El Dorado Hydroelectric Project
FERC Project No. 184

2018 Water Quality Monitoring Report

EL DORADO IRRIGATION DISTRICT
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Placerville, CA 95667

March 2019

1.0 Introduction

The El Dorado Irrigation District developed a water quality monitoring plan (Plan; EID 2007; amended 2018) to satisfy the water quality monitoring requirements as required by conditions of the Federal Energy Regulatory Commission (FERC) license for the El Dorado Hydroelectric Project (Project 184)[1]. The monitoring plan was designed to provide information regarding overall water quality within the vicinity of Project 184 (Project), identify potential water quality problems related to the Project operations and where the Project can control such factors, and develop resource measures for the protection, mitigation, and enhancement of water quality.

Monitoring in 2018 was conducted in accordance with the amended Plan and incorporates the following modifications:

1. Utilize Escherichia coli (E. coli) as the bacterial indicator in lieu of fecal and total coliform
2. Discontinue monitoring at Carpenter Creek and Mill Creek; monitor all water quality parameters, except E. coli, at the remaining El Dorado Canal tributary locations once every six years; conduct E. coli monitoring at Alder Creek every six years, in coordination with other tributary water quality monitoring
3. Relocate the monitoring site for the South Fork American River upstream of Kyburz Diversion Dam (WQ5)
4. Change frequency of monitoring from every other year to every three years

This report summarizes the results of the 2018 water quality monitoring effort, which is the sixth year of water quality monitoring conducted pursuant to the Plan. The data collected in 2018 were compiled and distributed electronically to the Forest Service (FS), State Water Resources Control Board (SWRCB), and the Project 184 Ecological Resources Committee (ERC) on January 31, 2019, as required by the Plan.

2.0 Sampling Locations

The following sampling locations are identified in the Plan and depicted in Figure 1:

- Echo Creek below Echo Lake dam (WQ1)
- Pyramid Creek below Lake Aloha dam (WQ2)
- Caples Creek below Caples Lake dam (WQ3)

[1] Section 7 of the El Dorado Hydroelectric Project Relicensing Settlement Agreement, U.S. Forest Service 4(e) License Condition No. 37, and the California State Water Resources Control Board Section 401 Clean Water Act Water Quality Certification Condition No. 15

- Silver Fork American River below Silver Lake dam (WQ4)
- South Fork American River upstream of Kyburz diversion dam (WQ5)
- South Fork American River downstream of Kyburz diversion dam (WQ6)
- No Name Creek above No Name Creek diversion dam (WQ9)
- No Name Creek below No Name Creek diversion dam (WQ10)
- Alder Creek above Alder Creek diversion dam (WQ11)
- Alder Creek below Alder Creek diversion dam (WQ12)
- Bull Creek above Bull Creek diversion dam (WQ15)
- Bull Creek below Bull Creek diversion dam (WQ16)
- Ogilby Creek above Ogilby Creek diversion dam (WQ17)
- Ogilby Creek below Ogilby Creek diversion dam (WQ18)
- Esmeralda Creek above Esmeralda Creek diversion dam (WQ19)
- Esmeralda Creek below Esmeralda Creek diversion dam (WQ20)

3.0 Collection

In-situ and analytical water quality monitoring were performed in 2018 as required by the Plan. Date, time, site location and in-situ water quality data were recorded on a standard form and later transcribed to electronic format in a Microsoft Excel spreadsheet. Sampling occurred over an eight-month period during March, May, June, July, August, September, following the first storm of the season (November 23, 2018), and December. E. coli samples were collected five times per month from May through September and were scheduled to capture days with high recreational periods (i.e., holiday weekends).

Temperature, dissolved oxygen, conductivity, and pH were measured in the field at each location using a YSI ProDSS Handheld Multi-Probe Meter. The meter was calibrated prior to each sampling period per manufacturer's specifications. A HACH handheld pH meter was also calibrated and ready for use during each field monitoring event.

Water samples were collected at each location for laboratory analysis of the following parameters: copper, aluminum, conductivity, turbidity, TSS, alkalinity, hardness, and nitrate. California Laboratory Services (CLS) in Rancho Cordova, California, a state certified laboratory, analyzed water samples collected for this effort. All the samples were analyzed pursuant to methodologies approved by the United States Environmental Protection Agency (USEPA), the California Department of Public Health, or Environmental Laboratory Accreditation Program (ELAP) and results were certified to be in compliance both technically and for completeness.

4.0 Parameters and Results

Temperature

Average, minimum, and maximum temperatures measured at each water quality monitoring site during the 2018 monitoring effort are reported in Table 1. Graphs depicting all *in situ* parameters measured at each monitoring site are provided in Figures 2 - 10.

Table 1. Average, minimum, and maximum water temperatures (°C) at each monitoring site

Site	AVG	MIN	MAX
WQ1	10.2	1.4	21.5
WQ2	15.4	12.3	21.2
WQ3	7.6	0.4	15.1
WQ4	11.1	0.6	21.6
WQ5	11.1	2.8	20.8
WQ6	8.3	2.3	16
WQ9	10.0	5.8	16.3
WQ10	10.4	5.3	16.4
WQ11	11.6	2.7	20.3
WQ12	12.5	2.7	22.6
WQ15	10.3	4.8	16.8
WQ16	10.7	5.3	16.4
WQ17	8.0	5.0	11.9
WQ18	11.9	5.2	21.7
WQ19	9.3	4.1	15
WQ20	10.6	5.0	17.7

A total of 121 water temperature measurements were recorded in 2018. Water temperatures ranged from a minimum of 0.4 °C at Caples Creek below Caples Lake Dam (WQ3) to 22.6 °C Alder Creek below Alder Creek Diversion Dam (WQ12). The average water temperature measured throughout the entire project area in 2018 was 10.7 °C. Water temperatures measured at all water quality monitoring sites in 2018 were suitable for trout and other coldwater species throughout the study period. A detailed evaluation of water temperatures in the stream reaches within the vicinity of the Project is provided in the Project No. 184 2018 Water Temperature Monitoring Report (EID 2019).

Dissolved Oxygen

Average, minimum, and maximum dissolved oxygen (DO) concentrations measured at each water quality monitoring site during the 2018 monitoring effort are reported in Table 2. Graphs depicting all *in situ* parameters measured at each monitoring site are provided in Figures 2 - 10.

Table 2. Average, minimum, and maximum DO concentrations (mg/L) at each monitoring site

Site	AVG	MIN	MAX
WQ1	8.5	6.1	10.9
WQ2	7.3	6.2	8.0
WQ3	8.6	7.4	9.7
WQ4	9.0	6.7	12.1
WQ5	9.6	7.2	11.8
WQ6	9.5	7.3	11.9
WQ9	9.4	7.7	10.9
WQ10	9.3	7.8	10.9
WQ11	9.2	7.3	11.6
WQ12	9.4	7.4	11.8
WQ15	9.4	7.7	10.9
WQ16	9.4	7.8	11.1
WQ17	9.0	7.8	10.1
WQ18	9.3	7.8	11.2
WQ19	9.1	7.6	10.7
WQ20	9.5	7.7	11.2

The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins states "The DO concentrations shall not be reduced below the following minimum levels at any time…waters designated COLD 7.0 mg/L" (CVRWQCB, 1998; Fourth Edition revised October 2011).

A total of 121 DO measurements were recorded in 2018. DO ranged from 6.1 mg/L at Echo Creek below Echo Lake Dam (WQ1) to 12.1 mg/L at Silver Fork below Silver Lake Dam (WQ4). The average DO concentration throughout the entire project area in 2018 was 9.1 mg/L.

Three DO measurements below 7.0 mg/L were recorded during the 2018 monitoring effort. The date, DO concentrations, and location for the three measurements below 7.0 mg/L are listed below:

July 25, 2018

- 6.1 mg/L at Echo Lake below Echo Lake Dam (WQ1)
- 6.2 mg/L at Pyramid Creek below Lake Aloha Dam (WQ2)

August 28, 2018

- 6.7 mg/L at Silver Fork below Silver Lake Dam (WQ4)

All measurements below 7.0 mg/L were recorded at high elevation sites (Echo Lake below Echo Lake Dam (WQ1), Pyramid Creek below Lake Aloha Dam (WQ2), and Silver Fork below Silver Lake Dam (WQ4). Dissolved oxygen levels can be affected by barometric pressure due to elevation.

Conductivity

Average, minimum, and maximum conductivity levels recorded at each water quality monitoring site during the 2018 monitoring effort are reported in Table 3. Graphs depicting all *in situ* parameters measured at each monitoring site are provided in Figures 2 - 10.

Table 3. Average, minimum, and maximum conductivity levels (uS/cm^3) at each monitoring site

Site	AVG	MIN	MAX
WQ1	14	7	24
WQ2	2	2	3
WQ3	22	2	38
WQ4	15	14	18
WQ5	38	13	53
WQ6	41	13	76
WQ9	115	41	162
WQ10	101	15	158
WQ11	37	28	42
WQ12	40	29	52
WQ15	62	26	77
WQ16	71	7	94
WQ17	49	41	58
WQ18	58	42	73
WQ19	50	33	90
WQ20	32	7	39

Currently there are no criteria or water quality objectives for conductivity specific to the American River watershed. A total of 121 conductivity measurements were recorded in 2018. Conductivity levels ranged from 2 uS/cm^3 at Echo Creek (WQ2) to 162 uS/cm^3 in No Name Creek above the diversion dam (WQ9). The average conductivity level throughout the entire project area in 2018 was 48.1 uS/cm^3.

pH

Average, minimum, and maximum pH levels recorded at each water quality monitoring site during the 2018 monitoring effort are reported in Table 4. Graphs depicting all *in situ* parameters measured at each monitoring site are provided in Figures 2 - 10.

Table 4. Average, minimum, and maximum pH levels at each monitoring site

Site	AVG	MIN	MAX
WQ1	7.1	6.5	7.9
WQ2	6.5	6.3	6.8
WQ3	7.7	7.2	8.4
WQ4	7.6	7.2	8.3
WQ5	7.7	6.8	8.2
WQ6	7.7	6.9	8.2
WQ9	8.2	7.7	8.5
WQ10	8.2	7.8	8.4
WQ11	7.9	7.6	8.2
WQ12	7.8	7.6	8.2
WQ15	7.9	7.7	8.1
WQ16	7.9	7.7	8.2
WQ17	7.2	7.1	7.4
WQ18	7.7	7.4	8.0
WQ19	7.4	7.0	7.9
WQ20	7.8	7.1	8.4

The Basin Plan states that "pH shall not be depressed below 6.5 nor raised above 8.5 and that changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD beneficial uses" ((CVRWQCB, 1998; Fourth Edition revised October 2011).

A total of 121 pH measurements were recorded in 2018. pH levels ranged from 6.3 at Pyramid Creek below Lake Aloha dam (WQ2) to 8.5 at No Name Creek above No Name Creek diversion dam (WQ9). The average pH throughout the entire project area in 2018 was 7.6. There was no appreciable difference between the pH measurements upstream or downstream of the diversion at each monitoring site.

One pH measurement below 6.5 was recorded during the 2018 monitoring effort. This measurement was 6.3 at Pyramid Creek below Lake Aloha dam (WQ2) and is within the accuracy range of the meter (±2% of the reading or 0.2 mg/L; whichever is greater).

Consistent with Basin Plan standards, no pH levels were greater than 8.5 at all locations during all sampling events throughout the year.

Turbidity

Average, minimum, and maximum turbidity levels recorded during the 2018 monitoring effort at each water quality monitoring site are reported in Table 5. Turbidity measurements measured at each monitoring site in 2018 are presented with *in situ* parameters in Figures 2 - 10.

Table 5. Average, minimum, and maximum turbidity levels (NTUs) at each monitoring site

Site	AVG	MIN	MAX
WQ1	0.6	0.3	0.9
WQ2	0.2	0.0	0.4
WQ3	1.3	0.4	4.1
WQ4	1.8	0.5	8.4
WQ5	0.9	0.2	1.7
WQ6	0.8	0.2	1.2
WQ9	0.8	0.2	1.2
WQ10	4.8	0.0	12.0
WQ11	0.9	0.0	4.6
WQ12	0.5	0.0	1.0
WQ15	1.5	0.3	4.3
WQ16	1.3	0.2	3.6
WQ17	2.8	0.5	7.0
WQ18	3.2	0.2	20.1
WQ19	10.0	0.4	62.0
WQ20	5.8	0.4	40.0

The Basin Plan states, "where natural turbidity is less than 1 Nephelometric Turbidity Unit (NTU), controllable factors shall not cause downstream turbidity to exceed 2; where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU." (CVRWQCB, 1998; Fourth Edition revised October 2011).

A total of 119 turbidity measurements were taken in 2018. Turbidity measurements were generally low throughout the study area (average = 2.4 NTUs). A comparison of turbidity measurements recorded upstream and downstream of diversion dams in 2018 found a total of five occurrences where turbidity downstream of the diversion was greater than 1 NTU of the value measured upstream of the diversion dam. The location, date, and turbidity measurements for these occurrences are provided in Table 6.

Table 6. Turbidity levels (NTUs) above and below the diversions when turbidity levels below the diversion were > 1 NTU of the value measured above the diversion dam

	Date	Upstream	Downstream	Difference
No Name (WQ9/WQ10)	August 28, 2018	1.5	12.0	+10.5
	September 14, 2018	0.1	9.2	+9.1
	December 19, 2018	0.9	7.6	+6.7
Ogilby Creek (WQ17/WQ18)	July 23, 2018	0.6	20.1	+19.5
Esmeralda Creek (WQ19/WQ20)	July 23, 2018	0.9	40.0	+39.1

Three occurrences when turbidity measured downstream of the diversion were > 1 NTU of the value measured above the diversion dam were recorded at No Name Creek (WQ9/WQ10). As discussed in previous Project 184 Water Quality Monitoring Reports (EID 2009; EID 2011, EID 2013, EID 2015, EID2017), a cabin owner has placed a decorative water wheel in the middle of No Name Creek upstream of the designated sampling location (WQ10) which causes an increase in sediment and organic matter to move downstream. The two other occurrences when turbidity measured downstream of the diversion were > 1 NTU of the value measured above the diversion dam were recorded on July 23, 2018 at Ogilby Creek (WQ17/WQ18) and Esmeralda Creek (WQ19/WQ20). No Project related activities occurred to account for the increased turbidity measurements recorded at any of the three locations 2018.

Total Suspended Sediments

Total Suspended Sediment (TSS) concentrations measured at all sample sites in 2018 are plotted in Figure 11.

The Basin Plan has a narrative objective that states, "Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses" (CVRWQCB, 1998; Fourth Edition revised October 2011). TSS measurements were generally low throughout the project area. Of 119 samples analyzed, 104 samples had TSS levels that were not detectable in laboratory analysis. The highest TSS level was 86 mg/L measured at Esmerelda Creek above Esmerelda Creek diversion dam (WQ19) on July 23, 2018.

Alkalinity

Alkalinity levels measured at all sample sites in 2018 are plotted in Figure 12.

There are currently no Basin Plan objectives for alkalinity. The U.S. Environmental Protection Agency recommends ambient water quality criteria for alkalinity to protect freshwater aquatic life to be measured as a continuous concentration 4-day average expressed as a total recoverable. The aquatic life 4-day average concentration for alkalinity is 20 mg/L. The recommendation also states that "20 mg/L is a minimum concentration except where natural concentrations are less (Water Quality Goals, 2011). The frequency of monitoring in the approved Plan does not provide for a direct relationship to the recommended average concentration.

Average, minimum, and maximum alkalinity concentrations measured during the 2018 monitoring effort at each water quality monitoring site are presented in Table 7.

Table 7. Average, minimum, and maximum alkalinity concentrations (mg/L) measured at each monitoring site

Site	AVG	MIN	MAX
WQ1	6.4	4.0	9.4
WQ2	3.8	2.6	6.4
WQ3	8.5	4.0	11.0
WQ4	6.1	4.6	7.0
WQ5	12.5	6.8	16.0
WQ6	12.5	9.2	14.0
WQ9	65.3	29.0	83.0
WQ10	55.9	19.0	79.0
WQ11	14.0	1.7	20.0
WQ12	16.6	1.6	24.0
WQ15	32.5	19.0	41.0
WQ16	37.6	24.0	51.0
WQ17	24.2	13.0	40.0
WQ18	21.3	16.0	26.0
WQ19	22.0	14.0	29.0
WQ20	15.9	8.4	19.0

The average alkalinity throughout the Project area was 22.1 mg/L. The sampling locations with the highest concentrations of alkalinity were No Name Creek (WQ9 and WQ10; range 79 – 83 mg/L). The higher alkalinity concentrations measured at these sites is attributed to soil rich in calcium carbonate (CaCO3) that is present under these waters (USDA/NRCS, 2008).

Hardness (Calcium Carbonate)

Hardness levels measured at all sample sites in 2018 are plotted in Figure 13. Average, minimum, and maximum hardness concentrations measured during the 2018 monitoring effort at each water quality monitoring site are presented in Table 8.

Table 8. Average, minimum, and maximum hardness concentrations (mg/L) measured at each monitoring site

Site	AVG	MIN	MAX
WQ1	4.4	2.3	6.3
WQ2	4.4	0.0	16.0
WQ3	7.9	4.6	11.0
WQ4	5.6	4.6	7.7
WQ5	10.8	5.6	13.0
WQ6	10.9	8.0	13.0
WQ9	62.6	29.0	80.0
WQ10	55.1	30.0	76.0
WQ11	13.3	12.0	16.0
WQ12	14.8	13.0	18.0
WQ15	24.6	18.0	28.0
WQ16	32.1	20.0	37.0
WQ17	18.0	14.0	21.0
WQ18	21.4	14.0	29.0
WQ19	15.1	11.0	19.0
WQ20	11.7	9.9	15.0

There is currently no Basin Plan objective for hardness. The average hardness throughout the Project area was 19.4 mg/L. The sampling locations with the highest hardness value were No Name Creek (WQ9) and No Name Creek below No Name Creek diversion dam (WQ10); range = 76 – 80 mg/L). The geology at this location contains large quantities of calcium carbonate that naturally leach into the streams (USDA/NRCS, 2008) producing higher hardness (and alkalinity) concentrations at these locations.

Nitrate (Nitrate plus Nitrite)

Nitrate levels measured at all sample sites in 2018 are plotted in Figure 14.

There are currently no Basin Plan objectives for nitrate. However, the EPA recommends ambient water quality criteria for non-cancer health effects to be 10 mg/L (Water Quality Goals, 2011). Additionally, both the California and Federal primary contaminated levels in drinking water are 10 mg/L. The nitrate levels were extremely low throughout the Project area (range 0 – 0.3 mg/L).

Copper

There is no specific Basin Plan objective for copper; however, the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP, 2005), and the California Toxics Rule (CTR, 2000), provide a formula for deciphering a one-hour total recoverable dissolved copper limit based on its hardness value. This standard has been incorporated by adoption into the Basin Plan. With this standard, the lower the hardness value, the lower the available copper is in the water (greater copper concentration can be allowed due to limited availability of copper in the water table), and the greater the hardness value, the lower the copper concentration must be (more available dissolved copper can affect aquatic life).

The maximum criteria concentrations are provided in Table 9, which is included with the Figures at the end of this report. Of the 119 samples collected, copper levels exceeded the SIP/CTR one-hour total recoverable dissolved copper limits for 5 samples:

June 21, 2018

- Echo Creek below Echo Lake dam (WQ1)
- Pyramid Creek below Lake Aloha dam (WQ2)

July 25, 2018

- South Fork American River downstream of Kyburz diversion dam (WQ6)
- Alder Creek above of Alder Creek diversion dam (WQ11)

August 28, 2018

- Alder Creek below Alder Creek diversion dam (WQ12)

No Project related activities occurred to account for the increased copper measurements recorded at any of the three locations 2018.

Aluminum

Aluminum concentrations measured at all sample sites in 2018 are plotted in Figure 15.

There are currently no Basin Plan objectives for aluminum. The U.S. Environmental Protection Agency recommends ambient water quality criteria for freshwater aquatic life expressed at a maximum concentration 1-hour average to be 750 ug/L (Water Quality Goals, 2011). Of the 119 samples collected, all but five samples were below 750 ug/L:

July 23, 2018

- 1100 ug/L - No Name Creek above No Name Creek diversion dam (WQ9)

- 1000 ug/L - No Name Creek below No Name Creek diversion dam (WQ10)
- 1200 ug/L - Esmerelda Creek above Esmerelda Creek diversion dam (WQ19)

August 27, 2018
- 920 ug/L - No Name Creek below No Name Creek diversion dam (WQ10)

September 14, 2018
- 1400 ug/L - No Name Creek below No Name Creek diversion dam (WQ10)

No Project related activities occurred to account for the increased copper measurements recorded at any of the three locations 2018.

E. coli

E. coli concentrations measured at all sample sites in 2018 are plotted in Figure 16. The E. coli concentrations recorded at each site in 2018 are provided in Table 10, which is included with the Figures at the end of this report.

As described in the SWRCB's conditional approval of the amended Plan, the District proposes use of United States Environmental Protection Agency Recreational Water Quality Criteria (USEPA RWQC) Recommendation No. 2 as the metric for evaluating E. coli thresholds for this effort until the SWRCB adopts E. coli criteria in the Bacteria Provisions for Inland Surface Waters, Enclosed Bays, and Estuaries of California. At that point in time, the District proposes to use State Water Board criteria for E. coli.

USEPA RWQC Recommendation No. 2 for E. coli is as follows: the geometric mean should not be greater than 100 colony-forming units (CFU) per 100 ml over a 30-day interval and there should not be greater than a ten percent excursion frequency of the statistical threshold value of 320 CFU/100 ml in the same 30-day interval.

All E.coli samples collected in 2018 were below the threshold criteria.

5.0 Conclusions

Measurements for *in-situ* parameters were similar above and below the diversion dams along each stream reach and provide normal distributions across the sampling locations based on stream flow elevation and time of year. Laboratory-measured analytical parameters were also similar above and below the diversion dams in the Project-affected stream reaches. Project operations do not show any measureable increase or

decrease in water quality parameters in almost all cases. Therefore, project operations do not appear to affect water quality in the stream reaches.

Water quality in the Project area was within an acceptable range of most all applicable Basin Plan objectives and other criteria during the 2018 monitoring program. Therefore, Project operations did not appear to adversely affect water quality in the stream reaches within the vicinity of the Project.

6.0 Literature Cited

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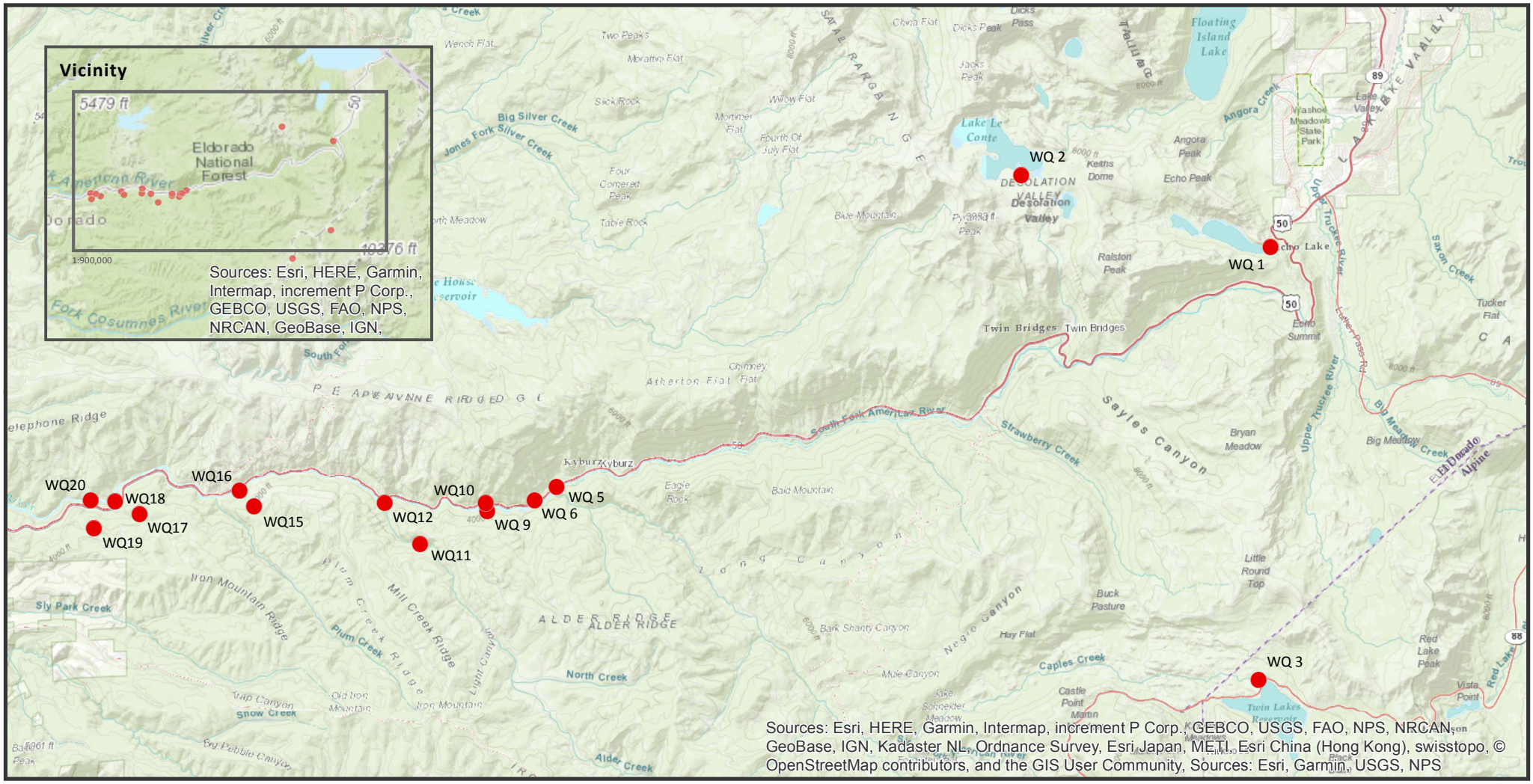
Figures

Figure 1. Water Quality Monitoring Locations



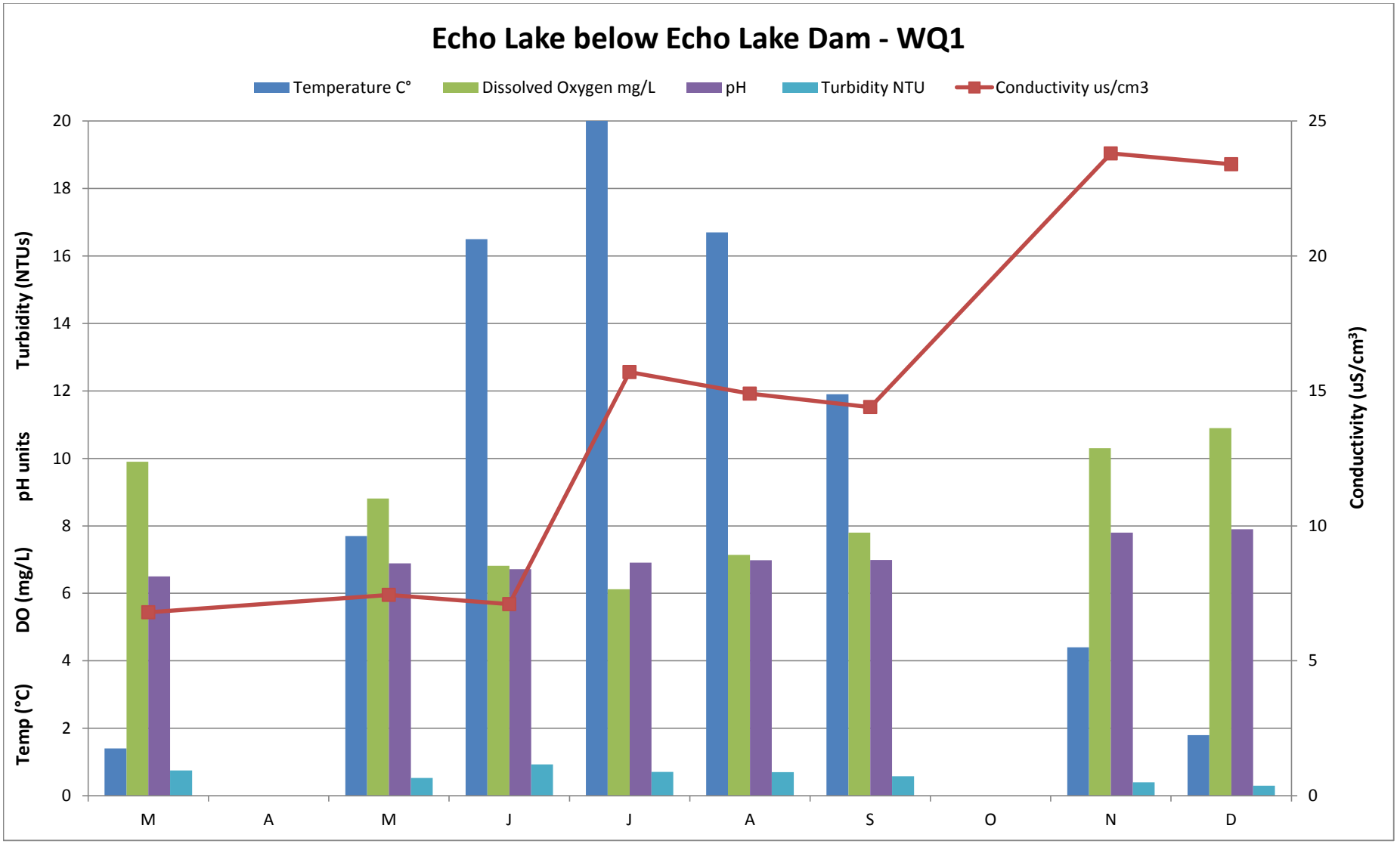
● Water Quality Monitoring Locations

0 5 10

Miles

WQ-1	Echo Creek below Echo Lake Dam
WQ-2	Pyramid Creek below Aloha Dam
WQ-3	Caples Creek below Caples Lake Dam
WQ-4	Silver Fork American River below Silver Lake Dam
WQ-5	South Fork American River upstream of Kyburz Diversion Dam
WQ-6	South Fork American River downstream of Kyburz Diversion Dam
WQ-9	No Name Creek above No Name Creek Diversion Dam
WQ-10	No Name Creek below No Name Creek Diversion Dam
WQ-11	Alder Creek above of Alder Creek Diversion Dam
WQ-12	Alder Creek below of Alder Creek Diversion Dam
WQ-15	Mill Creek upstream of South Fork of American River
WQ-16	Bull Creek above Bull Creek Diversion Dam
WQ-17	Bull Creek below Bull Creek Diversion Dam
WQ-18	Ogilby Creek above Ogilby Creek Diversion Dam
WQ-19	Ogilby Creek below Ogilby Creek Diversion Dam
WQ-20	Esmeralda Creek above Esmeralda Creek Diversion Dam
WQ-21	Esmeralda Creek below Esmeralda Creek Diversion Dam

B. Burdelsky
EID GIS
05/22/2018


Echo Lake below Echo Lake Dam - WQ1
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Temp (°C) DO (mg/L) pH units Turbidity (NTUs)
Conductivity (uS/cm³)
0
2
4
6
8
10
12
14
16
18
20
0
5
10
15
20
25
M
A
M
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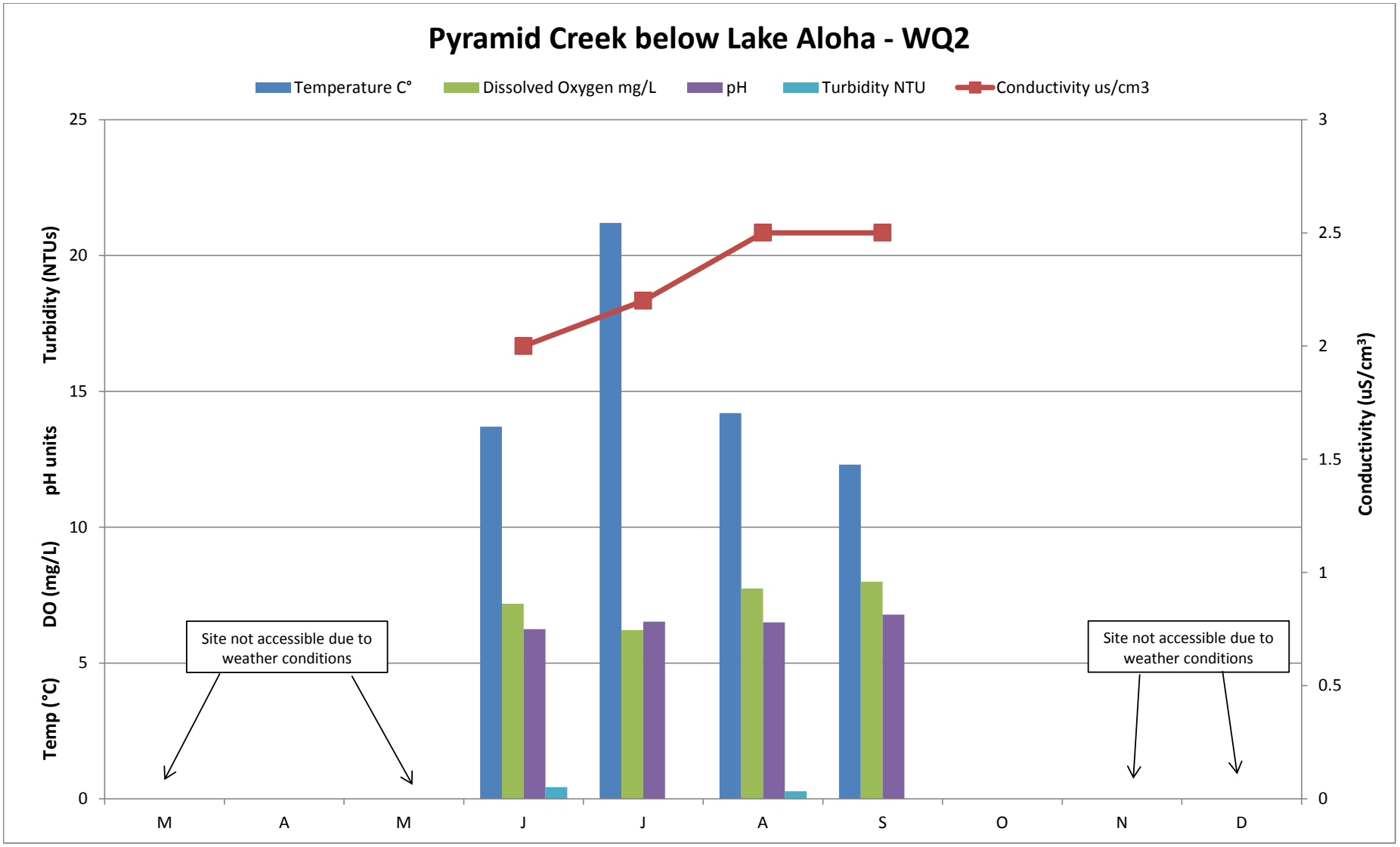
N
D


Pyramid Creek below Lake Aloha - WQ2
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
3
2.5
2
1.5
1
0.5
0
M
A
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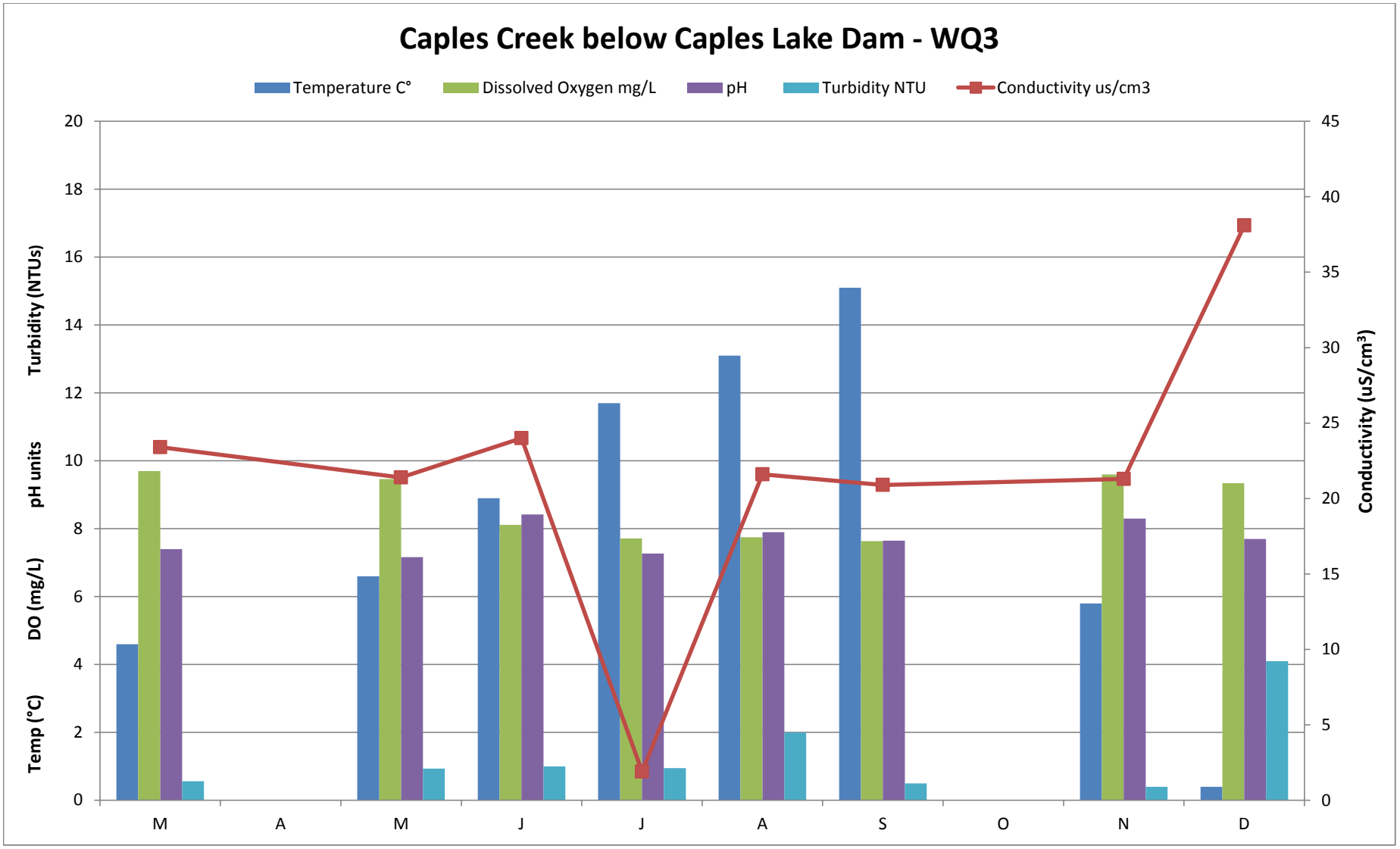
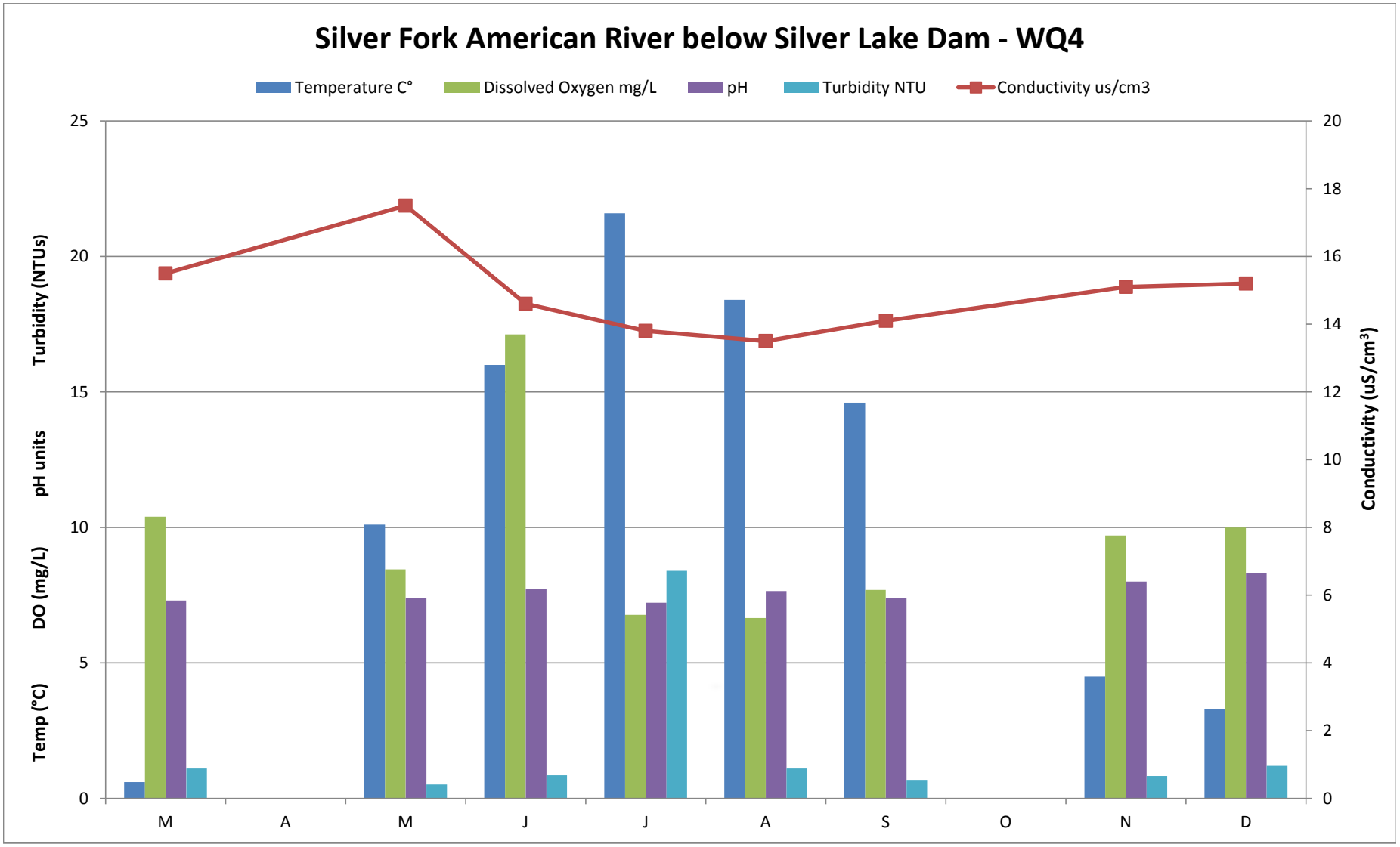
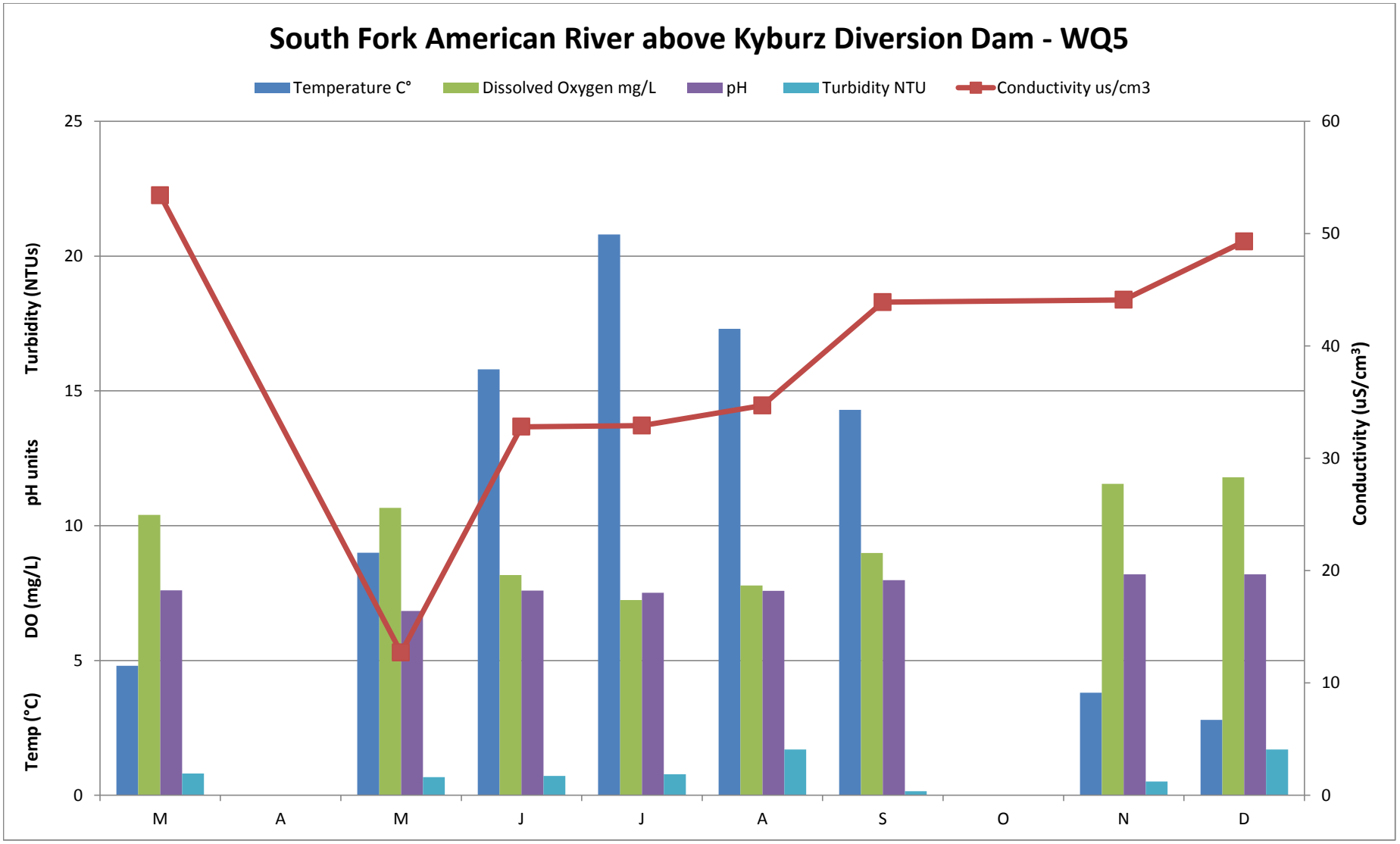
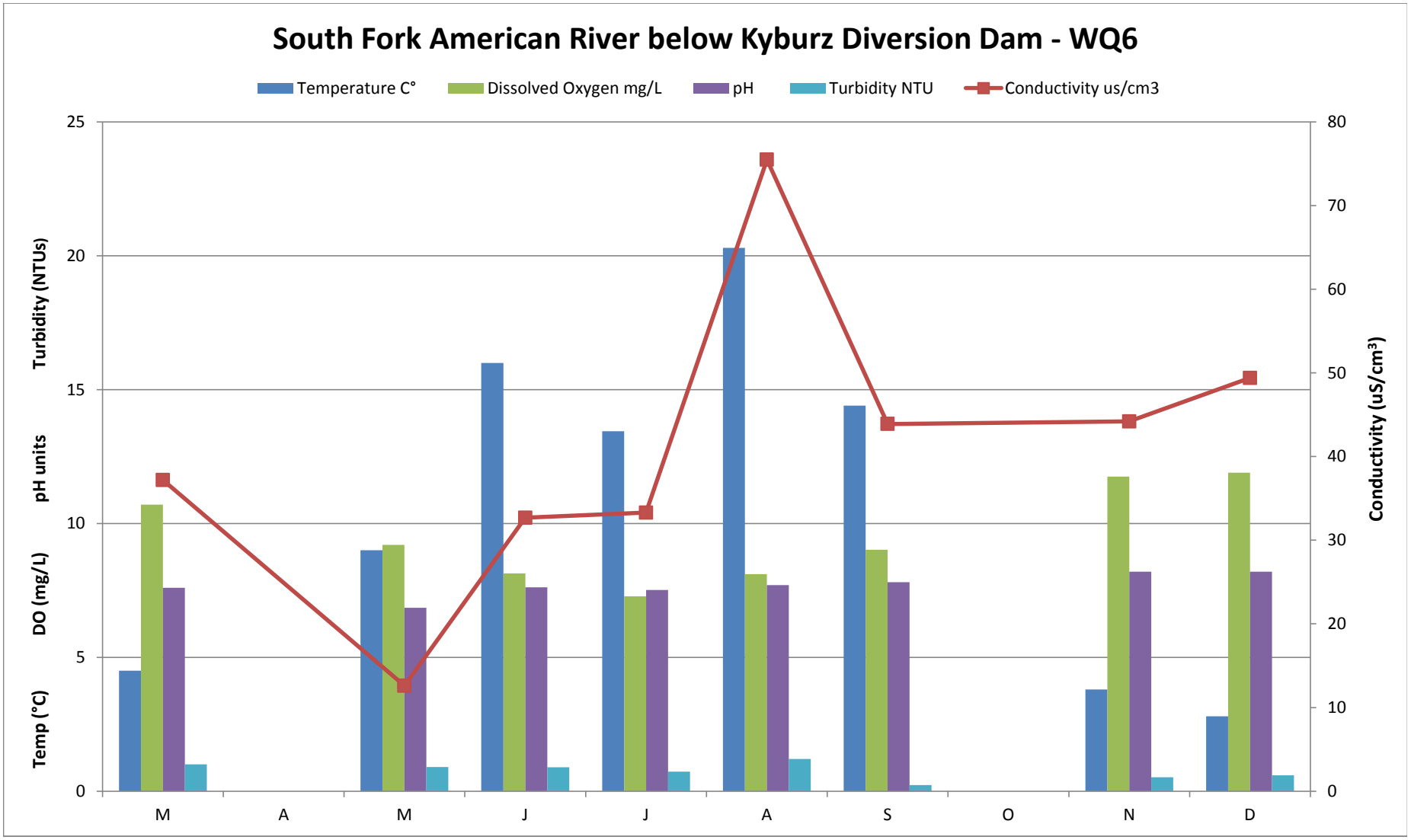
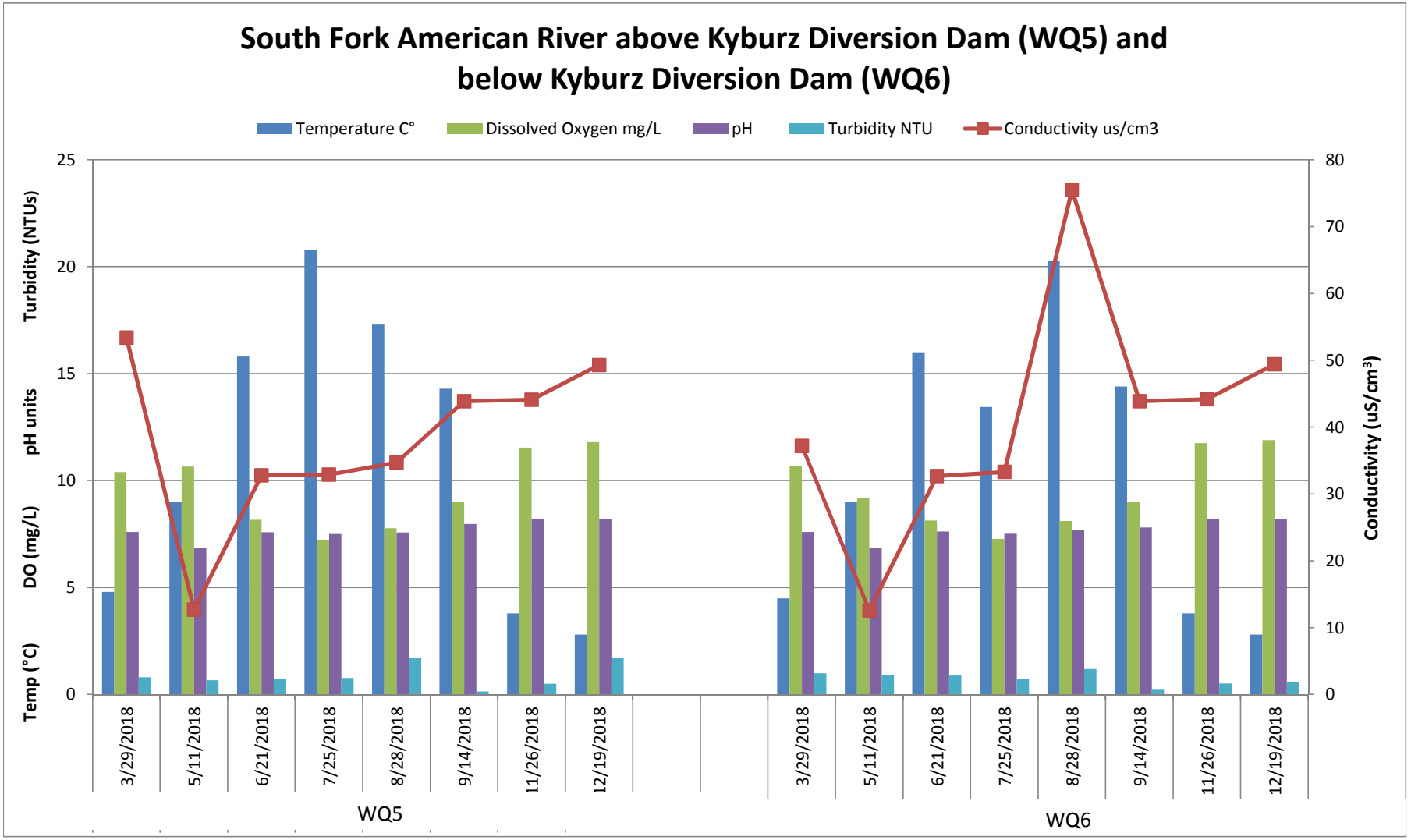
A
S
O
N
D
Site not accessible due to weather conditions
Site not accessible due to weather conditions

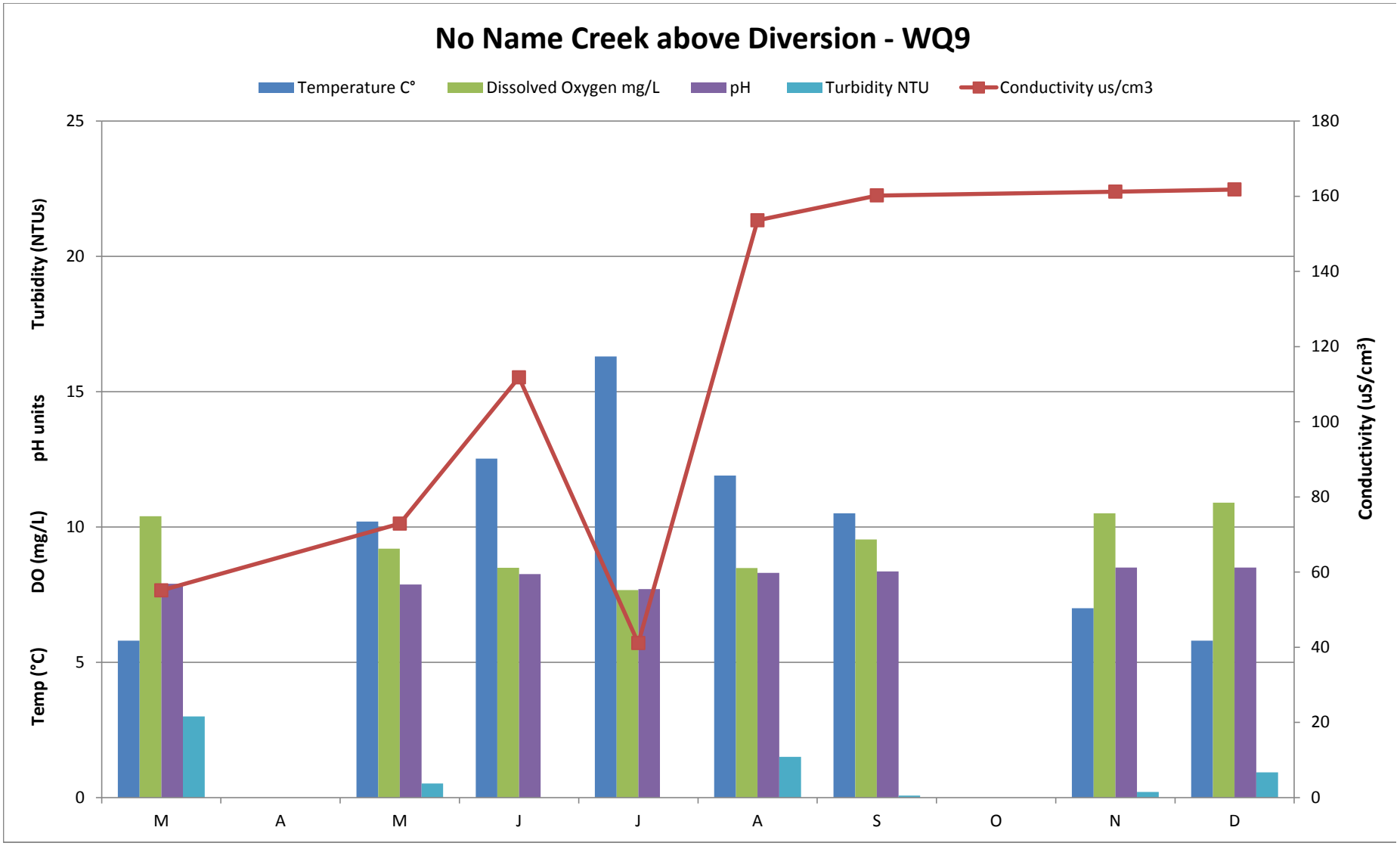

Caples Creek below Caples Lake Dam - WQ3
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Temp (°C)
DO (mg/L)
pH units
Turbidity (NTUs)
Conductivity (uS/cm3)
0
2
4
6
8
10
12
14
16
18
20
0
5
10
15
20
25
30
35
40
45
M
A
M
J
J
A
S
O
N
D

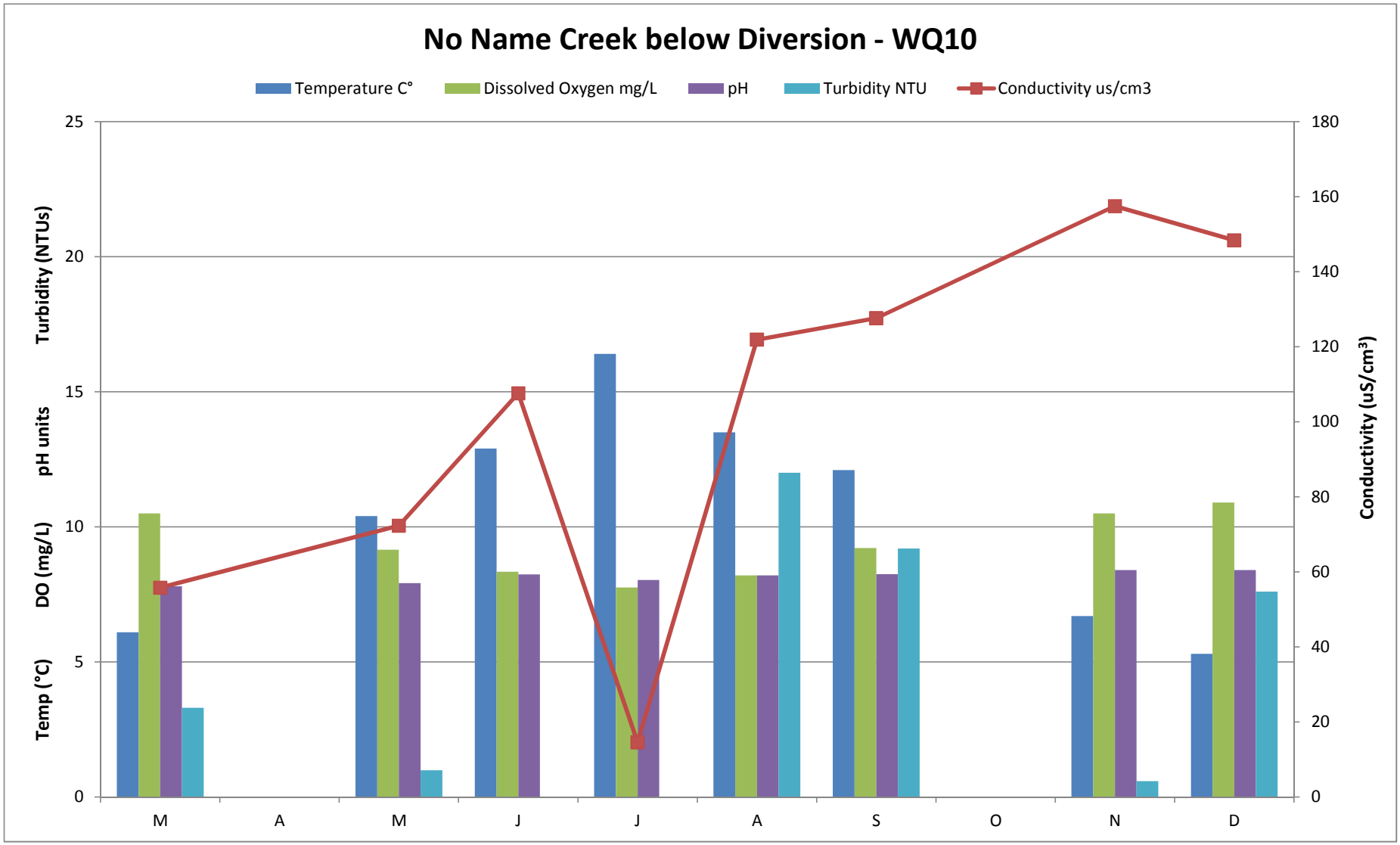

Silver Fork American River below Silver Lake Dam - WQ4
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
20
18
16
14
12
10
8
6
4
2
0
M
A
M
J
J
A
S
O
N
D

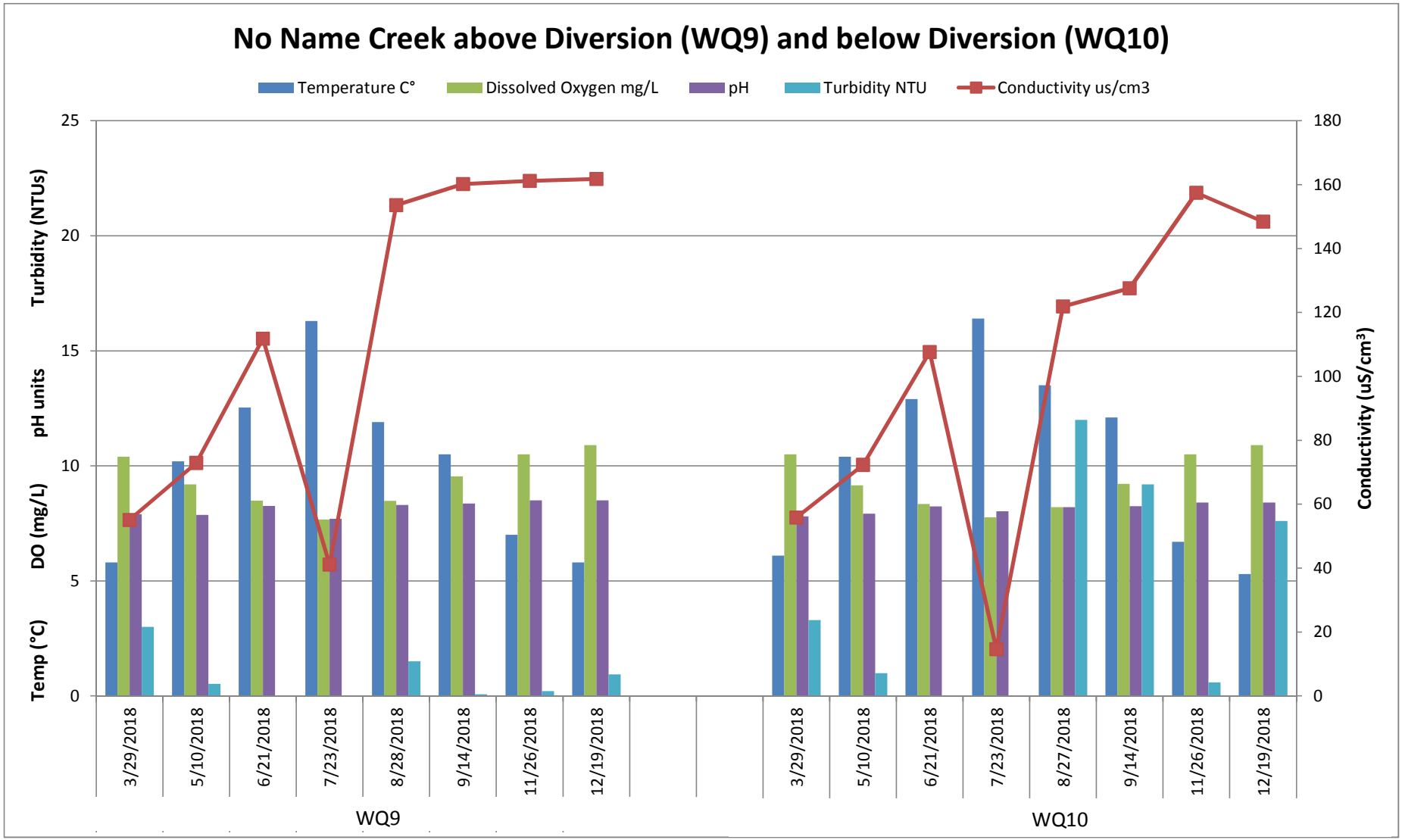

South Fork American River above Kyburz Diversion Dam - WQ5
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Temp (°C)
DO (mg/L)
pH units
Turbidity (NTUs)
Conductivity (uS/cm³)
0
5
10
15
20
25
0
10
20
30
40
50
60
M
A
M
J
J
A
S
O
N
D

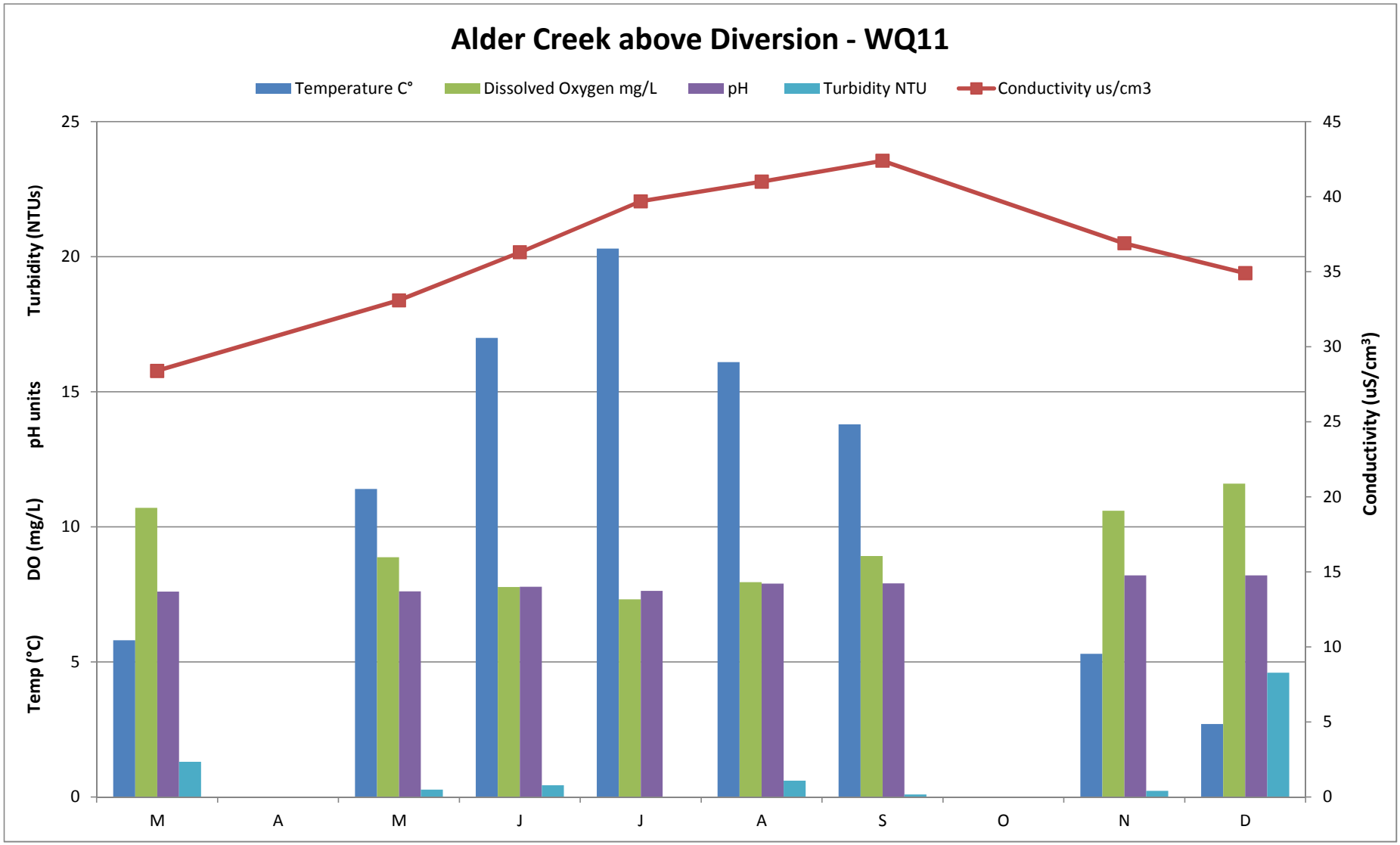

South Fork American River below Kyburz Diversion Dam - WQ6
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

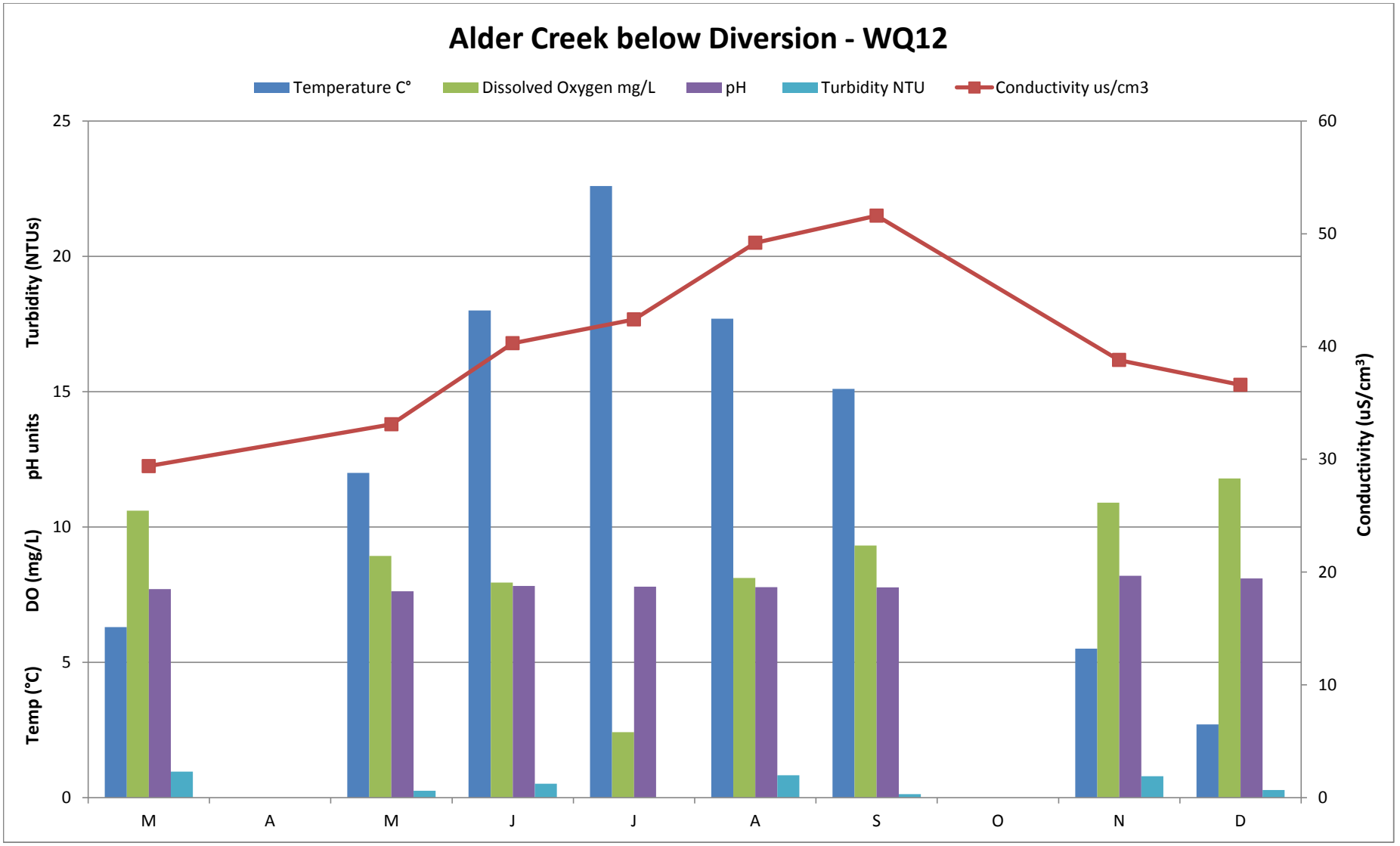

South Fork American River above Kyburz Diversion Dam (WQ5) and below Kyburz Diversion Dam (WQ6)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
80
70
60
50
40
30
20
10
0
3/29/2018
5/11/2018
6/21/2018
7/25/2018
8/28/2018
9/14/2018
11/26/2018
12/19/2018
WQ5
WQ6

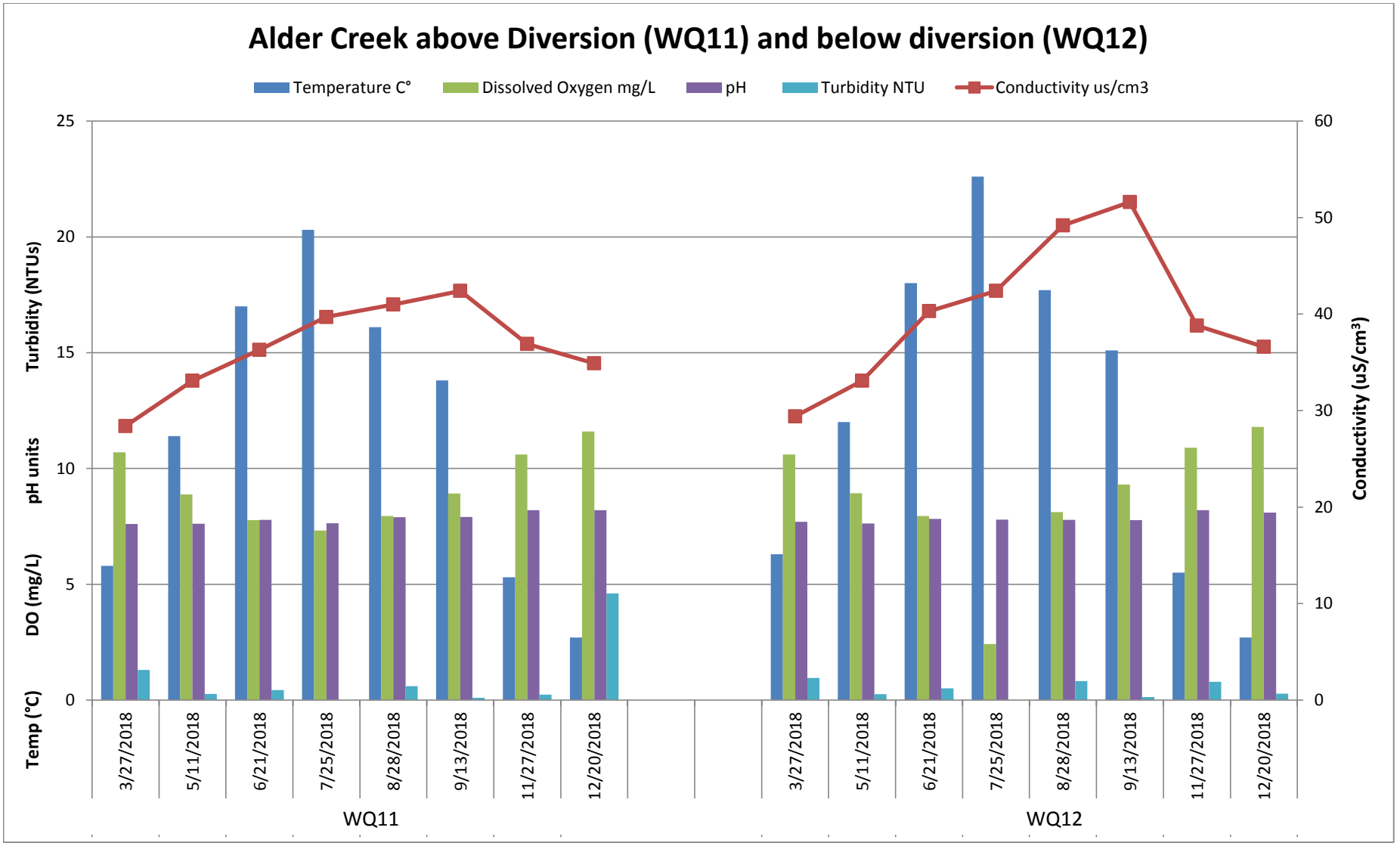

No Name Creek above Diversion - WQ9
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Temp (°C)
DO (mg/L)
pH units
Turbidity (NTUs)
Conductivity (uS/cm³)
0
5
10
15
20
25
0
20
40
60
80
100
120
140
160
180
M
A
M
J
J
A
S
O
N
D

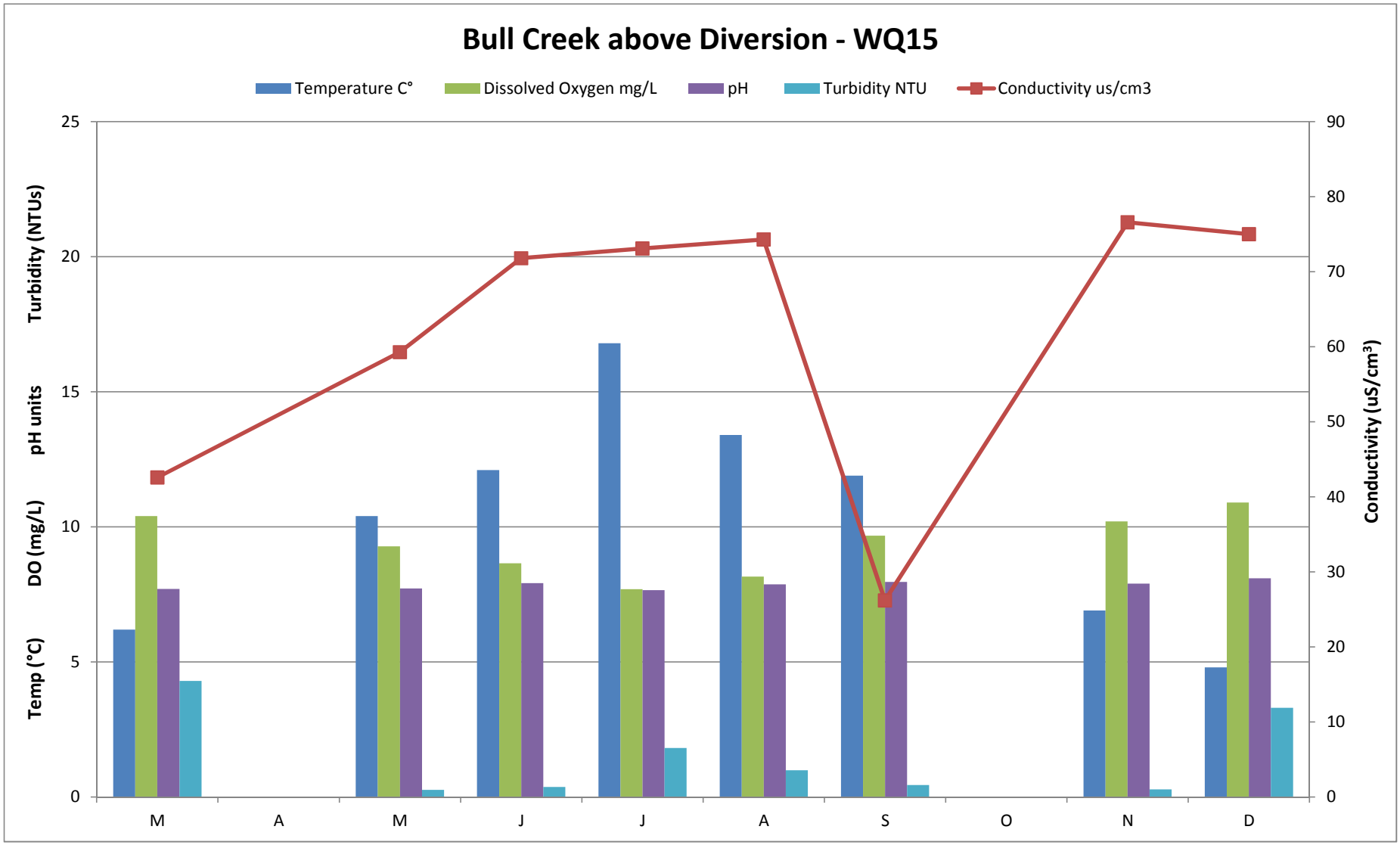

No Name Creek below Diversion - WQ10
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
180
160
140
120
100
80
60
40
20
0
M
A
M
J
J
A
S
O
N
D

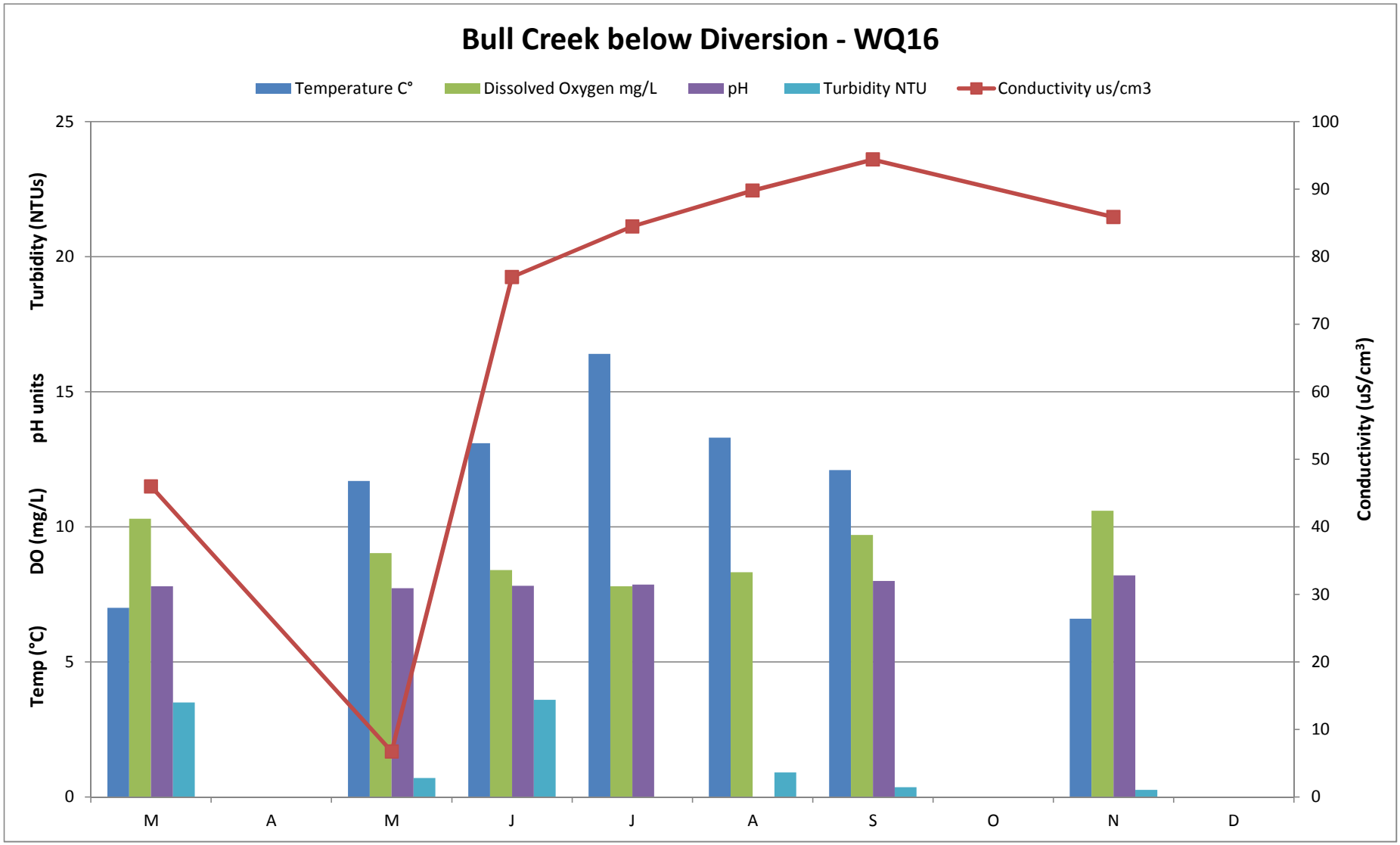

No Name Creek above Diversion (WQ9) and below Diversion (WQ10)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
180
160
140
120
100
80
60
40
20
0
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/28/2018
9/14/2018
11/26/2018
12/19/2018
WQ9
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/27/2018
9/14/2018
11/26/2018
12/19/2018
WQ10

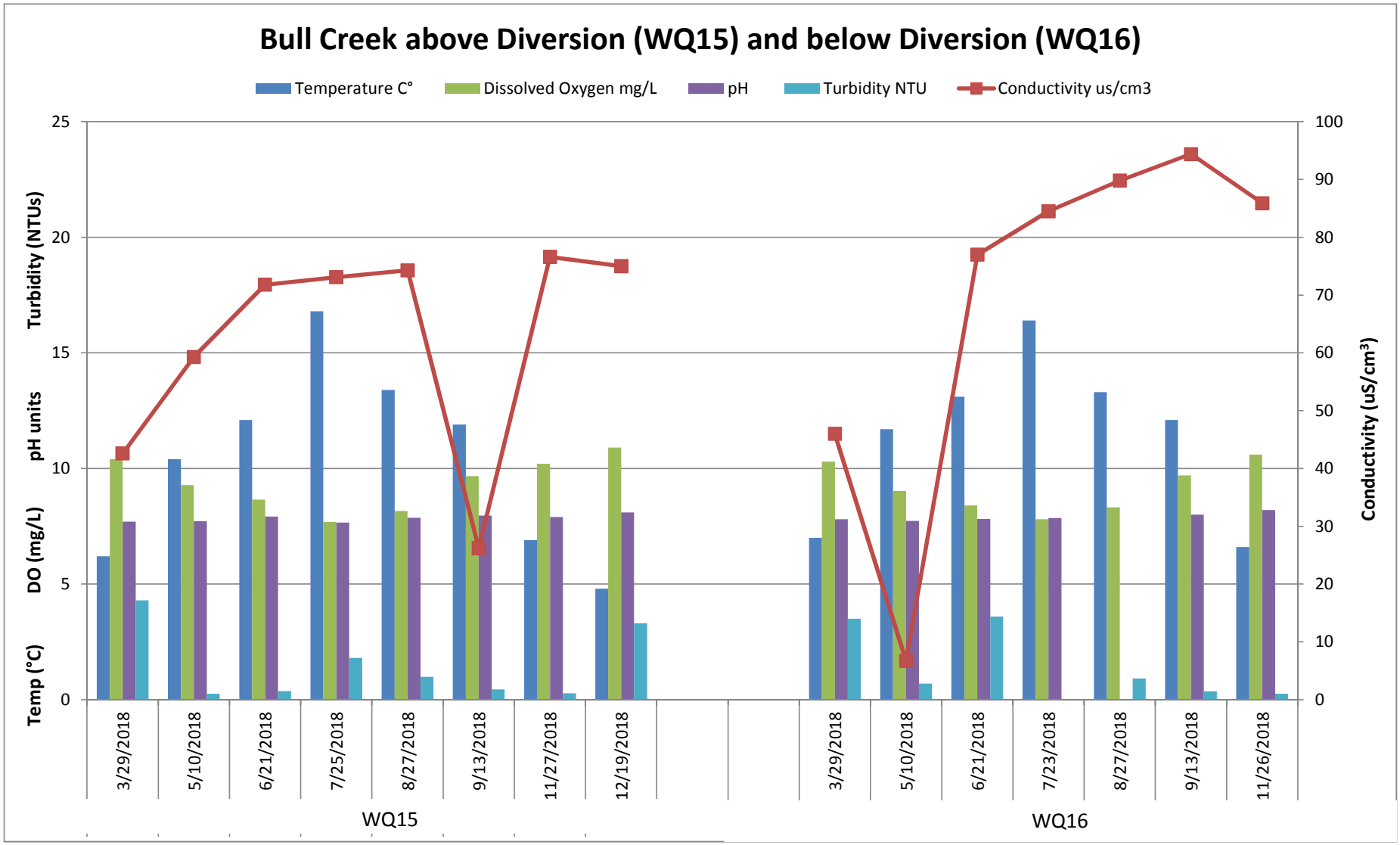

Alder Creek above Diversion - WQ11
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
45
40
35
30
25
20
15
10
5
0
M
A
M
J
J
A
S
O
N
D

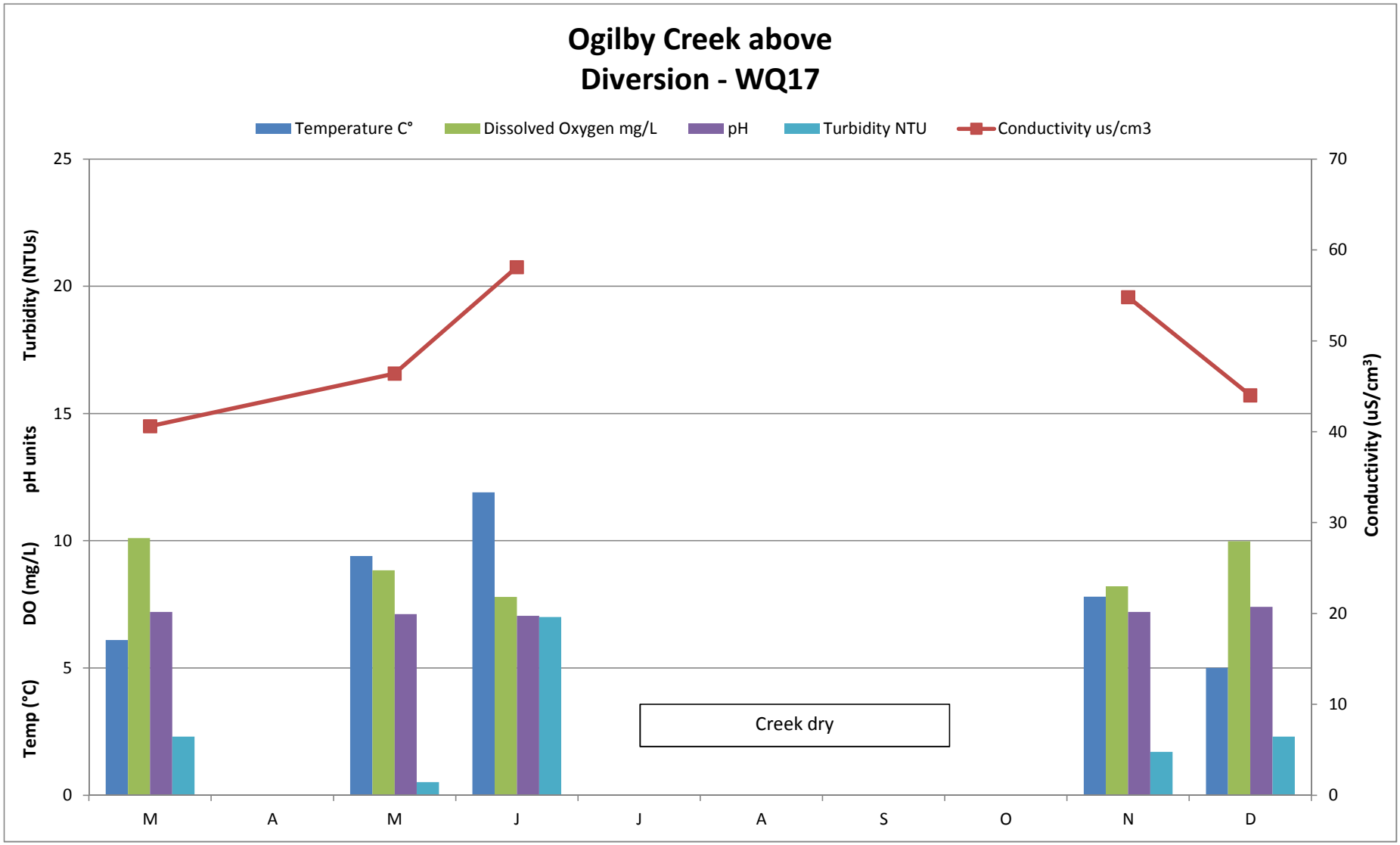

Alder Creek below Diversion - WQ12
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

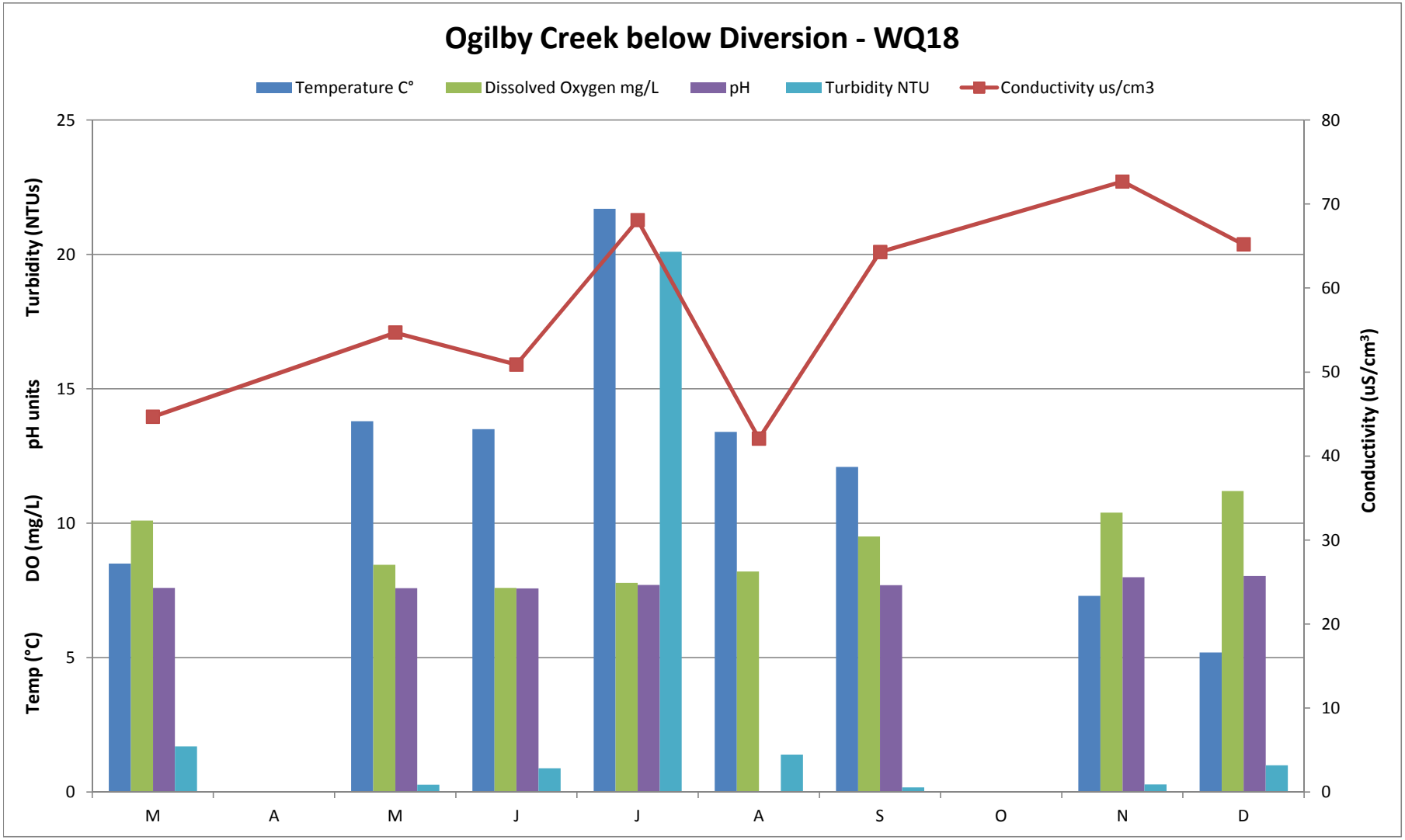

Alder Creek above Diversion (WQ11) and below diversion (WQ12)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Temp (°C)
DO (mg/L)
pH units
Turbidity (NTUs)
Conductivity (uS/cm³)
0
5
10
15
20
25
0
10
20
30
40
50
60
3/27/2018
5/11/2018
6/21/2018
7/25/2018
8/28/2018
9/13/2018
11/27/2018
12/20/2018
WQ11
WQ12

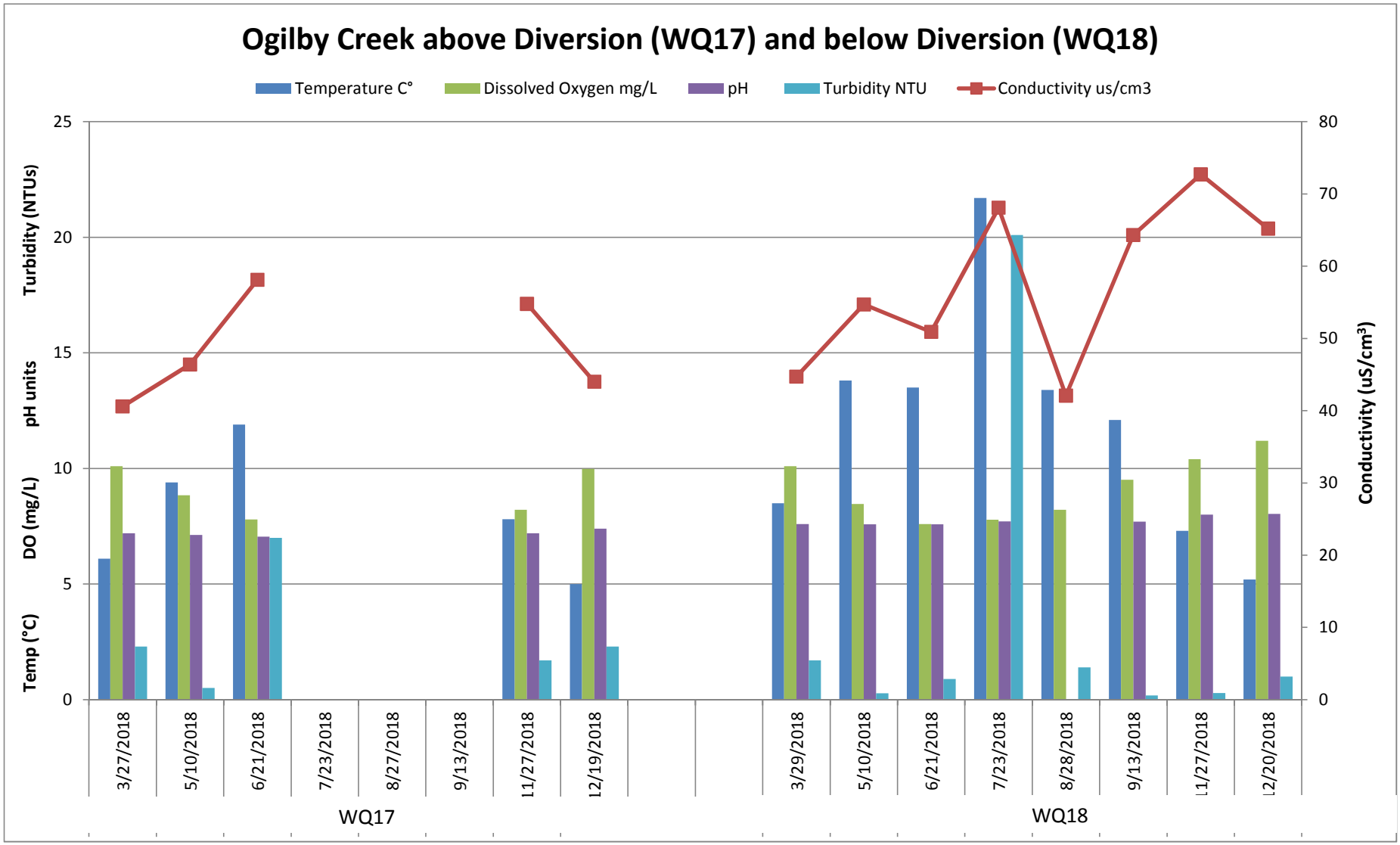

Bull Creek above Diversion - WQ15
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
90
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

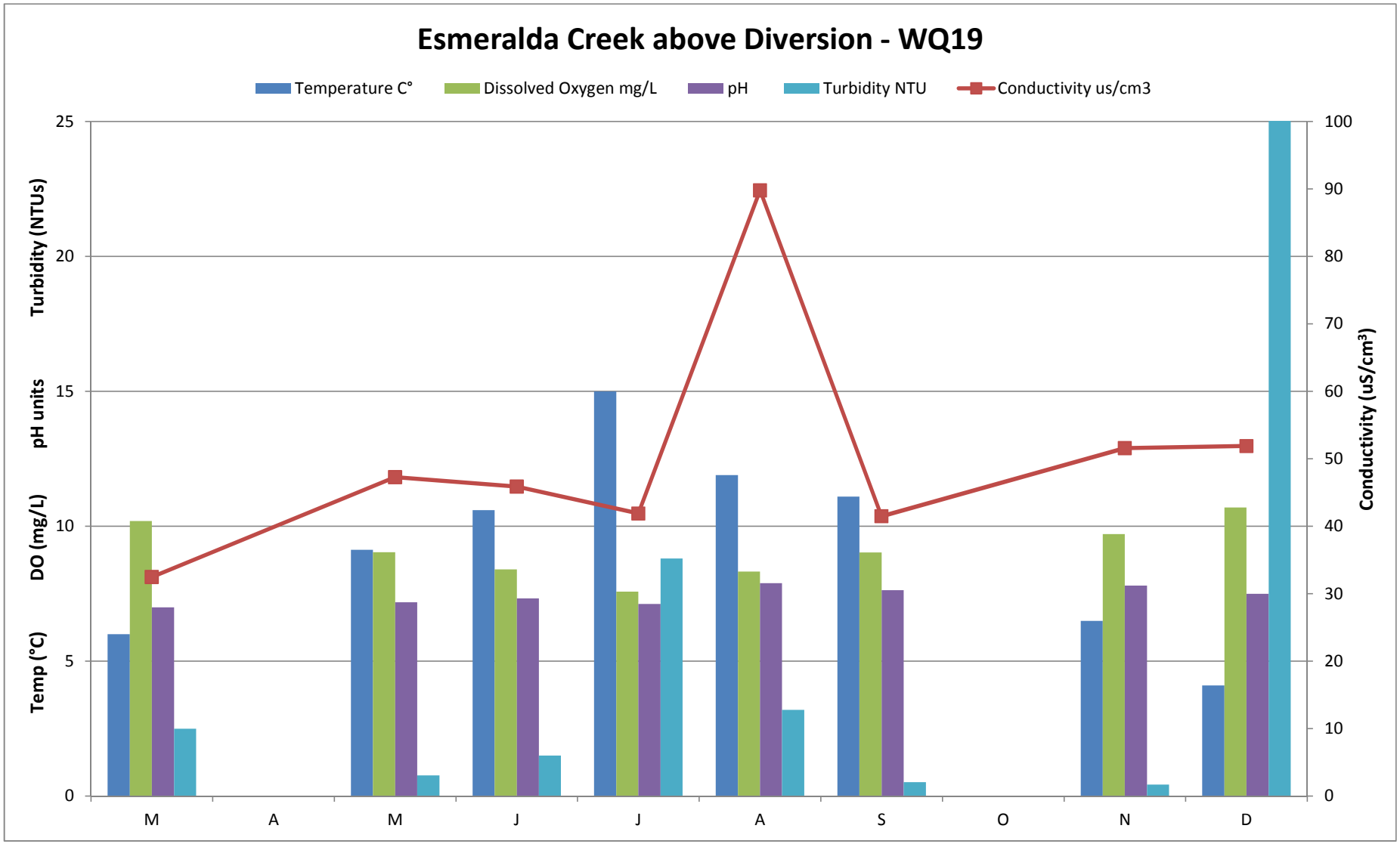

Bull Creek below Diversion - WQ16
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
100
90
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

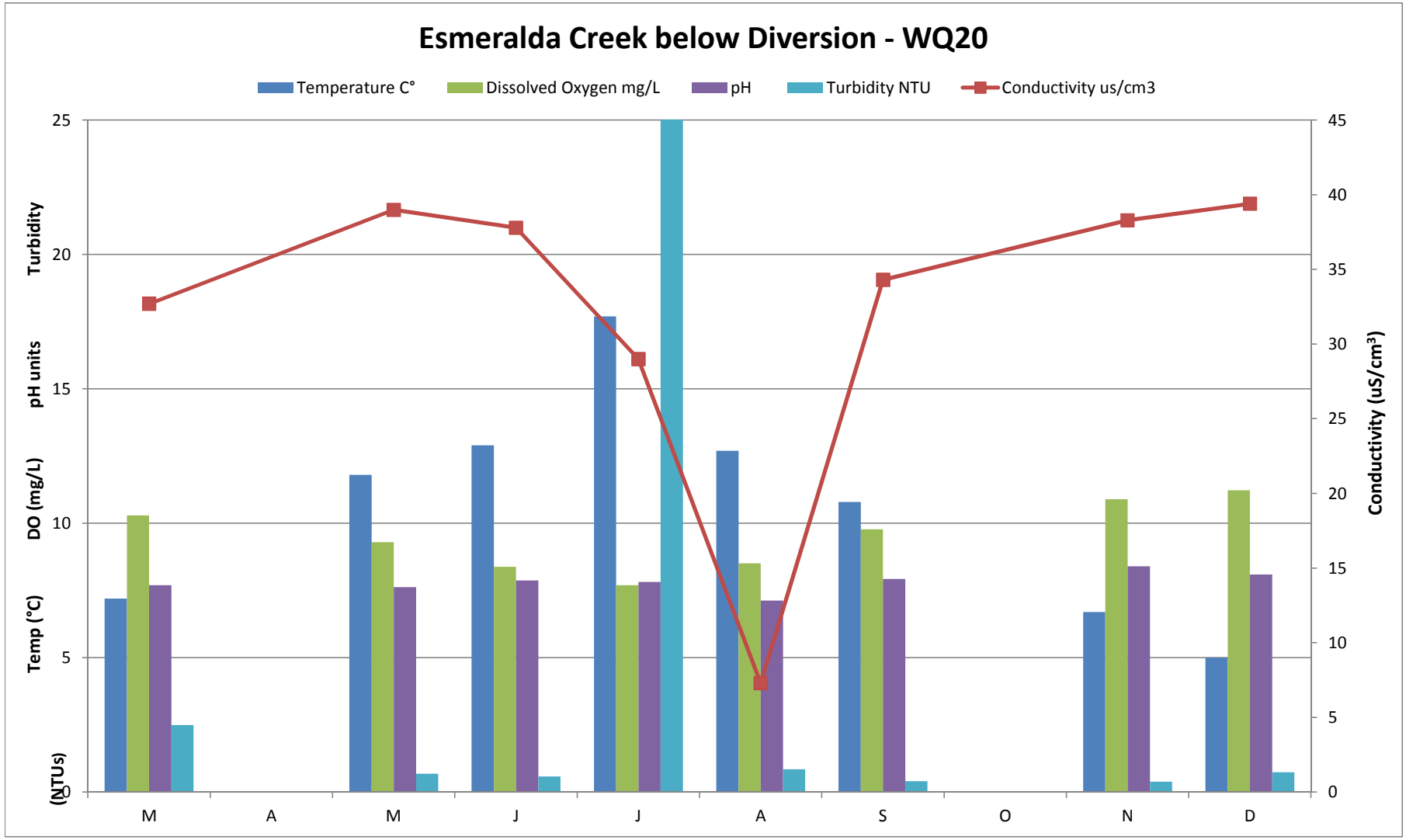

Bull Creek above Diversion (WQ15) and below Diversion (WQ16)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
100
90
80
70
60
50
40
30
20
10
0
3/29/2018
5/10/2018
6/21/2018
7/25/2018
8/27/2018
9/13/2018
11/27/2018
12/19/2018
WQ15
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/27/2018
9/13/2018
11/26/2018
WQ16

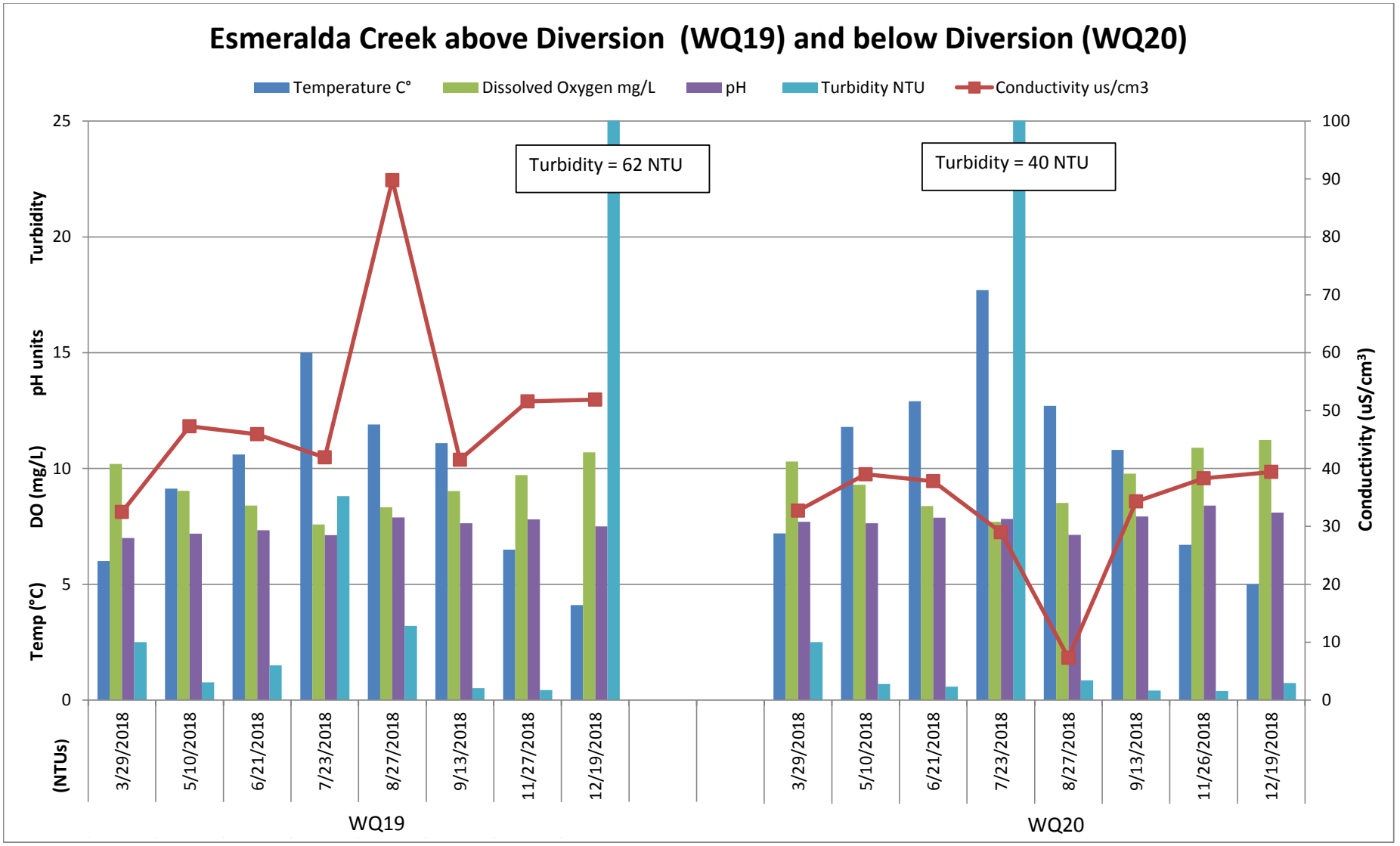

Ogilby Creek above Diversion - WQ17
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D
Creek dry

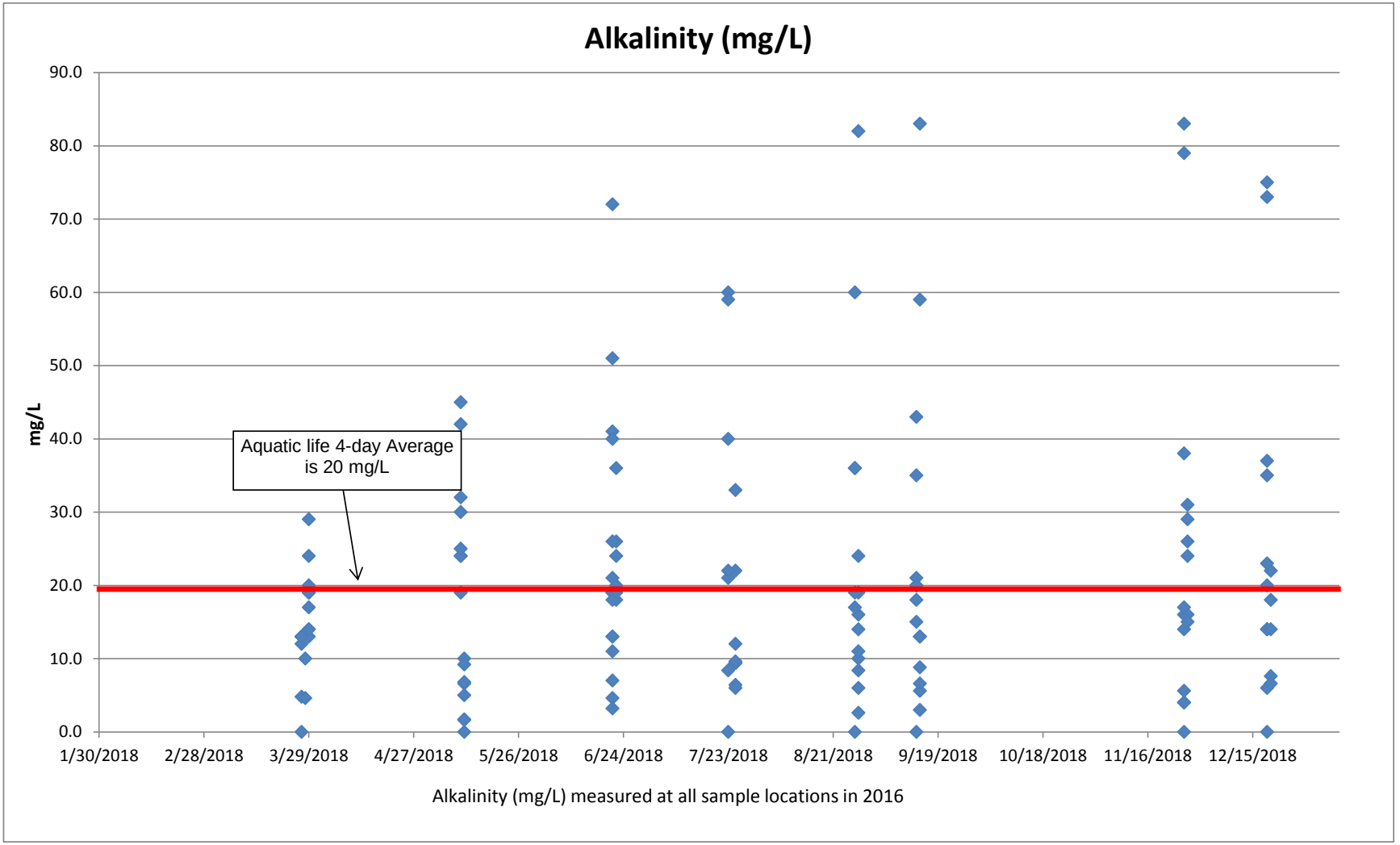

Ogilby Creek below Diversion - WQ18
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

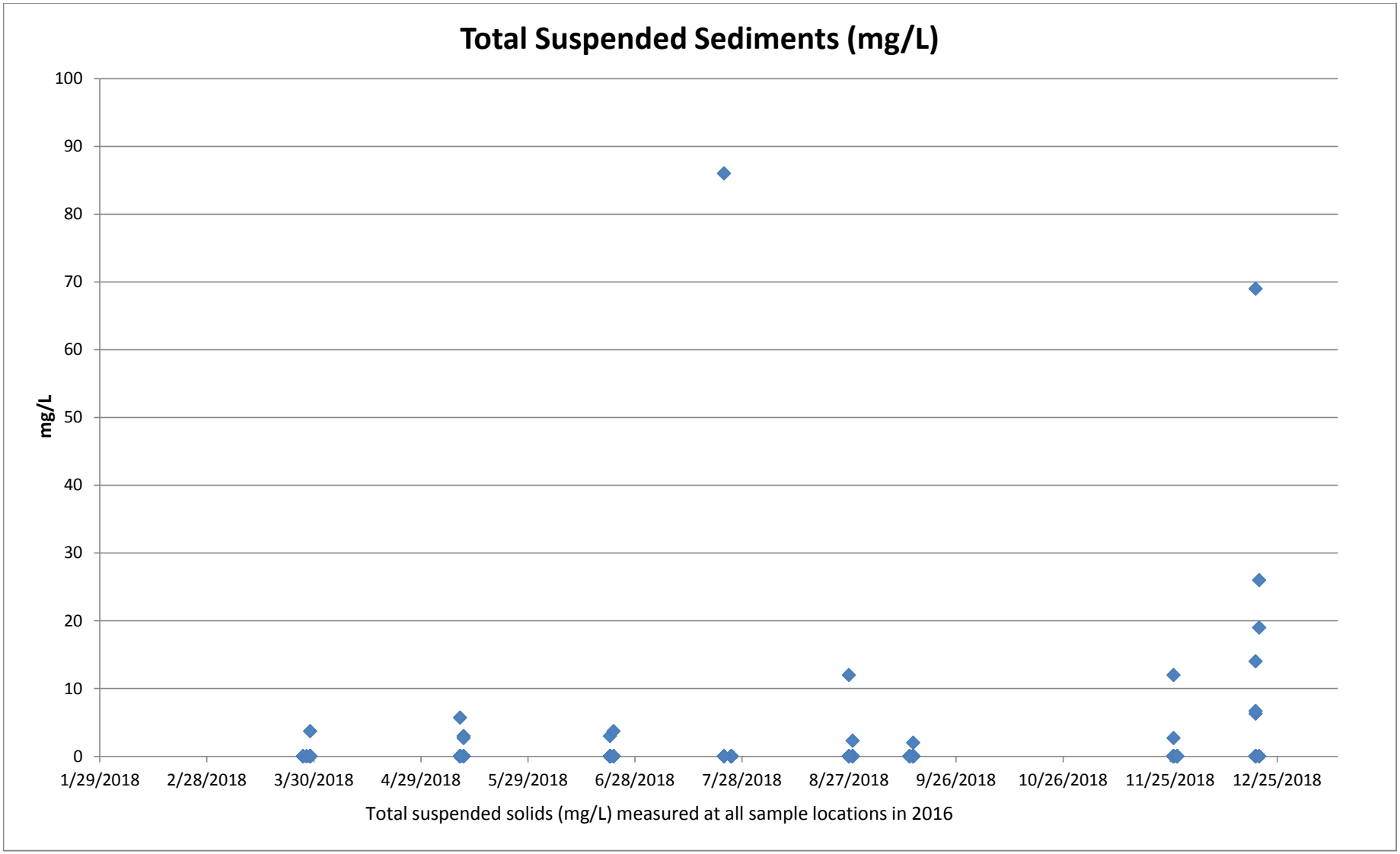

Ogilby Creek above Diversion (WQ17) and below Diversion (WQ18)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
80
70
60
50
40
30
20
10
0
3/27/2018
5/10/2018
6/21/2018
7/23/2018
8/27/2018
9/13/2018
11/27/2018
12/19/2018
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/28/2018
9/13/2018
11/27/2018
12/20/2018
WQ17
WQ18

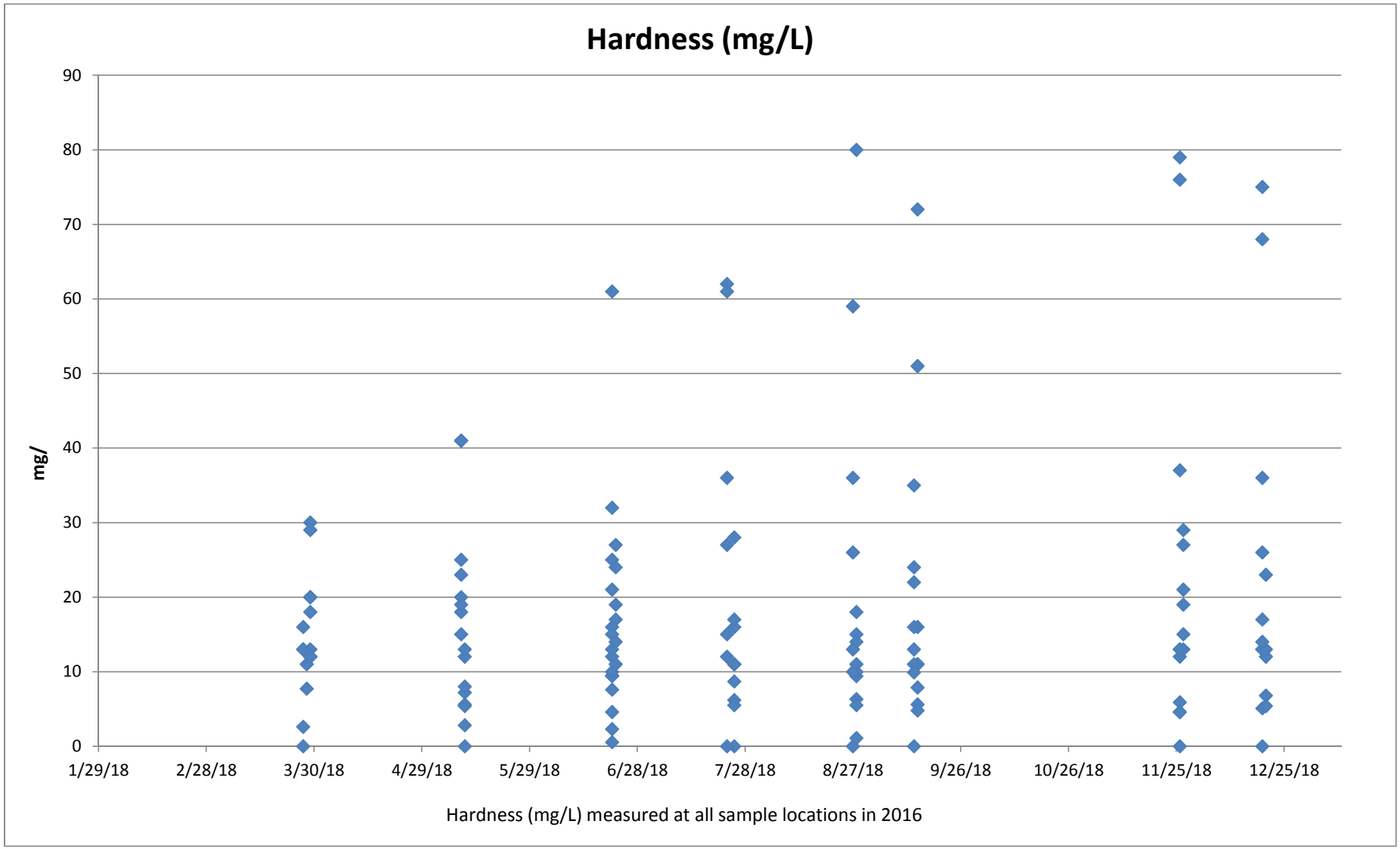

Esmeralda Creek above Diversion - WQ19
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
25
20
15
10
5
0
100
90
80
70
60
50
40
30
20
10
0
M
A
M
J
J
A
S
O
N
D

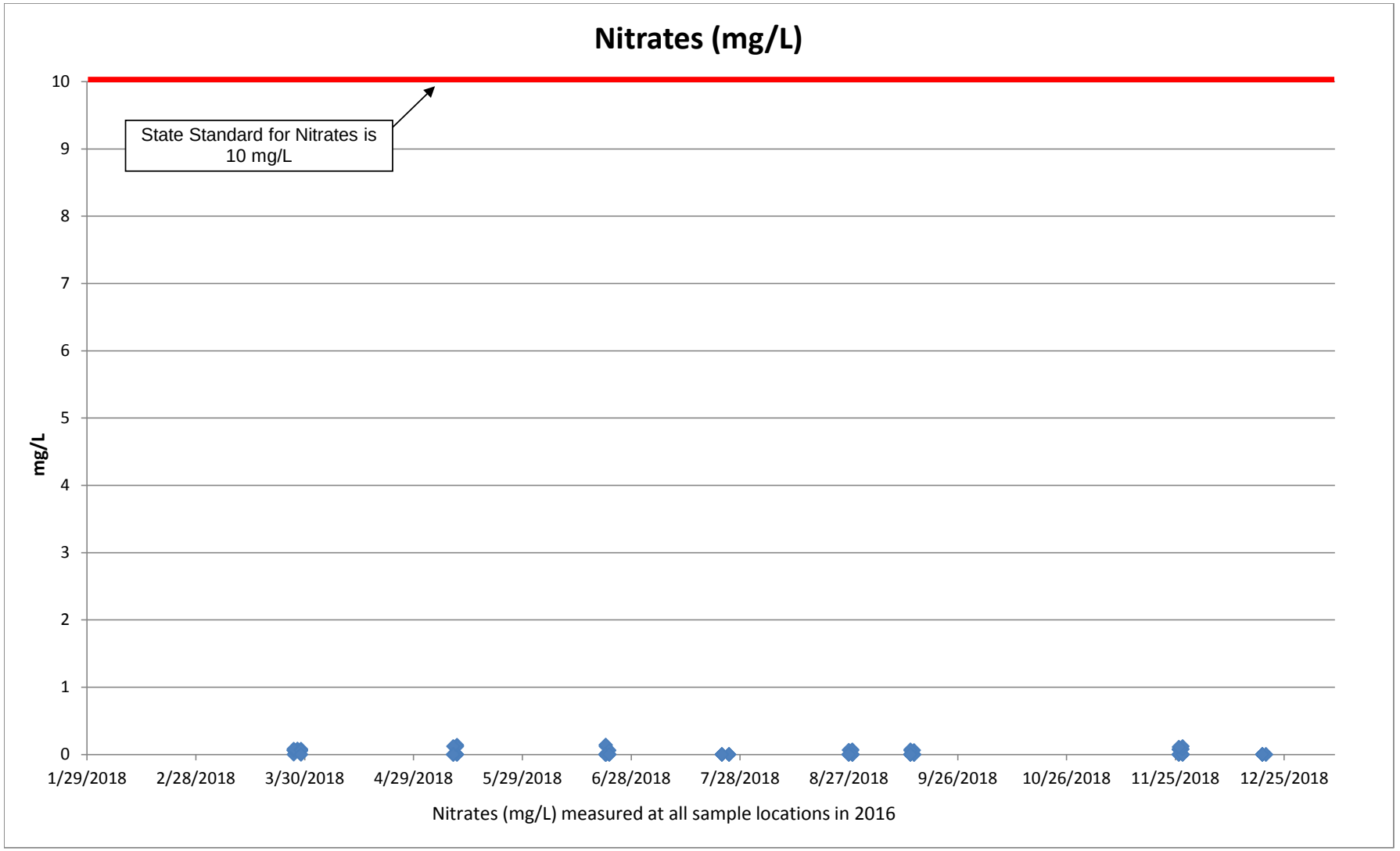

Esmeralda Creek below Diversion - WQ20
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity (NTUs)
pH units
DO (mg/L)
Temp (°C)
Conductivity (uS/cm³)
0
5
10
15
20
25
30
35
40
45
M
A
M
J
J
A
S
O
N
D


Esmeralda Creek above Diversion (WQ19) and below Diversion (WQ20)
Temperature C°
Dissolved Oxygen mg/L
pH
Turbidity NTU
Conductivity us/cm3
Turbidity = 62 NTU
Turbidity = 40 NTU
Turbidity
pH units
DO (mg/L)
Temp (°C)
(NTUs)
Conductivity (uS/cm³)
25
20
15
10
5
0
100
90
80
70
60
50
40
30
20
10
0
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/27/2018
9/13/2018
11/27/2018
12/19/2018
3/29/2018
5/10/2018
6/21/2018
7/23/2018
8/27/2018
9/13/2018
11/26/2018
12/19/2018
WQ19
WQ20


Alkalinity (mg/L)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
mg/L
Aquatic life 4-day Average is 20 mg/L
1/30/2018
2/28/2018
3/29/2018
4/27/2018
5/26/2018
6/24/2018
7/23/2018
8/21/2018
9/19/2018
10/18/2018
11/16/2018
12/15/2018
Alkalinity (mg/L) measured at all sample locations in 2016


Total Suspended Sediments (mg/L)
100
90
80
70
60
50
40
30
20
10
0
mg/L
1/29/2018
2/28/2018
3/30/2018
4/29/2018
5/29/2018
6/28/2018
7/28/2018
8/27/2018
9/26/2018
10/26/2018
11/25/2018
12/25/2018
Total suspended solids (mg/L) measured at all sample locations in 2016


Hardness (mg/L)
mg/
90
80
70
60
50
40
30
20
10
0
1/29/18
2/28/18
3/30/18
4/29/18
5/29/18
6/28/18
7/28/18
8/27/18
9/26/18
10/26/18
11/25/18
12/25/18
Hardness (mg/L) measured at all sample locations in 2016


Nitrates (mg/L)
State Standard for Nitrates is 10 mg/L
mg/L
10
9
8
7
6
5
4
3
2
1
0
1/29/2018
2/28/2018
3/30/2018
4/29/2018
5/29/2018
6/28/2018
7/28/2018
8/27/2018
9/26/2018
10/26/2018
11/25/2018
12/25/2018
Nitrates (mg/L) measured at all sample locations in 2016

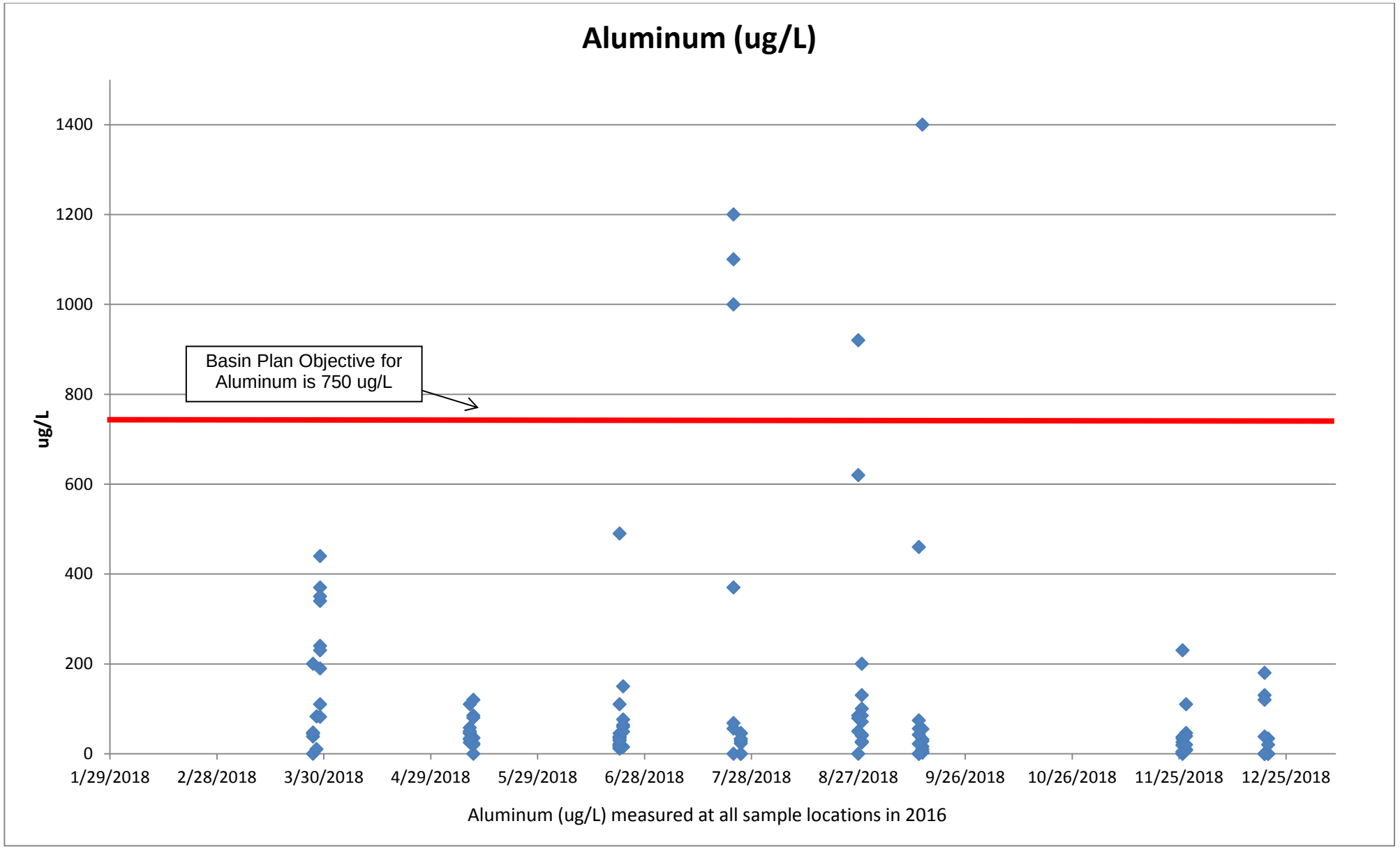

Aluminum (ug/L)
1400
1200
1000
800
600
400
200
0
ug/L
Basin Plan Objective for Aluminum is 750 ug/L
1/29/2018
2/28/2018
3/30/2018
4/29/2018
5/29/2018
6/28/2018
7/28/2018
8/27/2018
9/26/2018
10/26/2018
11/25/2018
12/25/2018
Aluminum (ug/L) measured at all sample locations in 2016

Table 9. Water Quality Limits for Copper per California Toxics Rule Criteria to protect freshwater aquatic life

Results based on the following equation:

Criteria Maximum Concentration (1-hour Average, dissolved) = (e{0.9422[ln(hardness)] – 1.700})

Sample ID	Date	Copper ug/L	Copper ug/L	Hardness CaCO3 mg/L	Max dissolved Concentration (ug/L)	Meet or exceed acute criterion
WQ-01	3/27/2018	0.15	0.15	2.6	0.4315	MEET
WQ-01	5/11/2018	0.36	0.36	2.8	0.4627	MEET
WQ-01	6/21/2018	1.4	1.4	2.3	0.3844	EXCEED
WQ-01	7/25/2018	0	0	6.2	0.9785	0
WQ-01	8/28/2018	0.37	0.37	6.3	0.9934	MEET
WQ-01	9/14/2018	0.27	0.27	5.6	0.8890	MEET
WQ-01	11/26/2018	0	0	4.6	0.7386	0
WQ-01	12/19/2018	0	0	5.1	0.8140	0
WQ-02	3/27/2018	0	0	11	1.6795	0
WQ-02	5/11/2018	0	0	7.2	1.1265	0
WQ-02	6/21/2018	0.3	0.3	7.6	1.1854	MEET
WQ-02	7/25/2018	0		8.7	1.3464	0
WQ-02	8/28/2018	0.18	0.18	9.4	1.4483	MEET
WQ-02	9/14/2018	0	0	7.9	1.2295	0
WQ-02	11/26/2018	0	0	0	#NUM!	0
WQ-02	12/19/2018	0	0	0	#NUM!	0
WQ-03	3/28/2018	0.21	0.21	11	1.6795	MEET
WQ-03	5/11/2018	0.27	0.27	7.2	1.1265	MEET
WQ-03	6/21/2018	0.35	0.35	7.6	1.1854	MEET
WQ-03	7/25/2018	0	0	8.7	1.3464	0
WQ-03	8/28/2018	0.51	0.51	9.4	1.4483	MEET
WQ-03	9/14/2018	0.25	0.25	7.9	1.2295	MEET
WQ-03	11/26/2018	0.34	0.34	4.6	0.7386	MEET
WQ-03	12/20/2018	0	0	6.8	1.0675	0
WQ-04	3/28/2018	0.21	0.21	7.7	1.2001	MEET
WQ-04	5/11/2018	0.15	0.15	5.4	0.8591	MEET
WQ-04	6/21/2018	0.22	0.22	4.6	0.7386	MEET
WQ-04	7/25/2018	0	0	5.5	0.8741	0
WQ-04	8/28/2018	0.72	0.72	5.5	0.8741	MEET
WQ-04	9/14/2018	0.23	0.23	4.8	0.7688	MEET
WQ-04	11/26/2018	0	0	5.9	0.9338	0
WQ-04	12/20/2018	0	0	5.4	0.8591	0
WQ-05	3/29/2018	0.27	0.27	13	1.9657	MEET
WQ-05	5/11/2018	0.17	0.17	5.6	0.8890	MEET
WQ-05	6/21/2018	0.43	0.43	9.4	1.4483	MEET
WQ-05	7/25/2018	0	0	11	1.6795	0
WQ-05	8/28/2018	0.35	0.35	10	1.5352	MEET
WQ-05	9/14/2018	0.33	0.33	11	1.6795	MEET
WQ-05	11/26/2018	0.12	0.12	13	1.9657	MEET
WQ-05	12/19/2018	0	0	13	1.9657	0
WQ-06	3/29/2018	0.23	0.23	12	1.8230	MEET
WQ-06	5/11/2018	0.18	0.18	8	1.2441	MEET
WQ-06	6/21/2018	0.39	0.39	9.5	1.4628	MEET
WQ-06	7/25/2018	7.4	7.4	11	1.6795	EXCEED
WQ-06	8/28/2018	0.73	0.73	11	1.6795	MEET
WQ-06	9/14/2018	0.39	0.39	11	1.6795	MEET
WQ-06	11/26/2018	0.29	0.29	12	1.8230	MEET
WQ-06	12/19/2018	0	0	13	1.9657	0
WQ-09	3/29/2018	0.44	0.44	29	4.1864	MEET
WQ-09	5/10/2018	0.15	0.15	41	5.8014	MEET
WQ-09	6/21/2018	0.19	0.19	61	8.4355	MEET
WQ-09	7/23/2018	0	0	62	8.5657	0
WQ-09	8/28/2018	0.67	0.67	80	10.8909	MEET
WQ-09	9/14/2018	0.35	0.35	72	9.8616	MEET
WQ-09	11/26/2018	0	0	79	10.7625	0
WQ-09	12/19/2018	0	0	75	10.2483	0
WQ-10	3/29/2018	0.51	0.51	30	4.3223	MEET
WQ-10	5/10/2018	0.3	0.3	41	5.8014	MEET
WQ-10	7/23/2018	0	0	61	8.4355	0
WQ-10	8/27/2018	1.2	1.2	59	8.1746	MEET
WQ-10	9/14/2018	0.98	0.98	51	7.1260	MEET
WQ-10	11/26/2018	0	0	76	10.3770	0
WQ-10	12/19/2018	0	0	68	9.3446	0
WQ-11	3/27/2018	0.1	0.1	13	1.9657	MEET
WQ-11	5/11/2018	0.11	0.11	12	1.8230	MEET

Sample ID	6/21/2018	0.25	Copper ug/L	12	Max dissolved Concentration (ug/L)	Meet or exceed acute criterion
WQ-11	7/25/2018	2.9	2.9	16	2.3905	EXCEED
WQ-11	8/28/2018	0.42	0.42	15	2.2495	MEET
WQ-11	9/13/2018	0.13	0.13	13	1.9657	MEET
WQ-11	11/27/2018	0	0	13	1.9657	0
WQ-11	12/20/2018	0	0	12	1.8230	0
WQ-12	3/27/2018	0.1	0.1	13	1.9657	MEET
WQ-12	5/11/2018	0	0	13	1.9657	0
WQ-12	6/21/2018	0.21	0.21	13	1.9657	MEET
WQ-12	7/25/2018	0	0	17	2.5310	0
WQ-12	8/28/2018	9.4	9.4	18	2.6711	EXCEED
WQ-12	9/13/2018	0.35	0.35	16	2.3905	MEET
WQ-12	11/27/2018	0.17	0.17	15	2.2495	MEET
WQ-12	12/20/2018	0	0	13	1.9657	0
WQ-15	3/29/2018	0.44	0.44	18	2.6711	MEET
WQ-15	5/10/2018	0.18	0.18	23	3.3650	MEET
WQ-15	6/21/2018	0.09	0.09	25	3.6401	MEET
WQ-15	6/22/2018	0	0	24	3.5027	0
WQ-15	7/25/2018	0	0	28	4.0503	0
WQ-15	8/27/2018	0.46	0.46	26	3.7771	MEET
WQ-15	9/13/2018	1.5	1.5	24	3.5027	MEET
WQ-15	11/27/2018	0	0	27	3.9138	0
WQ-15	12/19/2018	0	0	26	3.7771	0
WQ-16	3/29/2018	0.46	0.46	20	2.9499	MEET
WQ-16	5/10/2018	0.51	0.51	25	3.6401	MEET
WQ-16	6/21/2018	1.1	1.1	32	4.5933	MEET
WQ-16	6/22/2018	0.14	0.14	27	3.9138	MEET
WQ-16	7/23/2018	0	0	36	5.1324	0
WQ-16	8/27/2018	0.58	0.58	36	5.1324	MEET
WQ-16	9/13/2018	0.19	0.19	35	4.9979	MEET
WQ-16	11/26/2018	0.81	0.81	37	5.2666	MEET
WQ-16	12/19/2018	0.00	0	36	5.1324	0
WQ-17	3/27/2018	0.16	0.16	16	2.3905	MEET
WQ-17	5/10/2018	0.11	0.11	18	2.6711	MEET
WQ-17	6/21/2018	0.13	0.13	21	3.0886	MEET
WQ-17	6/22/2018	0.1	0.1	19	2.8107	MEET
WQ-17	7/23/2018	0	0	0	#NUM!	0
WQ-17	8/27/2018	0	0	0	#NUM!	0
WQ-17	9/13/2018	0	0	0	#NUM!	0
WQ-17	11/27/2018	0.49	0.49	21	3.0886	MEET
WQ-17	12/19/2018	0	0	14	2.1079	0
WQ-18	3/29/2018	0.3	0.3	20	2.9499	MEET
WQ-18	5/10/2018	0.35	0.35	20	2.9499	MEET
WQ-18	6/21/2018	0.23	0.23	16	2.3905	MEET
WQ-18	6/22/2018	0.22	0.22	17	2.5310	MEET
WQ-18	7/23/2018	0	0	27	3.9138	0
WQ-18	8/28/2018	0.51	0.51	14	2.1079	MEET
WQ-18	9/13/2018	0.19	0.19	22	3.2270	MEET
WQ-18	11/27/2018	1.2	1.2	29	4.1864	MEET
WQ-18	12/20/2018	0	0	23	3.3650	0
WQ-19	3/29/2018	0.19	0.19	12	1.8230	MEET
WQ-19	5/10/2018	0	0	19	2.8107	0
WQ-19	6/21/2018	0	0	15	2.2495	0
WQ-19	6/22/2018	0.11	0.11	14	2.1079	MEET
WQ-19	7/23/2018	0	0	15	2.2495	0
WQ-19	8/27/2018	0.82	0.82	13	1.9657	MEET
WQ-19	9/13/2018	0.13	0.13	11	1.6795	MEET
WQ-19	11/27/2018	0.73	0.73	19	2.8107	MEET
WQ-19	12/19/2018	0	0	17	2.5310	0
WQ-20	3/29/2018	0.51	0.51	12	1.8230	MEET
WQ-20	5/10/2018	0.16	0.16	15	2.2495	MEET
WQ-20	6/21/2018	0.11	0.11	10	1.5352	MEET
WQ-20	6/22/2018	0.26	0.26	11	1.6795	MEET
WQ-20	7/23/2018	0	0	12	1.8230	0
WQ-20	8/27/2018	0.22	0.22	10	1.5352	MEET
WQ-20	9/13/2018	0.23	0.23	9.9	1.5208	MEET
WQ-20	11/26/2018	1.7	1.7	13	1.9657	MEET
WQ-20	12/18/2019	0	0	12	1.8230	0

E.coli concentrations (MPN/100 mL)

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-01	5/21/2018	10:10	1.0
WQ-01	5/24/2018	10:45	3.1
WQ-01	5/29/2018	10:50	1.0
WQ-01	5/26/2018	9:15	1.0
WQ-01	6/18/2018	4:05	1.0
WQ-01	6/21/2018	2:13	4.1
WQ-01	7/2/2018	2:10	3.1
WQ-01	7/5/2018	1:40	3.1
WQ-01	7/16/2018	1:55	1.0
WQ-01	7/28/2018	2:00	48.7
WQ-01	7/30/2018	1:45	8.6
WQ-01	8/6/2018	1:45	4.1
WQ-01	8/13/2018	1:45	36.9
WQ-01	8/20/2018	1:55	4.1
WQ-01	8/28/2018	1:49	11.0
WQ-01	8/30/2018	1:35	2.0
WQ-01	9/4/2018	1:45	1.0
WQ-01	9/10/2018	1:45	7.5
WQ-01	9/14/2018	1:50	5.2
WQ-01	9/24/2018	1:45	3.1

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-02	*	*	*
WQ-02	*	*	*
WQ-02	*	*	*
WQ-02	*	*	*
WQ-02	6/18/2018	4:20	1.0
WQ-02	6/21/2018	11:30	1.0
WQ-02	7/2/2018	11:28	1.0
WQ-02	7/5/2018	11:10	1.0
WQ-02	7/16/2018	1:55	1.0
WQ-02	7/25/2018	11:22	1.0
WQ-02	7/30/2018	11:18	1.0
WQ-02	8/6/2018	11:20	1.0
WQ-02	8/13/2018	11:21	1.0
WQ-02	8/20/2018	11:20	1.0
WQ-02	8/28/2018	11:19	1.0
WQ-02	8/30/2018	11:15	1.0
WQ-02	9/4/2018	11:25	1.0
WQ-02	9/10/2018	11:25	1.0
WQ-02	9/14/2018	11:20	1.0
WQ-02	9/24/2018	11:30	1.0

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-03	5/21/2018	10:55	1.0
WQ-03	5/24/2018	11:30	1.0
WQ-03	5/29/2018	11:35	1.0
WQ-03	6/18/2018	11:45	1.0
WQ-03	6/21/2018	11:10	1.0
WQ-03	7/2/2018	11:10	1.0
WQ-03	7/5/2018	11:25	1.0
WQ-03	7/18/2018	11:20	1.0
WQ-03	7/25/2018	11:15	1.0
WQ-03	7/30/2018	11:40	1.0
WQ-03	8/6/2018	11:20	1.0
WQ-03	8/13/2018	11:17	1.0
WQ-03	8/20/2018	11:30	3.1
WQ-03	8/28/2018	10:05	5.2
WQ-03	8/30/2018	1:15	1.0
WQ-03	9/4/2018	1:15	1.0
WQ-03	9/10/2018	11:20	3.1
WQ-03	9/14/2018	9:30	1.0
WQ-03	9/24/2018	11:00	1.0

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-04	5/21/2018	11:10	1.0
WQ-04	5/24/2018	11:50	1.0
WQ-04	5/29/2018	12:00	1.0
WQ-04	6/18/2018	12:00	1.0
WQ-04	6/21/2018	11:35	1.0
WQ-04	7/2/2018	11:30	1.0
WQ-04	7/5/2018	11:40	1.0
WQ-04	7/18/2018	11:40	5.2
WQ-04	7/25/2018	12:10	1.0
WQ-04	7/30/2018	11:55	1.0
WQ-04	8/6/2018	11:35	3.1
WQ-04	8/13/2018	11:55	2.0
WQ-04	8/20/2018	12:00	1.0
WQ-04	8/28/2018	10:40	2.0
WQ-04	8/30/2018	12:55	1.0
WQ-04	9/4/2018	1:30	2.0
WQ-04	9/10/2018	11:40	4.1
WQ-04	9/14/2018	10:20	1.0
WQ-04	9/24/2018	11:15	1.0

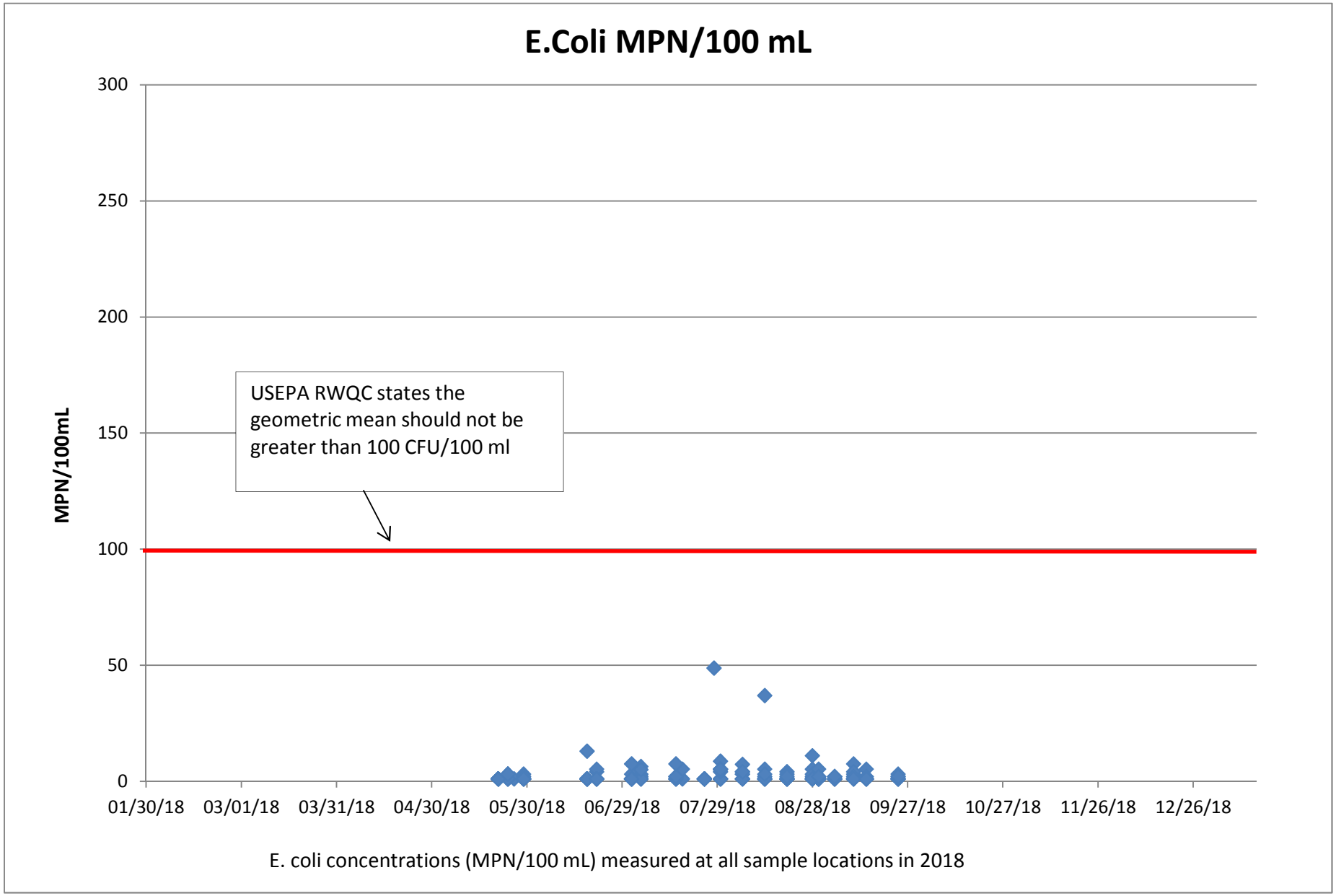
Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-05	5/21/2018	12:06	1.0
WQ-05	5/24/2018	12:45	1.0
WQ-05	5/29/2018	12:55	3.1
WQ-05	6/18/2018	1:00	13.0
WQ-05	6/21/2018	11:35	5.2
WQ-05	7/2/2018	12:23	1.0
WQ-05	7/5/2018	12:35	2.0
WQ-05	7/16/2018	12:45	1.0
WQ-05	7/25/2018	1:30	1.0
WQ-05	7/30/2018	12:55	5.2
WQ-05	8/6/2018	12:35	3.1
WQ-05	8/13/2018	1:15	1.0
WQ-05	8/20/2018	1:00	1.0
WQ-05	8/28/2018	2:55	1.0
WQ-05	8/30/2018	11:55	1.0
WQ-05	9/4/2018	12:05	1.0
WQ-05	9/10/2018	12:40	1.0
WQ-05	9/14/2018	2:45	2.0
WQ-05	9/24/2018	12:15	2.0

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-06	5/21/2018	12:10	1.0
WQ-06	5/24/2018	12:50	1.0
WQ-06	5/29/2018	1:00	1.0
WQ-06	6/18/2018	1:05	1.0
WQ-06	6/21/2018	12:40	1.0
WQ-06	7/2/2018	12:27	1.0
WQ-06	7/5/2018	12:35	1.0
WQ-06	7/16/2018	12:50	2.0
WQ-06	7/25/2018	1:45	1.0
WQ-06	7/30/2018	1:00	5.2
WQ-06	8/6/2018	12:40	7.3
WQ-06	8/13/2018	1:20	1.0
WQ-06	8/20/2018	1:50	1.0
WQ-06	8/28/2018	2:45	1.0
WQ-06	8/30/2018	12:05	1.0
WQ-06	9/4/2018	12:15	1.0
WQ-06	9/10/2018	12:45	1.0
WQ-06	9/14/2018	2:35	1.0
WQ-06	9/24/2018	12:20	1.0

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-11	5/21/2018	1:00	1.0
WQ-11	5/24/2018	1:05	3.1
WQ-11	5/29/2018	1:50	2.0
WQ-11	6/18/2018	1:55	1.0
WQ-11	6/21/2018	1:45	1.0
WQ-11	7/2/2018	1:30	1.0
WQ-11	7/5/2018	1:30	6.3
WQ-11	7/16/2018	1:30	2.0
WQ-11	7/25/2018	3:15	1.0
WQ-11	7/30/2018	1:45	4.1
WQ-11	8/6/2018	1:30	1.0
WQ-11	8/13/2018	2:00	5.2
WQ-11	8/20/2018	1:50	1.0
WQ-11	8/28/2018	1:50	3.1
WQ-11	8/30/2018	11:00	5.2
WQ-11	9/4/2018	11:25	2.0
WQ-11	9/10/2018	1:30	2.0
WQ-11	9/14/2018	1:15	1.0
WQ-11	9/24/2018	1:00	1.0

Sample ID	Date	Time	E.Coli MPN/100 mL
WQ-12	5/21/2018	12:30	1.0
WQ-12	5/24/2018	4:05	3.1
WQ-12	5/29/2018	1:11	1.0
WQ-12	6/18/2018	1:15	1.0
WQ-12	6/21/2018	1:00	1.0
WQ-12	7/2/2018	12:45	7.5
WQ-12	7/5/2018	1:00	5.0
WQ-12	7/16/2018	12:58	7.5
WQ-12	7/25/2018	2:30	1.0
WQ-12	7/30/2018	1:10	5.1
WQ-12	8/6/2018	1:00	4.1
WQ-12	8/13/2018	1:35	3.1
WQ-12	8/20/2018	2:15	2.0
WQ-12	8/28/2018	1:05	1.0
WQ-12	8/30/2018	10:15	2.0
WQ-12	9/4/2018	10:40	2.0
WQ-12	9/10/2018	12:55	1.0
WQ-12	9/14/2018	12:30	1.0
WQ-12	9/24/2018	12:35	2.0

* Unsafe to reach location due to weather conditions
*** Creek dry - no surface water to sample in vicintiy of sample site
Data that is less than 1.0 documented as 1.0 in this table


E.Coli MPN/100 mL
MPN/100mL
300
250
200
150
100
50
0
USEPA RWQC states the geometric mean should not be greater than 100 CFU/100 ml
01/30/18
03/01/18
03/31/18
04/30/18
05/30/18
06/29/18
07/29/18
08/28/18
09/27/18
10/27/18
11/26/18
12/26/18
E. coli concentrations (MPN/100 mL) measured at all sample locations in 2018