Rush */	*24 Hour Rush idditional Charges May Apply	FAX Results: 10 viz- 10 FAX Results: 10 viz- 10 Email Results: 10 viz- 10 State EDT: 10 viz- 10 (Include Source Number in Notes)
Sampler Inform	ation			# of & Pr	Conta eserv	ainers vatives		Sa T	mple ype	A	naly	sis R	eque	ested	Matrix	Notes
Name: Employer: Wood E&I So Signature: Samplo ID	utions, Inc.	Time	Unpreserved H2SO4	HCI HNO3	Va2S203 VaOH	NaOH/ZnAcetate NH4CI MCAA Frozen	Total # of Containers	Routine	Resample Special	Fotal Sulfide	TDS	TKN	fotal Phosphorus	Chlorophyll-a	DW = Drinking Water WW = Wastewater GW = Groundwater S = Soil SG = Studge L = Liquid M = Miscellaneours	Chi-a samples on 0.7 um GFF SU60VT
CL07 - Int	C413	0840					1							x	in - materiandes	Filter Volume: 375
CL07 - Surf	04/13	0346												x		Filter Volume: 500
CL08 - Int	04/13	0920											Π	x		Filter Volume: 500
CL08 - Surf	04/13	0929												x		Filter Volume: 325
CL09 - Int	0413	1005												x		Filter Volume: 360
CL09 - Surf	04/13	1010												×		Filter Volume: 350
CL10 - Int	04/13	10:45												x		Filter Volume: 325
CL10 - Surf	0413	1050												x		Filter Volume: 325
LE02 - Int	04/3	915												x		Filter Volume: 240
LE02 - Surf	04/13	930												x		Filter Volume: 325
Relinquished By (sign)	Print Nan	ne / Com	pany		1	Date / Time			R	ecei	ved	By (	Sign)	6	Pr	nt Name / Company
A A E	KakBuck	ley, 1 12 i	WBQ > a	4	4/13 4/13	20 132	20 16123	14	27		ť		~	-	Victor D. BROCKAD	12 DE
For Lab Use Only) Sample	Integrity Upon	Receipt			16	H62			T		Lab	Note	18			
Sample(s) Submitted Custody Seal(s) Sample(s)	on Ice? Yes Intact? Yes Intact? Yes	No No No	N	À	c	Tempera Cooler Bi	ture °C ank								<b>COD</b> 1 c'd: 04/13	635 /2020 16:08

mailing P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704  $\begin{array}{c} P \; 951 \; 653 \; 3351 \\ F \; 951 \; 653 \; 1662 \\ www.babcocklabs.com \end{array}$ 

Page 3 of 3



ALS - Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 20D0247 Printed: 04/22/2020

Attention: Amanda C. Porter Project Name: Chlorophyll

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
C0D1635-01	20D0247-01	Filter		04/13/2020 08:40	04/15/2020 11:50
C0D1635-02	20D0247-02	Water		04/13/2020 08:45	04/15/2020 11:50
C0D1635-03	20D0247-03	Fi <b>l</b> ter		04/13/2020 09:20	04/15/2020 11:50
C0D1635-04	20D0247-04	Filter		04/13/2020 09:25	04/15/2020 11:50
C0D1635-05	20D0247-05	Filter		04/13/2020 10:05	04/15/2020 11:50
C0D1635-06	20D0247-06	Filter		04/13/2020 10:10	04/15/2020 11:50
C0D1635-07	20D0247-07	Filter		04/13/2020 10:45	04/15/2020 11:50
C0D1635-08	20D0247-08	Fi <b>l</b> ter		04/13/2020 10:50	04/15/2020 11:50
C0D1635-09	20D0247-09	Filter		04/13/2020 09:15	04/15/2020 11:50
C0D1635-10	20D0247-10	Fi <b>l</b> ter		04/13/2020 09:30	04/15/2020 11:50

#### DEFINITIONS

Definition
Dilution Factor
Method Detection Limit
Not Detected
Reporting Limit

Respectfully yours,

Aldo B. Minano Project Manager

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Client: Babcock Laborat	tories, Inc.		Project Nam	e:	Chlorophyl	I		Printed: 04/	22/2020
			C0D163	5-01					
			20D0247-01	(Filter)	)				
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail					
Microbiology									
Chlorophyll a	4.64	1.00	1.00 mg/n	1 <sup>3</sup> ]	2004331	04/22/2020 11	1:42 EGV	EPA 10200 F	ł
			C0D163	5-07					
			20D0247-02	(Water	)				
Analyte	Result	MDL	RL Units	, DF	Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail					
Microbiology									
Chlorophyll a	6.65	1.00	1.00 mg/n	1 <sup>3</sup> ]	2004331	04/22/2020 11	1:42 EGV	EPA 10200 H	1
			C0D163	5-03					
			20D0247-03	(Filter)	)				
Analyte	Result	MDI	RI Units		Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail		/			
Mi									
Chlorophyll a	4.33	1.00	1.00 mg/n	 1 <sup>3</sup> ]	2004331	04/22/2020 11	1:42 EGV	EPA 10200 F	4
.,		1100			2001331	-,,,			
			20D0247-04	5-04 (Filter)	)				
					, 				
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS True	sdail					
Microbiology									
Chlorophyll a	5.53	1.00	1.00 mg/n	1 <sup>3</sup> ]	2004331	04/22/2020 11	1:42 EGV	EPA 10200 H	ł
			C0D163	5-05					
			20D0247-05	(Filter)	)				
Analyte	Result	MDL	RL Units	DF	Batch	Analyzed	Analyst	Method	Notes
			AIS True	sdail					

This report applies to the sample(s), or product(s), investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed. This report shall not be reproduced without the written consent of ALS-Truesdail Laboratories, Inc., and must be reproduced in its entirety.



Client: Babcock Laboratories,	Inc.		Projec	t Name:		Chlorophyll	l		Printed: 04/2	2/2020
			001635	5-05 (Co	ntinue	ad)				
		20D	0247-05	(Filter)	(Conti	inued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	9.00	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	
			C0	D1635-(	06					
			20D02	47-06 (	Fi <b>l</b> ter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	28.5	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	
			C0	D1635-(	)7					
			20D02	247-07 (	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	8.85	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	
			C0	D1635-(	08					
			20D02	.47-08 (	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	17.6	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	
			C0	D1635-(	)9					
			20D02	.47 <b>-09</b> (I	Fi <b>l</b> ter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes

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Client: Babcock Laboratories, Inc.

									Printed: 04/2	2/2020
		c	0D1635	-09 (Co	ntinue	ed)				
		20D0	)247-09	(Filter)	(Conti	nued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	99.5	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	
			С0	D1635-1	0					
			20D02	47-10 (I	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	105	1.00	1.00	mg/m³	1	2004331	04/22/2020 11	:42 EGV	EPA 10200 H	

Project Name:

Chlorophyll

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Printed: 4/14/2020 13:34

4

Babcock Laboratories, Inc.

# C0D1635

Ly Aut a labor shak I have been seen as an	SENDING	LABORATORY:
--	---------	-------------

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A. Waddell **RECEIVING LABORATORY:** 

Truesdail Laboratories - Subcontract 3337 Michelson Drive Suite CN750 Irvine, CA 92614 Phone :(714) 730-6239 Fax: (714) 730-6462

Copy/Relog from C0B2113. System Name: Wood Environmental&Infrastructure Solutions, Inc Sampler: Client

Please include MDLs and EXCEL EDD

Analysis	E: Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0D1635-01 Solid		Sampled: 04/13/20 08:40	CL07-Int		Proj.No.:LECL TMDL 1915100402.0003
Subout Containers Supplied: Whirl-Pak (A)	04/23/20 23:59	04/23/20 08:40	Report Chlorophy	/ll a / Filter Volume = 375r	mL
Sample ID: C0D1635-02 Solid		Sampled: 04/13/20 08:45	CL07-Surf		Proj.No.:LECL TMDL 1915100402.0003
Subout Containers Supplied: Whirl-Pak (A)	04/23/20 23:59	04/23/20 08:45	Report Chlorophy	/ll a / Filter Volume = 500r	mL
Sample ID: C0D1635-03 Solid		Sampled: 04/13/20 09:20	CL08-Int		Proj.No.:LECL TMDL 1915100402.0003
Subout Containers Supplied: Whirl-Pak (A)	04/23/20 23:59	04/23/20 09:20	Report Chlorophy	/ll a / Filter Volume = 500r	mL
Sample ID: C0D1635-04 Solid		Sampled: 04/13/20 09:25	CL08-Surf		Proj.No.:LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 09:25	Report Chlorophy	/ll a / Filter Volume = 325r	mL
Sample ID: C0D1635-05 Solid	th.	Sampled: 04/13/20 10:05	CL09-Int		Proj.No.:LECL TMDL 1915100402.0003
Subout Containers Supplied: Whirl-Pak (A)	04/23/20 23:59	04/23/20 10:05	Report Chlorophy	/ll a / Filter Volume = 360n	mL
Sample ID: C0D1635-06 Solid		Sampled: 04/13/20 10:10	CL09-Surf		Proj.No.:LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 10:10	Report Chlorophy	ting No.	mL
			77833	561481	Page 5 o


Printed: 4/14/2020 13:34

Babcock Laboratories, Inc.

#### C0D1635

Analysis	Ez Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0D1635-07 Solid		Sampled: 04/13/20 10:45	CL10-Int		Proj.No.:LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 10:45	Report Chlorophyll	a / Filter Volume = 325m	L
Sample ID: C0D1635-08 Solid		Sampled: 04/13/20 10:50	CL10-Surf		<i>Proj.No.:</i> LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 10:50	Report Chlorophyll	a / Filter Volume = 325m	L
Sample ID: C0D1635-09 Solid		Sampled: 04/13/20 09:15	LE02-Int		Proj.No.:LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 09:15	Report Chlorophyll	a / Filter Volume = 240n	JL
Sample ID: C0D1635-10 Solid		Sampled: 04/13/20 09:30	LE02-Surf		Proj.No.:LECL TMDL 1915100402.0003
Subout <i>Containers Supplied:</i> Whirl-Pak (A)	04/23/20 23:59	04/23/20 09:30	Report Chlorophyll	a / Filter Volume = 325n	οL

	Track 77833	ing No. 561481			
	All Containers Intact:	YesNo	Samples Preserved Properly: _	Yes	No
Samples Received at oC	Sample Labels / COC Agree:	YesNo	Custody Seals Present:	Yes	No
Please forward all acknowledger NO MARDCOPIES PLEASE. Released By	nents of sample receipt, final	Received By	o <u>data@babcocklabs.com</u> JULOVO OHISH Date	070	11.50
Released By	Date	Received By	Date	P	age 2 of 2 Page 6 of 6



Client Name:	Wood Environment&Infrastructure Sc	Analytical Report:	Page 1 of 1		
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake		
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0		
Client Name: Contact: Address:	San Diego, CA, 92123	Work Order Number:	C0D1639		
Report Date:	20-Apr-2020	Received on Ice (Y/N	Yes Temp: 1 °C		

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

		Sample Iu	Entineation			
Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	By
C0D1639-01	CL07	Liquid	4/13/20 8:40	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1639-02	CL08	Liquid	4/13/20 9:20	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1639-03	CL09	Liquid	4/13/20 10:05	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1639-04	CL10	Liquid	4/13/20 10:45	Client	4/13/20 16:08	Courier (Victor Diaz)-DE
C0D1639-05	LE02	Liquid	4/13/20 8:45	Client	4/13/20 16:08	Courier (Victor Diaz)-DE

Note: Requested Low Level Total Phosphorus analysis was subcontracted to Eurofins CalScience.

Sample Identification

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesso Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Case Narrative+ COC.rpt

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Client Name: Contact: Address:	Wood Enviror John Rudolph 9210 Sky Par San Diego, C	nment&lr n k Court ‡ A, 92123	frastructure Sc #200		Ar F Work (	alytical Repor Project Name roject Numbe <b>Order Numbe</b>	rt: Page 1 e: Amec F r: LECL T <b>r: C0D16</b> 3	of 1 Foster Wheeler-Lake MDL 1915100402.0 <b>39</b>
Report Date:	20-Apr-2020				Recei	ved on Ice (Y/	N Yes	Temp: 1 °C
E.S. B (951) 65: www.ba	abcock & Sons, 3-3351 FAX (951) 653- bcocklabs.com	nc. Enviro	nmental Laboratori	es Chain	of Custody	/ & Sample Info	ormation Rec	cord
Client: Woo	d E&I Solutions, Inc.		Contact: John Rudolph			Phone No.	Additional Reporti	ng Requests
Project Name:	LECL TMDL Monitori	ng	Email: john.rudolph@v Turn Around Time: Lab TAT Approval:	voodplo.com <u>Routine</u> *3-5 Da Rush By:	y *48 Hour Rush *Ar	24 Hour Rush ditionil Charges May Apply	FAX Re FAX Re Email Re State (Include Source Nur	Sults: vi≕ ta sults: vi≕ ta EDT: vi≕ ta nber in Notes)
Project Number	Sampler Information		# of Containers & Preservatives	Sample Type Analy:	sis Requested	Matrix	Note	S
Nam Employe Signatur	er: Wood E&I Solutions,	Inc.	preserved 504 03 03 25202000 25200 2500 2000000	outine # of Containers outine esample pecial inste - Nitrite	mmonia tal Phosphorus (P)Ortho-P tal Sulfide ssolved AL	DW = Drinking Water     fi       WW = Wastewater     T       GW = Groundwater     G       S = Soil     G       SG = Sludge     L	to lab filtration required Itered). otal Phosphones - Sub calscience: RUSH TAT Dissolved AI is not field f	to Eurofins iitered
	Sample ID	Date Time	HN HN Na Na Na Na Na Na Na Na Na Na Na	1 2 2 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	An A	M = Miscellaneous		
	CL07	041120540		x x x x				
-	CL08	04/12/10/06		x x x	xxxxxx			
i	CL09	dell'3 mart		xxx	x x x x x x x			
	LE02	04 13 684		x x	* * * * *			
							Name (Company)	
Relinquish Kated VA-E	red By (sign) Ruckelly Ka Zimmen Unic	Print Name / Co CB\Cllly for D.22	mpany     Date / Tim       Whod     4/13/20       1 D B     4/13/20	B Received	by (Sign)	Victor Dia BROCK-ADI	D.E.	/
(For Lab Use On Sai	ly) Sample Integr mple(s) Submitted on Ice Custody Seal(s) Intact Sample(s) Intact	rity Upon Recei ? Yes N ? Yes N ? Yes N	pt <u>TC=t+C</u> lo Temper lo N/A / lo Cooler E	Lab ature °C Ilank	Notes	СОD1 c'd: 04/13/2 .н	<b>639</b> 2020 16:08	

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#### Page 1 of 1



## Calscience

### **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

Laboratory Job ID: 570-25837-1 Client Project/Site: C0D1639

#### For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 4/20/2020 9:15:03 AM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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#### Qualifiers

### General Chemistry Qualifier Qualifier Description

Qua	311
Γ4	

Qualifiers		3
General Che Qualifier	Mistry Qualifier Description	Λ
F1	MS and/or MSD recovery exceeds control limits.	4
Glossary		5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	0
%R	Percent Recovery	-7
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	
DER	Duplicate Error Ratio (normalized absolute difference)	ð
Dil Fac	Dilution Factor	
DL	Detection Limit (DoD/DOE)	9
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision Level Concentration (Radiochemistry)	
EDL	Estimated Detection Limit (Dioxin)	
LOD	Limit of Detection (DoD/DOE)	
LOQ	Limit of Quantitation (DoD/DOE)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative Error Ratio (Radiochemistry)	
RL	Reporting Limit or Requested Limit (Radiochemistry)	

RPD Relative Percent Difference, a measure of the relative difference between two points

- TEF Toxicity Equivalent Factor (Dioxin)
- TEQ Toxicity Equivalent Quotient (Dioxin)

#### Job ID: 570-25837-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-25837-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/15/2020 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

#### **General Chemistry**

Method 365.1: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-63689 and analytical batch 570-63750 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 570-25837-1

**General Chemistry** 

Client Sample ID: C0D1639-01 Date Collected: 04/13/20 08:40 Date Received: 04/15/20 10:15							Lab San	nple ID: 570-2 Matrix	25837-1 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.211		0.0200	0.00490	mg/L		04/17/20 06:30	04/17/20 09:37	1
Client Sample ID: C0D1639-02							Lab Sam	ple ID: 570-2	5837-2
Date Collected: 04/13/20 09:20								Matrix	Water
Date Received: 04/15/20 10:15									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.223		0.0200	0.00490	mg/L		04/17/20 06:30	04/17/20 09:39	1
Client Sample ID: C0D1639-03 Date Collected: 04/13/20 10:05 Date Received: 04/15/20 10:15							Lab San	nple ID: 570-2 Matrix	25837-3 : Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.448		0.0200	0.00490	mg/L		04/17/20 06:30	04/17/20 09:40	1
Client Sample ID: C0D1639-04 Date Collected: 04/13/20 10:45 Date Received: 04/15/20 10:15							Lab San	nple ID: 570-2 Matrix	25837-4 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.432		0.0200	0.00490	mg/L		04/17/20 06:30	04/17/20 09:42	1
Client Sample ID: C0D1639-05 Date Collected: 04/13/20 08:45 Date Received: 04/15/20 10:15							Lab Sam	nple ID: 570-2 Matrix	25837-5 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.174	F1	0.0200	0.00490	mg/L		04/17/20 06:30	04/17/20 09:43	1

Job ID: 570-25837-1

#### Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-6366 Matrix: Water Analysis Batch: 63750	89/5-A	R MR					C	lie	ent Samj	ple ID: M Prep Ty Prep E	ethod pe: Tof Batch:	Blank tal/NA 63689
Analyte	Resu	lt Qualifier	RI		MDI Un	it.	п	Р	renared	Δnalv	zed	Dil Fac
Phosphorus, Total	N			0.0	0490 ma	//		4/1	7/20 06:30	$\overline{04/17/20}$	09:19	1
					j	-				• • • • • • • •		·
Lab Sample ID: LCS 570-636 Matrix: Water	89/6-A					Cli	ent S	Sar	nple ID:	Lab Cor Prep Ty	ntrol Sa pe: Tot	ample tal/NA
Analysis Batch: 63750										Prep E	Batch: (	63689
-			Spike	LCS	LCS					%Rec.		
Analyte			Added	Result	Qualifie	r Unit		D	%Rec	Limits		
Phosphorus, Total			0.200	0.1988		mg/L		_	99	93_107		
Lab Sample ID: LCSD 570-6 Matrix: Water Analysis Batch: 63750	3689/7-A					Client S	amp	le	ID: Lab	Control Prep Ty Prep E	Samplo pe: Tot Batch: (	e Dup tal/NA 63689
			Spike	LCSD	LCSD					%Rec.		RPD
Analyte			Added	Result	Qualifie	r Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total			0.200	0.1982		mg/L		_	99	93 - 107	0	4
Lab Sample ID: 570-25837-5 Matrix: Water	MS							С	lient Sa	mple ID: Prep Ty	C0D16 pe: Tot	39-05 al/NA
Analysis Batch: 63750	Sample Sa	amplo	Sniko	MS	MS					%Rec	satch:	03009
Analyte	Result Q	ualifier	Added	Result	Qualifie	r Unit		D	%Rec	l imits		
Phosphorus, Total	0.174 F1	<u> </u>	0.200	0.3493	F1	mg/L		_	88 -	93_107		
						-						
Lab Sample ID: 570-25837-5	MSD							С	lient Sa	mple ID:	C0D16	39-05
Matrix: Water										Prep Ty	pe: Tot	tal/NA
Analysis Batch: 63750		_								Prep E	Batch:	63689
	Sample Sa	ample	Spike	MSD	MSD					%Rec.		RPD
Analyte	Result Q	ualifier	Added	Result	Qualifie	r Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.174 F1	1	0.200	0.3499	F1	mg/L			88	93_107	0	4

#### Client Sample ID: C0D1639-01 Date Collected: 04/13/20 08:40 Date Received: 04/15/20 10:15

_	Batch	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	63689	04/17/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	63750	04/17/20 09:37	YR9U	ECL 1
	Instrument	D: ACA1								

#### Client Sample ID: C0D1639-02 Date Collected: 04/13/20 09:20 Date Received: 04/15/20 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	63689	04/17/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	63750	04/17/20 09:39	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Client Sample ID: C0D1639-03 Date Collected: 04/13/20 10:05 Date Received: 04/15/20 10:15

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	63689	04/17/20 06:30	YR9U	ECL 1
Tota/NA	Analysis	365.1		1	5 mL	5 mL	63750	04/17/20 09:40	YR9U	ECL 1

#### Client Sample ID: C0D1639-04

Instrument ID: ACA1

#### Date Collected: 04/13/20 10:45 Date Received: 04/15/20 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	63689	04/17/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	63750	04/17/20 09:42	YR9U	ECL 1
	Instrumer	nt ID <sup>.</sup> ACA1								

#### Client Sample ID: C0D1639-05 Date Collected: 04/13/20 08:45 Date Received: 04/15/20 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Fina <b>l</b> Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	63689	04/17/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	63750	04/17/20 09:43	YR9U	ECL 1
	Instrumen	it ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

**Matrix: Water** 

**Matrix: Water** 

Matrix: Water

#### Lab Sample ID: 570-25837-1 **Matrix: Water**

Lab Sample ID: 570-25837-2

Lab Sample ID: 570-25837-3

Lab Sample ID: 570-25837-4

Client: Babcock Laboratories, Inc. Project/Site: C0D1639

#### Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation	10109	09-29-20
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Nevada	State	CA00111	07-31-20
Oregon	NELAP	CA300001	01-29-21
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-20

Job ID: 570-25837-1

Eurofins Calscience LLC

#### **Method Summary**

#### Client: Babcock Laboratories, Inc. Project/Site: C0D1639

d	Method Description	Protocol	Laboratory	
	Phosphorus, Total	EPA	ECL 1	- 1
365.3/365 Phosphorus, Total	MCAWW	ECL 1		
otocol Refe	rences:			5
EPA = US E	nvironmental Protection Agency			6

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

Protocol References:

Method

365.2/365.3/365

365.1

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

#### Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: C0D1639

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-25837-1	C0D1639-01	Water	04/13/20 08:40	04/15/20 10:15	
570-25837-2	C0D1639-02	Water	04/13/20 09:20	04/15/20 10:15	
570-25837-3	C0D1639-03	Water	04/13/20 10:05	04/15/20 10:15	
570-25837-4	C0D1639-04	Water	04/13/20 10:45	04/15/20 10:15	
570-25837-5	C0D1639-05	Water	04/13/20 08:45	04/15/20 10:15	

		SUBCONT	RACT ORDER	Printe	d: 4/14/2020	13:21
		Babcock La C0	boratories, Inc. D1639			
SENDING LABORATORY	:		RECEIVING LABORA	TORY:		
Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A Copy/Relog from C0B2114. S	A. Waddell System Name: Wood	d Environment & Infrast	Eurofins Calscience, In 7440 Lincoln Way Garden Grove, CA 928 Phone :(714) 895-5494 Fax: (714) 894-7501 ructure Solutions, Inc	ic. 41-1427		
Sampler: Client Please include MDLs and EX PLEASE EXPEDITE	CEL EDD	xpires Regulatory Days			570-25837 C	hain of Custody
Analysis	Due	Past Date Sampled	Laboratory ID	Comr	ments	
Sample ID: C0D1639-01 Liquid		Sampled: 04/13/20 08:40	CL07			<i>Proj.No.:</i> LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	04/17/20 23:59	04/23/20 08:40	Low Level Total Pho	osphorus		
Sample ID: C0D1639-02 Liquid	anna an	Sampled: 04/13/20 09:20	CL08			Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	04/17/20 23:59	04/23/20 09:20	Low Level Total Pho	osphorus		
Sample ID: C0D1639-03 Liquid		Sampled: 04/13/20 10:05	CL09	·	<u>A</u>	Proj.No.:LECL TMDL 1915100402.0003
Subout_02 <i>Containers Supplied:</i> 500 mL Poly H2SO4 (A)	04/17/20 23:59	04/23/20 10:05	Low Level Total Pho	osphorus		
Sample ID: C0D1639-04 Liquid		Sampled: 04/13/20 10:45	CL10			Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	04/17/20 23:59	04/23/20 10:45	Low Level Total Pho	osphorus		
Sample ID: C0D1639-05 Liquid	nin fallen fan de fan de fan de fan de fan de fallen f	Sampled: 04/13/20 08:45	LE02		*****	Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	04/17/20 23:59	04/23/20 08:45	Low Level Total Pho	osphorus		

## Tracking No.

Page 1 of 2

4/20/2020

Printed: 4/14/2020 13:21

#### SUBCONTRACT ORDER

Babcock Laboratories, Inc. C0D1639

## Tracking No. 77833561448

	All Containers Intact:	YesNo	Samples Preserved Properly:	Yes <u>No</u>
Samples Received at oC	Sample Labels / COC Agree:	YesNo	Custody Seals Present:	Yes <u>No</u>
Please forward all acknowledg NO HARDCOPIES PLEASE. Released By	gements of sample receipt, final $\frac{4}{12020}$	reports and invoices	to <u>data@babcocklabs.com</u> //////// Date/	10:10-
Released By	Date	Received By	3. 4 /2 - 5 CB	Page 2 of 2
	Paga	12  of  14		4/20/2020

25837





Page 13 of 14

4/20/2020

5

Client: Babcock Laboratories, Inc.

#### Login Number: 25837 List Number: 1 Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 570-25837-1

List Source: Eurofins Calscience



Analytical Report: Page 1 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number:C0F3378Received on Ice (Y/N):YesTemp: 8 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### **Sample Identification**

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
C0F3378-01	CL07	Liquid	06/26/20 11:00	Client	06/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3378-02	CL08	Liquid	06/26/20 10:25	Client	06/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3378-03	CL09	Liquid	06/26/20 9:45	Client	06/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3378-04	CL10	Liquid	06/26/20 9:15	Client	06/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3378-05	LE02	Liquid	06/26/20 9:15	Client	06/26/20 14:53	Courier (Eliseo Vera)-DE

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 2 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Yes

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N):

Temp: 8 °C

#### Laboratory Reference Number

C0F3378-01

Sample Description CL07	<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid06/26/20 11:00		Received Date/Time 06/26/20 14:53				
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	06/26/20 19:47	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	06/26/20 19:47	ATR	
Solids								
Total Dissolved Solids	350	10	10	mg/L	SM 2540C	06/29/20 23:20	JGZ	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	07/02/20 09:25	ATR	
General Inorganics								
Sulfide	3.3	0.10	0.10	mg/L	SM 4500S2 D	06/28/20 15:45	DSS	
Nutrients								
Ammonia-Nitrogen	1.3	0.50	0.22	mg/L	SM4500NH3H G	06/29/20 10:28	AJH	
Kjeldahl Nitrogen	1.7	0.10	0.093	mg/L	EPA 351.2	06/29/20 12:35	SLL	
Ortho Phosphate Phosphorus	0.10	0.050	0.050	mg/L	EPA 300.0	06/26/20 20:14	ATR	
Metals and Metalloids								
Aluminum-Dissolved	27	100	16	ug/L	EPA 200.7	06/29/20 16:12	AP	J, N_pFilt
Aluminum	41	100	16	ug/L	EPA 200.7	07/01/20 16:12	AP	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 3 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Yes

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N):

Temp: 8 °C

#### Laboratory Reference Number

C0F3378-02

Sample Description CL08	<u>Ma</u> Liq	MatrixSampled Date/TimeLiquid06/26/20 10:25		Received Date/Time 06/26/20 14:53				
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag
Anions								
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	06/26/20 20:02	ATR	
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	06/26/20 20:02	ATR	
Solids								
Total Dissolved Solids	340	10	10	mg/L	SM 2540C	06/29/20 23:20	JGZ	
Total Suspended Solids	4	2	2	mg/L	SM 2540D	07/02/20 09:25	ATR	
General Inorganics								
Sulfide	3.0	0.10	0.10	mg/L	SM 4500S2 D	06/28/20 15:45	DSS	
Nutrients								
Ammonia-Nitrogen	0.29	0.10	0.044	mg/L	SM4500NH3H G	06/29/20 11:57	AJH	
Kjeldahl Nitrogen	1.1	0.10	0.093	mg/L	EPA 351.2	06/29/20 12:36	SLL	
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	06/26/20 20:31	ATR	
Metals and Metalloids								
Aluminum-Dissolved	18	100	16	ug/L	EPA 200.7	06/29/20 16:14	AP	J, N_pFilt
Aluminum	42	100	16	ug/L	EPA 200.7	07/01/20 16:14	AP	J

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 4 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N): Yes Temp: 8 °C

#### Laboratory Reference Number

C0F3378-03

Sample Description CL09		<u>Matrix</u> Liquid		<u>San</u> 0	npled Date/Time 6/26/20 09:45	Received Date/Time 06/26/20 14:53			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	06/26/20 20:17	ATR		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	06/26/20 20:17	ATR		
Solids									
Total Dissolved Solids	450	10	10	mg/L	SM 2540C	06/29/20 23:20	JGZ		
Total Suspended Solids	5	2	2	mg/L	SM 2540D	07/02/20 09:25	ATR		
General Inorganics									
Sulfide	ND	0.10	0.10	mg/L	SM 4500S2 D	06/28/20 15:45	DSS		
Nutrients									
Ammonia-Nitrogen	0.75	0.10	0.044	mg/L	SM4500NH3H G	06/29/20 11:59	AJH		
Kjeldahl Nitrogen	2.5	0.10	0.093	mg/L	EPA 351.2	06/29/20 12:38	SLL		
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	06/26/20 20:47	ATR		
Metals and Metalloids									
Aluminum-Dissolved	41	100	16	ug/L	EPA 200.7	06/29/20 16:21	AP	J, N_pFill	
Aluminum	100	100	16	ug/L	EPA 200.7	07/01/20 16:16	AP		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 5 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N): Yes Temp: 8 °C

#### Laboratory Reference Number

C0F3378-04

Sample Description CL10		<u>Matrix</u> Liquid		Sampled Date/Time 06/26/20 09:15		Received Date/Time 06/26/20 14:53			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	06/26/20 20:31	ATR		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	06/26/20 20:31	ATR		
Solids									
Total Dissolved Solids	310	10	10	mg/L	SM 2540C	06/29/20 23:20	JGZ		
Total Suspended Solids	15	2	2	mg/L	SM 2540D	07/02/20 09:25	ATR		
General Inorganics									
Sulfide	0.80	0.10	0.10	mg/L	SM 4500S2 D	06/28/20 15:45	DSS		
Nutrients									
Ammonia-Nitrogen	0.22	0.10	0.044	mg/L	SM4500NH3H G	06/29/20 12:01	AJH		
Kjeldahl Nitrogen	2.2	0.10	0.093	mg/L	EPA 351.2	06/29/20 12:39	SLL		
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	06/26/20 21:04	ATR		
Metals and Metalloids									
Aluminum-Dissolved	38	100	16	ug/L	EPA 200.7	06/29/20 16:23	AP	J, N_pFilt	
Aluminum	110	100	16	ug/L	EPA 200.7	07/01/20 16:18	AP		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 6 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N): Yes Temp: 8 °C

#### Laboratory Reference Number

C0F3378-05

Sample Description LE02		<u>Matrix</u> Liquid		Sampled Date/Time 06/26/20 09:15		Received Date/Time 06/26/20 14:53			
Analyte(s)	Result	RDL	MDL	Units	Method	Analysis Date	Analyst	Flag	
Anions									
Nitrate as N	ND	0.20	0.16	mg/L	EPA 300.0	06/26/20 20:46	ATR		
Nitrite as N	ND	0.10	0.091	mg/L	EPA 300.0	06/26/20 20:46	ATR		
Solids									
Total Dissolved Solids	3500	20	20	mg/L	SM 2540C	06/29/20 23:20	JGZ		
General Inorganics									
Sulfide	0.40	0.10	0.10	mg/L	SM 4500S2 D	06/28/20 15:45	DSS		
Nutrients									
Ammonia-Nitrogen	0.41	0.10	0.044	mg/L	SM4500NH3H G	06/29/20 09:49	AJH		
Kjeldahl Nitrogen	4.6	0.50	0.46	mg/L	EPA 351.2	06/29/20 13:47	SLL		
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L	EPA 300.0	06/26/20 21:20	ATR		

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 7 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order	Number:	C0F3378
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Received on Ice (Y/N):	Yes	Temp:	8	°C
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#### **Anions - Batch Quality Control**

					Spiko	Sourco		% DEC		חסס	
Analyte(s)	Posult	PDI		Linite	l evel	Result	%REC	Limits	RPD	Limit	Flag
Analyte(3)	Result	NDL		Units	Level	rteouit	JULCEO	Linito	N D	Ennit	1 lug
Batch 0F26029 - Analyzed as R	eceived IC										
Blank (0F26029-BLK1)				F	repared	& Analyze	d: 06/26/2	0			
Nitrite as N	ND	0.10	0.091	mg/L							
Nitrate as N	ND	0.20	0.16	mg/L							
LCS (0F26029-BS1)				F	repared	& Analyze	d: 06/26/2	0			
Nitrite as N	2.24	0.10	0.091	mg/L	2.50		90	90-110			
Nitrate as N	5.32	0.20	0.16	mg/L	5.65		94	90-110			
Matrix Spike (0F26029-MS1)		Source	: C0F3173-0 <sup>2</sup>	1 F	repared	& Analyze	d: 06/26/2	0			
Nitrite as N	1.98	0.10	0.091	mg/L	2.50	ND	79	80-120			QFnt, QMout
Nitrate as N	5.20	0.20	0.16	mg/L	5.65	ND	92	75-131			
Matrix Spike (0F26029-MS2)		Source	: C0F3378-0	5 F	repared	& Analyze	d: 06/26/2	D			
Nitrite as N	2.15	0.10	0.091	mg/L	2.50	ND	86	80-120			
Nitrate as N	5.33	0.20	0.16	mg/L	5.65	ND	94	75-131			
Matrix Spike Dup (0F26029-MSD1)		Source	: C0F3173-0 <sup>2</sup>	1 F	repared	& Analyze	d: 06/26/2	0			
Nitrite as N	1.98	0.10	0.091	mg/L	2.50	ND	79	80-120	0.1	20	QFnt, QMout
Nitrate as N	5.29	0.20	0.16	mg/L	5.65	ND	94	75-131	2	20	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 8 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work	Order	Number:	C0F3378
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Received on Ice (Y/N):	Yes	Temp:	8	°C
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#### **Solids - Batch Quality Control**

					Snike	Source		%REC		RPD	
Analvte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
											-
Batch 0F29110 - Analyzed as r	eceived										
Blank (0F29110-BLK1)					Prepared	& Analyze	d: 06/29/2	0			
Total Dissolved Solids	ND	10	10	mg/L							
Duplicate (0F29110-DUP1)		Source:	C0F3378-01		Prepared	& Analyze	d: 06/29/2	0			
Total Dissolved Solids	341	10	10	mg/L		351			3	20	
Duplicate (0F29110-DUP2)		Source:	C0F3378-02	2	Prepared	& Analyze	d: 06/29/2	0			
Total Dissolved Solids	338	10	10	mg/L		339			0.3	20	
Batch 0G02069 - Analyzed as r	eceived										
Blank (0G02069-BLK1)					Prepared	& Analyze	d: 07/02/2	0			
Total Suspended Solids	ND	0.5	0.5	mg/L							
Duplicate (0G02069-DUP1)		Source:	C0F3149-02	2	Prepared	& Analyze	d: 07/02/2	0			
Total Suspended Solids	3.50	2	2	mg/L		3.00			15	25	
Duplicate (0G02069-DUP2)		Source:	C0F3158-01		Prepared	& Analyze	d: 07/02/2	0			
Total Suspended Solids	106	10	10	mg/L		110			4	25	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 9 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number: C0F3378

Received on Ice (Y/N):	Yes	Temp:	8	°C	
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#### **General Inorganics - Batch Quality Control**

					Snike	Source		%RFC		RPD	
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0F28080 - Analyzed as rea	ceived										
Blank (0F28080-BLK1)					Prepared	& Analyze	d: 06/28/2	0			
Sulfide	ND	0.10	0.10	mg/L							
LCS (0F28080-BS1)					Prepared	& Analyze	d: 06/28/2	0			
Sulfide	0.400	0.10	0.10	mg/L	0.400		100	50-150			
Matrix Spike (0F28080-MS1)		Source:	C0F3360-02	2	Prepared	& Analyze	d: 06/28/2	0			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150			
Matrix Spike Dup (0F28080-MSD1)		Source:	C0F3360-02	2	Prepared	& Analyze	d: 06/28/2	0			
Sulfide	0.400	0.10	0.10	mg/L	0.400	ND	100	50-150	0	30	

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Analytical Report: Page 10 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work	Order	Number:	C0F3378
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Received on Ice (Y/N):	Yes	Temp:	8	°C
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#### **Nutrients - Batch Quality Control**

• • • • • •					Spike	Source		%REC		RPD	<u>Flar</u>
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag
Batch 0F26047 - Analyzed as Re	eceived IC										
Blank (0F26047-BLK1)				F	Prepared	& Analyze	d: 06/26/2	0			
Ortho Phosphate Phosphorus	ND	0.050	0.050	mg/L							
LCS (0F26047-BS1)				F	Prepared	& Analyze	d: 06/26/2	0			
Ortho Phosphate Phosphorus	0.271	0.050	0.050	mg/L	0.300		90	90-110			
Matrix Spike (0F26047-MS1)		Source	: C0F3379-0	2	Prepared	& Analyze	d: 06/26/2	0			
Ortho Phosphate Phosphorus	0.282	0.050	0.050	mg/L	0.300	ND	94	80-120			
Matrix Spike Dup (0F26047-MSD1)		Source	: C0F3379-0	<b>2</b> F	Prepared	& Analyze	d: 06/26/2	0			
Ortho Phosphate Phosphorus	0.282	0.050	0.050	mg/L	0.300	ND	94	80-120	0.1	20	
Batch 0F29072 - Acid Digest											
Blank (0F29072-BLK1)				F	Prepared	& Analyze	d: 06/29/2	0			
Kjeldahl Nitrogen	ND	0.10	0.093	mg/L							
LCS (0F29072-BS1)				F	Prepared	& Analyze	d: 06/29/2	0			
Kjeldahl Nitrogen	0.912	0.10	0.093	mg/L	1.00		91	80-120			
Matrix Spike (0F29072-MS1)		Source	: C0F3379-0	1 F	Prepared	& Analyze	d: 06/29/2	0			
Kjeldahl Nitrogen	1.39	0.10	0.093	mg/L	1.00	0.527	86	42-154			
Matrix Spike Dup (0F29072-MSD1)		Source	: C0F3379-0	1 F	Prepared	& Analyze	d: 06/29/2	0			
Kjeldahl Nitrogen	1.44	0.10	0.093	mg/L	1.00	0.527	91	42-154	4	25	
Batch 0F29073 - Analyzed as re	ceived										
Blank (0F29073-BLK1)				F	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							

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Analytical Report: Page 11 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work	Order	Number:	C0F3378
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Received on Ice (Y/N):	Yes	Temp:	8	°C
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#### **Nutrients - Batch Quality Control**

Analyte(s)	Result	RDL		Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 0F29073 - Analyzed as re	ceived										
LCS (0F29073-BS1)				I	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	0.980	0.10	0.044	mg/L	1.00		98	90-110			
Matrix Spike (0F29073-MS1)		Source	: C0F3379-0	1	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	1.11	0.10	0.044	mg/L	1.00	0.0484	106	80-120			
Matrix Spike Dup (0F29073-MSD1)		Source	: C0F3379-0	1	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	1.00	0.10	0.044	mg/L	1.00	0.0484	95	80-120	11	20	
Batch 0F29074 - Analyzed as re	ceived										
Blank (0F29074-BLK1)				I	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	ND	0.10	0.044	mg/L							
LCS (0F29074-BS1)				1	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	0.981	0.10	0.044	mg/L	1.00		98	90-110			
Matrix Spike (0F29074-MS1)		Source	: C0F3369-0	1	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	3.04	0.20	0.088	mg/L	2.00	0.899	107	80-120			
Matrix Spike Dup (0F29074-MSD1)		Source	C0F3369-0	1	Prepared	& Analyze	d: 06/29/2	0			
Ammonia-Nitrogen	2.96	0.20	0.088	mg/L	2.00	0.899	103	80-120	2	20	

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Analytical Report: Page 12 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work	Order	Number:	C0F3378
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Received on Ice (Y/N):	Yes	Temp:	8	°C
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#### Metals and Metalloids - Batch Quality Control

					Spike	Source	0/ DE0	%REC		RPD		
Analyte(s)	Result	RDL		Units	Level	Result	%REC	Limits	RPD	Limit	Flag	
Batch 0F29090 - 200.7/ No Digest	:											
Blank (0F29090-BLK1)					Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	ND	100	16	ug/L								
Blank (0F29090-BLK2)					Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	ND	100	16	ug/L							QBfil	
Blank (0F29090-BLK3)					Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	ND	100	16	ug/L							QBfil	
Blank (0F29090-BLK4)					Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	ND	100	16	ug/L								
LCS (0F29090-BS1)					Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	343	100	16	ug/L	334		103	85-115				
Matrix Spike (0F29090-MS1)		Source: (	C0F3051-0	3	Prepared & Analyzed: 06/29/20							
Aluminum-Dissolved	377	100	16	ug/L	334	ND	113	70-130				
Matrix Spike Dup (0F29090-MSD1)		Source: (	C0F3051-0	3	Prepared	& Analyze	d: 06/29/2	0				
Aluminum-Dissolved	368	100	16	ug/L	334	ND	110	70-130	2	20		
Batch 0G01089 - EPA 200.2												
Blank (0G01089-BLK1)					Prepared	& Analyze	d: 07/01/2	0				
Aluminum	ND	100	16	ug/L								
LCS (0G01089-BS1)					Prepared	& Analyze	d: 07/01/2	0				
Aluminum	1260	100	16	ug/L	1170		108	85-115				

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com



Client Name:	Wood Environment&Infrastructure Solutions, In
Contact:	John Rudolph
Address:	9210 Sky Park Court #200
	San Diego, CA 92123

Analytical Report: Page 13 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work	Order	Number:	C0F3378
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Received on Ice (Y/N): Yes Temp: 8	N): Yes Temp:	red on Ice (Y/N): Yes Temp:	8	°C	
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#### Metals and Metalloids - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 0G01089 - EPA 200.2										
Matrix Spike (0G01089-MS1)		Source: C0F	3378-04	Prepared	& Analyze	d: 07/01/2	0			
Aluminum	1370	100	16 ug/	L 1170	108	109	70-130			
Matrix Spike Dup (0G01089-MSD1)		Source: C0F	3378-04	Prepared	& Analyze	d: 07/01/2	0			
Aluminum	1420	100	16 ug/	L 1170	108	112	70-130	3	20	

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Analytical Report: Page 14 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Report Date: 13-Jul-2020

Work Order Number:C0F3378Received on Ice (Y/N):YesTemp:8 °C

#### **Notes and Definitions**

J	Estimated value
N_pFilt	Sample filtered and preserved upon receipt to the laboratory.
QBfil	Method blank was filtered prior to processing.
QFnt	The referenced sample did not require this QC analyte, so a follow-up is not needed.
QMout	MS and/or MSD recovery did not meet laboratory acceptance criteria.
ND:	Analyte NOT DETECTED at or above the Method Detection Limit (if MDL is reported), otherwise at or above the Reportable Detection Limit (RDL)
NR:	Not Reported
RDL:	Reportable Detection Limit
MDL:	Method Detection Limit
* / (Non-N	ELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

llesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

e-Standard No Alias.rpt

This report applies only to the sample(s) analyzed. As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client. Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

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Analytical Report: Page 15 of 15 Project Name: Amec Foster Wheeler-Lake Elsir Project Number: LECL TMDL 1915100402.0003

Work Order Number: C0F3378

Received on Ice (Y/N): Yes

Temp: 8 °C

Report Date: 13-Jul-2020

E.S. Babcock & Sons, Inc. Environmental Laboratories Chain of Custody & Sample Information Record (951) 653-3351 FAX (951) 653-1662 www.babcocklabs.com

Client: Wood E&I Solutions, Inc.	,		Cor	ntac	t: Jo	ohn I	Rud	olp	h									••				Phone No.	858-243-8158
FAX No.			Fm	ail·		iohn	rud.	oloh	aw	nodr		nom											Additional Reporting Requests
Project Name: LECL TMDL Monito Project Number: 1915100402	ring		Tur	n Ar TAT	oun App	d Ti	me:	:		F F	Rou	tine	2	*	3-5 Ru	Day sh	ć	*48	3 Ho Rus	bur ih	*Ad	*24 Hour Rush Iditional Charges May Apply	include GC Data Package:ves No FAX Results:ves No Email Results:ves No State EDT:ves No (Include Source Number in Notes)
Sampler Information				#	of Co Pres	ontai serva	iner	s IS			S.	amp Type	e		Ana	ilvs	is F	Rea	ues	ted		Matrix	Notes
Name:		*								tainers								ÿ				DW = Drinking Water WW = Wastewater	No lab filtration required for Ortho-P (field filtered). Total Phosphorus - Sub to Eurofins
Employer: Wood E&I Solutions	, Inc.	-				ato				Con					0			Shire				GW = Groundwater	Calscience. RUSH TAT
Signature:		<del>.</del> .	breserved		5203	DH DH/ZnAcet	ICI	AA	zen	tal # of (	utine	sample	ecial		ate - NILLI	2	nonia	ridsould In	I Sulfide	I AL	solved AL	S = Soil SG = Sludge L = Llavíd	Dissolved Al is not field filtered
Sample ID	Date	Time	Unp H2S	HCI	Na2	NaC	NHA	MC	Fro:	To	Ro	Re	Sp	TSS	TDS	TKA	Ami	TOL	Tota	Tota	Diss	M = Miscellaneous	((1110000)
CL07	6/26/20	1100								0				X	x x	x	х	X	xx	< x	x		
CL08	6/26/20	1025								6				x	x x	x	x	x	xx	x	x		
CL09	6/26/20	0945								•	1			x	x x	x	x	x	xx	x	x		
CL10	6/26/20	0915								C				x	x x	x	x	x	xx	x	x		
LE02	6/26/20	0915								5				,	x x	X	x	X	x x	<			
							-			-	-				_					-			
Relinquished By (sign)	Print Nan	ne / Con	npany	1		D	ate	/ Ti	me				J	Rec	eive	ed E	3y (	Sig	n)			Pri	nt Name / Company
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									inin to a														

(For Lab Use Only)	Sample Integrity U	Jpon Rec	eipt		74460	$\geq$	Lab Notes	
Sample(s) S	Submitted on Ice?	Yes	No	. ×.	Temperature		Constraint Constra	C0F3378 里爾里
Custo	dy Seal(s) Intact?	Yes	No	(N/A)	2°C			Bold: 06/26/2020 14/52
3	Sample(s) Intact?	Yes	No	10.000 <sup>-0</sup>	Cooler Blank			RC0. 00/20/2020 14:53
	(							

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Client Name:	Wood Environment&Infrastructure Solutic	Analytical Report:	Page 1 of 3
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsin
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0003
	San Diego, CA, 92123	Work Order Number:	C0F3380
Report Date:	07-Jul-2020	Received on Ice (Y/N)	Yes Temp: 8 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

#### Sample Identification

Lab Sample #	<u>Client Sample ID</u>	<u>Matrix</u>	Date Sampled	<u>By</u>	Date Submitted	<u>By</u>
C0F3380-01	CL07	Liquid	6/26/20 11:00	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3380-02	CL08	Liquid	6/26/20 10:25	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3380-03	CL09	Liquid	6/26/20 9:45	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3380-04	CL10	Liquid	6/26/20 9:15	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3380-05	LE02	Liquid	6/26/20 9:15	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE

Note: Requested Low Level Total Phosphorus analysis was subcontracted to Eurofins CalScience.

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 1 of 3



Client Name:	Wood Environment&Infrastructure Solutic	Analytical Report:	Page 2 of 3	3
Contact:	John Rudolph	Project Name:	Amec Fost	er Wheeler-Lake Elsin
Address:	9210 Sky Park Court #200	Project Number:	LECL TMD	L 1915100402.0003
	San Diego, CA, 92123	Work Order Number:	C0F3380	
Report Date:	07-Jul-2020	Received on Ice (Y/N)	Yes	Temp: 8 °C

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

#### E-CASE NARRATIVE+ COC.RPT

This report applies only to the sample(s) analyzed, As a mutual protection to clients, the public, and Babcock Laboratories, Inc., this report is submitted and accepted for the exclusive use of the Client to whom it is addressed. Interpretation and use of the information contained within this report are the sole responsibility of the Client, Babcock Laboratories, Inc. is not responsible for any misinformation or consequences that may result from misinterpretation or improper use of this report. This report is not to be modified or abbreviated in any way. Additionally, this report is not to be used, in whole or in part, in any advertising or publicity matter without written authorization from Babcock Laboratories, Inc. The liability of Babcock Laboratories, Inc. is limited to the actual cost of the requested analyses, unless otherwise agreed upon in writing. There is no other warranty expressed or implied.

location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 2 of 3 CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



<text><form><form></form></form></text>	Client Name: Contact: Address:	Wood Environi John Rudolph 9210 Sky Park San Diego, CA	ment& Cour A, 921	&Infra rt #20 23	stru D	ctu	ire -	Sol	lutio	:							١	Wa	Ar F	nal F Pro <b>O</b> I	lytical Report: Project Name: pject Number: r <b>der Number:</b>	Page Ameo LECL <b>C0F3</b>	e 3 of 3 c Foster _ TMDL 3 <b>380</b>	Wheele 191510	er-La 040	ake Elsir 2.0003
E.S. Baboock & Sons, Inc. Environmental Laboratories   Chain of Custody & Sample Information Record     (81) 633-335 FAX (85) 163-1682   www.baboodhias.com     Client:   Viood E&I Solutions, Inc.   Critatic Lichn Rudoph     Project Name:   EGL TMDL Monitoring   Turn Around Time:   Roading     Project Name:   EGL TMDL Monitoring   Turn Around Time:   Roading   Sample Information Record     Work bookdailes.com   Barnoler Information   # Preservatives   Note   Roading   Sample Information   Note     Project Name:   Lich TAT Aground Time:   Roading   Sample Information   Notes   N	Report Date:	07-Jul-2020															R	ec	eive	ed	on Ice (Y/N)	Yes		Temp:	8	°C
Client:   Wood E&I Solutions, Inc.   C-rutact: John Rudolph   Phone No.   E55-233-3158     FAX No.   Email:   john ndobjh@wcodpi.com   Fax Nour   Project Name:   Let CL TMDL Monitoring   Turn Around Time:   Roth   Yah Butur	E.S. E (951) 65 www.ba	Babcock & Sons, 53-3351 FAX (951) 653 abcocklabs.com	<mark>, Inc. 1</mark> 3-1662	Enviro	m	en	taH	_ak	ora	ator	ies			С	tha	in	of	Cu	sto	od	y & Sample Ir	nformat	tion Red	cord		_
FAX No.   Email:   john.ndobpl@weodplc.com   Additional formation   Addite of Addit formation   Additional formati	Client: Woo	d E&I Solutions, Inc.			Cor	itac	t: Jo	hn F	Rudo	lph											Phone No.	858-243-	8158	Begunata		
Project Name:   LECL TMOL Monitoring   Turn Around Time:   Routing   Yash	FAX No.				Em	ail:		john.	rudo	ph@\	woodp	olc.c	com									Include	e QC Data Pac	kage: 🗌 Yes 🗍	Na	
Integration Lab IAI Approval: by Sample Information Lab IAI Approval: by   Sample Information 6 Preservatives Sample Information 6 Preservatives Integration Notes   Name: Integration 6 Preservatives Integration Integration Notes   Sample Information 6 Preservatives Integration Notes Notes   Bannet: Integration Integration Integration Notes   Signature: Integration Integration Integration Notes   Signature: Integration Integration Integration Integration   Signature:<	Project Name:	LECL TMDL Monitor	ing		Tur	n Ar	oun	d Tir	me:		F	lou	tine	3	*3-5 I Ru:	Day sh	*2	48 H Ru	our sh	1	24 Hour Rush		FAX Re Email Re State	Sults:  ves Sults:  ves EDT:  ves	No No No	
Sampler information   & Preservatives   Type   Analysis Requested   Matrix   Notes     Name:   Biginature:   Big	r toject Number	. 1915100402			Lab	1A1 #	App of Co	ntai	l: ners		By:	S	ample							•Ad	ditional Charges May Apply	(Inclue	de Source Num	iber in Notes)		
Name   Difference   Big of the second secon	Mam	Sampler Information			$\left  \right $	8	Pres	erva	tives		- sia	H	Туре	$\vdash$	Ana	lysis	s Re	que	sted	-	Matrix	No lab filtrat	Notes tion required fo	r Ortho-P (field	-	
Signature:   Image: Signature in the second secon	Employe	e: r: Wood E&I Solutions,	Inc.					tate			Containe				te		Iorus				DW = Drinking Water WW = Wastewater GW = Groundwater	filtered). Total Phosp Calscience.	ohorus - Sub to RUSH TAT	Eurofins		
Sample (D   Date   Time   Six (Q R)   Q R R R R R R R R R R R R R R R R R R R	Signature	B;			preserved		S203	DHZnAce	tol	zen	tal # of	outine	sample		ate - Nitri	7	al Phosph	P/Ortho-P	al Sulfide	solved AL	S = Soil SG = Sludge L = Liquid	Dissolved A	I is not field filt	ared		
CL07   G/2420   CL08   G/24720   C25   C   C   X X X X X X X X X X X X X X X X X X X	S	Sample ID	Date	Time	Unp H2S	1 P	Na2	Nag	HN	E C	To	Ro	Re	TSS	TDS	TKD	Tota	SRP	Tota	Diss	M = Miscellaneous	21	1000	T		
CL08   6/24/26 (0.2.5)   1		CL07	6 26/2	0 1100				-			9	-		X	XX	x	XX	x	x x	Х						
CL09   6/24/26   6/4/25   6   7		CL08	6/2/2/2	01025		+					0	-		X	XX	X	XX	X	XX	х						
CC10		CL09	612612	09995				-	+	+	-	-		X	XX	X	XX	X	XX	X						
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(For Lab Use Only)   Sample Integrity Upon Receipt   Lab Notes     Sample(s) Submitted on Ice?   Yes   No     Custody Seal(s) Intact?   Yes   No     Sample(s) Intact?   Yes   No     Sample(s) Intact?   Yes   No     Cooler Blank   H	Eller	51	580	VSTY	2	2	10	15	5 (	10/2	Coli	0		1	mil	di.					Cusy Jem	4J2/6	5			
(For Lab Use Only)   Sample Integrity Upon Receipt   Lab Notes     Sample(s) Submitted on Ice?   Yes   No   Temperature     Custody Seal(s) Intact?   Yes   No   Color Blank     Sample(s) Intact?   Yes   No   Color Blank																										
Custody Seal(s) Intact? Yes No N/A & C RC'd: 06/26/2020 14:53 Sample(s) Intact? Yes No □ Cooler Blank .H	(For Lab Use Only, Sam	) Sample Integri ple(s) Submitted on Ice?	ty Upon Yes	Receipt No		2)			Tem	pera	/ fi ture	63			Lat	No	tes				<b>C0F33</b>	80		嬀		
		Custody Seal(s) Intact? Sample(s) Intact?	Yes	No No	C	IIA			Coo	er Bla	°C								_		Rc'd: 06/26/20 .н	20 14:	53 10	避		

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

#### Page 3 of 3

# 🔅 eurofins

## Environment Testing America

## **ANALYTICAL REPORT**

Eurofins Calscience LLC 7440 Lincoln Way Garden Grove, CA 92841 Tel: (714)895-5494

Laboratory Job ID: 570-32264-1 Client Project/Site: C0F3380

#### For:

Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, California 92507

Attn: Cindy A Waddell

Authorized for release by: 7/6/2020 8:47:32 PM

Carla Hollowell, Project Manager I (714)895-5494 carlahollowell@eurofinsus.com

Review your project results through Total Access



Visit us at: www.eurofinsus.com/Env The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.
# **Table of Contents**

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## **Definitions/Glossary**

These commonly used abbreviations may or may not be present in this report. Listed under the "D" column to designate that the result is reported on a dry weight basis

## Client: Babcock Laboratories, Inc. Project/Site: C0F3380

Percent Recovery

Contains Free Liquid

Too Numerous To Count

Glossary Abbreviation

¤ %R

CFL

TNTC

3
4
5
6
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9

CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

#### Job ID: 570-32264-1

#### Laboratory: Eurofins Calscience LLC

Narrative

Job Narrative 570-32264-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The samples were received on 7/1/2020 9:45 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.1° C.

#### **General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 570-32264-1

**General Chemistry** 

Client Sample ID: C0F3380-01 Date Collected: 06/26/20 11:00 Date Received: 07/01/20 09:45							Lab Sarr	ple ID: 570-3 Matrix:	2264-1 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.161		0.0200	0.00490	mg/L		07/02/20 06:30	07/02/20 09:25	1
Client Sample ID: C0F3380-02 Date Collected: 06/26/20 10:25 Date Received: 07/01/20 09:45							Lab Sam	ple ID: 570-3 Matrix:	2264-2 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0770		0.0200	0.00490	mg/L		07/02/20 06:30	07/02/20 09:26	1
Client Sample ID: C0F3380-03 Date Collected: 06/26/20 09:45 Date Received: 07/01/20 09:45							Lab Sam	nple ID: 570-3 Matrix:	2264-3 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0530		0.0200	0.00490	mg/L		07/02/20 06:30	07/02/20 09:28	1
Client Sample ID: C0F3380-04 Date Collected: 06/26/20 09:15 Date Received: 07/01/20 09:45							Lab Sam	ple ID: 570-3 Matrix:	2264-4 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.0565		0.0200	0.00490	mg/L		07/02/20 06:30	07/02/20 09:29	1
Client Sample ID: C0F3380-05 Date Collected: 06/26/20 09:15 Date Received: 07/01/20 09:45							Lab Sam	ple ID: 570-3 Matrix:	2264-5 Water
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	0.226		0.0200	0.00490	mg/L		07/02/20 06:30	07/02/20 09:31	1

Job ID: 570-32264-1

### Method: 365.1 - Phosphorus, Total

Lab Sample ID: MB 570-790 Matrix: Water Analysis Batch: 79097	)68/5-A							Clie	ent Sam	ple ID: M Prep Ty Prep E	ethod pe: Tot Batch: <sup>*</sup>	Blank al/NA 79068
Analyta	IN Bosi	ult Qualifiar	ы		MDI Unit		п	Б	roparod	Analy	rad	Dil Eac
Phosphorus Total	Nesi			0.0	0490 ma/	<u> </u>		07/0	2/20 06·30		<u>.eu</u> <u>09:13</u> –	
			0.0200	0.01	onoo mg			0170	2/20 00:00	0 01/02/20	00.10	
Lab Sample ID: LCS 570-79	068/6-A					Cli	ient	Sar	nple ID:	: Lab Cor	ntrol Sa	ample
Matrix: Water										Prep Ty	pe: Tot	al/NA
Analysis Batch: 79097										Prep E	Batch: '	79068
			Spike	LCS	LCS					%Rec.		
Analyte			Added	Result	Qualifier	Unit		D	%Rec	Limits		
Phosphorus, Total			0.200	0.2033		mg/L			102	93_107		
Lab Sample ID: LCSD 570-7 Matrix: Water Analysis Batch: 79097	<b>′9068/7-A</b>					Client S	Sam	ple	ID: Lab	Control Prep Ty Prep E	Samplo pe: Tot Batch: `	e Dup al/NA 79068
-			Spike	LCSD	LCSD					%Rec.		RPD
Analyte			Added	Result	Qualifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total			0.200	0.2046		mg/L			102	93 - 107	1	4
								_				
Lab Sample ID: 570-32264-5	5 MS							С	lient Sa	imple ID:	C0F33	80-05
Matrix: Water										Prep Ty	pe: Io	al/NA
Analysis Batch: 79097	Samula S		<b>C</b> uilte	MC	ме					Prep E	satch:	79068
Analysia	Sample S	ampie Suglifier	Spike Аддад	NIS Beault	NIS	11		<b>D</b>	% Bee	%Rec.		
Phoenhorup Total				Result	Quaimer					02 107		
Filosphorus, rota	0.220		0.200	0.4330		mg/L			104	93 - 107		
Lab Sample ID: 570-32264-5	5 MSD							С	lient Sa	mple ID:	C0F33	80-05
Matrix: Water								_		Prep Tv	pe: Tot	al/NA
Analysis Batch: 79097										Prep E	Batch:	79068
,	Sample S	Sample	Spike	MSD	MSD					%Rec.		RPD
Analyte	Result C	Qualifier	Added	Result	Qualifier	Unit		D	%Rec	Limits	RPD	Limit
Phosphorus, Total	0.226		0.200	0.4335		mg/L		· _	104	93_107	0	4

#### Client Sample ID: C0F3380-01 Date Collected: 06/26/20 11:00 Date Received: 07/01/20 09:45

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Fina <b>l</b> Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	79068	07/02/20 06:30	YR9U	ECL 1
Total/NA	Analysis Instrumen	365.1 t ID: ACA1		1	5 mL	5 mL	79097	07/02/20 09:25	YR9U	ECL 1

#### Client Sample ID: C0F3380-02 Date Collected: 06/26/20 10:25 Date Received: 07/01/20 09:45

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	79068	07/02/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	79097	07/02/20 09:26	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Client Sample ID: C0F3380-03 Date Collected: 06/26/20 09:45

#### Date Received: 07/01/20 09:45

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	79068	07/02/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	79097	07/02/20 09:28	YR9U	ECL 1
	Instrumer	nt ID <sup>.</sup> ACA1								

#### Client Sample ID: C0F3380-04

## Date Collected: 06/26/20 09:15

Date Received: 0	7/01/20 09:45
------------------	---------------

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	79068	07/02/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	79097	07/02/20 09:29	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Client Sample ID: C0F3380-05 Date Collected: 06/26/20 09:15 Date Received: 07/01/20 09:45

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	365.2/365.3/365			50 mL	50 mL	79068	07/02/20 06:30	YR9U	ECL 1
Total/NA	Analysis	365.1		1	5 mL	5 mL	79097	07/02/20 09:31	YR9U	ECL 1
	Instrumen	t ID: ACA1								

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 570-32264-1

Lab Sample ID: 570-32264-2

Lab Sample ID: 570-32264-3

Lab Sample ID: 570-32264-5

## 2 3 4 5 6 7 8

Client: Babcock Laboratories, Inc. Project/Site: C0F3380

#### Laboratory: Eurofins Calscience LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation	10109	09-29-20
	Districts		
California	SCAQMD LAP	17LA0919	11-30-20
California	State	2944	09-29-20
Guam	State	20-003R	10-31-20
Nevada	State	CA00111	07-31-20
Oregon	NELAP	CA300001	01-29-21
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-11-20

Job ID: 570-32264-1

**Eurofins Calscience LLC** 

## **Method Summary**

#### Client: Babcock Laboratories, Inc. Project/Site: C0F3380

Method	Method Description	Protocol	Laboratory		
365.1	Phosphorus, Total	EPA	ECL 1		
365.2/365.3/365	Phosphorus, Total	MCAWW	ECL 1		

#### Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

#### Laboratory References:

ECL 1 = Eurofins Calscience LLC Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

## Sample Summary

Client: Babcock Laboratories, Inc. Project/Site: C0F3380

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
570-32264-1	C0F3380-01	Water	06/26/20 11:00	07/01/20 09:45	
570-32264-2	C0F3380-02	Water	06/26/20 10:25	07/01/20 09:45	
570-32264-3	C0F3380-03	Water	06/26/20 09:45	07/01/20 09:45	
570-32264-4	C0F3380-04	Water	06/26/20 09:15	07/01/20 09:45	
570-32264-5	C0F3380-05	Water	06/26/20 09:15	07/01/20 09:45	

		SUBCON Babcock I C	TRACT ORDER Print Laboratories, Inc.	ed: 6/30/2020 12:44 Loc: 570 <b>32264</b>
SENDING LABORATORY			<b>RECEIVING LABORATORY:</b>	-
Babcock Laboratories, Inc. 6100 Quail Valley Court Riverside, CA 92507-0704 Phone: (951) 653-3351 Fax: (951) 653-1662 Project Manager: Cindy A	. Waddell		Eurofins Calscience, Inc. 7440 Lincoln Way Garden Grove, CA 92841-142 Phone :(714) 895-5494 Fax: (714) 894-7501	
Copy/Relog from C0D1639. S Sampler: Client	System Name: Woo	d Environment & Infra	structure Solutions, Inc	
Please include MDLs and EX PLEASE EXPEDITE	CEL EDD	xpires Regulatory Day	/8	570-32264 Chain of Custody
Analysis	Due	Past Date Sampled	Laboratory ID Con	nments
Sample ID: C0F3380-01 Liquid		Sampled: 06/26/20 11:00	CL07	Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	07/02/20 23:59	07/06/20 11:00	Low Level Total Phosphorus	S
Sample ID: C0F3380-02 Liquid		Sampled: 06/26/20 10:25	CL08	Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	07/02/20 23:59	07/06/20 10:25	Low Level Total Phosphorus	S
Sample ID: C0F3380-03 Liquid		Sampled: 06/26/20 09:45	CL09	Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	07/02/20 23:59	07/06/20 09:45	Low Level Total Phosphoru	S
Sample ID: C0F3380-04 Liquid		Sampled: 06/26/20 09:15	CL10	Proj.No.: <u>LECL TMDL</u> 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	07/02/20 23:59	07/06/20 09:15	Low Level Total Phosphoru	S
Sample ID: C0F3380-05 Liquid		Sampled: 06/26/20 09:15	LE02	Proj.No.:LECL TMDL 1915100402.0003
Subout_02 Containers Supplied: 500 mL Poly H2SO4 (A)	07/02/20 23:59	07/06/20 09:15	Low Level Total Phosphoru	S

SUBCONTRACT ORDER

Babcock Laboratories, Inc. C0F3380

# Tracking No. 00808210986

Printed: 6/30/2020 12:44

	All Containers Intact:	YesNo	Samples Preserved Properly:	YesNo
Samples Received at oC	Sample Labels / COC Agree:	YesNo	Custody Seals Present:	YesNo
Please forward all acknowledgem NO HARDCOPIES PLEASE.	nents of sample receipt, final rep	orts and invoices to	data@babcocklabs.com	
Released By	Date	Received By	Date 7/ Q1/2020	0945
Released By	Date J	Received By	Date 3.5 /3.14	Page 2 of 2

n)1002000101 -edEx 92841 ca-us SNA PRIORITY OVERNIGHT 0:300416: 30,00020 51: 24.20 LB MAK 02661347CAFE3313 WED - 01 JUL BILL SENDLR SHIP DATE: ACTUGT: 24 CAD: U2661 RIVERSIDE, CA 22507 UNITED STATES US 10 SAMPLE RECEIVING EUROFINS CALSCIENCE, INC. 7440 LINCOLN WAY GARDEN GROVE CA 92841 DEPT URIGIN ID:UNTA (951) 653-3351 BABCOCK LABORATORIES 92 APVA OCT 1008 0821 0986 11**/11/11/11/11/11/11/11/11/11/11/11/11** 570-32264 Waybill BIDD QUALL WALLEY ST 

32264

5 6

Client: Babcock Laboratories, Inc.

#### Login Number: 32264 List Number: 1 Creator: Soriano, Precy

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

List Source: Eurofins Calscience



Client Name:	Wood Environment&Infrastructure Solutic	Analytical Report:	Page 1 of 3	
Contact:	John Rudolph	Project Name:	Amec Foste	r Wheeler-Lake Elsin
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL	1915100402.0003
	San Diego, CA, 92123	Work Order Number:	C0F3387	
Report Date:	31-Jul-2020	Received on Ice (Y/N)	Yes	Temp: 4 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Lab Sample #	Client Sample ID	<u>Matrix</u>	Date Sampled	By	Date Submitted	<u>By</u>
C0F3387-01	CL07-Int	Solid	6/26/20 11:00	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-02	CL07-Surf	Solid	6/26/20 11:05	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-03	CL08-Int	Solid	6/26/20 10:25	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-04	CL08-Surf	Solid	6/26/20 10:30	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-05	CL09-Int	Solid	6/26/20 9:45	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-06	CL09-Surf	Solid	6/26/20 9:50	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-07	CL10-Int	Solid	6/26/20 9:15	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-08	CL10-Surf	Solid	6/26/20 9:20	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-09	LE02-Int	Solid	6/26/20 9:15	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE
C0F3387-10	LE02-Surf	Solid	6/26/20 14:53	Client	6/26/20 14:53	Courier (Eliseo Vera)-DE

Note: Analysis for Chlorophyll a was subcontracted to Truesdail Laboratories, Inc.

*mailing* P.O. Box 432 Riverside, CA 92502-0432 location 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com

#### Page 1 of 3

CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Client Name:	Wood Environment&Infrastructure Solutic	Analytical Report:	Page 2 of 3
Contact:	John Rudolph	Project Name:	Amec Foster Wheeler-Lake Elsin
Address:	9210 Sky Park Court #200	Project Number:	LECL TMDL 1915100402.0003
	San Diego, CA, 92123	Work Order Number:	C0F3387
Report Date:	31-Jul-2020	Received on Ice (Y/N)	Yes Temp: 4 °C

#### Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted.

lesto Hardd

Alexis Nicole Harold For Cindy A. Waddell

cc:

#### E-CASE NARRATIVE+ COC.RPT

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*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 2 of 3

CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



Contact: Address:	<ul> <li>Name: Wood Environment&amp;Infrastructure Solutic</li> <li>Intact: John Rudolph</li> <li>dress: 9210 Sky Park Court #200</li> <li>San Diego, CA, 92123</li> </ul>										V	Vo	Analytical Rep Project Nai Project Numb rk Order Numb	ort: me: ber: <b>ber:</b>	Page 3 Amec LECL C0F33	Foster W TMDL 19 8 <b>7</b>	/heele )1510(	r-La )402	ike El 2.000					
port Date:	31-Jul-2020	)														R	€C€	eived on Ice (Y/	N)	Yes	I	Гemp:	4	°C
E.S. E (951) 65 www.ba	3abcock & So 33-3351 FAX (951) abcocklabs.com	ns, Inc. Envi 653-1662	ron	ime	ent	al L	.ab	ora	ator	ies		С	hai	in c	of (	Cus	sto	dy & Sample Ir	nform	nation F	Record			
Client: Woo	d E&I Solutions, Inc			Cont	act:	Joł	n R	ludo	lph									Phone No.	858-2	43-8158				
FAX No.			E	mai	1:	joł	nn.ru	lopr	oh@\	wood	plc.c	om							Inc	dditional Rep dude QC Data	Package: Tres	No No		
Project Name: Project Number	LECL TMDL Mo	nitoring	T	'urn Lab '	Arc TAT	ound App	Tin	ne:		F By:	Routir	10	*3-: R	5 Day Rush	/	*48 I Ri	lour Jsh	*24 Hour Rush Additional Charges May Apply	a	FA) Emai S nclude Source	X Results: Yes il Results: Yes itate EDT: Yes Number in Note	No No No No		
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Nam	e:							Π		lers	T							DW = Drinking Water			165			
Employe	r: <u>Wood E&amp;I Soluti</u> e:	ons, Inc.	served			03	ZnAcetate		-	# of Contail	ine	ial	sulfide - Nitrite		nia	hosphorus rtho-P	phyll-a	WW = Wastewater GW = Groundwater S = Soil SG = Sludge		Chl-a samples	on 0.7 um GFF			
	Sample ID	Date Tim	Jupre	1250	1CI	Va2S2	HOPH	NCAA	rozer	Total	Rout	Spec	otal S litrate	NN	omm	otal F	thloro	L = Liquid						
C	CL07 - Int	612620 110	0	-			-			1			- 2	-1-1	q	- 0	x	M = Miscellanecus	Filter \	Volume: 50	OmL			
C	L07 - Surf	6/26/20 110	5							-							x		Filter \	olume: 50	OmL			
C	CL08 - Int	6/26/20 102	5														x		Filter \	<sup>/olume:</sup> 50	OmL			
CI	L08 - Surf	6/26/201030	>		_					_						-	x		Filter \	olume: 50	0mL			
C	CL09 - Int	6/26/20 094	5		+		-					$\square$		_		-	x		Filter \	olume: 50	Omb		and in the local data	
CI	109 - Surf	6/26/20 095	0											_			X		Filter \	olume: 50	Onl			
C	L10 - Surf	6/26/20 09 1	0	+					++-		$\square$	++				-	X		Filter	olume: 43	OML			
L	E02 - Int	626/20 (791)	5	$\square$	-						+	+		-	$\left  \right $		x ·		Filter V	'olume: 27	5.1			
LE	E02 - Surf	6/26/20 090	0						T		$\square$	Ħ		-	H		x		Filter V	olume: 25	Oml			
Relinquishe	d By (sign)	Print Name / C. 1/2 / 1 - P 1 - 5 For 1 - 5 Co	ompa 7 9	any Lje	υØ	14 14	Da 15	ate / '	Time - / 28 6 / 2	120	200	Re	S	ed By	/ (Si	ign)	-	Pri <i>E 1.5 E0 V</i> (42950 / 4.1	nt Nam SP-1 Md l	-10 -10 -/55	5			
(For Lab Use Only Sam	) Sample Int ple(s) Submitted on	legrity Upon Recei Ice? Yes 1	pt lo				Т	emp	7 perat	H(	30		L	ab N	otes			<b>COF33</b>	87	, [				
	Custody Seal(s) Int Sample(s) Int	act? Yes Mact? Yes M	10 10	N/	a)			Cool	er Bla	°C nk								c'd: 06/26/20	20 1	4:53				

*mailing* P.O. Box 432 Riverside, CA 92502-0432 *location* 6100 Quail Valley Court Riverside, CA 92507-0704 P 951 653 3351 F 951 653 1662 www.babcocklabs.com Page 3 of 3

CA ELAP No. 2698 EPA No. CA00102 NELAP No.OR4035 LACSD No., 10119



ALS - Truesdail Laboratories 3337 Michelson Drive, Suite CN750 Irvine, CA 92612 <u>T</u> +1 714 730 6239

## Report

Client: Babcock Laboratories, Inc. 6100 Quail Valley Ct Riverside, CA 92507 Work Order No.: 20G0078 Printed: 07/30/2020

Attention: Cindy A. Waddell Project Name: Chlorophyll Project Number: LECL TMDL Monitoring

#### CASE NARRATIVE

#### SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Туре	Date Sampled	Date Received
C0F3387-01	20G0078-01	Filter		06/26/2020 11:00	07/07/2020 10:30
C0F3387-02	20G0078-02	Filter		06/26/2020 11:05	07/07/2020 10:30
C0F3387-03	20G0078-03	Filter		06/26/2020 10:25	07/07/2020 10:30
C0F3387-04	20G0078-04	Filter		06/26/2020 10:30	07/07/2020 10:30
C0F3387-05	20G0078-05	Filter		06/26/2020 09:45	07/07/2020 10:30
C0F3387-06	20G0078-06	Filter		06/26/2020 09:50	07/07/2020 10:30
C0F3387-07	20G0078-07	Filter		06/26/2020 09:15	07/07/2020 10:30
C0F3387-08	20G0078-08	Filter		06/26/2020 09:20	07/07/2020 10:30
C0F3387-09	20G0078-09	Filter		06/26/2020 09:15	07/07/2020 10:30
C0F3387-10	20G0078-10	Filter		06/26/2020 14:53	07/07/2020 10:30

#### DEFINITIONS

Symbol	Definition
U	Analyte included in the analysis, but not detected
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Aldo B. Minano Project Manager



Client: Babcock Laboratories, Inc.		Projec Projec	t Name: t Numbe	er:	Chlorophy LECL TMD	<b>ll</b> L Monitoring		Printed: 07/3	0/2020	
			CO	F3387-0	)1					
			20G00	)78-01 (I	Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	15.7	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	3:00 GDG	EPA 10200 H	
			<b>C</b> 0	E2287-0	17					
			20G00	)78-02 (I	, 2 Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	23.4	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	3:00 GDG	EPA 10200 H	
			C	F3387-0	13					
			20G00	)78-03 (I	, s Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	38.0	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	3:00 GDG	EPA 10200 H	
			C O	E2287.0	14					
			20G00	)78-04 (I	, <del>,</del> Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	16.1	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	3:00 GDG	EPA 10200 H	
			<b>C</b> 0							
			20600	78-05 (I	, , , , , , , , , , , , , , , , , , ,	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
L			ALS	Truesd	ail					



Client: Babcock Laborato	ries, Inc.		Projec Projec	t Name: t Numbe	er:	Chlorophy LECL TMDI	<b>ll</b> L Monitoring		Printed: 07/	30/2020
			C0F3387-05 (Continued)							
		20G	0078-05	(Filter)	(Cont	inued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	19.9	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	8:00 GDG	EPA 10200 H	1
			CC	)F3387-0	)6					
			20G00	)78-06 (	Filter	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	31.3	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	8:00 GDG	EPA 10200 H	ł
			СС	)F3387-0	)7					
			20G00	)78-07 (	Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	47.0	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	8:00 GDG	EPA 10200 H	4
			СС	)F3387-0	8					
			20G00	)78-08 (	Filter	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	Truesd	ail					
Microbiology										
Chlorophyll a	59.4	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	8:00 GDG	EPA 10200 H	ł
			СС	)F3387-0	)9					
			20G00	)78-09 (	Filter)	)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
L			ALS	Truesd	ail					



Client: Babcock Laborate	ories, Inc.		Projec	t Name:		Chlorophy	I			
			Projec	t Numbe	er:	LECL TMDL	. Monitoring		Printed: 07/	30/2020
			C0F3387	7-09 (Co	ntinue	ed)				
		200	0078-09	(Filter)	(Cont	inued)				
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	5 Truesd	lail					
Microbiology										
Chlorophyll a	171	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	8:00 GDG	EPA 10200 H	ł
			С	)F3387-1	10					
			20G0(	)78-10 (	Filter)					
Analyte	Result	MDL	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
			ALS	5 Truesd	lail					
Microbiology										
Chlorophyll a	149	1.00	1.00	mg/m³	1	2007368	07/20/2020 18	3:00 GDG	EPA 10200 H	l



Client: Babcock Laboratories, Inc.		Projec	t Name:	Chlor	ophy <b>ll</b>					
		Projec	t Number:	LECL	TMDL Mor	nitoring		Printe	ed: 07/3	0/2020
		QUAL	ΙΤΥ CONTI	ROL						
		Mie	crobiology	/						
		ALS	5 Truesdai	I						
Analyte	Result	RL	Units	Spike Leve <b>l</b>	Source Resu <b>l</b> t	%REC	% Rec Limits	RPD	RPD Limit	Note
Batch: 2007368 - EPA 10200										
Blank (2007368-BLK1)				Prepa	ired & Ana	lyzed: 7/	/20/2020			
Chlorophyll a	ND	1.00	mg/m³							U



SUBCONTRACT ORDER

ļ,

Babcock Laboratories, Inc.

### C0F3387

SENDING LABORATORY:	RECEIVING LABORATORY:
Babcock Laboratories, Inc.	Truesdail Laboratories - Subcontract
6100 Quail Valley Court	3337 Michelson Drive Suite CN750
Riverside, CA 92507-0704	Irvine, CA 92614
Phone: (951) 653-3351	Phone :(714) 730-6239
Fax: (951) 653-1662	Fax: (714) 730-6462
Project Manager: Cindy A. Waddell	

Copy/Relog from C0D1635. System Name: Wood Environmental&Infrastructure Solutions, Inc Sampler: Client

Please include MDLs and EXCEL EDD

Analysis	Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0F3387-01 /Solid		Sampled: 06/26/20 11:00	CL07-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 11:00	Report Chlorophy	ll a / Filter Volume = 500r	mL
Sample ID: C0F3387-02 Solid		Sampled: 06/26/20 11:05	CL07-Surf		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 11:05	Report Chlorophy	ll a / Filter Volume = 500r	nL
Sample ID: C0F3387-03 Solid		Sampled: 06/26/20 10:25	CL08-Int		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 10:25	Report Chlorophy	ll a / Filter Volume = 500r	nL
Sample ID: C0F3387-04 Solid		Sampled: 06/26/20 10:30	CL08-Surf		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 10:30	Report Chlorophy	ll a / Filter Volume = 500r	nL
Sample ID: C0F3387-05 Solid		Sampled: 06/26/20 09:45	CL09-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 09:45	Report Chlorophy	ll a / Filter Volume = 500r	nL
Sample ID: C0F3387-06 Solid		Sampled: 06/26/20 09:50	CL09-Surf		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 09:50 Trackir 208082	Report Chlorophy ng No. 11950	ll a / Filter Volume = 500n	nL Page 1 of 2 Page 6 o

Page 6 of 7



Printed: 7/6/2020 13:01

4

Analysis	E Due	xpires Regulatory Days Past Date Sampled	Laboratory ID	Comments	
Sample ID: C0F3387-07 Solid		Sampled: 06/26/20 09:15	CL10-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 09:15	Report Chlorophy	/ll a / Filter Volume = 430r	nL
Sample ID: C0F3387-08 Solid		Sampled: 06/26/20 09:20	CL10-Surf		Proj.No.: <u>LECL TMDL</u> Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 09:20	Report Chlorophy	rll a / Filter Volume = 450r	nL
Sample ID: C0F3387-09 Solid		Sampled: 06/26/20 09:15	LE02-Int		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 09:15	Report Chlorophy	/ll a / Filter Volume = 325r	nL
Sample ID: C0F3387-10 Solid		Sampled: 06/26/20 14:53	LE02-Surf		Proj.No.:LECL TMDL Monitoring
Subout Containers Supplied: Whirl-Pak (A)	07/23/20 23:59	07/06/20 14:53	Report Chlorophy	'll a / Filter Volume = 250r	nLe

j J						
· .	Trackir <b>9</b> 008082	ng No. 11950				
4	All Containers Intact:	YesN	o Samples Preserv	ed Properly:	Yes	No
Samples Received at oC	Sample Labels / COC Agree:	YesNo	Custody Seals Pr	esent:	Yes	No
Please forward all acknowledge NO FARDCOPIES PLEASE. Released By	ments of sample receipt, final $\frac{162020}{Date}$	Received By	s to <u>data@babcockl</u>	abs.com - AA2 Date	010	1030
Released By	Date	Received By		Date 3.	7/Rg Pa	ge 7 of 7

APPENDIX D - SATELLITE DATA REPORTS

**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2019-07-31

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs08\_20190731

Authors:	Mail:	Telephone:
Philip Klinger	klinger@eomap.de	+49 8152 9986 115
Karin Schenk	schenk@eomap.de	+49 8152 9986 112



## CONTENT

1.	SERV	ICE PROVISION REPORT
LIST	OF AL	L DELIVERED SCENES
CON	TENT.	
LIST	OF DE	LIVERED FILES (ONE PRODUCT EXAMPLE)
FILE	NAMI	NG4
NOT	ES (E.C	G. TECHNICAL ISSUES, EXCEPTIONAL CONDITIONS, ETC.)4
2.	METH	HODOLOGY AND PRODUCTS
2.	1	Modular Inversion and Processing System (MIP)
2.	2	Products7
2.	3	QUALITY CONTROL AND FLAGGING
2.	4	DATA FORMAT
2.	5	DATA SOURCES
CON	TACT.	

## 1. Service Provision Report

Contractor Details	Service Provider Details
Wood Environment & Infrastructure Solutions, Inc.	EOMAP GmbH & Co. KG
9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany
San Diego, CA 92123, USA	
Point of Contact	Point of Contact
John D. Rudolph	Philip Klinger
john.rudolph@woodplc.com	klinger@eomap.de, +49 (0)8152 9986115

Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2019-07-31
Version	8

#### List of all delivered scenes

Sensor	Time of record	
Landsat 8	2019-06-24 18:22:25 UTC	

#### Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\square$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\square$
True Color/False Color Composite	RGB	$\square$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs08_20190731.pdf	PDF	Delivery Report
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030.kmz	KMZ	GoogleEarth overlay
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030_metadata.xml	XML	Metadata
CHL_us-california040037_EOMAP_20190726_182233_LSAT8_m0030_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for

#### Notes (e.g. technical issues, exceptional conditions, etc.)

- Some areas affected by sunglint flagged on Lake Elsinore
- Eastern part of Canyon Lake is too narrow for Landsat 8 spatial resolution of 30m.

Data Analyst Philip Uli-y

Philip Klinger

QA/QC

Karin Schenk

EOMVS

## 2. Methodology and Products

## 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

<sup>&</sup>lt;sup>3</sup> Heege, T., Fischer, J. (2004): Mapping of water constituents in Lake Constance using multispectral airborne scanner data and a physically based processing scheme. Can. J. Remote Sensing, Vol. 30, No. 1, pp. 77-86

<sup>&</sup>lt;sup>4</sup> Kiselev, V., Bulgarelli, B. and Heege, T., (2015). Sensor independent adjacency correction algorithm for coastal and inland water systems. Remote Sensing of Environment, 157: 85-95. , ISSN 0034-4257, <u>http://dx.doi.org/10.1016/j.rse.2014.07.025</u>

 <sup>&</sup>lt;sup>5</sup> Heege, T. & Fischer, J. (2000): Sun glitter correction in remote sensing imaging spectrometry. SPIE Ocean Optics XV Conference, Monaco, Oct. 16-20.
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Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

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## 2.2 Products

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Figure 4: Harmful Algae Bloom Indicator product from 2019-07-26

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.



## 2.3 Quality Control and Flagging

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Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.



Figure 5: QUT product from 2019-07-26



EOMAP Quality Coding QUC 2019-07-26 18:22:33 UTC Landsat 8 Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2019-07-26

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	ow combinatio	n of the two	most relevant flags:		
First number =	most rele	evant flag				1
1-digit-numbe	r refer to	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	11	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieva	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

## 2.4 Data Format

The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

## 2.5 Data Sources

EOMAP uses the following data hubs to access and download satellite raw data from different sensors:

- Sentinel-3: PEPS https://peps.cnes.fr
- Landsat-8 Amazon Web Services, https://landsat-pds.s3.amazonaws.com
- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/


### Contact

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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2019-09-03

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs09\_20190903

Authors:	Mail:	Telephone:
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Karin Schenk	schenk@eomap.de	+49 8152 9986 112



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## 1. Service Provision Report

Contractor Details	Service Provider Details
Wood Environment & Infrastructure Solutions, Inc.	EOMAP GmbH & Co. KG
9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany
San Diego, CA 92123, USA	
Point of Contact	Point of Contact
John D. Rudolph	Philip Klinger
john.rudolph@woodplc.com	klinger@eomap.de, +49 (0)8152 9986115

Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2019-09-03
Version	9

#### List of all delivered scenes

Sensor	Time of record
Landsat 8	2019-08-27 18:22:44 UTC

#### Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs09_20190903.pdf	PDF	Delivery Report
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030.kmz	KMZ	GoogleEarth overlay
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030_metadata.xml	XML	Metadata
CHL_us-california040037_EOMAP_20190827_182244_LSAT8_m0030_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for

### Notes (e.g. technical issues, exceptional conditions, etc.)

• Eastern part of Canyon Lake is too narrow for Landsat 8 spatial resolution of 30m.

Data Analyst Philip Uli-y

Philip Klinger



Karin Schenk



## 2. Methodology and Products

## 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

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1-digit-numbe	r refer to	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	11	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieva	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

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The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

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- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2020-01-27

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs12\_20200127

Authors:	Mail:	Telephone:
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## 1. Service Provision Report

Contractor Details	Service Provider Details	
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Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2020-01-27
Version	12

#### List of all delivered scenes

Sensor	Time of record
Sentinel-2A	2019-09-21 18:44:59 UTC

#### Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs12_20200127.pdf	PDF	Delivery Report
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010.kmz	KMZ	GoogleEarth overlay
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010_metadata.xml	XML	Metadata
CHL_us-california_EOMAP_20190921_184459_SENT2_m0010_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for metadata files and ASCII XYZQ files.

#### Notes (e.g. technical issues, exceptional conditions, etc.)

Data Analyst

Philip Vili-y

Philip Klinger



Karin Schenk



## 2. Methodology and Products

## 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

<sup>&</sup>lt;sup>3</sup> Heege, T., Fischer, J. (2004): Mapping of water constituents in Lake Constance using multispectral airborne scanner data and a physically based processing scheme. Can. J. Remote Sensing, Vol. 30, No. 1, pp. 77-86

<sup>&</sup>lt;sup>4</sup> Kiselev, V., Bulgarelli, B. and Heege, T., (2015). Sensor independent adjacency correction algorithm for coastal and inland water systems. Remote Sensing of Environment, 157: 85-95. , ISSN 0034-4257, <u>http://dx.doi.org/10.1016/j.rse.2014.07.025</u>

 <sup>&</sup>lt;sup>5</sup> Heege, T. & Fischer, J. (2000): Sun glitter correction in remote sensing imaging spectrometry. SPIE Ocean Optics XV Conference, Monaco, Oct. 16-20.
<sup>6</sup> EU FP7-Projekt GLASS: WP4 Validation report (29.2.2016): <u>www.glass-project.eu/assets/Deliverables/GLaSS-D4.2.pdf</u>

<sup>&</sup>lt;sup>7</sup> Bumberger J., Heege T., Klinger P., et al. (2017): Towards a Harmonized Validation Procedure for Inland Water Optical Remote Sensing Data using Inherent Optical Properties, Rem. Sens. 2017(9), 21p, submitted 28 Feb. 2017



Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

MIP is the most established, sensor-independent and operational aquatic remote sensing processing system for the full range of high, medium and low-resolution satellite sensors. Fully-automated water monitoring processors are installed in satellite ground segments worldwide (Europe, Australia, Asia and America), to ensure fast and efficient access to a wide range of satellite data. The data processing and orchestration software, the EOMAP Workflow System (EWS) allows for continuous, daily production.



## 2.2 Products

**Turbidity** (TUR) is a key parameter of water quality and is linearly related to the backward scattering of light of organic and inorganic particles in water. Turbidity is also linearly related to Total Suspended Matter (TSM) at low to moderate turbidity values. The measurement unit is Nephelometric Turbidity Unit (NTU). Satellite-derived turbidity is determined by the backward scattering of light between 450 to 800nm, which is physically retrieved using satellite data. The standard relation of EOMAP concentrations to inherent optical properties is defined as 1 NTU = 0.0118 1/m backward scattering at 550nm, or 1 NTU = 0.619 1/m total scattering at 550nm for an assumed ratio bb/b = 0.019. The linear relation between turbidity and suspended matter/solids in low to moderate concentrations is in most cases a regional constant, but can vary with particle size distribution. Note that the geometrical properties of an in-situ measurement device, and the wavelength in use, may differ in comparison to the satellite product. For example, the standard FTU determination, a measure of turbidity similar to NTU, is based on the measurement of light scattered within a 90° angle from a beam directed at the water sample. Alongside temporal differences in satellite and in situ measurements, different sampling depths and the measurement location, this needs to be considered when comparing and interpreting satellite derived vs. in situ measured turbidity values. The Turbidity product from 2019-09-21 is shown in Figure 2.





**Chlorophyll-a** (CHL) retrieval is based on the derived information of in-water organic absorption, in-water turbidity and spectral characteristics of each water body. Chlorophyll-a in [ $\mu$ g/l], is provided as a measure linearly related to the pigment-specific absorption at 440nm, with 1  $\mu$ g/l Chl equal to 0.035 1/m pigment absorption. Phaeophytin and further pigments cannot be discriminated methodologically with the spectral resolution provided by Landsat 8/Sentinel-2 and similar sensors and is therefore included in this product. The pigment-related absorption is always smaller than the absorption of organic components (SOA). For clear water condi-



tions (low chlorophyll/total suspended solids), the specific absorption chlorophyll increases significantly (Bricaud et al. 1995<sup>9</sup>). Chlorophyll values can vary over 4 magnitudes, for marine waters or clear lakes typical concentrations between 0.01 and 10  $\mu$ g/l, while for eutrophic lakes concentrations can reach 100  $\mu$ g/l and more. The chlorophyll products are typically reliable within a range of 10 – 50 % in comparison to in situ measures (Broszeit 2015<sup>10</sup>), which are typically based on one of three different methods, which include photometric, fluorescence and HPLC approaches and their subcategories. The Chlorophyll-a product from 2019-09-21 is shown in Figure 3.



Figure 3: Chlorophyll-a product from 2019-09-21

The Harmful Algae Bloom Indicator (HAB) refers to the presence of cyanobacteria. It is sensitive to the appearance of cyanobacteria-related pigments, i.e. phycocyanin and phycoerythrin. Both pigments show absorption features in green wavelengths from 500 nm to approx. 640 nm; phycoerythrin shows its absorption maximum at 540-570 nm, phycocyanin at 610-620 (Colyer et al. 2005). Most satellite sensors support the identification of this feature with only two bands, i.e. one in the green wavelength region (e.g. L7 and L8 at 530 – 590 nm) and in the red wavelength region at approx. 640 – 670 nm. The used standard parameterisation of phytoplankton absorption in MIP as described above, however, does not account phycocyanin and phycoerythrin absorption in the retrieval process. The modelled phytoplankton absorption therefore lacks the absorption features of these pigments. Nonetheless, if these pigments are present in the water a slight spectral mismatch between modelled water leaving reflectance (R<sub>modelled</sub>) and satellite derived reflectance (R<sub>satellite</sub>) occurs. The algorithm then compares the slope of R<sub>modelled</sub> and R<sub>satellite</sub> between the green and red band ( $\delta R = R_{green} - R_{red}$ ) in order to classify pixels with regard to phycocyanin and phycoerythrin occurrence, i.e. harmful algae bloom probability. The HAB indicator from 2019-09-21 is shown in Figure 4.

<sup>&</sup>lt;sup>10</sup> Broszeit, A., 2015. Assessing long-term inland water quality using satellite imagery: A Feasibility and validation study of different lake types. MSc Thesis, Julius-Maximilian-University Würzburg, 96p



<sup>&</sup>lt;sup>9</sup> Bricaud, A., Babin, M., Morel, A., Claustre, H. (1995): Variability in the chlorophyll-specific absorption coefficients of natural phytoplankton: Analysis and parametrization. Journal of Geophysical Research Atmospheres, 100(C7):13,321-13,332

<section-header>

Figure 4: Harmful Algae Bloom Indicator product from 2019-09-21

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.



## 2.3 Quality Control and Flagging

As a standard output of the processing, an accuracy or quality indicator is calculated for each retrieved parameter and for each detected water pixel. This measure comprises a comprehensive range of factors that can impact the derived product quality, including:

- the geometry between sun, target, and sensor,
- the estimated sun glint probability,
- the retrieved aerosol optical depth,
- residuals of the measured and modelled sensor radiances and subsurface reflectances,
- the comparison of retrieved water species concentrations to extreme values as defined in the configuration files,
- pixels affected by cloud shadow and
- shallow water areas.

Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.



Figure 5: QUT product from 2019-09-21



EOMAP Quality Coding QUC 2019-09-21 18:44:59 UTC Sentinel-2A Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2019-09-21

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	ow combinatio	n of the two	most relevant flags:		
First number =	most rele	evant flag				1
1-digit-numbe	r refer to	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
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- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2019-10-24

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs10.2\_20191024

Authors:	Mail:	Telephone:
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9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany	
San Diego, CA 92123, USA		
Point of Contact	Point of Contact	
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john.rudolph@woodplc.com	klinger@eomap.de, +49 (0)8152 9986115	

Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2019-10-24
Version	10.2

#### List of all delivered scenes

Sensor	Time of record
Landsat 8	2019-10-14 18:22:56 UTC

#### Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
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Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs10220191024.pdf	PDF	Delivery Report
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030.kmz	KMZ	GoogleEarth overlay
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030_metadata.xml	XML	Metadata
CHL_us-california040037_EOMAP_20191014_182256_LSAT8_m0030_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

see list of product abbreviations
Country ID following ISO 3166 ALPHA-2 standards
name of city/region or other relevant area characterization
Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
time
Sensor in use
Spatial resolution/grid spacing in meters
is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for
metadata files and ASCII XYZQ files.

### Notes (e.g. technical issues, exceptional conditions, etc.)

• Eastern part of Canyon Lake is too narrow for Landsat 8 spatial resolution of 30m.

Data Analyst Philip Uli-y

Philip Klinger



Karin Schenk



## 2. Methodology and Products

## 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
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- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

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Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

MIP is the most established, sensor-independent and operational aquatic remote sensing processing system for the full range of high, medium and low-resolution satellite sensors. Fully-automated water monitoring processors are installed in satellite ground segments worldwide (Europe, Australia, Asia and America), to ensure fast and efficient access to a wide range of satellite data. The data processing and orchestration software, the EOMAP Workflow System (EWS) allows for continuous, daily production.



## 2.2 Products

**Turbidity** (TUR) is a key parameter of water quality and is linearly related to the backward scattering of light of organic and inorganic particles in water. Turbidity is also linearly related to Total Suspended Matter (TSM) at low to moderate turbidity values. The measurement unit is Nephelometric Turbidity Unit (NTU). Satellite-derived turbidity is determined by the backward scattering of light between 450 to 800nm, which is physically retrieved using satellite data. The standard relation of EOMAP concentrations to inherent optical properties is defined as 1 NTU = 0.0118 1/m backward scattering at 550nm, or 1 NTU = 0.619 1/m total scattering at 550nm for an assumed ratio bb/b = 0.019. The linear relation between turbidity and suspended matter/solids in low to moderate concentrations is in most cases a regional constant, but can vary with particle size distribution. Note that the geometrical properties of an in-situ measurement device, and the wavelength in use, may differ in comparison to the satellite product. For example, the standard FTU determination, a measure of turbidity similar to NTU, is based on the measurement of light scattered within a 90° angle from a beam directed at the water sample. Alongside temporal differences in satellite and in situ measurements, different sampling depths and the measurement location, this needs to be considered when comparing and interpreting satellite derived vs. in situ measured turbidity values. The Turbidity product from 2019-10-14 is shown in Figure 2.





**Chlorophyll-a** (CHL) retrieval is based on the derived information of in-water organic absorption, in-water turbidity and spectral characteristics of each water body. Chlorophyll-a in [ $\mu$ g/l], is provided as a measure linearly related to the pigment-specific absorption at 440nm, with 1  $\mu$ g/l Chl equal to 0.035 1/m pigment absorption. Phaeophytin and further pigments cannot be discriminated methodologically with the spectral resolution provided by Landsat 8/Sentinel-2 and similar sensors and is therefore included in this product. The pigment-related absorption is always smaller than the absorption of organic components (SOA). For clear water condi-



tions (low chlorophyll/total suspended solids), the specific absorption chlorophyll increases significantly (Bricaud et al. 1995<sup>9</sup>). Chlorophyll values can vary over 4 magnitudes, for marine waters or clear lakes typical concentrations between 0.01 and 10  $\mu$ g/l, while for eutrophic lakes concentrations can reach 100  $\mu$ g/l and more. The chlorophyll products are typically reliable within a range of 10 – 50 % in comparison to in situ measures (Broszeit 2015<sup>10</sup>), which are typically based on one of three different methods, which include photometric, fluorescence and HPLC approaches and their subcategories. The Chlorophyll-a product from 2019-10-14 is shown in Figure 3.



Figure 3: Chlorophyll-a product from 2019-10-14

The Harmful Algae Bloom Indicator (HAB) refers to the presence of cyanobacteria. It is sensitive to the appearance of cyanobacteria-related pigments, i.e. phycocyanin and phycoerythrin. Both pigments show absorption features in green wavelengths from 500 nm to approx. 640 nm; phycoerythrin shows its absorption maximum at 540-570 nm, phycocyanin at 610-620 (Colyer et al. 2005). Most satellite sensors support the identification of this feature with only two bands, i.e. one in the green wavelength region (e.g. L7 and L8 at 530 – 590 nm) and in the red wavelength region at approx. 640 – 670 nm. The used standard parameterisation of phytoplankton absorption in MIP as described above, however, does not account phycocyanin and phycoerythrin absorption in the retrieval process. The modelled phytoplankton absorption therefore lacks the absorption features of these pigments. Nonetheless, if these pigments are present in the water a slight spectral mismatch between modelled water leaving reflectance (R<sub>modelled</sub>) and satellite derived reflectance (R<sub>satellite</sub>) occurs. The algorithm then compares the slope of R<sub>modelled</sub> and R<sub>satellite</sub> between the green and red band ( $\delta R = R_{green} - R_{red}$ ) in order to classify pixels with regard to phycocyanin and phycoerythrin occurrence, i.e. harmful algae bloom probability. The HAB indicator from 2019-10-14 is shown in Figure 4.

<sup>&</sup>lt;sup>10</sup> Broszeit, A., 2015. Assessing long-term inland water quality using satellite imagery: A Feasibility and validation study of different lake types. MSc Thesis, Julius-Maximilian-University Würzburg, 96p



<sup>&</sup>lt;sup>9</sup> Bricaud, A., Babin, M., Morel, A., Claustre, H. (1995): Variability in the chlorophyll-specific absorption coefficients of natural phytoplankton: Analysis and parametrization. Journal of Geophysical Research Atmospheres, 100(C7):13,321-13,332

<section-header>

Figure 4: Harmful Algae Bloom Indicator product from 2019-10-14

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.


# 2.3 Quality Control and Flagging

As a standard output of the processing, an accuracy or quality indicator is calculated for each retrieved parameter and for each detected water pixel. This measure comprises a comprehensive range of factors that can impact the derived product quality, including:

- the geometry between sun, target, and sensor,
- the estimated sun glint probability,
- the retrieved aerosol optical depth,
- residuals of the measured and modelled sensor radiances and subsurface reflectances,
- the comparison of retrieved water species concentrations to extreme values as defined in the configuration files,
- pixels affected by cloud shadow and
- shallow water areas.

Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.



Figure 5: QUT product from 2019-10-14



EOMAP Quality Coding QUC 2019-10-14 18:22:56 UTC Landsat 8 Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2019-10-14

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	w combinatio	n of the two	most relevant flags:		
First number =	most rele	vant flag				1
1-digit-numbe	er refer to s	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	114	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieval	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

# 2.4 Data Format

The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

# 2.5 Data Sources

EOMAP uses the following data hubs to access and download satellite raw data from different sensors:

- Sentinel-3: PEPS https://peps.cnes.fr
- Landsat-8 Amazon Web Services, https://landsat-pds.s3.amazonaws.com
- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



## Contact

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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2020-01-08

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs11\_20200108

Authors:	Mail:	Telephone:
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Karin Schenk	schenk@eomap.de	+49 8152 9986 112



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1.	SERV	RVICE PROVISION REPORT			
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# 1. Service Provision Report

Contractor Details	Service Provider Details
Wood Environment & Infrastructure Solutions, Inc.	EOMAP GmbH & Co. KG
9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany
San Diego, CA 92123, USA	
Point of Contact	Point of Contact
John D. Rudolph	Philip Klinger
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Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2020-01-08
Version	11

## List of all delivered scenes

Sensor	Time of record
Sentinel-2B	2019-10-16 18:45:00 UTC

## Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
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CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010.kmz	KMZ	GoogleEarth overlay
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_metadata.xml	XML	Metadata
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
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**Turbidity** (TUR) is a key parameter of water quality and is linearly related to the backward scattering of light of organic and inorganic particles in water. Turbidity is also linearly related to Total Suspended Matter (TSM) at low to moderate turbidity values. The measurement unit is Nephelometric Turbidity Unit (NTU). Satellite-derived turbidity is determined by the backward scattering of light between 450 to 800nm, which is physically retrieved using satellite data. The standard relation of EOMAP concentrations to inherent optical properties is defined as 1 NTU = 0.0118 1/m backward scattering at 550nm, or 1 NTU = 0.619 1/m total scattering at 550nm for an assumed ratio bb/b = 0.019. The linear relation between turbidity and suspended matter/solids in low to moderate concentrations is in most cases a regional constant, but can vary with particle size distribution. Note that the geometrical properties of an in-situ measurement device, and the wavelength in use, may differ in comparison to the satellite product. For example, the standard FTU determination, a measure of turbidity similar to NTU, is based on the measurement of light scattered within a 90° angle from a beam directed at the water sample. Alongside temporal differences in satellite and in situ measurements, different sampling depths and the measurement location, this needs to be considered when comparing and interpreting satellite derived vs. in situ measured turbidity values. The Turbidity product from 2019-12-20 is shown in Figure 2.





**Chlorophyll-a** (CHL) retrieval is based on the derived information of in-water organic absorption, in-water turbidity and spectral characteristics of each water body. Chlorophyll-a in [ $\mu$ g/l], is provided as a measure linearly related to the pigment-specific absorption at 440nm, with 1  $\mu$ g/l Chl equal to 0.035 1/m pigment absorption. Phaeophytin and further pigments cannot be discriminated methodologically with the spectral resolution provided by Landsat 8/Sentinel-2 and similar sensors and is therefore included in this product. The pigment-related absorption is always smaller than the absorption of organic components (SOA). For clear water condi-



tions (low chlorophyll/total suspended solids), the specific absorption chlorophyll increases significantly (Bricaud et al. 1995<sup>9</sup>). Chlorophyll values can vary over 4 magnitudes, for marine waters or clear lakes typical concentrations between 0.01 and 10  $\mu$ g/l, while for eutrophic lakes concentrations can reach 100  $\mu$ g/l and more. The chlorophyll products are typically reliable within a range of 10 – 50 % in comparison to in situ measures (Broszeit 2015<sup>10</sup>), which are typically based on one of three different methods, which include photometric, fluorescence and HPLC approaches and their subcategories. The Chlorophyll-a product from 2019-12-20 is shown in Figure 3.



Figure 3: Chlorophyll-a product from 2019-12-20

The Harmful Algae Bloom Indicator (HAB) refers to the presence of cyanobacteria. It is sensitive to the appearance of cyanobacteria-related pigments, i.e. phycocyanin and phycoerythrin. Both pigments show absorption features in green wavelengths from 500 nm to approx. 640 nm; phycoerythrin shows its absorption maximum at 540-570 nm, phycocyanin at 610-620 (Colyer et al. 2005). Most satellite sensors support the identification of this feature with only two bands, i.e. one in the green wavelength region (e.g. L7 and L8 at 530 – 590 nm) and in the red wavelength region at approx. 640 – 670 nm. The used standard parameterisation of phytoplankton absorption in MIP as described above, however, does not account phycocyanin and phycoerythrin absorption in the retrieval process. The modelled phytoplankton absorption therefore lacks the absorption features of these pigments. Nonetheless, if these pigments are present in the water a slight spectral mismatch between modelled water leaving reflectance (R<sub>modelled</sub>) and satellite derived reflectance (R<sub>satellite</sub>) occurs. The algorithm then compares the slope of R<sub>modelled</sub> and R<sub>satellite</sub> between the green and red band ( $\delta R = R_{green} - R_{red}$ ) in order to classify pixels with regard to phycocyanin and phycoerythrin occurrence, i.e. harmful algae bloom probability. The HAB indicator from 2019-12-20 is shown in Figure 4.

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Figure 4: Harmful Algae Bloom Indicator product from 2019-12-20

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.



# 2.3 Quality Control and Flagging

As a standard output of the processing, an accuracy or quality indicator is calculated for each retrieved parameter and for each detected water pixel. This measure comprises a comprehensive range of factors that can impact the derived product quality, including:

- the geometry between sun, target, and sensor,
- the estimated sun glint probability,
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- pixels affected by cloud shadow and
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Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.



Figure 5: QUT product from 2019-12-20



EOMAP Quality Coding QUC 2019-12-20 18:44:53 UTC Sentinel-2A Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2019-12-20

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	w combinatio	on of the two	most relevant flags:		
First number =	most rele	vant flag	in or the thro	inost telefunctings:		
1-digit-numbe	r refer to	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	114	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieva	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

# 2.4 Data Format

The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

# 2.5 Data Sources

EOMAP uses the following data hubs to access and download satellite raw data from different sensors:

- Sentinel-3: PEPS https://peps.cnes.fr
- Landsat-8 Amazon Web Services, https://landsat-pds.s3.amazonaws.com
- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



## Contact

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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2020-01-08

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs11\_20200108

Authors:	Mail:	Telephone:
Philip Klinger	klinger@eomap.de	+49 8152 9986 115
Karin Schenk	schenk@eomap.de	+49 8152 9986 112



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# 1. Service Provision Report

Contractor Details	Service Provider Details
Wood Environment & Infrastructure Solutions, Inc.	EOMAP GmbH & Co. KG
9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany
San Diego, CA 92123, USA	
Point of Contact	Point of Contact
John D. Rudolph	Philip Klinger
john.rudolph@woodplc.com	klinger@eomap.de, +49 (0)8152 9986115

Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2020-01-08
Version	11

## List of all delivered scenes

Sensor	Time of record
Sentinel-2B	2019-10-16 18:45:00 UTC

## Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs11_20200108.pdf	PDF	Delivery Report
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_wgs84_xyz.txt	ASCII	Product text file, real values
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010.kmz	KMZ	GoogleEarth overlay
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_metadata.xml	XML	Metadata
CHL_us-california_EOMAP_20191220_184453_SENT2_m0010_overview.pdf	PDF	Overview PDF, metadata and quicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for metadata files and ASCII XYZQ files.

## Notes (e.g. technical issues, exceptional conditions, etc.)

Data Analyst

Philip Vili-y

Philip Klinger



Karin Schenk



# 2. Methodology and Products

# 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

<sup>&</sup>lt;sup>3</sup> Heege, T., Fischer, J. (2004): Mapping of water constituents in Lake Constance using multispectral airborne scanner data and a physically based processing scheme. Can. J. Remote Sensing, Vol. 30, No. 1, pp. 77-86

<sup>&</sup>lt;sup>4</sup> Kiselev, V., Bulgarelli, B. and Heege, T., (2015). Sensor independent adjacency correction algorithm for coastal and inland water systems. Remote Sensing of Environment, 157: 85-95. , ISSN 0034-4257, <u>http://dx.doi.org/10.1016/j.rse.2014.07.025</u>

 <sup>&</sup>lt;sup>5</sup> Heege, T. & Fischer, J. (2000): Sun glitter correction in remote sensing imaging spectrometry. SPIE Ocean Optics XV Conference, Monaco, Oct. 16-20.
<sup>6</sup> EU FP7-Projekt GLASS: WP4 Validation report (29.2.2016): <u>www.glass-project.eu/assets/Deliverables/GLaSS-D4.2.pdf</u>

<sup>&</sup>lt;sup>7</sup> Bumberger J., Heege T., Klinger P., et al. (2017): Towards a Harmonized Validation Procedure for Inland Water Optical Remote Sensing Data using Inherent Optical Properties, Rem. Sens. 2017(9), 21p, submitted 28 Feb. 2017



Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

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	GV	GV range	Flag status	Flag description	Color code	Color
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	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieva	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

# 2.4 Data Format

The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

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- Landsat-8 Amazon Web Services, https://landsat-pds.s3.amazonaws.com
- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2020-04-27

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs14\_20200427

Authors:	Mail:	Telephone:
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# 1. Service Provision Report

Contractor Details	Service Provider Details
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Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2020-04-27
Version	14

## List of all delivered scenes

Sensor	Time of record
Sentinel-2B	2020-04-23 18:44:53 UTC

## Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
Diffuse Attenuation Coefficient	KDC	
Quality Coding	QUC	$\boxtimes$
Total Quality	QUT	$\boxtimes$
True Color/False Color Composite	RGB	$\boxtimes$
Remote Sensing Reflectance	RRS	
Secchi Disc Depth	SDD	
Sum of Inorganic Absorption	SIA	
Sum if Organic Absorption	SOA	
Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
Trophic State Index (Chlorophyll)	TSC	
Total Suspended Matter	TSM	
Light Penetration Depth	Z90	
Water Body Extent	WEX	

## List of delivered files (one product example)

File name		Content
1773_Delivery_EOMAP2WoodPlc_Vs14_20200423.pdf	PDF	Delivery Report
CHL_us-california_11smt_EOMAP_20200423_184453_SENT2_m0010.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california_11smt_EOMAP_20200423_184453_SENT2_m0010	GeoTIFF	Product raster file, 32bit real values
CHL_us-california_11smt_EO-		Product text file, real values
MAP_20200423_184453_SENT2_m0010_wgs84_xyz.txt		
CHL_us-california_11smt_EOMAP_20200423_184453_SENT2_m0010.kmz	KMZ	GoogleEarth overlay
CHL_us-california_11smt_EOMAP_20200423_184453_SENT2_m0010_metadata.xml	XML	Metadata
CHL_us-california_11smt_EOMAP_20200423_184453_SENT2_m0010_overview.pdf	PDF	Overview PDF, metadata and quicklook



## File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

With	
[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for metadata files and ASCII XYZQ files.

#### Notes (e.g. technical issues, exceptional conditions, etc.)

- Sunglint on parts of Canyon Lake could not be corrected sufficiently and is therefore flagged.

Data Analyst Philip Uli-y

Philip Klinger

QA/QC

Karin Schenk



# 2. Methodology and Products

# 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

<sup>&</sup>lt;sup>3</sup> Heege, T., Fischer, J. (2004): Mapping of water constituents in Lake Constance using multispectral airborne scanner data and a physically based processing scheme. Can. J. Remote Sensing, Vol. 30, No. 1, pp. 77-86

<sup>&</sup>lt;sup>4</sup> Kiselev, V., Bulgarelli, B. and Heege, T., (2015). Sensor independent adjacency correction algorithm for coastal and inland water systems. Remote Sensing of Environment, 157: 85-95. , ISSN 0034-4257, <u>http://dx.doi.org/10.1016/j.rse.2014.07.025</u>

 <sup>&</sup>lt;sup>5</sup> Heege, T. & Fischer, J. (2000): Sun glitter correction in remote sensing imaging spectrometry. SPIE Ocean Optics XV Conference, Monaco, Oct. 16-20.
<sup>6</sup> EU FP7-Projekt GLASS: WP4 Validation report (29.2.2016): <u>www.glass-project.eu/assets/Deliverables/GLaSS-D4.2.pdf</u>

<sup>&</sup>lt;sup>7</sup> Bumberger J., Heege T., Klinger P., et al. (2017): Towards a Harmonized Validation Procedure for Inland Water Optical Remote Sensing Data using Inherent Optical Properties, Rem. Sens. 2017(9), 21p, submitted 28 Feb. 2017



Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

MIP is the most established, sensor-independent and operational aquatic remote sensing processing system for the full range of high, medium and low-resolution satellite sensors. Fully-automated water monitoring processors are installed in satellite ground segments worldwide (Europe, Australia, Asia and America), to ensure fast and efficient access to a wide range of satellite data. The data processing and orchestration software, the EOMAP Workflow System (EWS) allows for continuous, daily production.


## 2.2 Products

**Turbidity** (TUR) is a key parameter of water quality and is linearly related to the backward scattering of light of organic and inorganic particles in water. Turbidity is also linearly related to Total Suspended Matter (TSM) at low to moderate turbidity values. The measurement unit is Nephelometric Turbidity Unit (NTU). Satellite-derived turbidity is determined by the backward scattering of light between 450 to 800nm, which is physically retrieved using satellite data. The standard relation of EOMAP concentrations to inherent optical properties is defined as 1 NTU = 0.0118 1/m backward scattering at 550nm, or 1 NTU = 0.619 1/m total scattering at 550nm for an assumed ratio bb/b = 0.019. The linear relation between turbidity and suspended matter/solids in low to moderate concentrations is in most cases a regional constant, but can vary with particle size distribution. Note that the geometrical properties of an in-situ measurement device, and the wavelength in use, may differ in comparison to the satellite product. For example, the standard FTU determination, a measure of turbidity similar to NTU, is based on the measurement of light scattered within a 90° angle from a beam directed at the water sample. Alongside temporal differences in satellite and in situ measurements, different sampling depths and the measurement location, this needs to be considered when comparing and interpreting satellite derived vs. in situ measured turbidity values. The Turbidity product from 2020-04-23 is shown in Figure 2.





**Chlorophyll-a** (CHL) retrieval is based on the derived information of in-water organic absorption, in-water turbidity and spectral characteristics of each water body. Chlorophyll-a in [ $\mu$ g/l], is provided as a measure linearly related to the pigment-specific absorption at 440nm, with 1  $\mu$ g/l Chl equal to 0.035 1/m pigment absorption. Phaeophytin and further pigments cannot be discriminated methodologically with the spectral resolution provided by Landsat 8/Sentinel-2 and similar sensors and is therefore included in this product. The pigment-related absorption is always smaller than the absorption of organic components (SOA). For clear water condi-



tions (low chlorophyll/total suspended solids), the specific absorption chlorophyll increases significantly (Bricaud et al. 1995<sup>9</sup>). Chlorophyll values can vary over 4 magnitudes, for marine waters or clear lakes typical concentrations between 0.01 and 10  $\mu$ g/l, while for eutrophic lakes concentrations can reach 100  $\mu$ g/l and more. The chlorophyll products are typically reliable within a range of 10 – 50 % in comparison to in situ measures (Broszeit 2015<sup>10</sup>), which are typically based on one of three different methods, which include photometric, fluorescence and HPLC approaches and their subcategories. The Chlorophyll-a product from 2020-04-33 is shown in Figure 3.



Figure 3: Chlorophyll-a product from 2020-04-23

The Harmful Algae Bloom Indicator (HAB) refers to the presence of cyanobacteria. It is sensitive to the appearance of cyanobacteria-related pigments, i.e. phycocyanin and phycoerythrin. Both pigments show absorption features in green wavelengths from 500 nm to approx. 640 nm; phycoerythrin shows its absorption maximum at 540-570 nm, phycocyanin at 610-620 (Colyer et al. 2005). Most satellite sensors support the identification of this feature with only two bands, i.e. one in the green wavelength region (e.g. L7 and L8 at 530 – 590 nm) and in the red wavelength region at approx. 640 – 670 nm. The used standard parameterisation of phytoplankton absorption in MIP as described above, however, does not account phycocyanin and phycoerythrin absorption in the retrieval process. The modelled phytoplankton absorption therefore lacks the absorption features of these pigments. Nonetheless, if these pigments are present in the water a slight spectral mismatch between modelled water leaving reflectance (R<sub>modelled</sub>) and satellite derived reflectance (R<sub>satellite</sub>) occurs. The algorithm then compares the slope of R<sub>modelled</sub> and R<sub>satellite</sub> between the green and red band ( $\delta R = R_{green} - R_{red}$ ) in order to classify pixels with regard to phycocyanin and phycoerythrin occurrence, i.e. harmful algae bloom probability. The HAB indicator from 2020-04-23 is shown in Figure 4.

<sup>&</sup>lt;sup>10</sup> Broszeit, A., 2015. Assessing long-term inland water quality using satellite imagery: A Feasibility and validation study of different lake types. MSc Thesis, Julius-Maximilian-University Würzburg, 96p



<sup>&</sup>lt;sup>9</sup> Bricaud, A., Babin, M., Morel, A., Claustre, H. (1995): Variability in the chlorophyll-specific absorption coefficients of natural phytoplankton: Analysis and parametrization. Journal of Geophysical Research Atmospheres, 100(C7):13,321-13,332

EOMAP Harmful Algae Bloom Indicator 2020-04-23 18:44:53 UTC Sentinel-2B Lake Elsinore & Canyon Lake



Figure 4: Harmful Algae Bloom Indicator product from 2020-04-23

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.



## 2.3 Quality Control and Flagging

As a standard output of the processing, an accuracy or quality indicator is calculated for each retrieved parameter and for each detected water pixel. This measure comprises a comprehensive range of factors that can impact the derived product quality, including:

- the geometry between sun, target, and sensor,
- the estimated sun glint probability,
- the retrieved aerosol optical depth,
- residuals of the measured and modelled sensor radiances and subsurface reflectances,
- the comparison of retrieved water species concentrations to extreme values as defined in the configuration files,
- pixels affected by cloud shadow and
- shallow water areas.

Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.



Figure 5: QUT product from 2020-04-23



EOMAP Quality Coding QUC 2020-04-23 18:44:53 UTC Sentinel-2B Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2020-04-23

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	ow combinatio	n of the two	most relevant flags:		
First number = most relevant flag					1	
1-digit-number refer to second relevant flag, e.g. 1 for sunglint risk, 2 for large solar zenith angle						
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	11	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
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- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



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**Delivery Report** 

# Water Quality Monitoring Lake Elsinore & Canyon Lake

Date: 2020-06-30

Client: Wood Plc

Delivery no.: 1773\_Delivery\_EOMAP2WoodPlc\_Vs15\_20200630

Authors:	Mail:	Telephone:
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Karin Schenk	schenk@eomap.de	+49 8152 9986 112



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Wood Environment & Infrastructure Solutions, Inc.	EOMAP GmbH & Co. KG
9210 Sky Park Court, Suite 200	Schlosshof 4, 82229 Seefeld, Germany
San Diego, CA 92123, USA	
Point of Contact	Point of Contact
John D. Rudolph	Philip Klinger
john.rudolph@woodplc.com	klinger@eomap.de, +49 (0)8152 9986115

Contractor PO / Reference number	
Contractor project title	
Service Provider reference number	1773
Date of delivery	2020-06-30
Version	15

#### List of all delivered scenes

Sensor	Time of record
Landsat-8	2020-06-26 18:22:17 UTC

#### Content

Product	Abbreviation	Yes/No
Total Absorption	ABS	
Aerosol Optical Thickness	AOT	
Yellow Substances	CDM	
Chlorophyll-a	CHL	$\boxtimes$
Ratio of Absorption and Scattering	DIV	
Harmful Algae Bloom Indicator	НАВ	$\boxtimes$
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Surface Temperature	SST	
Turbidity	TUR	$\boxtimes$
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Water Body Extent	WEX	

## List of delivered files (one product example)

File name	File format	Content
1773_Delivery_EOMAP2WoodPlc_Vs18_20200630.pdf	PDF	Delivery Report
CHL_us-california_040037_EOMAP_20200626_182217_LSAT8_m0030.tif	GeoTIFF	Product raster file, 8bit scaled and coloured
CHL_us-california_040037_EOMAP_20200626_182217_LSAT8_m0030_32bit.tif	GeoTIFF	Product raster file, 32bit real values
CHL_us-california_040037_EO-	ASCII	Product text file, real values
MAP_20200626_182217_LSAT8_m0030_wgs84_xyz.txt		
CHL_us-california_040037_EOMAP_20200626_182217_LSAT8_m0030.kmz	KMZ	GoogleEarth overlay
CHL_us-california_040037_EO-	XML	Metadata
MAP_20200626_182217_LSAT8_m0030_metadata.xml		
CHL us-california 040037 EOMAP 20200626 182217 LSAT8 m0030 overview.pdf	PDF	Overview PDF, metadata and guicklook



#### File naming

[Product abbreviation]\_[Country code]-[Area]\_EOMAP\_[Date of satellite image recording]\_[Time of satellite image recording]\_[sensor code]\_[spatial resolution]\_[optional]

#### With

[Product abbreviation]	see list of product abbreviations
[Country code]	Country ID following ISO 3166 ALPHA-2 standards
[Area]	name of city/region or other relevant area characterization
[Date of satellite image rec.]	Satellite image date used for the analysis in YYMMDD (YY= Year, MM = Month, DD = Date) in UTC
[Time of satellite image rec.]	Satellite image date used for the analysis in HHMMSS (HH= Hours, MM = Minute, SS = Seconds) in UTC
	time
[sensor code]	Sensor in use
[spatial resolution]	Spatial resolution/grid spacing in meters
[optional]	is an optional parameter which can is used to support the intuitive use of the data, such as 'metadata' or 'XYZQ' for metadata files and ASCII XYZQ files.

#### Notes (e.g. technical issues, exceptional conditions, etc.)

- Sunglint on parts of Lake Elsinore could not be corrected sufficiently and is therefore flagged.
- Increased uncertainty of water constituent concentrations in eastern arm of Canyon Lake due to resolution of the used sensor (30m Landsat-8).

Data Analyst

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## 2. Methodology and Products

## 2.1 Modular Inversion and Processing System (MIP)

For the retrieval of satellite-derived water quality data, the physics-based Modular Inversion and Processing System (MIP), developed by EOMAP, has been applied to the satellite imagery. This sensor-independent approach includes all the relevant processing steps to guarantee a robust, standardised and operational retrieval of water quality parameters from various satellite data sources. The advantage of physics-based methods is that they do not require a priori information about the study area and can therefore be applied independently of satellite type and study area.

MIP imbeds sensor-independent algorithms and processing modules to derive consistent water quality parameters for multiple scales through a number of different satellite sensors. The algorithms take all relevant environmental impacts into account and do so for each individual measurement and pixel according to the current state-of-the-art, including:

- a. water, land, cloud identification
- b. estimation and correction of atmosphere and aerosol impacts<sup>1 2</sup>
- c. correction altitude level impacts<sup>3</sup>
- d. correction of adjacency impact (light scattering into the water signal from adjacent land surfaces)<sup>4</sup>
- e. correction<sup>5</sup> or flagging<sup>6</sup> of sunglitter impact
- f. retrieval of in-water absorption and scattering as physical measures<sup>7</sup>
- g. accounting for varying spectral slopes of specific inherent optical properties<sup>8</sup>
- h. provision of uncertainty measures and flagging procedures
- i. accounting for the full bidirectional effects in the atmosphere, at the water-atmosphere boundary layers and in-water, using a fully coupled radiative transfer model
- j. application of procedures to minimize errors, resulting from the coupled interaction of light between atmosphere, water surface and in-water on the signal, through coupled inversion procedures

The different workflow steps from satellite raw imagery import to value-added water quality retrieval are displayed in Figure 1.

<sup>&</sup>lt;sup>8</sup> Heege T., Schenk K., Klinger P., Broszeit A., Wenzel J., Kiselev V. (2015): Monitoring status and trends of water quality in inland waters using earth observation technologies. Proceedings "Water Quality in Europe: Challenges and Best Practice" UNESCO-IHP European Regional Consultation Workshop, Koblenz, Germany, Dec 2015, p. 1-4



<sup>&</sup>lt;sup>1</sup> Heege, T., Kiselev, V., Wettle, M., Hung N.N. (2014): Operational multi-sensor monitoring of turbidity for the entire Mekong Delta . Int. J. Remote Sensing, Special Issues Remote Sensing of the Mekong, Vol. 35 (8), pp. 2910-2926

<sup>&</sup>lt;sup>2</sup> Richter, R., Heege, T., Kiselev, V., Schläpfer, D. (2014): Correction of ozone influence on TOA radiance. Int. J. of Remote Sensing. Vol. 35(23), pp. 8044-8056, doi: 10.1080/01431161.2014.978041

<sup>&</sup>lt;sup>3</sup> Heege, T., Fischer, J. (2004): Mapping of water constituents in Lake Constance using multispectral airborne scanner data and a physically based processing scheme. Can. J. Remote Sensing, Vol. 30, No. 1, pp. 77-86

<sup>&</sup>lt;sup>4</sup> Kiselev, V., Bulgarelli, B. and Heege, T., (2015). Sensor independent adjacency correction algorithm for coastal and inland water systems. Remote Sensing of Environment, 157: 85-95. , ISSN 0034-4257, <u>http://dx.doi.org/10.1016/j.rse.2014.07.025</u>

 <sup>&</sup>lt;sup>5</sup> Heege, T. & Fischer, J. (2000): Sun glitter correction in remote sensing imaging spectrometry. SPIE Ocean Optics XV Conference, Monaco, Oct. 16-20.
<sup>6</sup> EU FP7-Projekt GLASS: WP4 Validation report (29.2.2016): <u>www.glass-project.eu/assets/Deliverables/GLaSS-D4.2.pdf</u>

<sup>&</sup>lt;sup>7</sup> Bumberger J., Heege T., Klinger P., et al. (2017): Towards a Harmonized Validation Procedure for Inland Water Optical Remote Sensing Data using Inherent Optical Properties, Rem. Sens. 2017(9), 21p, submitted 28 Feb. 2017



Figure 1: EOMAP's physics-based workflow to derive satellite-based water quality

MIP is the most established, sensor-independent and operational aquatic remote sensing processing system for the full range of high, medium and low-resolution satellite sensors. Fully-automated water monitoring processors are installed in satellite ground segments worldwide (Europe, Australia, Asia and America), to ensure fast and efficient access to a wide range of satellite data. The data processing and orchestration software, the EOMAP Workflow System (EWS) allows for continuous, daily production.



## 2.2 Products

**Turbidity** (TUR) is a key parameter of water quality and is linearly related to the backward scattering of light of organic and inorganic particles in water. Turbidity is also linearly related to Total Suspended Matter (TSM) at low to moderate turbidity values. The measurement unit is Nephelometric Turbidity Unit (NTU). Satellite-derived turbidity is determined by the backward scattering of light between 450 to 800nm, which is physically retrieved using satellite data. The standard relation of EOMAP concentrations to inherent optical properties is defined as 1 NTU = 0.0118 1/m backward scattering at 550nm, or 1 NTU = 0.619 1/m total scattering at 550nm for an assumed ratio bb/b = 0.019. The linear relation between turbidity and suspended matter/solids in low to moderate concentrations is in most cases a regional constant, but can vary with particle size distribution. Note that the geometrical properties of an in-situ measurement device, and the wavelength in use, may differ in comparison to the satellite product. For example, the standard FTU determination, a measure of turbidity similar to NTU, is based on the measurement of light scattered within a 90° angle from a beam directed at the water sample. Alongside temporal differences in satellite and in situ measurements, different sampling depths and the measurement location, this needs to be considered when comparing and interpreting satellite derived vs. in situ measured turbidity values. The Turbidity product from 2020-06-26 is shown in Figure 2.





**Chlorophyll-a** (CHL) retrieval is based on the derived information of in-water organic absorption, in-water turbidity and spectral characteristics of each water body. Chlorophyll-a in [ $\mu$ g/l], is provided as a measure linearly related to the pigment-specific absorption at 440nm, with 1  $\mu$ g/l Chl equal to 0.035 1/m pigment absorption. Phaeophytin and further pigments cannot be discriminated methodologically with the spectral resolution provided by Landsat 8/Sentinel-2 and similar sensors and is therefore included in this product. The pigment-related absorption is always smaller than the absorption of organic components (SOA). For clear water condi-



tions (low chlorophyll/total suspended solids), the specific absorption chlorophyll increases significantly (Bricaud et al. 1995<sup>9</sup>). Chlorophyll values can vary over 4 magnitudes, for marine waters or clear lakes typical concentrations between 0.01 and 10  $\mu$ g/l, while for eutrophic lakes concentrations can reach 100  $\mu$ g/l and more. The chlorophyll products are typically reliable within a range of 10 – 50 % in comparison to in situ measures (Broszeit 2015<sup>10</sup>), which are typically based on one of three different methods, which include photometric, fluorescence and HPLC approaches and their subcategories. The Chlorophyll-a product from 2020-06-26 is shown in Figure 3.





The Harmful Algae Bloom Indicator (HAB) refers to the presence of cyanobacteria. It is sensitive to the appearance of cyanobacteria-related pigments, i.e. phycocyanin and phycoerythrin. Both pigments show absorption features in green wavelengths from 500 nm to approx. 640 nm; phycoerythrin shows its absorption maximum at 540-570 nm, phycocyanin at 610-620 (Colyer et al. 2005). Most satellite sensors support the identification of this feature with only two bands, i.e. one in the green wavelength region (e.g. L7 and L8 at 530 – 590 nm) and in the red wavelength region at approx. 640 – 670 nm. The used standard parameterisation of phytoplankton absorption in MIP as described above, however, does not account phycocyanin and phycoerythrin absorption in the retrieval process. The modelled phytoplankton absorption therefore lacks the absorption features of these pigments. Nonetheless, if these pigments are present in the water a slight spectral mismatch between modelled water leaving reflectance (R<sub>modelled</sub>) and satellite derived reflectance (R<sub>satellite</sub>) occurs. The algorithm then compares the slope of R<sub>modelled</sub> and R<sub>satellite</sub> between the green and red band ( $\delta R = R_{green} - R_{red}$ ) in order to classify pixels with regard to phycocyanin and phycoerythrin occurrence, i.e. harmful algae bloom probability. The HAB indicator from 2020-06-26 is shown in Figure 4.

<sup>&</sup>lt;sup>10</sup> Broszeit, A., 2015. Assessing long-term inland water quality using satellite imagery: A Feasibility and validation study of different lake types. MSc Thesis, Julius-Maximilian-University Würzburg, 96p



<sup>&</sup>lt;sup>9</sup> Bricaud, A., Babin, M., Morel, A., Claustre, H. (1995): Variability in the chlorophyll-specific absorption coefficients of natural phytoplankton: Analysis and parametrization. Journal of Geophysical Research Atmospheres, 100(C7):13,321-13,332

EOMAP Harmful Algae Bloom Indicator 2020-06-26 18:22:17 UTC Landsat-8 Lake Elsinore & Canyon Lake



Figure 4: Harmful Algae Bloom Indicator product from 2020-06-26

**RGB** composite images represent the area of interest in true colour or false colour modes by combining predefined bands, depending on the sensor in use.



## 2.3 Quality Control and Flagging

As a standard output of the processing, an accuracy or quality indicator is calculated for each retrieved parameter and for each detected water pixel. This measure comprises a comprehensive range of factors that can impact the derived product quality, including:

- the geometry between sun, target, and sensor,
- the estimated sun glint probability,
- the retrieved aerosol optical depth,
- residuals of the measured and modelled sensor radiances and subsurface reflectances,
- the comparison of retrieved water species concentrations to extreme values as defined in the configuration files,
- pixels affected by cloud shadow and
- shallow water areas.

Threshold values define distinct values when a parameter is assumed to influence the quality. All parameters are integrated into one remaining quality parameter, allowing both an improved flagging and a quality weighting of pixels, that can later be merged into integrated 3rd level products.

The quality information is part of each standard geodata delivery and is visualized by two different 8bit Geo-TIFFs:

- QUT Total Quality, quantifying the overall quality of each pixel from low to high. Only valid water pixels excluding land, cloud or flagged pixels are represented in QUT indicator (Figure 5).
- QUC EOMAP Quality coding (Figure 6), revealing the processor's internal quality check, split into the defined indicators (e.g. sunglint, shallow water risk, etc.). These are classified into 'no quality concerns', 'quality risk and 'bad quality' (flag). Note that 'quality risk' pixels are marked as such but not flagged.







EOMAP Quality Coding QUC 2020-06-26 18:22:17 UTC Landsat-8 Lake Elsinore & Canyon Lake



Figure 6: QUC product from 2020-06-26

The QUC file indicates the main quality influencing parameter using a specific EOMAP quality coding classification scheme with corresponding grey values (GV), shown in Figure 7.

Professional v	ersion allo	ow combinatio	n of the two	most relevant flags:		
First number = most relevant flag						1
1-digit-numbe	r refer to	second releva	nt flag, e.g. 1	for sunglint risk, 2 for large solar zenith angle		
Examples:	2	5 Warning flag	g for large zer	nit solar angle and Whitecaps		1
	11	4 Critical flag	for sunglint, p	olus warning for aerosol above limits		
	GV	GV range	Flag status	Flag description	Color code	Color
	0	0	Water	No risk identified	000	
	10	10 - 19	Warning	sunglint risk	148 138 84	
	20	20 - 29	Warning	large solar zenith angle	83 141 213	
	30	30 - 39	Warning	large spacecraft zenith angle	218 150 148	
	40	40 - 49	Warning	Aerosol above limit or Cirrus risk	196 215 155	
	50	50 - 59	Warning	Cloud Shadow	177 160 199	
	60	60 - 69	Warning	Shallow water risk	146 205 220	
	70	70 - 79	Warning	Mixed pixel risk	250 191 143	
	80	80 - 89	Warning	Retrieved concentration at configuration limit	190 190 190	
	90	90 - 99	Warning	Retrieval / processor warning	210 210 210	
	110	110 - 119	Critical	sunglint risk	73 69 41	
	120	120 - 129	Critical	large solar zenith angle	22 54 92	
	130	130 - 139	Critical	large spacecraft zenith angle	150 54 52	
	140	140 - 149	Critical	Aerosol above limit or Cirrus risk	118 147 60	
	150	150 - 159	Critical	Cloud Shadow	96 73 122	
	160	160 - 169	Critical	Shallow water risk	49 134 155	
	170	170 - 179	Critical	Mixed pixel risk	226 107 10	
	180	180 - 189	Critical	Retrieved concentration at configuration limit	120 120 120	
	190	190 - 199	Critical	Retrieval / processor warning	130 130 130	
	220	220	No value	Transition Zone	102 255 51	
	221	221	Unreliable	Shallow water automatically	146 205 220	
	222	222	Unreliable	Shallow water manually	60 159 186	
	223	223	Unreliable	Floating material	32 95 107	
	230	230	No water	Land	102 255 51	
	232	232	Unreliable	Invalid pixel manually	255 192 0	
	240	240	No water	Cloud	255 255 255	
	242	242	Unreliable	Cloud Shadow manually	96 73 122	
	244	244	Unreliable	Hill shadow	73 57 93	
	250	250	No retrieva	No retrieval / out of AOI or image extend	255 0 0	

Figure 7: EOMAP QUC quality coding



EOMAP's water quality products are accompanied by the processor's internal quality control mechanisms QUT and QUC, resulting in pixel flagging in case of unreliable values. Moreover, a manual quality check and - if required - additional masking is applied to each product.

As an example, cloud shadow effects typically occur in the vicinity of clouds, resulting in unrealistically low water parameter values. In order to detect and flag these areas, EOMAP has developed a specific algorithm based on geometric models, considering the sun angle and sensor viewing geometry, the retrieved aerosol properties, the height of the clouds, an analysis of the blue channel radiances and a statistical anomaly detection of the water species concentrations. When applying this cloud shadow detection algorithm, approx. 85% of the cloud shadows are detected and masked. Remaining cloud shadows are manually flagged and can be identified in the QUC file by GV 242.

Due to the spatial extent of single pixels (Sentinel-2: 10\*10m, Landsat 8: 30\*30m), it is likely that spectral mixing of signals from land and water can affect the pixels along the edge of the water body, leading to unreliable retrieval of water parameter values. Such pixels are labelled with the quality flag 'transition zone'. EO-MAP uses a high-resolution land-water-mask database to determine the land-water-boundary, which is then filtered to create a transition zone that is automatically flagged during processing. In the 8bit water constituent products the transition zone is marked by GV 251, whereas in the QUC product it is 220.

## 2.4 Data Format

The water quality data is delivered as 32bit real value GeoTIFF as well as 8bit scaled and colored GeoTIFF for easier visualization. The colours currently used are a suggestion/standard, but can be changed according to client specific request. In addition, metadata is stored in the .xml and the metadata .pdf files.

## 2.5 Data Sources

EOMAP uses the following data hubs to access and download satellite raw data from different sensors:

- Sentinel-3: PEPS https://peps.cnes.fr
- Landsat-8 Amazon Web Services, https://landsat-pds.s3.amazonaws.com
- Sentinel-2: ESA Sentinel HUB https://scihub.copernicus.eu/dhus/#/home
- MODIS Aqua and Terra: USGS https://earthexplorer.usgs.gov/



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APPENDIX E - CURRENT DATA IN HISTORICAL CONTEXT



## Lake Elsinore- Historical Monitoring Results

No data available from June 2012-July2015 TMDL target of 0.75 mg/L is annual average to be attained by 2020 Bold represents current monitoring year July 2019-June 2020







## Lake Elsinore- Historical Monitoring Results (continued)





No data available from June 2012-July 2015 Bold represents current monitoring year July 2019-June 2020



## **Canyon Lake- Historical Monitoring Results**





No data available from May 2005-July 2007; June 2012-Sept 2013 TMDL target of 0.75 mg/L is annual average to be attained by 2020 Bold represents current monitoring year July 2019-June 2020



## **Canyon Lake- Historical Monitoring Results (continued)**

No data available from June 2012-July2015 2015 TMDL target of 40 μg/L is annual average to be attained by 2015 2020 TMDL target of 25 μg/L is annual average to be attained by 2020 Bold represents current monitoring year July 2019-June 2020



No data available from May 2005-July 2007; June 2012-July2015 Bold represents current monitoring year July 2019-June 2020