

Adelaide Desalination Project (ADP) – DBOM

Quarterly Salinity Monitoring Report

April to June 2019

Rev	Date	Approved AdelaideAqua
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1. Volumes of seawater received, and outfall discharged

Table 1 below shows the summary of seawater received and outfall discharged volumes for this reporting period.

The ADP winter shutdown period began from 14th June. The volume shown below during winter shutdown period is only seawater recirculation or shock dosing.

Table 1 - Intake and Discharge Volume Summary

Month	Intake (ML)	Outfall (ML)
April	881	522
May	1483	860
June	403	240
Quarterly Total	2767	1622

2. Water Quality

2.1 Seawater Characteristics Results

Tables 2A and 2B below show the summary of seawater characteristics for this reporting period.

Table 2A - Seawater Characteristics Summary-Online Analyser

Parameter	Conductivity	Temperature	pH	DO
	µS/cm	C		mg/L
Average	57,011	18.0	7.82	8.89
Minimum	50,760	13.9	5.50	6.80
Maximum	58,188	25.3	8.00	9.70

Source: Online analyser (10 minutes intervals data over 3 month)

Table 2B - Seawater Characteristics Summary-External lab

Parameter	Biochemical Oxygen Demand	Suspended solids	Nitrogen (Total)	Phosphorus (Total)	Zinc (Total)	Lead (Total)	Copper (Total)
	mg/L	mg/L	mg/L as N	mg/L as P	mg/L	mg/L	mg/L
Average	<2	<1	0.14	0.02	<0.003	<0.001	0.003
Minimum	<2	<1	<0.05	<0.005	<0.003	<0.001	<0.001
Maximum	<2	<1	0.40	0.04	0.012	<0.001	0.004

Source: AWQC

The ADP conducts intake chemical shock dosing to control the bio-growth in the intake tunnel. During the intake shock dosing, pH dropped to 5.5 (normal operation range 8.0-8.5) due to the acid dosing and came back to normal sea water pH range after shock dosing.

2.2 Discharge Characteristics Results

Tables 3A and 3B below show the summary of discharge characteristics for this reporting period.

Table 3A - Discharge Characteristics Summary-Online Analyser

Parameter	Conductivity	Temperature	pH	DO	Cl ₂
	µS/cm	C		mg/L	mg/L
Average	84,397	17.4	7.62	9.08	0.0
Minimum	20,024	12.4	6.25	7.46	0.0
Maximum	100,791	27.7	8.84	11.16 ^[1]	0.0

Note:

1: DO value exceeded maximum seawater saturation value at lowest temperature during reporting period. Probe re-calibrated monthly

Source: Online analyser (10 minutes intervals data over 3 months)

Table 3B - Discharge Characteristics Summary- External lab

Parameter	Biochemical Oxygen Demand	Suspended solids	Nitrogen (Total)	Phosphorus (Total)	Zinc (Total)	Lead (Total)	Copper (Total)
	mg/L	mg/L	mg/L as N	mg/L as P	mg/L	mg/L	mg/L
Average	<2	<1	0.22	0.12	0.012	<0.001	0.006
Minimum	<2	<1	0.13	0.06	<0.003	<0.001	<0.001
Maximum	<2	2	0.35	0.17	0.026	<0.001	0.009

Source: AWQC

During intake shock dosing, discharge stream pH value dropped in correlation to intake pH drop and came back to normal operation range after shock dosing.

Low conductivity value has been noticed due to low conductivity permeate flushing during normal plant shutdown. The value came back to normal operation range after plant shutdown finished.

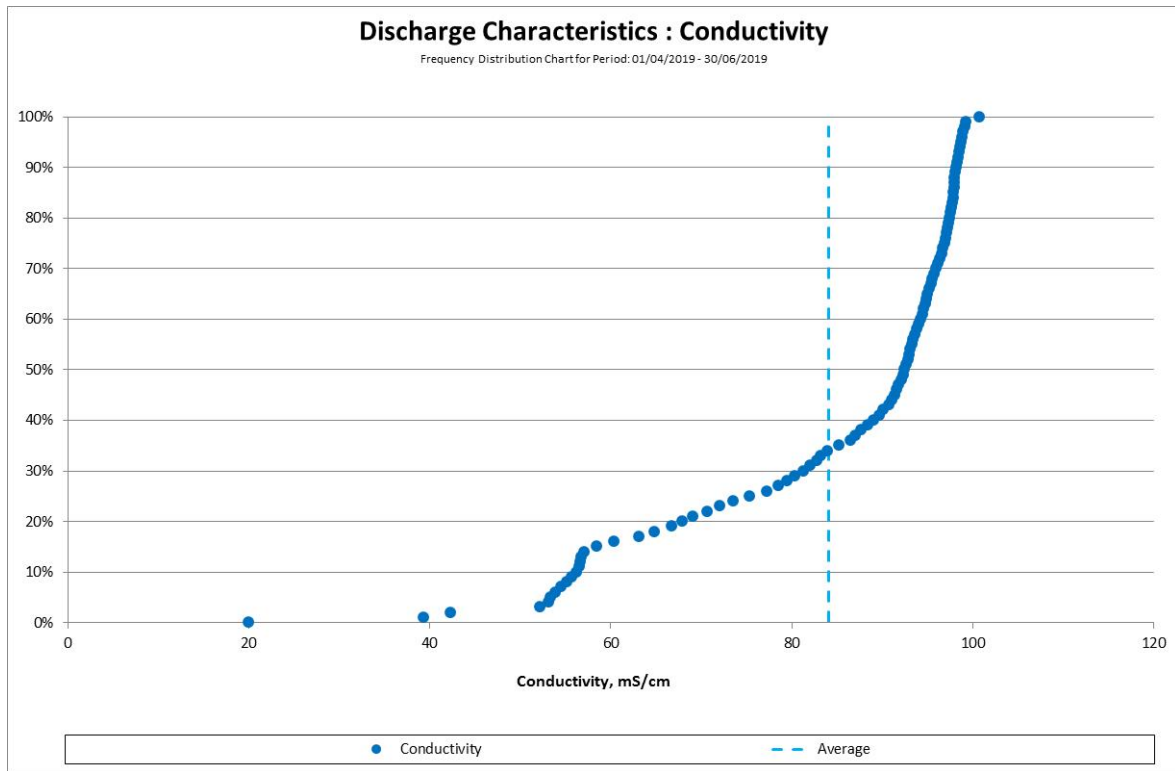


Figure 1 - Discharge Characteristic: Conductivity - Frequency Distribution

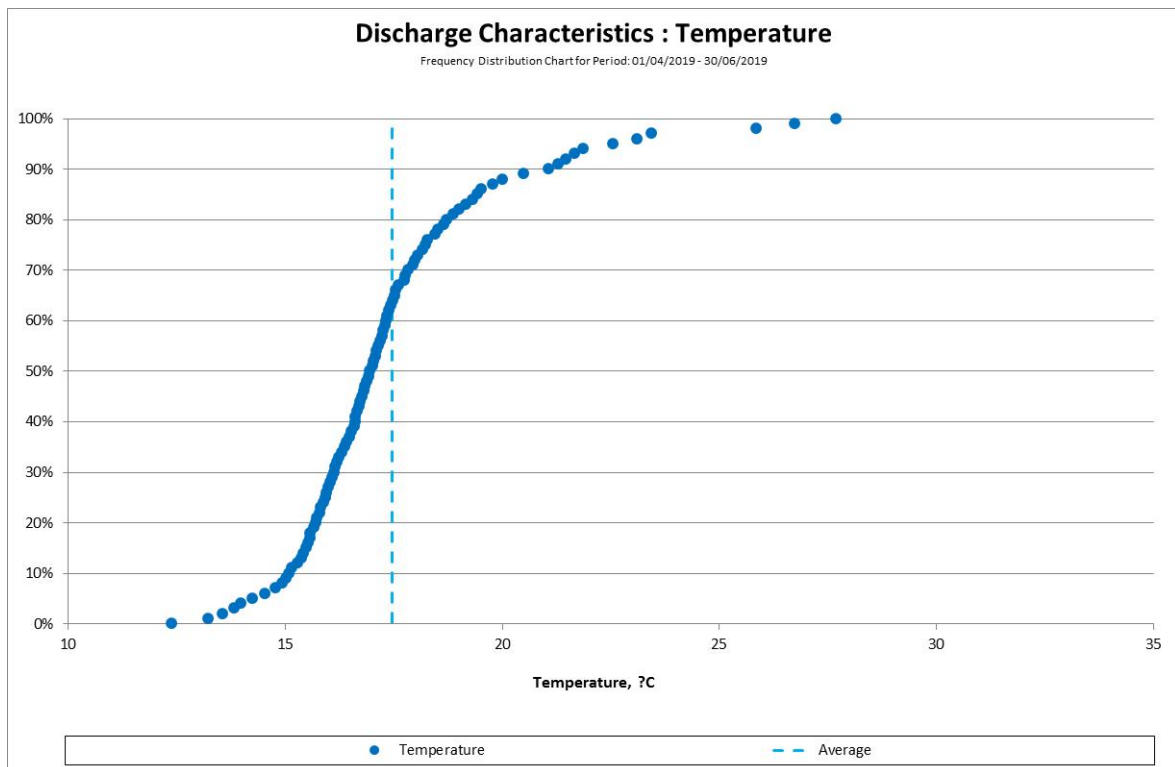


Figure 2 - Discharge Characteristics: Temperature - Frequency Distribution

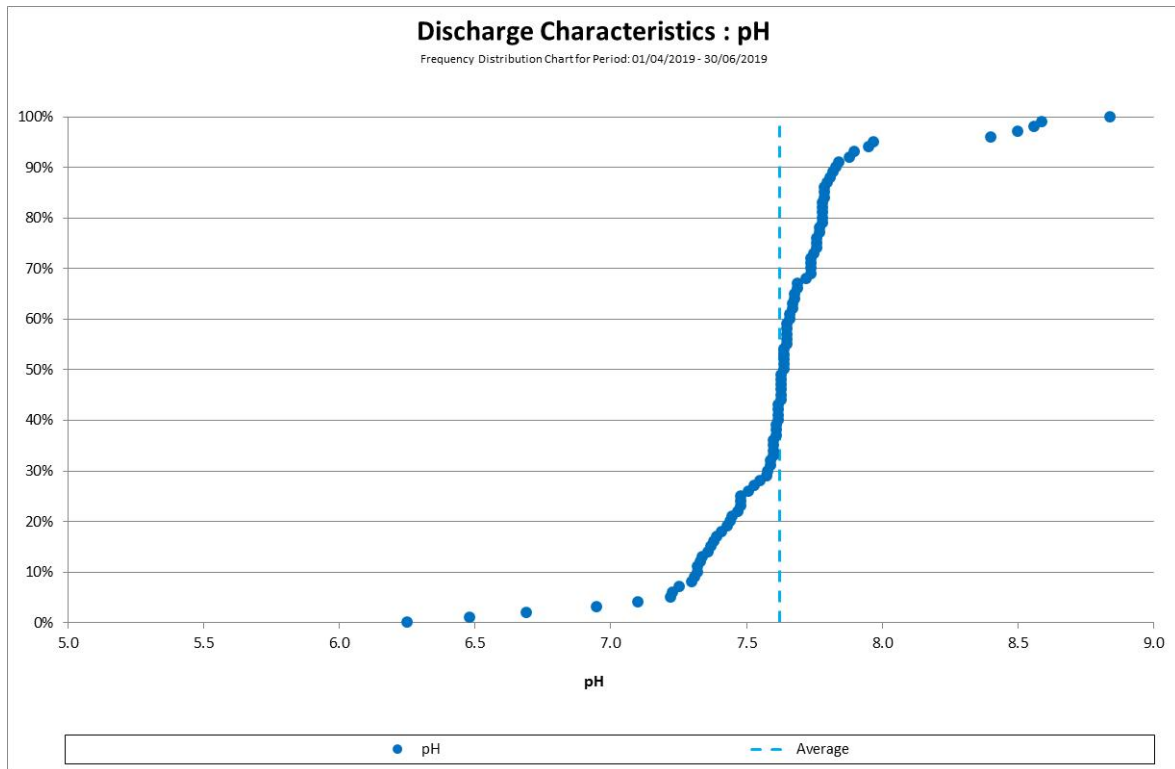


Figure 3 - Discharge Characteristics: pH - Frequency Distribution

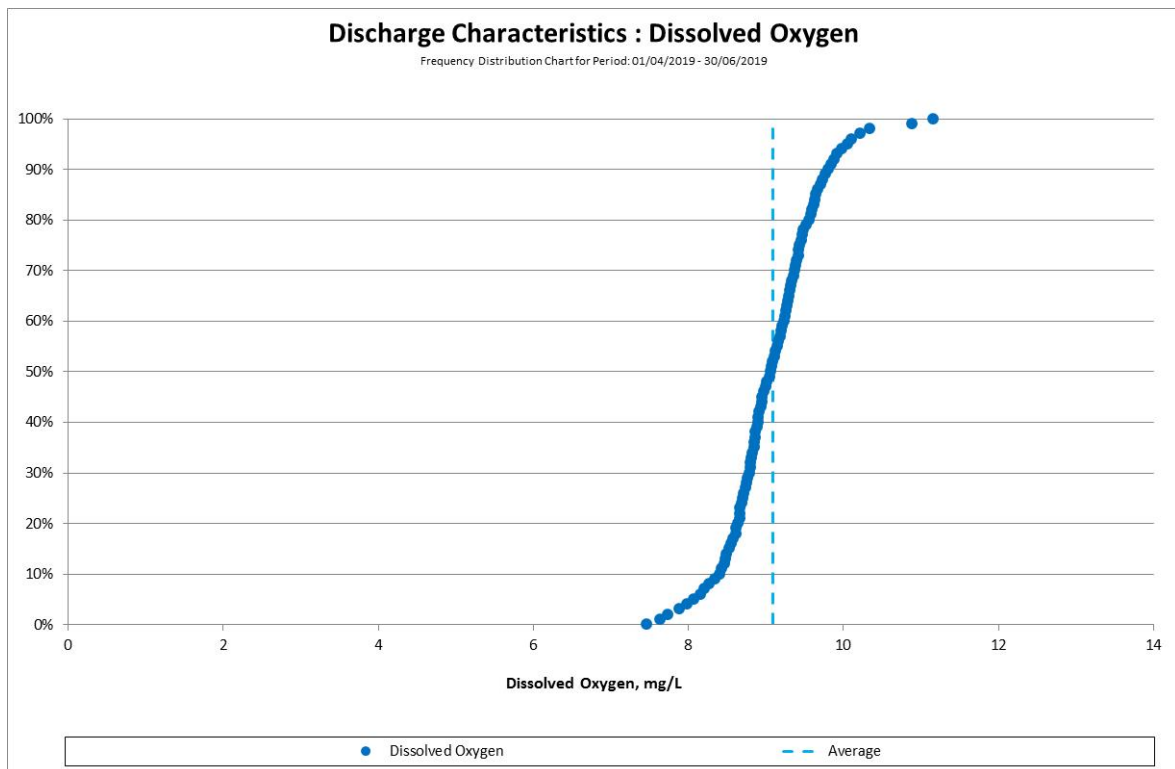


Figure 4 - Discharge Characteristics: DO - Frequency Distribution

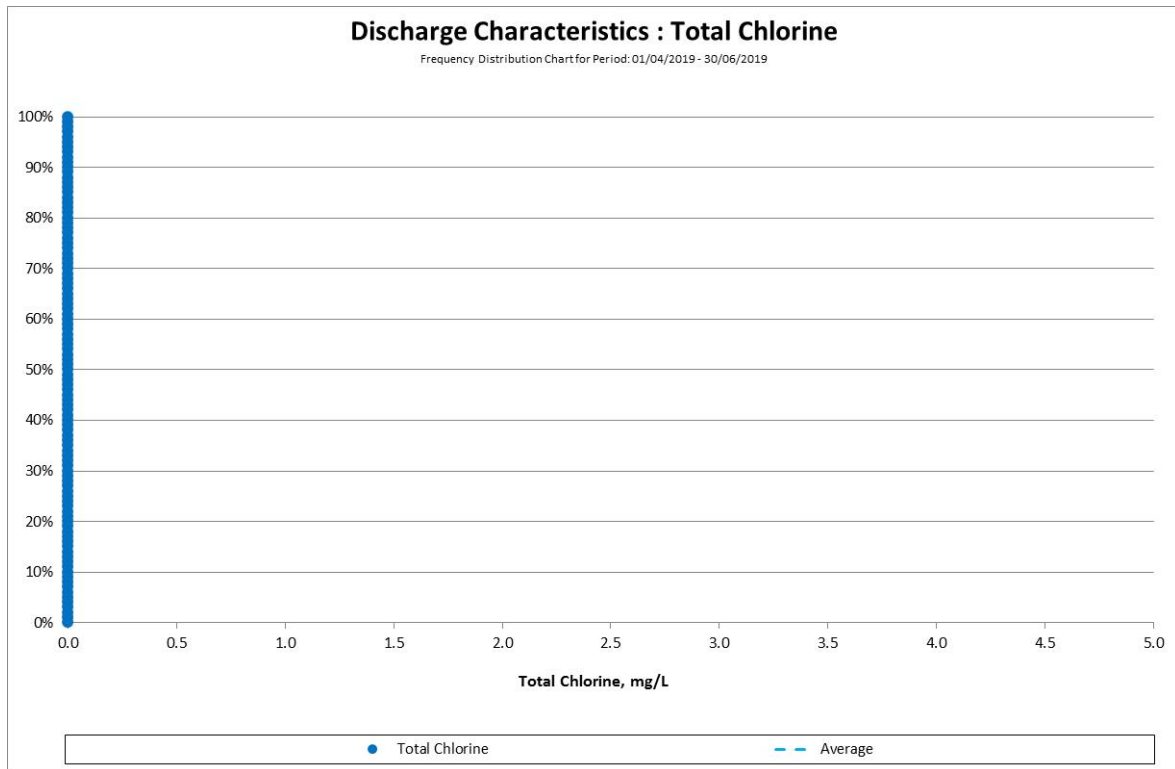


Figure 5 - Discharge Characteristics: Chlorine - Frequency Distribution

3. Salinity Monitoring Results

3.1 Average Salinity Discharge (U-149) Results

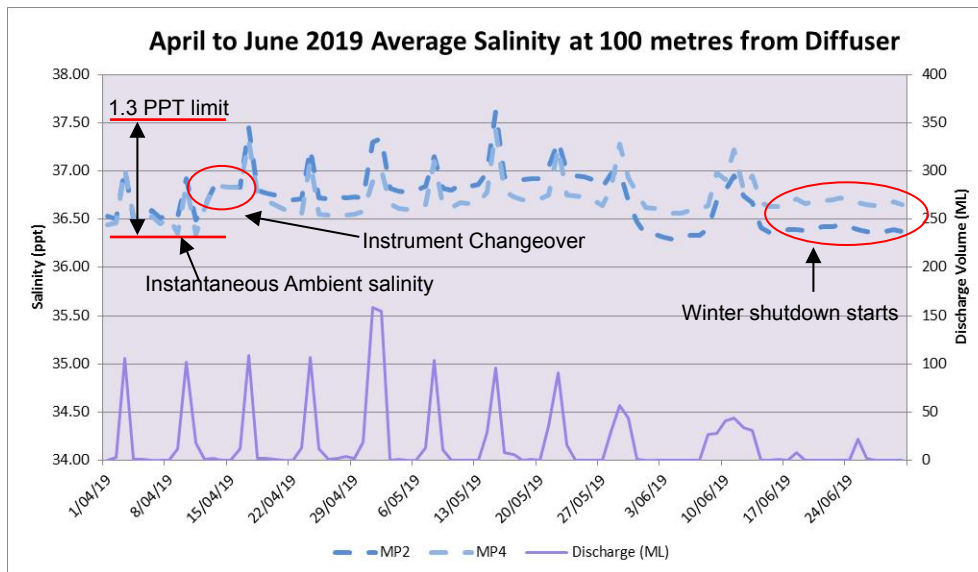
Table 4 below shows the summary of salinity readings at the edge of the mixing zone (100m from the discharge point) for this reporting period.

Table 4 – Average Salinity Discharge Summary

	Average Salinity Discharge (ppt)		
	April	May	June
Average	36.7	36.9	36.6
Minimum	36.3	36.5	36.3
Maximum	37.5	37.6	37.2

Figure 5 below shows instantaneous salinity reading at the edge of the mixing zone (100m from the discharge point) for this reporting period. When plant was running, the maximum difference between ambient and mixing zone edge salinity reached around 1.0ppt which is below the 1.3ppt maximum allowable difference.

No exceedances or issues associated with Average Salinity Discharge (U-149) were identified during this reporting period.



Note 1: Ambient Salinity to be worked out from the shape of the peak. Example has been given in the graph.

Note 2: 1.3ppt limit is set for 24-hour rolling average and ADP is using instantaneous value to provide extra safety.

Figure 6- Average salinity at 100m from diffuser during this reporting period

3.2 Salinity Discharge (U-145, U-146) Results

Table 5 below shows the summary of salinity discharge ratio results for this reporting period.

Table 5 Salinity discharge ratio summary

	Salinity Discharge Ratio		
	April	May	June
Average	1.1	1.2	1.1
Minimum	1.0	1.0	1.0
Maximum	1.9	1.9	1.9

Over the quarter, the highest salinity discharge ratio recorded was 1.9 on 29/05/2019. This confirms that the discharge salinity did not exceed the intake salinity by a factor of 2.1. No exceedances, issues associated with Salinity Discharge (U-145, U-146) were identified during this reporting period.