

MEMO

Date: 22 June 2021
To: Simon Poggioli (Project Engineer)
From: Alan Foley
Pages: 9 inc. this page excluding attachments
Regarding: Surface Water Quality – Event #11 Summary

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Fremantle Swan River Crossing – Surface Water Quality Monitoring Event #11

Background

Laing O'Rourke on behalf of Fremantle Bridges Alliance (the Alliance), has commissioned RPS Australia West Pty Ltd (RPS) to provide environmental services to support the Swan River Crossing (SRC) project development. The works include the replacement of the Fremantle Traffic Bridge and the improvement/duplication of the Fremantle Rail Bridge. As detailed within the Preliminary Environmental Impact Assessment (Main Roads Western Australia, 2020), surface water quality has the potential to be impacted during new bridge construction and demolition of the old structure. As such, a baseline assessment of the surface water quality is being completed to inform a future Construction Environment Management Plan (CEMP) monitoring program.

RPS has previously undertaken eight monitoring events while contracted to Arup/MRWA. This memo provides details on the surface water monitoring Event #11, completed in June 2021, and is a continuation of the program undertaken by RPS for MRWA, between August 2020 and March 2021.

Sampling locations

The program includes collection of surface water samples from five locations. Further details on sampling locations are presented in Figure A and Table 1.

For previous sampling events, Event #1 (August 2020) and Event #2 (September 2020), the program was reduced to four locations with background location WS-5 excluded due to the project awaiting Department Biodiversity, Conservation and Attractions (DBCA) access approval. Approval was received for sampling within the Swan River DBCA control area on 5 October 2020. As such, all sampling locations have been included from Event #3 onwards.

A copy of the DBCA approval, 2020-1928 Permit P12652, has been included in Appendix A.

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Table 1: Surface water sampling locations summary

Sampling point	Swan River Bathymetry ^{1,2} (m)	Commentary
WS1	~4.0-6.0 ¹	- Central channel (northern side) - Sample collected from Fremantle Traffic Bridge northern access point
WS2	~4.0-6.0 ¹	- Central channel (southern side) - Sample collected from Fremantle Traffic Bridge southern access point
WS3	~2.0-4.0 ¹	Northern shoreline
WS4	~4.0-5.0 ¹	- Southern shoreline - Small craft pen jetty
WS5	~2.0-6.0 ²	- Southern shoreline - Public jetty - Background location

Notes: 1. Results of a geophysical survey of the portions of the site was undertaken in 2012 (Marine & Earth Sciences, 2012), which was used to inform the Arup reports (Arup, 2013a and 2013b)

2. Swan and Canning Rivers navigation chart 1:25,000. April 2014, Edition 7. Department of Transport
https://www.transport.wa.gov.au/imagery/coastaldata/nauticalcharts/pdfs/WA898_swan_and_canning_rivers.pdf.

Sampling program schedule overview

The proposed SWQS sampling program schedule is presented in Table 2.

Table 2: Sampling program

Event	Sampling locations	Event Date	Date Completed	Status
Event 1	WS2, WS4	August 2020	7/08/2020	Completed
Event 2	WS1-WS4	September 2020	10/09/2020	Completed
Event 3	WS1-WS5	October 2020	7/10/2020	Completed
Event 4	WS1-WS5	November 2020	5/11/2020	Completed
Event 5	WS1-WS5	December 2020	3/12/2020	Completed
Event 6	WS1-WS5	January 2021	13/01/2021	Completed
Event 7	WS1-WS5	February 2021	11/02/2021	Completed
Event 8	WS1-WS5	March 2021	04/03/2021	Completed
Event 9	WS1-WS5	April 2021	20/04/2021	Completed
Event 10	WS1-WS5	May 2021	05/05/2021	Completed
Event 11	WS1-WS5	June 2021	03/06/2021	Completed – this round
Event 12	WS1-WS5	July 2021	-	TBC

Notes: To be completed (TBC). Event 9 (April 2021) was the first monitoring event completed as part of the current contract.

Surface water sampling methodology

Surface water sampling was conducted in accordance with the following relevant guidance:

- Department of Water and Environmental Regulation, *Assessment and Management of Contaminated Sites – Contaminated Sites Guidelines* (DER, 2014)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, *Schedule B – General Guidelines for the Assessment of Site Contamination* (NEPC, 2013)

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- *Water Quality—Sampling. Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples* (Standards Australia, 1998. AS/NZS 5667.1:1998)
- *Water Quality—Sampling. Part 6: Guidance on sampling of rivers and streams* (Standards Australia, 1998. AS/NZS 5667.6:1998)
- *Water Quality—Sampling. Part 9: Guidance on sampling from marine waters* (Standards Australia, 1998. AS/NZS 5667.9:1998)
- Heads of EPAs Australia and New Zealand (HEPA), *PFAS National Environmental Management Plan, Version 2.0* (HEPA, 2020).

Each Swan River surface water sample was collected using a Niskin Flask or surface water sampling pole depending upon water column depth as detailed below:

- Where the water column was >2 m, the following two depths were targeted:
 - Sample 1 (shallow sample): collected at ~1 m below surface level
 - Sample 2 (deep sample): collected ~1 m above riverbed level.
- Where the water column was <2 m (WS3), the sample was collected in the middle of the water column, using a surface water pole sampler.

Field observations were collected during each sampling event and included commentary on weather conditions, tides and vessel movement within the Fremantle port and surrounding waters.

Analysis program

All samples were analysed for the following analytical suite:

- Dissolved metals and metalloids: aluminium, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silicon, silver, and zinc.
- Total metals: aluminium and iron.
- Major anions: sulfate (SO_4^{2-}), chloride (Cl^-), fluoride (F^-), alkalinity (hydroxide OH^- , carbonate CO_3^{2-} , bicarbonate HCO_3^-).
- Major cations: sodium, potassium, calcium, magnesium.
- Nutrients: total and reactive phosphorus, total nitrogen, total Kjeldahl nitrogen (TKN), total ammonia ($\text{NH}_4\text{-N} + \text{NH}_3\text{-N}$), nitrates and nitrites ($\text{NO}_x\text{-N}$).
- Sulfide (S^{2-})
- Total acidity
- Total dissolved solids (TDS) and Total suspended solids (TSS)
- Turbidity
- Hydrocarbons: Total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX) and polycyclic aromatic hydrocarbons (PAH)

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- Organochlorine Pesticides (OCP)
- Per- and poly-fluoroalkyl substances (PFAS)
- Dissolved organic carbon (DOC)
- Chlorophyll-A and Phaeophytin-A.

Water column profiles for temperature, salinity (electrical conductivity (EC)), pH and dissolved oxygen (DO) were also collected at each sampling location.

Surface water assessment levels

All analytes were compared against relevant Water Quality Australia 2019 guidelines, nominally (95% species protection) as follows:

- Water Quality Australia (WQA, 2019)
 - Marine Water Guidelines (MWG) 95% species protection level
 - Estuary water (for nutrients and pH only).
 - Recreational Water Guidelines (RWG)
- PFAS National Environmental Management Plan (HEPA, 2020).
 - Marine Guidelines 99% species protection level¹
 - Recreational Water
- Treatment and management of soil and water in acid sulfate soil landscapes (DER, June 2015b).
 - Guideline levels for ASS surface water quality (ASS)

Site conditions

Site conditions noted during the monitoring Event #11 are summarised within Table 3.

Table 3: Site conditions

Items	Commentary
Weather conditions (during sampling event)	Overcast, northerly winds in the morning (6 km), turning north-north-easterly in the afternoon (6 km/hr), maximum temperature of 21.4°C.
Rainfall (noted during the previous week)	A total of 38.8 mm of rain was recorded at the Perth Station (Number: 9225) in the week prior to sampling.
Tide condition and direction	• Incoming tide. • Closest peak: – Low tide (01:28 am / 0.80 m) – High tide (12:18 pm / 1.05 m)

¹ The 99% species protection value is considered to most appropriate as PFAS is known bioaccumulate in aquatic organisms.

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Fremantle Port and Swan River vessel activities

- WS1: No boats traffic / bridge pile investigation works occurring adjacent to location
- WS2: Low general boat traffic / pile investigation works occurring adjacent to location.
- WS3: No boats traffic / bridge pile investigation works occurring adjacent to location
- WS4: Low boat traffic.
- WS5: Low boat traffic.

Monitoring results discussion

Results have been tabulated and are presented in Tables A to E, with laboratory reporting presented in Appendix B. Further commentary on specific analytes is provided below.

Field parameters

Field parameters were measured throughout the water column prior to sampling at each location. The water column profiles are presented in surface water sampling logs at the rear of the report (Appendix C), with field parameters of sampling depths summarised in Table 4.

Table 4: Sampling location field parameters

Sample Location	Depth (m)	Temp (°C)	pH	EC (µS/cm)	Redox (mV)	DO (%sat)
WS1-S	1.00	18.6	8.18	53,956	128	78
WS1-D	3.50	18.6	8.20	53,900	131	77
WS2-S	1.00	18.6	8.11	53,251	172	76
WS2-D	4.00	18.7	8.19	53,780	175	83
WS3-S	0.20	16.4	8.14	52,644	21	71
WS4-S	1.00	18.5	8.18	53,408	151	83
WS4-D	3.50	18.6	8.19	53,789	153	81
WS5-S	1.00	19.1	8.27	53,522	188	103
WS5-D	6.50	18.7	8.21	53,827	186	77

Physical parameters were noted to be relatively consistent throughout the profile i.e., alkaline, saline and in an oxidising state. These conditions are consistent with the significant flushing that occurs as a result of daily tidal movement of marine waters. RPS did note the following minor trends and guideline exceedances:

- Trends:
 - Redox marginally increased with depth at all locations except WS5.
 - Marginal increases of pH with depth at all locations except WS5.
 - Dissolved oxygen decreased with depth at all locations except WS2.
- Guideline exceedances:
 - DO percentage saturation (%sat) did not comply with the MWG (90-110%sat) at all locations, except WS5-S with results ranging from 71%sat (WS3-S) to 103%sat (WS5-S). Overall results are consistent with historical ranges.

Acid sulfate soil parameters

Acid sulfate soil (ASS) parameters observed during Event #11 can be summarised as follows:

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- Total acidity was significantly below the relevant guideline in all samples. Total acidity concentrations were consistent with previous sampling events.
- Sulfide concentrations were below the limit of reporting (LOR) at all locations and therefore below the relevant guideline. The sulfide concentrations during this event were comparable with previous events.
- Sulfate concentrations exceeded the recreational water guideline (500 mg/L) in all samples with concentrations ranging from 2,700 mg/L (all locations except WS1-S) to 2,800 mg/L (WS1-S). These results are marginally higher than the previous sampling event (Event #10) and are typical of water quality results at the mouth of the Swan River.
- Total alkalinity results were relatively consistent across locations, ranging from 130 mg/L (WS3-S) to 120 mg/L (all other locations). All results were consistent with previous events.

Solids

- TDS concentrations were relatively consistent over all locations and ranged from 36,000 mg/L (WS1-S) to 39,000 mg/L (WS1-D, WS4-D, WS5-S and WS5-D). Results were consistent with previous events.
- TSS was below the laboratory LOR in all locations (<5 mg/L). All results were within the historical range for each location.
- Turbidity results ranged from 0.5 (WS5-S and WS5-D) to 1.0 (WS2-S) NTU². Turbidity was relatively consistent with previous events.

Nutrients

Nutrient analytical results observed during Event #11 can be summarised as follows:

- Reactive phosphorus (RP) concentrations exceeded the MWG (0.005 mg/L) in four locations: WS2-S, WS2-D, WS5-S and WS5-D. All other locations were below the laboratory LOR. RP concentrations were marginally higher when compared to the previous event (Event #10) but were within historical ranges.
- Total phosphorous concentrations were below all assessment criteria. Total phosphorous concentrations were marginally lower than previous sampling events.
- All nitrogen species were below relevant MWG and RWG assessment criteria. Results were relatively consistent with previous sampling events.

Chlorophyll

All Chlorophyll "A" concentrations were below the MWG (0.003 mg/L) with a range of 0.0008 mg/L (WS1-D and WS5-S) to 0.0014 mg/L (WS4-S) observed. Results from this event were relatively consistent with previous events with minor increases from the previous event (Event #10) observed within most samples.

Low concentrations of Phaeophytin "A" were detected within all samples, with concentrations ranging from 0.0004 mg/L (WS4-S, WS4-D, WS5-S and WS5-D) to 0.0006 mg/L (WS1-D and WS2-D). Results were relatively consistent with the previous event (Event #10).

² NTU: Nephelometric Turbidity unit, i.e., the unit used to measure the turbidity of a fluid or the presence of suspended particles in water.

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Metals and metalloids

Metal analytical results observed during Event #11 can be summarised as follows:

- Dissolved metals:
 - The concentration of copper exceeded the MWG (0.0013 mg/L) in two locations: WS1-D (0.003 mg/L) and WS5-S (0.008 mg/L).
 - The concentrations of all other dissolved metals were below the adopted criteria for all samples.
- Total metals:
 - Total aluminium concentrations were below the LOR (0.02 mg/L) at all locations except for WS1-S (0.03 mg/L) during this sampling event. Minor decreases were observed when compared to the previous sampling event.
 - Total iron concentrations were below the LOR at all locations except for WS1-S (0.03 mg/L) and WS1-D (0.02 mg/L). All sample concentrations were significantly below the MWG (1 mg/L).

Hydrocarbons

All hydrocarbon results (BTEX, TRH and PAH) were below their relevant LOR.

Pesticides

All organochlorine pesticides results were below their relevant LOR.

PFAS

PFAS analytical results observed during Event #11 can be summarised as follows:

- Perfluorooctanesulfonate (PFOS) exceeded the 99% species protection MWG (0.00023 µg/L) in all samples, ranging from 0.0009 mg/L (WS1-S) to 0.0022 µg/L (WS4-S), with a mean of 0.0012 µg/L observed. The mean concentration during this event was higher than the previous event mean (0.0009 µg/L) and significantly lower than the historical mean of 0.0022 µg/L.
- Minor detections of Perfluorohexanesulfonic acid (PFHxS) and/or Perfluorooctanoic acid (PFOA) were observed at all sampling locations. However, all concentrations were significantly below relevant guidelines.
- Total PFAS was relatively consistent between all locations and ranged from 0.002 µg/L (WS1-S and WS1-D) to 0.005 µg/L (WS4-S) with a mean of 0.0028 µg/L, which was higher than the previous event (0.0018 µg/L) but lower than the historical mean of 0.0057 µg/L.

Quality control and quality assurance

To maintain a high level of Quality Control and Quality Assurance (QAQC) sampling and analysis was undertaken with reference to relevant guidelines (DER, 2014, NEPC, 2013 and HEPA, 2020) and *Australian Standard 4482.1:1997* (Standards Australia, 2005). Strict hygiene procedures were applied throughout to assure a high level of sample integrity and quality was maintained, including the decontamination of all sampling equipment between sampling locations to prevent possible cross-contamination.

In accordance with HEPA (2020) guidance, one field duplicate was collected per 10 primary samples for PFAS analysis. In addition, one field blank, trip blank and field rinsate was collected per day of sampling. The results are presented in Tables F to N and summarised as follows:

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- A total of 114 of the 120 (95%) analyte tests performed on the field duplicate sample had a Relative Percentage Difference (RPD) within 30% of the original samples indicating the sampling and analysis procedures applied by RPS and the laboratory were generally reproducible.
 - Two of the six total duplicate RPD failures were considered insignificant as both the primary and duplicate results were less than 5 x LOR. In such instances the elevated RPD merely indicates that analytical precision decreases as concentrations approach the LOR.
 - The remaining RPD exceedances (turbidity, NO_x-N, molybdenum and zinc) were considered significant as the concentration of either the primary or secondary sample was greater than 5 x LOR. The failures are likely due to minor differences in water quality when sampling. The duplicate sample concentration was higher for two exceedances: NO_x-N and molybdenum, as such were used for the data assessment. These exceedances were not considered to have affected the water quality assessment.
- The concentrations of turbidity, naphthalene and total positive PAHs were marginally above their respective LORs within the field rinsate sample (WR1) with the turbidity in the field blank (WB1) also above the laboratory LOR. Minor exceedances of acceptance criteria (>LOR) are potentially a reflection of the quality of deionised water used for the blank/rinsate collection.
- All trip blank samples were below their respective LORs.
- All internal laboratory QAQC procedures (method blanks, matrix spikes, laboratory control standards, internal duplicates) except for the following were within acceptable limits:
 - A number of PFAS compound internal standards were outside of general acceptance criteria but within analyte specific criteria. Laboratory LORs were increased to accommodate. All other criteria were within acceptable laboratory limits.
- All samples were analysed within the recommended holding time for each analyte with the exception of Chlorophyll “A” and Phaeophytin “A” which were noted to exceed holding time criteria, however, this was due to extract or analysis dates not being provided. As such, the holding times could not be calculated.

The conclusion of the QAQC assessment indicates that sampling and analysis was generally reproducible and complied with accepted standards. As such, the data collected is considered representative of the site and suitable for the data assessment undertaken.

Conclusions

Surface water monitoring Event #11 was completed on 3 June 2021. Samples were collected from all five of the sampling locations (Figure A). A shallow and deep sample were collected at each sampling point utilising the defined Niskin flask methodology, with the exception of WS3. Due to the shallow nature of WS3 (water column depth approximately ~0.4 m) a shallow sample was collected utilising a surface water sampling pole from a central point in the water column (~0.2 m).

A review of the analytical data collected indicates that the site waters were alkaline, saline and in an oxidising state. Minor exceedances of assessment criteria were noted (DO), however, these conditions are consistent with the marine environment present at the mouth of the Swan River.

Minor exceedances of reactive phosphorus MWG (0.005 mg/L) were observed at four locations: WS2-S, WS2-D, WS4-S, WS4-D. All other nitrogen and phosphorous concentrations were below relevant criteria. Results were relatively consistent with previous sampling events with results relatively consistent with previous sampling events.

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The concentration of copper marginally exceeded the MWG (0.0013 mg/L) in two locations: WS1-D and WS5-S. All other metal and metalloids concentrations were below relevant guidelines at all locations. Results were relatively consistent with previous events.

All hydrocarbon and organochlorine pesticides results were below their relevant LOR and as such also below adopted criteria in all samples analysed.

Minor detections of PFAS (PFHxS, PFOS and PFOA), were detected within all samples. The 99% species protection PFOS MWG (0.00023 mg/L) was exceeded in all samples, however, was significantly below the 95% species protection MWG (0.13 mg/L). No exceedances of any other relevant MWG or RWG were noted. Total PFAS concentrations were lower than historical data.

We trust that this is to your satisfaction, should you have any queries please contact the undersigned.



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Enc. Tables
 Figure A - Water quality sampling locations
 Appendix A – DBCA approval
 Appendix B – Laboratory reports
 Appendix C – Surface water sampling logs

TABLES

Table A
Surface Water Results: Field Parameters, ASS, Cations, Nutrients and Miscellaneous

Definitions:
MWG (Marine Water Estuary Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines), ASS (Acid Sulfate Soils) Standing Advice from DWER on dewatering trigger values taken from ASS Guideline Series (2015),
- (No Guideline), --- not tested, LOR (Limit of Reporting), # duplicate value

Notes:
Guideline values have been adopted from the following guidance documentation:
- *Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes* (DER 2015b)
- *Assessment and Management of Contaminated Sites* (DER 2014)
- *Freshwater and Marine Water Quality Guidelines Chapter 3* (ANZECC/ARMCANZ 2000)
All results expressed as mg/L except for pH (pH units), ratios (unitless), Redox mV (mili Volts), turbidity (NTU) and EC (µS/cm)
a) Values for estuary environments - Table 3.3.6 ANZECC/ARMCANZ 2000 Freshwater and Marine WQ Guidelines Chapter 3
c) Values based on Austalina Government, National Health and Medical Research Council, Guideline for Managing Risks in Recreational Water (NHMRC, 2008)
d) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines
e) TKN concentration calculated (TKN = TN-NOx-N)

Denotes less than LOR

Sample ID	Date	Trigger	Field Parameters				Acid Sulfate Soil Parameters and Anions								ASS Ratios		Cations				Nutrients						Miscellaneous					
			Units	pH units	µS/cm	mV	%sat	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 ^a	0.005 ^a	0.75 ^a	-	0.62 ^b	0.045 ^a	-	0.003 ^a	-
			RWG	6.5-8.5 ^c	-	-	>80 ^c	-	-	-	-	-	-	-	500 ^d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			ASS	<6	-	-	-	>40	-	-	-	-	-	>0.5	-	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
LOR	-	-	-	-	5	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	0.005	0.005	1	0.0001	0.0002			
WS1 - S	10/09/2020		8.18	50,919	80	104	9	120	36,000	<5	0.5	<0.5	2,400	18,000	---	0.08	0.13	390	1200	360	11000	0.03	0.006	0.2	0.2	0.009	<0.005	2	0.0012	0.0006		
WS1 - S	7/10/2020		8.25	52,200	134	106	7	120	37,000	<5	0.4	0.6	2,300	17,000	<5	0.06	0.14	400	1300	380	10000	0.03	0.007	0.2	0.2	<0.005	<0.005	2	0.0009	0.0005		
WS1 - S	5/11/2020		8.11	51,108	128	82	<5	120	37,000	<5	0.7	<0.5	2,800	20,000	<5	0.04	0.14	350	1200	310	10000	0.02	0.006	0.2	0.2	0.007	<0.005	3	0.0015	0.0006		
WS1 - S	3/12/2020		8.08	49,503	178	86	---	120	37,000	<5	0.8	<0.5	2,700	19,000	<5	---	0.14	410	1300	390	12000	0.02	<0.005	0.6	0.6	<0.005	0.005	3	0.0014	0.0005		
WS1 - S	13/01/2021		8.17	54,827	93	102	<5	130	37,000	<5	0.7	0.6	2,800	21,000	1	0.04	0.13	390	1200	390	11000	0.02	0.007	0.3	0.3	<0.005	<0.005	2	0.0017	0.0006		
WS1 - S	11/02/2021		8.27	54,769	101	97	<5	130	37,000	20	0.8	<0.5	2,900	20,000	<5	0.04	0.15	400	1200	360	12000	0.02	<0.005	0.5	0.5	<0.005	<0.005	3	0.0025	0.0005		
WS1 - S	4/03/2021		8.15	56,880	154	84	<5	120	37,000	<5	0.3	<0.5	3,100	21,000	<5	0.04	0.15	430	1400	410	12000	<0.01	<0.005	0.2	0.2	0.011	<0.005	<1	0.0008	0.0002		
WS1 - S	20/04/2021		8.26	52,809	79	86	9	120	37,000	<5	0.6	<0.5	2,700	20,000	<5	0.08	0.14	410	1400	370	12000	0.03	0.006	0.2	0.2	0.01	0.01	<1	0.0009	0.0006		
WS1 - S	5/05/2021		8.22	53,594	113	80	8	130	38,000	10	0.8	<0.5	2,500	19,000	<5	0.06	0.13	430	1400	410	12000	0.03	<0.005	<0.5	<0.5	0.012	<0.005	1	0.0008	0.0005		
WS1 - S	3/06/2021		8.18	53,956	128	78	7	120	36,000	<5	0.8	<0.5	2,800	20,000	<5	0.06	0.14	470	1500	400	12000	0.02	<0.005	<0.5	<0.5	0.013	<0.005	1	0.0009	0.0005		
WS1 - D	10/09/2020		8.20	50,935	91	107	9	120	36,000	<5	0.7	<0.5	2,400	18,000	---	0.08	0.13	390	1200	360	11000	0.03	0.005	0.2	0.2	0.008	<0.005	2	0.0008	0.0006		
WS1 - D	7/10/2020		8.29	53,399	131	104	7	120	37,000	<5	0.5	0.6	2,500	18,000	<5	0.06	0.14	420	1300	400	11000	0.04	0.005	0.1	0.1	0.006	0.007	2	0.0008	0.0004		
WS1 - D	5/11/2020		8.12	51,230	125	80	<5	130	37,000	<5	0.7	<0.5	2,800	20,000	<5	0.04	0.14	350	1200	310	11000	0.02	0.006	0.2	0.2	0.009	<0.005	3	0.0012	0.0005		
WS1 - D	3/12/2020		8.08	49,803	178	87	---	130	37,000	<5	0.8	0.6	2,800	20,000	<5	---	0.14	410	1300	390	12000	0.02	0.005	0.6	0.6	0.006	<0.005	2	0.0011	0.0004		
WS1 - D	13/01/2021		8.16	54,836	92	97	<5	130	37,000	<5	0.8	0.7	2,900	21,000	1	0.04	0.14	380	1200	390	11000	0.02	0.006	0.2	0.2	<0.005	<0.005	2	0.0018	0.0006		
WS1 - D	11/02/2021		8.27	54,761	100	98	<5	130	38,000	<5	0.6	<0.5	3,000	21,000	<5	0.04	0.14	380	1200	350	11000	0.02	0.006	0.4	0.4	<0.005	<0.005	3	0.0025	0.0005		
WS1 - D	4/03/2021		8.16	56,866	152	86	<5	130	34,000	23	0.8	<0.5	3,000	21,000	<5	0.04	0.14	430	1400	410	12000	<0.01	0.006	0.2	0.2	0.019	<0.005	<1	0.0011	<0.0002		
WS1 - D	20/04/2021		8.27	52,792	83	85	9	130	36,000	15	0.5	<0.5	2,700	20,000	<5	0.07	0.14	410	1400	370	12000	0.03	0.005	0.2	0.2	0.021	0.014	<1	0.0009	0.0005		
WS1 - D	5/05/2021		8.23	53,594	114	81	7	120	40,000	<5	0.5	<0.5	2,600	19,000	<5	0.06	0.14	450	1400	420	13000	0.03	<0.005	<0.5	<0.5	0.014	<0.005	1	0.0007	0.0005		
WS1 - D	3/06/2021		8.20	53,900	131	77	7	120	39,000	<5	0.9	<0.5	2,700	20,000	<5	0.06	0.14	450	1400	380	12000	0.01	<0.005	<0.5	<0.5	0.016	0.009	1	0.0008	0.0006		
WS2-S	7/08/2020		8.70	50,710	181	105	6	120	39,000	9	0.6	0.9	2,800	20,000	---	0.05	0.14	420	1300	370	12000	<0.05	<0.005	0.1	0.1	0.007	<0.005	<1	0.0004	0.0005		
WS2-S	10/09/2020		8.11	50,645	60	110	9	120	36,000	<5	0.6	<0.5	2,400	19,000	---	0.08	0.13	410	1300	360	11000	0.03	<0.005	0.2	0.2	0.007	0.009	2	0.0010	0.0005		
WS2-S	7/10/2020		8.16	49,541	94	102	6	120	34,000	<5	0.6	0.7	2,300	17,000	<5	0.05	0.14	380	1200	360	9700	0.04	<0.005	0.2	0.2	<0.005	0.017	2	0.0019	0.0006		
WS2-S	5/11/2020		8.07	49,927	60	79	7	120	36,000	<5	0.6	<0.5	2,700	19,000	<5	0.06	0.14	330	1100	300	10000	0.02	0.007	0.2	0.2	0.007	0.01	3	0.0017	0.0006		
WS2-S	3/12/2020		8.06	48,338	145	78	---	130	36,000	<5	0.7	0.6	2,700	19,000	<5	---	0.14	400	1300	380	12000	0.02	<0.005	0.8	0.8	<0.005	0.01	3	0.0022	0.0006		
WS2-S	13/01/2021		8.10	54,365	93	87	<5	130	37,000	<5	0.5	0.8	2,800	21,000	1	0.04	0.13	390	1200	390	11000	0.03	0.009	0.3	0.3	0.008	0.01	2	0.0014	0.0007		
WS2-S	11/02/2021		8.19	54,438	87	85	<5	130	37,000	11	0.5	<0.5	2,800	19,000	<5	0.04	0.15	370	1200	340	11000	0.02	0.01	0.5	0.5	0.008	0.014	2	0.0025	0.0005		
WS2-S	4/03/2021		8.14	56,887	163	84	<5	130	31,000	21	0.6	<0.5	3,000	21,000	<5	0.04	0.14	440	1400	420	13000	0.01	0.005	0.2	0.2	0.027	<0.005	<1	0.0009	0.0003		
WS2-S	20/04/2021		8.24	52,636	45	83	7	130	38,000	6	0.6	<0.5	2,700	20,000	<5	0.05	0.14	410	1400	370	12000	0.03	0.006	0.2	0.2	0.021	0.011	<1	0.0008	0.0005		
WS2-S	5/05/2021		8.22	53,493	107	81	8	130	38,000	5	0.6	<0.5	2,500	19,000	<5	0.06	0.13	430	1400	400	12000	0.03	<0.005	<0.5	<0.5	0.012	<0.005	2	0.0008	0.0007		
WS2-S	3/06/2021		8.11	53,251	172	76	6	120	38,000	<5	1	<0.5	2,700	20,000																		

Sample ID	Date	Trigger	Field Parameters				Acid Sulfate Soil Parameters and Anions								ASS Ratios		Cations				Nutrients						Miscellaneous					
			Units	pH units	µS/cm	mV	%sat	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 ^a	0.005 ^a	0.75 ^a	-	0.62 ^b	0.045 ^a	-	0.003 ^a	-
			RWG	6.5-8.5 ^c	-	-	>80 ^c	-	-	-	-	-	-	-	500 ^d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			ASS	<6	-	-	-	>40	-	-	-	-	-	>0.5	-	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
LOR	-	-	-	-	5	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	0.005	1	0.0001	0.0002				
WS3-S	10/09/2020		8.25	50,920	109	128	7	120	35,000	14	1.8	<0.5	2,400	19,000	---	0.06	0.13	390	1200	350	11000	0.04	0.005	0.2	0.2	<0.005	<0.005	2	0.0006	0.0008		
WS3-S	7/10/2020		8.29	52,289	132	115	7	120	37,000	33 [#]	1.6	0.8	2,400	18,000	<5	0.06	0.13	420	1300	400	11000	0.05	0.006	0.2	0.2	0.018	0.043	1	0.0019	0.0009		
WS3-S	5/11/2020		8.15	51,444	126	55	6	120	37,000	7	1	<0.5	2,700	19,000	<5	0.05	0.14	350	1200	310	11000	0.02	0.006	0.2	0.2	0.01	<0.005	2	0.0017	0.0009		
WS3-S	3/12/2020		8.11	49,569	184	98	---	110	38,000	19	2.4	<0.5	2,700	19,000	<5	---	0.14	380	1200	370	12000	0.03	0.006	0.8	0.8	<0.005	<0.005	2	0.0013	0.0011		
WS3-S	13/01/2021		8.19	55,172	102	101	<5	130	38,000	<5	0.5	0.5	2,900	21,000	1	0.04	0.14	390	1200	400	11000	0.03 [#]	0.005	0.2	0.2	0.006	0.006	2 [#]	0.0012	0.0006		
WS3-S	11/02/2021		8.28	54,792	106	67	<5	130	37,000	70 [#]	1.5	<0.5	3,000	21,000	<5	0.04	0.14	370	1200	340	11000	0.03	0.006	0.5	0.5	<0.005	<0.005	3	0.0026	0.0021 [#]		
WS3-S	4/03/2021		8.16	56,731	132	81	<5	130	38,000	10	0.4	<0.5	3,000	21,000	<5	0.04	0.14	460	1500	430	13000	0.01	<0.005	0.2	0.2	0.013	<0.005	<1	0.0007	0.0003		
WS3-S	20/04/2021		8.27	52,937	98	63	9	130	37,000	11	0.7	<0.5	2,700	20,000	<5	0.07	0.14	410	1400	380	12000	0.03	0.005	0.2	0.2	0.019	0.008	<1	0.001	0.0005		
WS3-S	5/05/2021		8.23	53,551	18	81	8	130	39,000	<5	0.4	<0.5	2,400	18,000	<5	0.06	0.13	440	1400	400	13000	0.03	<0.005	<0.5	<0.5	0.013	<0.005	1	0.0007	0.0006		
WS3-S	3/06/2021		8.14	52,644	21	71	7	130	38,000	<5	0.9	<0.5	2,700	20,000	<5	0.05	0.14	480	1500	400	13000	0.02	0.005	<0.5	<0.5	0.014	0.006	1	0.0009	0.0005		

Sample ID	Date	Trigger	Field Parameters				Acid Sulfate Soil Parameters and Anions								ASS Ratios		Cations				Nutrients						Miscellaneous					
			pH	E.C	Redox	DO	Total Acidity (CaCO3)	Total Alkalinity (CaCO3)	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Flouride	Acidity: Alkalinity	Sulfate: Chloride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN°	NH3-N	NOx-N	Dissolved Organic Carbon (DOC)	Chlorophyll "A"	Phaeophytin "A"		
			Units	pH units	µS/cm	mV	%sat	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	-	-	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
			MWG	7.5-8.5	-	-	90-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03 ^a	0.005 ^a	0.75 ^a	-	0.62 ^b	0.045 ^a	-	0.003 ^a	-
			RWG	6.5-8.5 ^c	-	-	>80 ^c	-	-	-	-	-	-	500 ^d	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ASS	<6	-	-	-	>40	-	-	-	-	>0.5	-	-	-	>1	>0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
LOR	-	-	-	-	5	5	5	5	0.1	0.5	1	1	0.1	-	-	0.5	0.5	0.5	0.5	0.01	0.005	0.1	0.005	0.005	0.005	0.005	1	0.0001	0.0002			
WS4-S	7/08/2020		8.27	50,809	106	106	6	130	40,000	16	0.6	0.7	3,100	21,000	---	0.05	0.15	400	1300	370	11000	<0.05	0.006	0.2	0.2	0.008	<0.005	1	0.0005	0.0005		
WS4-S	10/09/2020		7.93	50,651	42	109	9	120	35,000	11	0.5	0.6	2,400	18,000	---	0.08	0.13	390	1200	350	11000	0.03	<0.005	0.2	0.2	0.008	0.01	2	0.0007	0.0007		
WS4-S	7/10/2020		7.82	49,672	55	95	8	120	36,000	<5	0.3	0.8	2,300	17,000	<5	0.07	0.14	390	1200	370	10000	0.03	<0.005	0.2	0.2	0.006	0.007	2	0.0016	0.0007		
WS4-S	5/11/2020		7.89	50,039	32	81	7	130	36,000	<5	0.6	<0.5	2,700	19,000	<5	0.05	0.14	340	1100	300	10000	0.02	0.006	0.2	0.2	0.009	0.008	2	0.0013	0.0005		
WS4-S	3/12/2020		7.94	48,677	105	85	---	130	37,000	<5	0.8	0.8	2,700	19,000	<5	---	0.14	400	1200	380	12000	0.02	<0.005	0.6	0.6	<0.005	0.01	3	0.0016	0.0006		
WS4-S	13/01/2021		7.88	54,357	145	83	<5	130	38,000	<5	0.6	0.7	2,800	21,000	1	0.04	0.13	390	1200	390	11000	0.03	0.008	0.3	0.3	<0.005	0.01	2	0.0022	0.0007		
WS4-S	11/02/2021		7.99	54,440	100	131	<5	130	37,000	<5	0.8	<0.5	3,000	21,000	<5	0.04	0.14	380	1200	350	11000	0.02	0.009	0.5	0.5	<0.005	0.016	4	0.003	0.0009		
WS4-S	4/03/2021		8.07	56,909	150	82	<5	120	35,000	8	0.4	0.6	3,000	21,000	<5	0.04	0.14	470	1500	440	13000	0.01	0.005	0.2	0.2	0.024	<0.005	<1	0.0006	0.0003		
WS4-S	20/04/2021		8.11	52,228	29	80	8	130	36,000	9	0.4	<0.5	2,700	20,000	<5	0.06	0.14	410	1300	370	11000	0.03	0.008	0.2	0.2	0.024	0.014	<1	0.0015	0.0007		
WS4-S	5/05/2021		8.18	53,220	92	81	10	130	37,000	<5	0.7	<0.5	2,400	18,000	<5	0.08	0.13	460	1500	420	13000	0.04	<0.005	<0.5	<0.5	0.015	<0.005	2	0.0009	0.0006		
WS4-S	3/06/2021		8.18	53,408	151	83	8	120	38,000	<5	0.8	<0.5	2,700	20,000	<5	0.07	0.14	470	1500	390	12000	0.02	<0.005	<0.5	<0.5	0.016	0.009	1	0.0014	0.0004		
WS4-D	7/08/2020		8.27	50,996	108	105	<5	130	40,000	21	0.5	0.7	2,800	20,000	---	0.04	0.14	420	1300	380	12000	<0.05	<0.005	0.1	0.1	0.007	<0.005	<1	0.0004	0.0006		
WS4-D	10/09/2020		8.05	50,680	56	112	9	120	35,000	7	0.7	<0.5	2,400	18,000	---	0.08	0.13	370	1200	340	10000	0.03	<0.005	0.2	0.2	0.007	0.008	2	0.0008	0.0006		
WS4-D	7/10/2020		8.04	50,044	63	98	8	120	35,000	<5	0.4	<0.5	2,400	18,000	<5	0.07	0.13	410	1300	390	10000	0.03	<0.005	0.1	0.1	0.006	0.01	2	0.0015	0.0006		
WS4-D	5/11/2020		7.97	50,024	40	81	5	120	36,000	6	0.7	<0.5	2,700	19,000	<5	0.04	0.14	350	1200	300	10000	0.02	0.006	0.2	0.2	0.008	0.008	2	0.0012	0.0007		
WS4-D	3/12/2020		7.98	48,630	115	83	---	130	37,000	7	1.1	3.8	2,600	19,000	<5	---	0.14	400	1200	380	12000	0.02	<0.005	0.7	0.7	<0.005	0.008	3	0.0016	0.0006		
WS4-D	13/01/2021		7.98	54,348	124	86	<5	130	37,000	<5	0.6	<0.5	2,800	21,000	1	0.04	0.13	390	1200	390	11000	0.03	0.008	0.2	0.2	<0.005	0.04	2	0.0021	0.0007		
WS4-D	11/02/2021		8.08	54,460	102	133	<5	130	37,000	12	0.4	<0.5	3,000	21,000	<5	0.04	0.14	380	1200	350	11000	0.02	0.009	0.5	0.5	<0.005	0.011	4	0.003	0.0007		
WS4-D	4/03/2021		8.10	56,910	143	81	<5	130	32,000	<5	0.4	0.6	3,000	21,000	<5	0.04	0.14	460	1500	430	13000	0.01	0.005	0.2	0.2	0.023	<0.005	<1	0.0006	0.0004		
WS4-D	20/04/2021		8.26	52,908	25	87	9	120	39,000	5	0.5	<0.5	2,700	20,000	<5	0.08	0.14	410	1400	370	12000	0.03	0.007	0.2	0.2	0.027	0.014	<1	0.0012	0.0007		
WS4-D	5/05/2021		8.21	53,449	97	79	8	130	36,000	10	0.4	<0.5	2,500	19,000	<5	0.06	0.13	430	1400	400	12000	0.04	<0.005	<0.5	<0.5	0.016	<0.005	1	0.0008	0.0007		
WS4-D	3/06/2021		8.19	53,789	153	81	6	120	39,000	<5	0.6	<0.5	2,700	20,000	<5	0.05	0.14	470	1500	390	12000	0.01	<0.005	<0.5	<0.5	0.014	0.006	1	0.0012	0.0004		
WS5-S	7/10/2020		8.24	49,470	118	108	7	120	35,000	<5	0.3	<0.5	2,400	18,000	<5	0.06	0.13	410	1300	390	10000	0.04	<0.005	0.2	0.2	<0.005	0.015	2	0.0016	0.0005		
WS5-S	5/11/2020		8.10	49,829	81	79	8	130	36,000	<5	0.6	<0.5	2,700	19,000	<5	0.06	0.14	380	1200	330	10000	0.02	0.006	0.2	0.2	0.008	<0.005	2	0.0017	0.0007		
WS5-S	3/12/2020		8.10	49,008	166	109	---	130	36,000	7	1.1	0.6	2,700	19,000	<5	---	0.14	410	1300	390	12000	0.02	0.005	0.6	0.6	0.006	0.012	2	0.0017	0.0006		
WS5-S	13/01/2021		8.19	54,706	96	98	<5	130	37,000	<5	0.6	<0.5	2,900	21,000	1	0.04	0.14	390	1200	390	11000	0.03	0.006	0.2	0.2	<0.005	0.008	2	0.0024	0.0006		
WS5-S	11/02/2021		8.25	54,644	104	98	<5	130	37,000	<5	0.8	<0.5	3,000	21,000	<5	0.04	0.14	380	1200	350	11000	0.02	0.006	0.4	0.4	<0.005	0.006	3	0.0026	0.0006		
WS5-S	4/03/2021		8.15	56,880	159	89	<5	130	30,000	7	0.4	0.7	3,000	21,000	<5	0.04	0.14	490	1600	440	13000	0.01	<0.005	0.2	0.2	0.019	<0.005	<1	0.0009	0.0004		
WS5-S	20/04/2021		8.26	52,611	61	83	9	130	38,000																							

Table B
Surface Water Results: Metals

Definitions:

MWG (Marine Water Estuary Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines), ASS (Acid Sulfate Soils) Standing Advice from DWER on dewatering trigger values taken from ASS Guideline Series (2015), - (No Guideline), --- not tested, LOR (Limit of Reporting),* value for hexavalent chromium, # duplicate value

Notes:

Guideline values have been adopted from the following guidance documentation:

- *Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes* (DER 2015b)
- *Assessment and Management of Contaminated Sites* (DER 2014)
- *Freshwater and Marine Water Quality Guidelines Chapter 3* (ANZECC/ARMCANZ 2000)

All results expressed as mg/L except for pH (pH units), ratios (unitless), Redox mV (mili Volts), turbidity (NTU) and EC (µS/cm)

a) Chemicals for which possible bioaccumulation and secondary poisoning should be considered

b) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines

Denotes less than LOR

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																	Total Metals		
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 ^a	-	-	-	-	0.0014	-	-	1 ^b
			RWG	-	0.003 ^b	0.007 ^b	0.002 ^b	-	0.05 ^b	2 ^b	-	0.01 ^b	0.5 ^b	0.001 ^b	-	0.02 ^b	0.01 ^b	-	-	-	-	-
			ASS	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			LOR	0.01	0.002	0.001	0.0001	0.002	0.001	0.002	0.05	0.001	0.001	0.00005	0.001	0.001	0.01	0.1	0.00005	0.005	0.01	0.01
WS1 - S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	0.00006	0.002	0.02	0.02	
WS1 - S	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	0.00005	0.003	<0.02	0.02	
WS1 - S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS1 - S	3/12/2020		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	0.011	<0.00005	0.012	<0.002	<0.002	<1	0.0001	0.006	0.03	0.03	
WS1 - S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.7	<0.0001	0.005	0.04	0.08	
WS1 - S	11/02/2021		0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.011	0.03	0.04	
WS1 - S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.02	<0.02	
WS1 - S	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS1 - S	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	0.005	<0.02	0.02	
WS1 - S	3/06/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.003	0.03	0.03	
WS1 - D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	0.00006	0.003	0.03	0.04	
WS1 - D	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	<0.00005	0.002	0.02	<0.02	
WS1 - D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.03	
WS1 - D	3/12/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.0001	0.004	0.02	0.02	
WS1 - D	13/01/2021		0.07	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.7	0.0002	0.043	0.05	0.07	
WS1 - D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS1 - D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	<0.02	0.03	
WS1 - D	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.004	<0.02	<0.02	
WS1 - D	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	<0.002	0.02	<0.02	
WS1 - D	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	0.003	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.009	<0.02	0.02	

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																	Total Metals		
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 ^a	-	-	-	-	0.0014	-	-	1 ^b
			RWG	-	0.003 ^b	0.007 ^b	0.002 ^b	-	0.05 ^b	2 ^b	-	0.01 ^b	0.5 ^b	0.001 ^b	-	0.02 ^b	0.01 ^b	-	-	-	-	-
			ASS	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			LOR	0.01	0.002	0.001	0.0001	0.002	0.001	0.002	0.05	0.001	0.001	0.00005	0.001	0.001	0.01	0.1	0.00005	0.005	0.01	0.01
WS2-S	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	<0.02	
WS2-S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	<0.00005	0.003	0.02	0.02	
WS2-S	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	0.002	<0.01	<0.001	<0.005	<0.00005	0.011	<0.001	<0.001	0.7	<0.00005	0.003	<0.02	<0.02	
WS2-S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.04	
WS2-S	3/12/2020		0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	0.0002	0.0099	0.07	0.02	
WS2-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	0.9	0.0002	0.007	0.09	0.03	
WS2-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS2-S	4/03/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.007	<0.02	<0.02	
WS2-S	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS2-S	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	0.005	0.02	0.03	
WS2-S	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.003	<0.02	<0.02	
WS2-D	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	---	<0.0001	0.007	0.03	0.02	
WS2-D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	0.00006	0.003	0.02	0.02	
WS2-D	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	0.7	<0.00005	0.003	<0.02	<0.02	
WS2-D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.007	0.03	0.04	
WS2-D	3/12/2020		0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.005	0.03	0.04	
WS2-D	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.9	0.0001	0.004	<0.02	0.03	
WS2-D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.03	
WS2-D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.03	0.02	
WS2-D	20/04/2021		<0.02	<0.002	<0.002	0.0003 [#]	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WS2-D	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	<1	<0.0001	0.009	<0.02	0.02	
WS2-D	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.019 [#]	<0.002	<0.002	<1	<0.00005	0.007	<0.02	<0.02	
WS3-S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	<0.00005	0.003	0.05	0.08	
WS3-S	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.013	<0.001	<0.001	<0.5	<0.00005	0.003	0.02	0.2	
WS3-S	5/11/2020		0.07	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.034	0.06	0.05	
WS3-S	3/12/2020		0.03	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	0.008	0.05	0.09	
WS3-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	0.0001	0.005	0.02	0.03	
WS3-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	<0.0001	0.026	0.14	0.24	
WS3-S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.004	<0.02	<0.02	
WS3-S	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.003	<0.02	<0.02	
WS3-S	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	<1	<0.0001	0.006	<0.02	<0.02	
WS3-S	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	<0.02	<0.02	

Sample ID	Date	Trigger	Dissolved Metals & Metalloids																	Total Metals		
			Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
			Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			MWG	-	-	-	-	0.001	-	0.0013	-	0.0044	-	0.0001 ^a	-	-	-	-	0.0014	-	-	1 ^b
			RWG	-	0.003 ^b	0.007 ^b	0.002 ^b	-	0.05 ^b	2 ^b	-	0.01 ^b	0.5 ^b	0.001 ^b	-	0.02 ^b	0.01 ^b	-	-	-	-	-
			ASS	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			LOR	0.01	0.002	0.001	0.0001	0.002	0.001	0.002	0.05	0.001	0.001	0.00005	0.001	0.001	0.01	0.1	0.00005	0.005	0.01	0.01
WS4-S	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	---	0.0002	0.004	0.02	0.03	
WS4-S	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	<0.00005	0.002	0.02	0.02	
WS4-S	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	0.6	<0.00005	0.003	<0.02	<0.02	
WS4-S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.004	0.03	0.04	
WS4-S	3/12/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.004	0.03	0.03	
WS4-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	0.9	0.0002	0.003	0.03	0.04	
WS4-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	<0.0001	0.006	0.04	0.03	
WS4-S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.005	<0.02	<0.02	
WS4-S	20/04/2021		0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.6	<0.0001	0.019	<0.02	<0.02	
WS4-S	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	<1	<0.0001	0.006 [#]	<0.02	<0.02	
WS4-S	3/06/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	1	<0.0001	0.037	<0.02	<0.02	
WS4-D	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	<0.02	
WS4-D	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	---	<0.00005	0.002	0.02	0.02	
WS4-D	7/10/2020		<0.01	<0.001	0.001	<0.0001	<0.001	<0.001	0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	0.6	<0.00005	0.003	<0.02	<0.02	
WS4-D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	<0.5	<0.0001	0.004	0.04	0.04	
WS4-D	3/12/2020		0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.0001	0.003	0.03	0.03	
WS4-D	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	0.9	0.0001	0.006	0.03	0.03	
WS4-D	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.011	0.04	0.03	
WS4-D	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.008	<0.02	<0.02	
WS4-D	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.6	<0.0001	0.01	<0.02	<0.02	
WS4-D	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<1	<0.0001	0.004	0.04	<0.02	
WS4-D	3/06/2021		<0.02	0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.003	<0.02	<0.02	
WS5-S	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	0.002	<0.01	<0.001	<0.005	<0.00005	0.024	<0.001	<0.001	0.8	<0.00005	0.004	<0.02	0.02	
WS5-S	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.005	0.04	0.04	
WS5-S	3/12/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.0001	0.004	0.03	0.03	
WS5-S	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	0.8	0.0001	0.004	0.02	0.02	
WS5-S	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	0.002	<0.02	<0.002	<0.01	<0.00005	0.013	0.002	<0.002	<0.5	<0.0001	0.007	0.03	0.03	
WS5-S	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	0.006	<0.002	0.04	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.02	<0.02	
WS5-S	20/04/2021		0.02	0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.008	<0.02	0.02	
WS5-S	5/05/2021		<0.02	<0.002	0.003	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.017	<0.002	<0.002	<1	<0.0001	0.006	<0.02	<0.02	
WS5-S	3/06/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	0.008	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.004	<0.02	<0.02	
WS5-D	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	0.012	<0.001	<0.001	<0.5	<0.00005	0.002	<0.02	<0.02	
WS5-D	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.006	0.03	0.04	
WS5-D	3/12/2020		0.04	<0.002	0.002	<0.0002	<0.002	0.005	<0.002	0.04	<0.002	<0.01	<0.00005	0.013	0.022	<0.002	<1	<0.0001	0.019	0.03	0.03	
WS5-D	13/01/2021																					

Table C
Surface Water Results: MTBE, BTEX and TRH

Definitions:

MWG (Marine Water Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines)

LOR (Limits of Reporting), ' ' denotes no guideline. --- denotes not tested.

Notes:

All values in mg/L unless specified otherwise

All guideline values are adopted from:

- National Environment Protection (Assessment of Site Contamination) Measure 1999, Guideline on Investigation Levels for Soil and Groundwater (NEPC 2013)
- Assessment and Management of Contaminated Sites (DWER 2014)
- Health screening for petroleum hydrocarbons in soil and groundwater Part 2: Application document (CRC Care 2011)

a) Value may not protect key test species from chronic toxicity, refer to chapter eight of ANZECC & ARMCANZ (2000)

b) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines

Table uses colour coding for data interpretation, avoid black and white reproduction.

Denotes <LOR

Sample ID	Date	Trigger	Polycyclic Aromatic Hydrocarbons																												
			MTBE		BTEX			TRH																							
			MTBE	Benzene	Toluene	Ethylbenzene	m,p-xylene	o-xylene	F1: C6-C10 minus BTEX	F2: C>10-C16 minus N	F3: C>16-C34	F4: C>34-C40	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzofluoranthene	Chrysene	Benzofluoranthene	Benzo[a]fluoranthene	Benzo[e]pyrene	Indeno[1,2,3-cd]pyrene	Dibenz[a,h]anthracene	Benzog[h,i]perylene	Total Carcinogenic PAHs	Total Positive PAHs	
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			-	0.50 ^a	0.8 ^b	0.3 ^b	0.6 ^b	0.001	0.01	0.05	0.1	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
			0.001	0.001 ^b	0.001	0.001	0.002	0.001	0.01	0.05	0.1	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
WS1 - S	10/09/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	7/10/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	5/11/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	3/12/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	13/01/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	11/02/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	4/03/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	20/04/2021		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	5/05/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - S	3/06/2021		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	10/09/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	7/10/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	5/11/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	3/12/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	13/01/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	11/02/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	4/03/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	20/04/2021		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	5/05/2021		<0.005	<0.005	<0.005	<0.005	<0.010	<0.005	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS1 - D	3/06/2021		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	7/08/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	10/09/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	7/10/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	5/11/2020		<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	3/12/2020		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003	<0.01	<0.05	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001		
WS2-S	13/01/2021		<0.003	<0.003	<0.003	<0.003	<0.006	<0.003																							

Table D
Surface Water Results - OC/OP Pesticides

Definitions:

MWG (Marine Water Guideline) for slightly - moderately disturbed systems, RWG (Recreational Water Guidelines)

- denotes no guideline, --- denotes not tested.

Notes:

All values in mg/L unless specified otherwise

All guideline values are adopted from:

- National Environment

- Assessment and Management of Contaminated Sites (DWER 2014)

a) Chemicals for which possible bioaccumulation and secondary poisoning effects should be considered

b) Recreational water guideline values based on drinking water guidelines NHMRC & ARMCANZ (2011) Australian Drinking Water Guidelines

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR

Sample ID	Date	Trigger	Organochlorine Pesticides																							
			Aldrin	Aldrin + Dieldrin	α-BHC	β-BHC	γ-BHC	γ-BHC (Lindane)	α-Chlordane	γ-Chlordane	DDD	DDE	DDT	DDT + DDE + DDT	Dieldrin	α-Endosulfan	β-Endosulfan	Endosulfan sulphate	Endrin	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor			
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
MWG	LRG	-	-	-	-	-	0.01 ^b	0.002 ^b	-	-	0.009 ^b	-	-	0.000005 ^a	0.02 ^a	-	0.000004 ^a	-	-	0.0003 ^b	-	-				
ROW	ROW	0.00001	0.00002	0.00005	0.00005	0.00005	0.00005	0.00001	0.00001	0.00001	0.00001	0.00005	0.00003	0.00001	0.00002	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00002				
WS1 - S	10/09/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	7/10/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	5/11/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	3/12/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	13/01/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	11/02/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	4/03/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	20/04/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - S	5/05/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS1 - D	3/06/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	7/08/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	10/09/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	7/10/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	5/11/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	3/12/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	13/01/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	11/02/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	4/03/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	20/04/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	5/05/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - S	3/06/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	7/08/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	10/09/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	7/10/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	5/11/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	3/12/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	13/01/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	11/02/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	4/03/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	20/04/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	5/05/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS2 - D	3/06/2021	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS3 - S	10/09/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS3 - S	7/10/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS3 - S	5/11/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002				
WS3 - S	3/12/2020	<0.00001	<0.00002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.0								

Table E
Surface Water Results: Per- and Poly-Fluoroalkyl Substances

Definitions:
LOR (Limits of Reporting), MWG (Marine Water Guideline) -99 (99% species protection level) -95 (95% species protection level), RWG (Recreational Water Guidelines)
- denotes no guideline. --- denotes not tested.

Notes:
All values in µg/L unless specified otherwise
Table uses colour coding for data interpretation, avoid black and white reproduction.
All guideline values are adopted from:
- PFAS National Environmental Managment Plan Version 2.0 (HEPA 2020)
Denotes <LOR

Sample ID	Date	Trigger	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carboxylic Acids										(n:2) Fluorotelomer Sulfonic Acids				Perfluoroalkyl Sulfonamides						PFAS Sums					
			Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonate PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluoroheptanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTSA	6:2 FTSA	8:2 FTSA	10:2 FTSA	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfonamide	N-Me perfluorooctanesulfonamide	N-Et perfluorooctanesulfonamide	MePerfluorooctanesulf. amid oacetic acid	EtPerfluorooctanesulf. amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
			MWG-99	-	-	-	-	0.00023	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			MWG-95	-	-	-	-	0.13	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			RWG	-	-	2	-	2	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
			LOR	0.0004	0.001	0.0002	0.001	0.0002	0.002	0.002	0.002	0.0004	0.0004	0.0002	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.0004	0.0004	0.002	0.01	0.005	0.01	0.005	0.05	0.002	0.002	0.0002	0.0002	0.0002
WS1 - S	10/09/2020																																	
WS1 - S	7/10/2020																																	
WS1 - S	5/11/2020																																	
WS1 - S	3/12/2020																																	
WS1 - S	13/01/2021																																	
WS1 - S	11/02/2021																																	
WS1 - S	4/03/2021																																	
WS1 - S	20/04/2021																																	
WS1 - S	5/05/2021																																	
WS1 - S	3/06/2021																																	
WS1 - D	10/09/2020																																	
WS1 - D	7/10/2020																																	
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WS1 - D	20/04/2021																																	
WS1 - D	5/05/2021																																	
WS1 - D	3/06/2021																																	
WS2-S	7/08/2020																																	
WS2-S	10/09/2020																																	
WS2-S	7/10/2020																																	
WS2-S	5/11/2020																																	
WS2-S	3/12/2020																																	
WS2-S	13/01/2021																																	
WS2-S	11/02/2021																																	
WS2-S	4/03/2021																																	
WS2-S	20/04/2021																																	
WS2-S	5/05/2021																																	
WS2-S	3/06/2021																																	
WS2-D	7/08/2020																																	
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WS2-D	20/04/2021																																	
WS2-D	5/05/2021																																	
WS2-D	3/06/2021																																	
WS3-S	10/09/2020																																	
WS3-S	7/10/2020																																	
WS3-S	5/11/2020																																	
WS3-S	3/12/2020																																	
WS3-S	13/01/2021																																	
WS3-S	11/02/2021																																	
WS3-S	4/03/2021																																	
WS3-S	20/04/2021																								</									

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Surface Water Results: Per- and Poly-Fluoroalkyl Substances

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Notes:
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Denotes <LOR

Sample ID	Date	Trigger	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carboxylic Acids										(n:2) Fluorotelomer Sulfonic Acids				Perfluoroalkyl Sulfonamides						PFAS Sums					
			Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonate PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluorohecanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTSA	6:2 FTSA	8:2 FTSA	10:2 FTSA	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfonamide	N-Me perfluorooctanesulfonamid-oethanol	N-Et perfluorooctanesulfonamid-oethanol	MePerfluorooctanesulf- amid oacetic acid	EtPerfluorooctanesulf- amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
			MWG-99	-	-	-	-	0.00023	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			MWG-95	-	-	-	-	0.13	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			RWG	-	-	-	2	2	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
			LOR	0.0004	0.001	0.0002	0.001	0.0002	0.002	0.002	0.002	0.0004	0.0004	0.0002	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.0004	0.0004	0.002	0.01	0.005	0.01	0.005	0.05	0.002	0.002	0.0002	0.0002	0.0002
WS4-S	7/08/2020		<0.0004	<0.001	0.0004	<0.001	0.0006	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.0008	0.001		
WS4-S	10/09/2020		<0.0004	<0.001	0.0020	<0.001	0.0025	<0.002	<0.002	<0.002	0.001	0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0045	0.0031	0.0065	
WS4-S	7/10/2020		0.0005	<0.001	0.0025	<0.001	0.0037	<0.002	<0.002	<0.002	0.001	0.0006	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0062	0.0045	0.0091	
WS4-S	5/11/2020		0.0005	<0.001	0.0022	<0.001	0.0035	<0.002	<0.002	<0.002	0.002	0.0007	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0057	0.0044	0.0098	
WS4-S	3/12/2020		0.0005	<0.001	0.0024	<0.001	0.0042	<0.002	<0.002	<0.002	0.001	0.003	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0066	0.005	0.012	
WS4-S	13/01/2021		0.0005	<0.001	0.0020	<0.001	0.0026	<0.002	<0.002	<0.002	0.001	0.0006	0.0007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.0033	0.0074	
WS4-S	11/02/2021		0.0006	<0.001	0.0021	<0.001	0.0024	<0.002	<0.002	<0.002	0.001	0.0008	0.0007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0045	0.0031	0.0076	
WS4-S	4/03/2021		<0.0004	<0.001	0.0005	<0.001	0.0008	<0.002	<0.002	<0.002	<0.0004	<0.0004	<0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.0008	0.001	
WS4-S	20/04/2021		<0.0004	<0.001	0.0020	<0.001	0.0028	<0.002	<0.002	<0.002	<0.002	0.0009	0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0048	0.0033	0.0066
WS4-S	5/05/2021		<0.0004	<0.001	0.0009	<0.001	0.002*	<0.002	<0.002	<0.002	0.0006	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0029*	0.002	0.003	
WS4-S	3/06/2021		<0.0004	<0.001	0.0010	<0.001	0.0022	<0.002	<0.002	<0.002	<0.002	0.0009	0.0005	0.0004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0032	0.0026	0.005
WS4-D	7/08/2020		<0.0004	<0.001	0.0003	<0.001	0.0003	<0.002	<0.002	<0.002	<0.0004	<0.0004	<0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0006	0.0003	0.0006	
WS4-D	10/09/2020		<0.0004	<0.001	0.0020	<0.001	0.0025	<0.002	<0.002	<0.002	0.001	0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0045	0.0031	0.0065	
WS4-D	7/10/2020		0.0004	<0.001	0.0026	<0.001	0.0034	<0.002	<0.002	<0.002	0.001	0.0005	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.006	0.0042	0.0087	
WS4-D	5/11/2020		0.0005	<0.001	0.0022	<0.001	0.0033	<0.002	<0.002	<0.002	0.002	0.0006	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0055	0.0042	0.0095	
WS4-D	3/12/2020		0.0005	<0.001	0.0022	<0.001	0.0038	<0.002	<0.002	<0.002	0.001	0.002	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.006	0.0047	0.01	
WS4-D	13/01/2021		0.0004	<0.001	0.0020	<0.001	0.0026	<0.002	<0.002	<0.002	0.001	0.0006	0.0007	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.0033	0.0073	
WS4-D	11/02/2021		0.0007	<0.001	0.0021	<0.001	0.0025	<0.002	<0.002	<0.002	0.001	0.0007	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.0034	0.0079	
WS4-D	4/03/2021		<0.0004	<0.001	0.0004	<0.001	0.0008	<0.002	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.001	0.001	
WS4-D	20/04/2021		<0.0004	<0.001	0.0010	<0.001	0.0021	<0.002	<0.002	<0.002	<0.002	0.0009	0.0005	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0031	0.0027	0.0051
WS4-D	5/05/2021		<0.0004	<0.001	0.0007	<0.001	0.0010	<0.002	<0.002	<0.002	<0.002	0.0005	&																					

Table F
Surface Water QAQC Results (RPD Assessment): ASS, Cations, Nutrients and Miscellaneous

Definitions:
LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denoted not calculated.

Notes:
All values in mg/L unless specified otherwise
Table uses colour coding for data interpretation, avoid black and white reproduction.

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample Type	Date	Trigger	Acid Sulfate Soil Parameters									Cations				Nutrients						Miscellaneous			
				Total Acidity (CaCO3)	Total Alkalinity (CaCO3)	TDS	TSS	Turbidity	Sulfide	Sulfate	Chloride	Fluoride	Calcium	Magnesium	Potassium	Sodium	Total P	Reactive P	Total N	TKN	NH ₃ -N	NO _x -N	Dissolved Organic Carbon (DOC)	Chlorophyll "a"	Phaeophytin "a"	
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				LOR	1	1	10	5	0.1	0.1	1	1	0.1	1	1	1	1	0.01	0.005	0.1	0.1	0.005	0.005	1	0.0001	0.0002
WS2-S	Primary	7/08/2020		6	120	39,000	9	0.6	0.9	2800	20,000	---	420	1300	370	12000	<0.05	<0.005	0.1	0.1	0.007	<0.005	<1	0.0004	0.0005	
WZ1	Duplicate			7	120	39,000	6	0.6	0.8	2800	20,000	---	420	1300	370	11000	<0.05	<0.005	0.1	0.1	0.009	<0.005	<1	0.0005	0.0003	
RPD %				15	0	0	40	0	12	0	0	#	0	0	0	9	0	0	0	2	25	0	0	22	50	
WS1-S	Primary	10/09/2020		9	120	36,000	<5	0.5	<0.5	2400	18,000	---	390	1200	360	11000	0.03	0.006	0.2	0.20	0.009	<0.005	2	0.0012	0.0006	
WZ1	Duplicate			9	120	36,000	6	0.7	<0.5	2300	18,000	---	400	1300	360	11000	0.03	<0.005	0.2	0.20	0.008	<0.005	2	0.0012	0.0005	
RPD %				0	0	0	18	33	0	4	0	#	3	8	0	0	0	18	0	0	12	0	0	0	18	
WS3-S	Primary	7/10/2020		7	120	37,000	8	1.6	0.8	2400	18,000	<5	420	1300	400	11000	0.05	0.006	0.2	0.20	0.018	0.043	1	0.0019	0.0009	
WZ1	Duplicate			7	130	37,000	33	0.9	0.7	2400	18,000	<5	410	1300	390	11000	0.05	0.005	0.1	0.10	<0.005	<0.005	1	0.0011	0.0008	
RPD %				0	8	0	122	56	13	0	0	0	2	0	3	0	0	18	67	67	113	158	0	53	12	
WS2-D	Primary	5/11/2020		6	130	36,000	<5	0.8	<0.5	2700	19,000	<5	330	1100	290	9700	0.02	0.006	0.2	0.2	0.006	0.01	3	0.0016	0.0007	
WZ1	Duplicate			7	130	36,000	<5	1	<0.5	2700	19,000	<5	360	1200	320	11000	0.02	0.006	0.2	0.2	0.006	0.01	2	0.0015	0.0006	
RPD %				15	0	0	0	22	0	0	0	0	9	9	10	13	0	0	0	0	0	0	40	6	15	
WS2-S	Primary	3/12/2020		---	130	36,000	<5	0.7	0.6	2700	19,000	<5	400	1300	380	12000	0.02	<0.005	0.8	0.8	<0.005	0.01	3	0.0022	0.0006	
WZ1	Duplicate			---	130	36,000	<5	0.9	0.7	2700	19,000	<5	400	1300	380	12000	0.02	<0.005	0.7	0.7	<0.005	0.011	3	0.0018	0.0006	
RPD %				---	0	0	0	25	15	0	0	0	0	0	0	0	0	0	13	13	0	10	0	20	0	
WS2-S	Primary	13/01/2021		<5	130	38,000	<5	0.5	0.5	2900	21,000	1.3	390	1200	400	11000	0.02	0.005	0.2	0.2	0.006	0.006	1	0.0012	0.0006	
WZ1	Duplicate			<5	130	39,000	<5	0.5	0.5	2800	21,000	1.3	390	1200	390	11000	0.03	0.006	0.2	0.2	0.007	<0.005	2	0.0011	0.0005	
RPD %				0	0	3	0	0	0	4	0	0	0	0	3	0	40	0	0	0	0	18	67	9	18	
WS3-S	Primary	11/02/2021		<5	130	37,000	38	1.5	<0.5	3000	21,000	<5	370	1200	340	11000	0.03	0.006	0.5	0.5	<0.005	<0.005	3	0.0026	0.001	
WZ1	Duplicate			<5	130	37,000	79	2	<0.5	3000	21,000	<5	390	1200	350	12000	0.1	0.006	0.5	0.5	<0.005	<0.005	2	0.003	0.0021	
RPD %				0	0	0	0	29	0	0	0	0	5	0	3	9	108	0	0	0	0	0	40	14	71	
WS2-D	Primary	4/03/2021		<5	130	34,000	<5	0.7	<0.5	3000	21,000	<5	430	1400	400	12000	0.01	0.006	0.2	0.2	0.021	<0.005	<1	0.0008	0.0003	
WZ1	Duplicate			<5	130	38,000	22	0.5	0.9	3000	21,000	<5	470	1500	430	13000	0.01	<0.005	0.2	0.2	0.023	<0.005	<1	0.0007	0.0004	
RPD %				0	0	11	126	33	57	0	0	0	9	7	7	8	0	18	0	0	9	0	0	13	29	
WS2-D	Primary	20/04/2021		9	120	37,000	5	0.7	<0.5	2700	20,000	<5	420	1400	380	12000	0.03	0.005	0.2	0.2	0.022	0.008	<1	0.0006	0.0005	
WZ1	Duplicate			9	120	35,000	7	0.4	0.5	2700	20,000	<5	410	1400	370	12000	0.03	0.006	0.2	0.2	0.024	0.008	<1	0.0008	0.0005	
RPD %				0	0	6	33	55	0	0	0	0	2	0	3	0	0	18	0	0	9	0	0	29	0	
WS4-S	Primary	5/05/2021		10	130	37,000	<5	0.7	<0.5	2400	18,000	<5	460	1500	420	13000	0.04	<0.005	<0.5	<0.5	0.015	<0.005	2	0.0009	0.0006	
WZ1	Duplicate			8	120	37,000	<5	0.6	<0.5	2500	19,000	<5	460	1500	420	13000	0.03	<0.005	<0.5	<0.5	0.015	<0.005	1	0.0012	0.0007	
RPD %				0	8	0	0	15	0	4	5	0	0	0	0	0	29	0	0	0	0	0	67	29	15	
WS2-D	Primary	3/06/2021		7	120	38,000	<5	0.8	<0.5	2700	20,000	<5	460	1400	390	12000	0.02	0.006	<0.5	<0.5	0.018	0.019	1	0.001	0.0006	
WZ1	Duplicate			7	120	39,000	<5	0.5	<0.5	2700	20,000	<5	510	1600	420	13000	0.02	0.006	<0.5	<0.5	0.022	0.03	1	0.001	0.0004	
RPD %				0	0	3	0	46	0	0	0	0	10	13	7	8	0	0	0	0	20	45	0	0	40	

Table G
Surface Water QAQC Results (RPD Assessment): Metals

Definitions:
LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denoted not calculated.
Notes:

All values in mg/L unless specified otherwise
Table uses colour coding for data interpretation, avoid black and white reproduction.

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample Type	Date	Trigger	Dissolved Metals & Metalloids																		Total Metals	
				Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Lead	Mercury	Manganese	Molybdenum	Nickel	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				LOR	0.01	0.001	0.001	0.0001	0.002	0.001	0.02	0.05	0.001	0.00005	0.001	0.001	0.001	0.01	0.0002	0.00005	0.001	0.01	0.02
WS2-S	Primary	7/08/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	---	<0.0001	0.003	<0.02	<0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	---	<0.0001	0.004	0.03	0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	#	0	29	40	0	
WS1-S	Primary	10/09/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.012	<0.001	<0.001	---	0.00006	0.002	0.02	0.02	
WZ1	Duplicate			<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.013	<0.001	<0.001	---	<0.00005	0.003	0.02	0.03	
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	#	18	40	0	40	
WS3-S	Primary	7/10/2020		<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.00005	<0.005	0.013	<0.001	<0.001	<5	<0.00005	0.003	0.02	0.04	
WZ1	Duplicate			<0.01	<0.001	0.002	<0.0001	<0.001	<0.001	<0.001	0.001	<0.01	<0.001	<0.00005	<0.005	0.012	<0.001	<0.001	<5	<0.00005	0.004	<0.02	0.2
RPD %				0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	29	0	133	
WS2-D	Primary	5/11/2020		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<0.5	<0.0001	0.007	0.03	0.04	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<0.5	<0.0001	0.005	0.03	0.04	
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	
WS2-S	Primary	3/12/2020		0.04	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.012	<0.002	<0.002	<1	0.0002	0.0099	0.07	0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.005	<0.02	0.02	
RPD %				67	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	66	111	0	
WS3-S	Primary	13/01/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.014	<0.002	<0.002	<0.5	0.0001	0.005	0.02	0.03	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.016	<0.002	<0.002	0.5	<0.0001	0.005	<0.02	0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	40	
WS3-S	Primary	11/02/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.014	<0.002	<0.002	<0.5	<0.0001	0.026	0.14	0.24	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<0.5	<0.0001	0.008	0.19	0.29	
RPD %				0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	106	30	19	
WS2-D	Primary	4/03/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.006	0.03	0.02	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.00005	<0.01	0.013	<0.002	<0.002	<1	<0.0001	0.005	0.05	0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	50	0	
WS2-D	Primary	20/04/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.005	<0.02	<0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	0.0003	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<0.5	<0.0001	0.005	0.02	0.02	
RPD %				0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS4-S	Primary	5/05/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.015	<0.002	<0.002	<1	<0.0001	0.003	<0.02	<0.02	
WZ1	Duplicate			<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.013	<0.002	<0.002	<1	<0.0001	0.006	<0.02	<0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	67	0	0	
WS2-D	Primary	3/06/2021		<0.02	<0.002	0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.012	<0.002	<0.002	<1	<0.00005	0.007	<0.02	<0.02	
WZ1	Duplicate			<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.002	<0.01	<0.00005	0.019	<0.002	<0.002	1.1	<0.0001	0.005	<0.02	<0.02	
RPD %				0	0	0	0	0	0	0	0	0	0	0	45	0	0	10	0	33	0	0	

Table I
Surface Water QAQC Results (RPD Assessment): OC/OP Pesticides

Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denoted not calculated.

Notes:

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample type	Date	Trigger	Organochlorine Pesticides																				
				Aldrin	a-BHC	b-BHC	d-BHC	g-BHC (Lindane)	a-Chlordane	g-Chlordane	DDD	DDE	DDT	DDD + DDE + DDT	Dieldrin	a-Endosulfan	b-Endosulfan	Endosulfan sulphate	Endrin	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
LOR	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00006	0.00003	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002		
WS2-S	Primary	7/08/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS1-S	Primary	10/09/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS3-S	Primary	7/10/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-D	Primary	5/11/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-S	Primary	3/12/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-S	Primary	13/01/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS3-S	Primary	11/02/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-D	Primary	4/03/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-D	Primary	20/04/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS4-S	Primary	5/05/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-D	Primary	3/06/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WZ1	Duplicate			<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
RPD %				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table J
Surface Water QAQC Results (RPD Assessment): Per- and Poly-Fluoroalkyl Substances

Definitions:
LOR 1* (Limit of Reporting, Primary Laboratory). --- denotes not tested. # denoted not calculated.

Notes:
All values in mg/L unless specified otherwise
Table uses colour coding for data interpretation, avoid black and white reproduction.

	denotes <LOR (primary laboratory)
	denotes <5x LOR (primary laboratory)
	denotes exceedance of acceptance criteria (30%) where samples <5x LOR
	denotes exceedance of acceptance criteria (30%) where sample(s) >5x LOR

Sample ID	Sample type	Date	Trigger	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carboxylic Acids										(n:2) Fluorotelomer Sulfonic Acids				Perfluoroalkyl Sulfonamides						PFAS Sums				
				Perfluorobutanesulfonic acid	Perfluoropentanesulfonic acid	Perfluorohexanesulfonic acid	Perfluoroheptanesulfonic acid	Perfluorooctanesulfonate PFOS	Perfluorodecanesulfonic acid	Perfluorobutanoic acid	Perfluoropentanoic acid	Perfluorohexanoic acid	Perfluoroheptanoic acid	Perfluorooctanoic acid PFOA	Perfluorononanoic acid	Perfluorodecanoic acid	Perfluoroundecanoic acid	Perfluorododecanoic acid	Perfluorotridecanoic acid	Perfluorotetradecanoic acid	4:2 FTSA	6:2 FTSA	8:2 FTSA	10:2 FTSA	Perfluorooctane sulfonamide	N-Methyl perfluorooctane sulfonamide	N-Ethyl perfluorooctanesulfon-amine	N-Me perfluorooctanesulfonamid- ethanol	N-Et perfluorooctanesulfonamid- ethanol	MePerfluorooctanesulf- amid oacetic acid	EtPerfluorooctanesulf- amid oacetic acid	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Total Positive PFAS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WS2-S	Primary	7/08/2020	LOR	0.0004	0.001	0.0002	0.001	0.0002	0.002	0.002	0.002	0.0004	0.0004	0.0002	0.001	0.002	0.002	0.005	0.01	0.05	0.001	0.0004	0.0004	0.002	0.01	0.005	0.01	0.005	0.05	0.002	0.002	0.0002	0.0002	0.0002
WZ1	Duplicate		<0.0004	<0.001	0.0004	<0.001	0.0006	<0.002	<0.002	<0.002	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.0008	0.001		
RPD %				0	0	22	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	
WS1-S	Primary	10/09/2020	LOR	0.0004	<0.001	0.002	<0.001	0.003	<0.002	<0.002	<0.002	0.001	0.0004	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.005	0.0036	0.0074
WZ1	Duplicate		<0.0004	<0.001	0.002	<0.001	0.0026	<0.002	<0.002	<0.002	0.001	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0046	0.0031	0.0061	
RPD %				0	0	0	0	14	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	15	19	
WS1-S	Primary	7/11/2020	LOR	<0.0004	<0.001	0.001	<0.001	0.0021	<0.002	<0.002	<0.002	0.0007	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0031	0.0026	0.0043
WZ1	Duplicate		<0.0004	<0.001	0.002	<0.001	0.0028	<0.002	<0.002	<0.002	0.0009	<0.0004	0.0004	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0048	0.0032	0.0061	
RPD %				0	0	67	0	29	0	0	0	25	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	21	35	
WS2-D	Primary	5/11/2020	LOR	0.0006	<0.001	0.002	<0.001	0.0035	<0.002	<0.002	<0.002	0.002	0.0007	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0059	0.0044	0.01
WZ1	Duplicate		0.0006	<0.001	0.002	<0.001	0.0031	<0.002	<0.002	<0.002	0.002	0.0007	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0053	0.0039	0.0094	
RPD %				0	0	9	0	12	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	12	6	
WS2-S	Primary	3/12/2020	LOR	0.0005	<0.001	0.002	<0.001	0.0045	<0.002	<0.002	<0.002	0.001	0.002	0.0008	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0066	0.0053	0.011
WZ1	Duplicate		0.0005	<0.001	0.002	<0.001	0.0038	<0.002	<0.002	<0.002	0.001	0.003	0.0009	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.006	0.0047	0.011	
RPD %				0	0	5	0	17	0	0	0	0	0	40	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	12	0	
WS3-S	Primary	13/01/2021	LOR	<0.0004	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.002	0.0005	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.002	0.002	0.0028
WZ1	Duplicate		<0.0004	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.002	0.0006	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.002	0.002	0.0029	
RPD %				0	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
WS3-S	Primary	11/02/2021	LOR	0.0009	<0.001	0.002	<0.001	0.0024	<0.002	<0.002	<0.002	0.0009	0.0006	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0044	0.0029	0.0073
WZ1	Duplicate		0.0008	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	0.0009	0.0005	0.0006	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.004	0.0026	0.0068	
RPD %				0	0	0	0	18	0	0	0	0	18	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	11	7	
WS2-D	Primary	4/03/2021	LOR	<0.0004	<0.001	0.0004	<0.001	0.0007	<0.002	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.0009	0.001
WZ1	Duplicate		<0.0004	<0.001	0.0005	<0.001	0.0009	<0.002	<0.002	<0.002	<0.0004	<0.0004	<0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.0009	0.001	
RPD %				0	0	22	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WS2-D	Primary	20/04/2021	LOR	<0.0004	<0.001	0.0005	<0.001	0.0008	<0.002	<0.002	<0.002	<0.0004	<0.0004	0.0002	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.001	0.001	0.002
WZ1	Duplicate		<0.0004	<0.001	0.0008	<0.001	0.0010	<0.002	<0.002	<0.002	0.0005	<0.0004	0.0003	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.002	0.001	0.0026	
RPD %				0	0	46	0	22	0	0	0	22	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	0	26	
WS4-S	Primary	5/05/2021	LOR	<0.0004	<0.001	0.0009	<0.001	0.0010	<0.002	<0.002	<0.002	0.0006	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.002	0.002	0.003
WZ1	Duplicate		<0.0004	<0.001	0.0009	<0.001	0.0020	<0.002	<0.002	<0.002	0.0006	<0.0004	0.0005	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.0004	<0.0004	<0.002	<0.01	<0.005	<0.01	<0.005	<0.05	<0.002	<0.002	0.0029	0.0025	0.004	
RPD %				0	0	0	0	67	0	0	0																							

Table K
Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): Metals and Turbidity

Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory), --- denotes not tested.

Notes:

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes exceedance of acceptance criteria > LOR

Sample ID	Sample Type	Date	Trigger	Dissolved Metals & Metalloids																		Total Metals		Turbidity
				Aluminium	Antimony	Arsenic	Cadmium	Cobalt	Chromium	Copper	Iron	Manganese	Mercury	Molybdenum	Nickel	Lead	Selenium	Silicon	Silver	Zinc	Total Aluminium	Total Iron	Turbidity	
				Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
LOR				0.01	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.01	0.005	0.00005	0.001	0.001	0.001	0.001	0.1	0.00005	0.001	0.01	0.01	0.1
Rinsates																								
WR1	Water	7/08/2020		<0.01	<0.001	<0.001	0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.2	
WR1	Water	10/09/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.1	
WR1	Water	7/10/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.02	<0.1	
WR1	Water	5/11/2020		<0.01	<0.001	<0.001	0.0002	<0.001	<0.001	0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.3	<0.00005	0.005	<0.01	<0.01	0.3	
WR1	Water	3/12/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	0.008	0.01	<0.005	<0.00005	<0.001	<0.001	0.021	<0.001	---	<0.00005	0.015	<0.01	0.02	0.5	
WR1	Water	13/01/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.02	<0.1	
WR1	Water	11/02/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.01	<0.00005	<0.002	<0.002	<0.002	<0.002	0.2	<0.0001	0.006	<0.02	0.02	0.2	
WR1	Water	4/03/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	0.001	<0.01	<0.01	0.4	
WR1	Water	20/04/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	0.004	<0.01	<0.01	0.4	
WR1	Water	5/05/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.4	
WR1	Water	3/06/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.2	
Field Blank																								
WB1	Water	7/08/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.2	
WB1	Water	10/09/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.01	0.1	
WB1	Water	7/10/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	---	<0.00005	<0.001	<0.01	<0.02	<0.1	
WB1	Water	5/11/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.3	<0.00005	<0.001	<0.01	<0.01	0.2	
WB1	Water	3/12/2020		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.1	
WB1	Water	13/01/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.02	<0.1	
WB1	Water	11/02/2021		<0.02	<0.002	<0.002	<0.0002	<0.002	<0.002	<0.002	<0.02	<0.01	<0.00005	<0.002	<0.002	<0.002	<0.002	0.2	<0.0001	0.006	<0.02	<0.02	0.2	
WB1	Water	4/03/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	0.2	<0.00005	<0.001	<0.01	<0.01	0.3	
WB1	Water	20/04/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.4	
WB1	Water	5/05/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.2	
WB1	Water	3/06/2021		<0.01	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.00005	<0.001	<0.001	<0.001	<0.1	<0.00005	<0.001	<0.01	<0.01	0.4	

Table M
Surface Water QAQC Results (Rinsate, Field Blank and Trip-Blank): OC/OP Pesticides

Definitions:

LOR 1° (Limit of Reporting, Primary Laboratory), --- denotes not tested.

Notes:

All values in mg/L unless specified otherwise

Table uses colour coding for data interpretation, avoid black and white reproduction.

denotes <LOR (primary laboratory)

denotes exceedance of acceptance criteria > LOR

Sample ID	Sample type	Date	Trigger	Organochlorine Pesticides																			
				Aldrin	a-BHC	b-BHC	d-BHC	g-BHC (Lindane)	a-Chlordane	g-Chlordane	DDD	DDE	DDT	DDD + DDE + DDT	Dieldrin	a-Endosulfan	b-Endosulfan	Endosulfan sulphate	Endrin	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR	0.00001	0.00005	0.00005	0.00005	0.00005	0.00001	0.00001	0.00001	0.00001	0.00001	0.000006	0.00003	0.00001	0.00002	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002	
Rinsates																							
WR1	Water	7/08/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	10/09/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	7/10/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	5/11/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	3/12/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	13/01/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	11/02/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	4/03/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	20/04/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	5/05/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WR1	Water	3/06/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
Field Blank																							
WB1	Water	7/08/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	10/09/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	7/10/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	5/11/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	3/12/2020		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	13/01/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	11/02/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	4/03/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	20/04/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	5/05/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002
WB1	Water	3/06/2021		<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.000006	<0.00003	<0.00001	<0.00002	<0.00002	<0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002

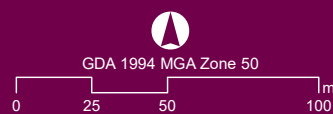
FIGURE





Figure A
Swan River crossing
Water quality sampling locations

Document Path: G:\Jobs\C_Jobs\C20078 - MRWA SR Bridge\Figures C20078-004\C20078-004_G_001_Fig A Proposed WQ Sampling_200629.mxd



Job Number: C20078-004
 Doc Number: 001
 Date: 29.06.20
 Scale: 1:2,500 @ A3
 Created by: MA
 Source: Orthophoto - Landgate, Jan 2020



Appendix A

DBCA Approval



2020/1928
PERMIT P12652

Pursuant to Part 4 (Regulation 29) of the Swan and Canning Rivers Management Regulations 2007, this is to certify that a permit is issued to the person(s) or organisation described hereunder as permit holder and that person(s) or organisation is permitted to carry out the authorised works, acts or activities for the duration specified, subject to the conditions listed below.

Permit holder: Main Roads Western Australia (John Braid)

Authorised works, acts or activities: Swan River Crossings Project – In-river scientific investigations – sampling suite includes contaminants, water quality, benthic habitat and sediment analysis

Location of works, acts or activities: Swan River between Fremantle Traffic Bridge and Stirling Bridge, Fremantle; and Lot 2010 on Plan 18598 and Lot 1941 on Plan 213981

Approval date: 2 October 2020

Expiry date: 31 December 2021

CONDITIONS

1. The applicant shall notify the Department of Biodiversity, Conservation and Attractions in writing not less than three (3) days prior to the commencement of works (see **Advice Note 1**).
2. The applicant shall ensure that all contractors and personnel involved in the investigations approved by the Department of Biodiversity, Conservation and Attractions are familiar with the conditions and requirements of this approval at all times.
3. The works shall take place in accordance with the methodologies provided in the *Swan River Crossings Project-Environmental (in-river) Surveys September 2020 V6.0*, unless modified by a condition of this approval.
4. The results of the benthic habitat surveys, once collated, shall be provided to the Department of Biodiversity, Conservation and Attractions (see **Advice Note 1**).
5. Further to **Condition 4**, the applicant shall undertake any necessary additional sampling and/or modify the scientific investigation methodologies as required by the Department of Biodiversity, Conservation and Attractions on review of the results of the benthic habitat surveys and deduced potential impacts to known benthic habitat and communities.
6. The applicant shall ensure that all equipment is visually inspected for any traces of aquatic organisms and shall remove the organisms prior to the equipment entering the Swan Canning Development Control Area.
7. The applicant shall monitor all works and ensure that appropriate measures are implemented to contain turbidity and prevent sediment plumes spreading and shall have a silt curtain readily available to deploy in order to contain any turbidity and sediment plumes that are uncontrolled or move beyond the immediate area of works (see **Advice Note 2**).
8. Water-based activities shall cease if a dolphin comes within 50 metres of any water vessel involved in the approved activities and shall not recommence until any dolphin has moved away more than 200 metres or has not been observed for 20 minutes.
9. Any refuelling shall take place outside of the Swan Canning Development Control Area or at a licensed refuelling facility.



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10. A spill kit shall be maintained on all vessels and shall be utilised to contain and clean up any spills that occur.
11. The applicant shall take all precautions to ensure no damage to the foreshore, riverbank or waterway (including infrastructure and vegetation) occurs as a result of the works. Should any inadvertent damage occur, the applicant is required to notify the Department of Biodiversity, Conservation and Attractions within 48 hours of that damage occurring (see **Advice Note 2**).
12. The applicant shall rectify at its expense any damage to the foreshore, riverbank or waterway (including infrastructure and vegetation) that occurs as a result of the works.
13. Within 24 hours of the completion of the activities, the applicant shall remove all waste materials, equipment and machinery.
14. An electronic copy of the report, addressing the findings of the scientific investigations approved under this permit shall be forwarded to the Department of Biodiversity, Conservation and Attractions prior to the expiration of this permit (see **Advice Note 1**).

ADVICE TO APPLICANT

1. Notifications and information can be emailed to rivers.planning@dbca.wa.gov.au.
2. In the event of spills, waste materials impacting the river or turbidity or sediment plumes, the Department of Biodiversity, Conservation and Attractions' Duty Officer (Riverpark) can be contacted on 9278 0981 (24 hrs) or Pollution Response Officer (Marine) on 9480 9924 (24 hrs).
3. The Department of Transport (DoT) Navigational Safety advises the applicant that:
 - Main Roads Western Australia (MRWA) and/or its contractors are to develop a communication plan with Commercial Ferry Operators and are to consult with commercial operators to gain comment and support for the Vessel Management Plan [Regarding 4.2 Legislative and Other Provisions (page 13 of the Vessel Management Plan): Should also include the 'Western Australian Marine Act 1982' and the 'Marine Safety (Domestic Commercial Vessel) National Law Act 2012'];
 - MRWA and/or its contractors are to monitor VHF Channel 16 during operating hours;
 - The works area and any hazards should be marked with yellow special marker buoys, approximately 1 metre in height equipped with flashing yellow lights;
 - All vessels taking part in the works must display shapes and lights in accordance with the Prevention of Collisions at Sea Regulations 1983 at all times;
 - Should diving operations be conducted between the Fremantle Rail Bridge and Fremantle Traffic Bridge, a closure of the respective navigation span will be required;
 - Navigational channels are to remain open wherever possible and only one navigation span is to be impeded at any one time;
 - Any anchor points which encroach the channel should be marked;
 - A Temporary Notice to Mariners (TNTM) must be issued by DoT outlining the scope of the works, the works area, navigational marking (lighting) and dates of the works, prior to commencement. MRWA and/or its contractors are to provide notification of the works to DoT a minimum of 21 days prior to the works commencing to enable a TNTM to be published, by email to: navigational.safety@transport.wa.gov.au;
 - MRWA and/or its contractors are to provide sufficient notification of any ad hoc day closures of navigational channels so that a TNTM can be published to alert mariners; and



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- MRWA and/or its contractors are to seek approval from Fremantle Ports Authority for any works to the west of the Fremantle Traffic and Rail Bridges.
- 4. The applicant is advised that the proposed works are located in a high to moderate and moderate to low acid sulphate soils risk area. The Acid Sulfate Soils Guideline Series for guidance on the identification, assessment and management of acid sulphate soils in Western Australia is available from the Department of Water and Environmental Regulation website at www.dwer.wa.gov.au. If any acid sulfate soils are exposed during the works the Department of Water and Environmental Regulation should be contacted for further advice.
- 5. The applicant is advised that this approval does not negate the need to obtain any other approval from relevant agencies, or from the Department of Biodiversity, Conservation and Attractions.

PERMIT APPROVED

Signed:  Date: 02/10/20

Jacey Mills
Manager, Statutory Assessments

As delegate of CEO
Under Section 38 of the SCRM Act 2006

Appendix B

Laboratory reports

MAKING COMPLIANCE EASY

Page number: 1

Quote number: 20p194V2

Remarks




Laboratories

Job No.- 263075
 Date Rec- 3/6/21
 Time Rec- 15:25
 Rec By- Gun
 TAT Req- SAME 1/2/3/5/10
 Temp- cool / ambient
 Cooling- Yes / Ice pack / None
 Security Seal- Yes / No

RPS Australia West Pty Ltd, Registered in Australia No. 42 107 962 872
rpsgroup.com

CERTIFICATE OF ANALYSIS 263075

Client Details

Client	RPS Australia West Pty Ltd
Attention	Zak Langtry
Address	Level 2, 27-31 Troode St, WEST PERTH, WA, 6005

Sample Details

Your Reference	<u>EEC20092.002 - Swan River Crossing</u>
Number of Samples	13 Water
Date samples received	03/06/2021
Date completed instructions received	03/06/2021

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/06/2021
Date of Issue	18/06/2021
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Heram Halim, Operations Manager
 Lien Tang, Assistant Operations Manager
 Michael Kubiak, Laboratory Manager
 Travis Carey, Organics - Team Leader

Authorised By



Michael Kubiak, Laboratory Manager

Miscellaneous Inorganics

Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Total Dissolved Solids (grav)	mg/L	5	36,000	39,000	38,000	38,000	38,000
Total Suspended Solids	mg/L	5	<5	<5	<5	<5	<5
Turbidity	NTU	0.1	0.8	0.9	1	0.8	0.9
Dissolved Organic Carbon	mg/L	1	1	1	1	1	1
Acidity as CaCO ₃	mg/L	5	7	7	6	7	7
Sulphide in water*	mg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	mg/L	0.1	<5	<5	<5	<5	<5

Miscellaneous Inorganics

Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Total Dissolved Solids (grav)	mg/L	5	38,000	39,000	39,000	39,000	39,000
Total Suspended Solids	mg/L	5	<5	<5	<5	<5	<5
Turbidity	NTU	0.1	0.8	0.6	0.5	0.5	0.5
Dissolved Organic Carbon	mg/L	1	1	1	1	1	1
Acidity as CaCO ₃	mg/L	5	8	6	6	7	7
Sulphide in water*	mg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	mg/L	0.1	<5	<5	<5	<5	<5

Miscellaneous Inorganics

Our Reference			263075-11	263075-12
Your Reference	UNITS	PQL	WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date prepared	-		04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021
Turbidity	NTU	0.1	0.4	0.2

Client Reference: EEC20092.002 - Swan River Crossing

Ionic Balance							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Calcium - Dissolved	mg/L	0.5	470	450	460	460	480
Potassium - Dissolved	mg/L	0.5	400	380	390	390	400
Magnesium - Dissolved	mg/L	0.5	1,500	1,400	1,500	1,400	1,500
Sodium - Dissolved	mg/L	0.5	12,000	12,000	12,000	12,000	13,000
Bicarbonate HCO ₃ as CaCO ₃	mg/L	5	120	120	120	120	130
Carbonate CO ₃ ²⁻ as CaCO ₃	mg/L	5	<5	<5	<5	<5	<5
Hydroxide OH ⁻ as CaCO ₃	mg/L	5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	5	120	120	120	120	130
Chloride	mg/L	1	20,000	20,000	20,000	20,000	20,000
Sulphate	mg/L	1	2,800	2,700	2,700	2,700	2,700
Ionic Balance	%		4.1	1.7	2.4	3.8	5.9
Hardness as CaCO ₃	mg/L	3	7,200	7,000	7,100	7,100	7,300

Ionic Balance							
Our Reference	UNITS	PQL	263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Calcium - Dissolved	mg/L	0.5	470	470	510	470	510
Potassium - Dissolved	mg/L	0.5	390	390	420	390	420
Magnesium - Dissolved	mg/L	0.5	1,500	1,500	1,600	1,500	1,600
Sodium - Dissolved	mg/L	0.5	12,000	12,000	13,000	12,000	13,000
Bicarbonate HCO ₃ as CaCO ₃	mg/L	5	120	120	120	120	120
Carbonate CO ₃ ²⁻ as CaCO ₃	mg/L	5	<5	<5	<5	<5	<5
Hydroxide OH ⁻ as CaCO ₃	mg/L	5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	5	120	120	120	120	120
Chloride	mg/L	1	20,000	20,000	20,000	20,000	20,000
Sulphate	mg/L	1	2,700	2,700	2,700	2,700	2,700
Ionic Balance	%		4.6	3.9	9.0	3.5	9.9
Hardness as CaCO ₃	mg/L	3	7,200	7,200	7,800	7,200	7,800

Client Reference: EEC20092.002 - Swan River Crossing

Nutrients in Water							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Total Nitrogen	mg/L	0.1	<0.5	<0.5	<0.5	<0.5	<0.5
NOx as N	mg/L	0.005	<0.005	0.009	0.019	0.019	0.006
Ammonia as N	mg/L	0.005	0.013	0.016	0.015	0.018	0.014
Total Phosphorus	mg/L	0.01	0.02	0.01	0.02	0.02	0.02
Phosphate as P	mg/L	0.005	<0.005	<0.005	0.006	0.006	0.005

Nutrients in Water							
Our Reference	UNITS	PQL	263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
Total Nitrogen	mg/L	0.1	<0.5	<0.5	<0.5	<0.5	<0.5
NOx as N	mg/L	0.005	0.009	0.006	0.018	0.008	0.030
Ammonia as N	mg/L	0.005	0.016	0.014	0.017	0.017	0.022
Total Phosphorus	mg/L	0.01	0.02	0.01	0.02	0.02	0.02
Phosphate as P	mg/L	0.005	<0.005	<0.005	0.006	0.006	0.006

Total Metals in water							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date digested	-		16/06/2021	16/06/2021	16/06/2021	18/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021	16/06/2021	18/06/2021	16/06/2021
Aluminium-Total	mg/L	0.01	0.03	<0.02	<0.02	<0.02	<0.02
Iron-Total	mg/L	0.01	0.03	0.02	<0.02	<0.02	<0.02

Total Metals in water							
Our Reference	UNITS	PQL	263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date digested	-		16/06/2021	16/06/2021	16/06/2021	16/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021	16/06/2021	16/06/2021	16/06/2021
Aluminium-Total	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Iron-Total	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02

Total Metals in water				
Our Reference	UNITS	PQL	263075-11	263075-12
Your Reference			WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date digested	-		16/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021
Aluminium-Total	mg/L	0.01	<0.01	<0.01
Iron-Total	mg/L	0.01	<0.01	<0.01

Dissolved Metals in Water							
Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		16/06/2021	16/06/2021	16/06/2021	18/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021	16/06/2021	18/06/2021	16/06/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.0001	<0.0001	<0.0001	<0.00005	<0.0001
Aluminium-Dissolved	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic-Dissolved	mg/L	0.001	<0.002	0.002	0.002	0.002	0.002
Cadmium-Dissolved	mg/L	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Cobalt-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Copper-Dissolved	mg/L	0.001	<0.002	0.003	<0.002	<0.002	<0.002
Iron-Dissolved	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum-Dissolved	mg/L	0.001	0.013	0.013	0.013	0.012	0.013
Nickel-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Lead-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Antimony-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc-Dissolved	mg/L	0.001	0.003	0.009	0.003	0.007	0.006
Silicon - Dissolved	mg/L	0.1	<1	<1	<1	<1	<1

Client Reference: EEC20092.002 - Swan River Crossing

Dissolved Metals in Water							
Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		16/06/2021	16/06/2021	16/06/2021	16/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021	16/06/2021	16/06/2021	16/06/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Aluminium-Dissolved	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium-Dissolved	mg/L	0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Cobalt-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Copper-Dissolved	mg/L	0.001	<0.002	<0.002	0.008	<0.002	<0.002
Iron-Dissolved	mg/L	0.01	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum-Dissolved	mg/L	0.001	0.012	0.013	0.013	0.012	0.019
Nickel-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Lead-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Antimony-Dissolved	mg/L	0.001	<0.002	0.002	<0.002	<0.002	<0.002
Selenium-Dissolved	mg/L	0.001	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc-Dissolved	mg/L	0.001	0.037	0.003	0.004	0.005	0.005
Silicon - Dissolved	mg/L	0.1	1.0	<1	<1	<1	1.1

Dissolved Metals in Water				
Our Reference			263075-11	263075-12
Your Reference	UNITS	PQL	WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date prepared	-		16/06/2021	16/06/2021
Date analysed	-		16/06/2021	16/06/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	<0.00005	<0.00005
Aluminium-Dissolved	mg/L	0.01	<0.01	<0.01
Arsenic-Dissolved	mg/L	0.001	<0.001	<0.001
Cadmium-Dissolved	mg/L	0.0001	<0.0001	<0.0001
Cobalt-Dissolved	mg/L	0.001	<0.001	<0.001
Chromium-Dissolved	mg/L	0.001	<0.001	<0.001
Copper-Dissolved	mg/L	0.001	<0.001	<0.001
Iron-Dissolved	mg/L	0.01	<0.01	<0.01
Mercury-Dissolved	mg/L	0.00005	<0.00005	<0.00005
Manganese-Dissolved	mg/L	0.005	<0.005	<0.005
Molybdenum-Dissolved	mg/L	0.001	<0.001	<0.001
Nickel-Dissolved	mg/L	0.001	<0.001	<0.001
Lead-Dissolved	mg/L	0.001	<0.001	<0.001
Antimony-Dissolved	mg/L	0.001	<0.001	<0.001
Selenium-Dissolved	mg/L	0.001	<0.001	<0.001
Zinc-Dissolved	mg/L	0.001	<0.001	<0.001
Silicon - Dissolved	mg/L	0.1	<0.1	<0.1

vTRH(C6-C10)/MBTEXN in water

Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
TRH C ₆ - C ₉	µg/L	10	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	10	<10	<10	<10	<10	<10
TRH C ₆ -C ₁₀ less BTEX (F1)	µg/L	10	<10	<10	<10	<10	<10
MTBE	µg/L	1	<1	<1	<1	<1	<1
Benzene	µg/L	1	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	1	<1	<1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	<2	<2	<2
o-xylene	µg/L	1	<1	<1	<1	<1	<1
Naphthalene	µg/L	1	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%		114	106	111	111	111
Surrogate toluene-d8	%		97	97	97	100	98
Surrogate 4-BFB	%		102	102	100	105	101

vTRH(C6-C10)/MBTEXN in water

Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date analysed	-		04/06/2021	04/06/2021	04/06/2021	04/06/2021	04/06/2021
TRH C ₆ - C ₉	µg/L	10	<10	<10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	10	<10	<10	<10	<10	<10
TRH C ₆ -C ₁₀ less BTEX (F1)	µg/L	10	<10	<10	<10	<10	<10
MTBE	µg/L	1	<1	<1	<1	<1	<1
Benzene	µg/L	1	<1	<1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	1	<1	<1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	<2	<2	<2
o-xylene	µg/L	1	<1	<1	<1	<1	<1
Naphthalene	µg/L	1	<1	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%		114	113	112	110	112
Surrogate toluene-d8	%		98	98	100	97	100
Surrogate 4-BFB	%		104	100	100	94	103

vTRH(C6-C10)/MBTEXN in water					
Our Reference			263075-11	263075-12	263075-13
Your Reference	UNITS	PQL	WB1	WR1	WTB1
Date Sampled			03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water
Date analysed	-		04/06/2021	04/06/2021	04/06/2021
TRH C ₆ - C ₉	µg/L	10	<10	<10	<10
TRH C ₆ - C ₁₀	µg/L	10	<10	<10	<10
TRH C ₆ -C ₁₀ less BTEX (F1)	µg/L	10	<10	<10	<10
MTBE	µg/L	1	<1	<1	<1
Benzene	µg/L	1	<1	<1	<1
Toluene	µg/L	1	<1	<1	<1
Ethylbenzene	µg/L	1	<1	<1	<1
m+p-xylene	µg/L	2	<2	<2	<2
o-xylene	µg/L	1	<1	<1	<1
Naphthalene	µg/L	1	<1	<1	<1
Surrogate Dibromofluoromethane	%		107	107	106
Surrogate toluene-d8	%		102	102	102
Surrogate 4-BFB	%		99	97	97

svTRH(C10-C40) in water							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
TRH C ₁₀ - C ₁₄	µg/L	50	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	100	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	100	<100	<100	<100	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	50	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆ less N (F2)	µg/L	50	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	100	<100	<100	<100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	100	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%		78	83	82	83	78

svTRH(C10-C40) in water							
Our Reference	UNITS	PQL	263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		08/06/2021	08/06/2021	08/06/2021	08/06/2021	08/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
TRH C ₁₀ - C ₁₄	µg/L	50	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	100	<100	<100	<100	<100	200
TRH C ₂₉ - C ₃₆	µg/L	100	<100	<100	<100	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	50	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆ less N (F2)	µg/L	50	<50	<50	<50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	100	<100	<100	<100	<100	200
TRH >C ₃₄ - C ₄₀	µg/L	100	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%		76	78	78	86	75

svTRH(C10-C40) in water				
Our Reference			263075-11	263075-12
Your Reference	UNITS	PQL	WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date extracted	-		08/06/2021	08/06/2021
Date analysed	-		10/06/2021	10/06/2021
TRH C ₁₀ - C ₁₄	µg/L	50	<50	<50
TRH C ₁₅ - C ₂₈	µg/L	100	<100	<100
TRH C ₂₉ - C ₃₆	µg/L	100	<100	<100
TRH >C ₁₀ - C ₁₆	µg/L	50	<50	<50
TRH >C ₁₀ -C ₁₆ less N (F2)	µg/L	50	<50	<50
TRH >C ₁₆ - C ₃₄	µg/L	100	<100	<100
TRH >C ₃₄ - C ₄₀	µg/L	100	<100	<100
Surrogate o-Terphenyl	%		81	80

PAHs in Water							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-D ₁₄	%		104	105	109	102	105

PAHs in Water							
Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-D ₁₄	%		100	98	103	94	101

PAHs in Water				
Our Reference			263075-11	263075-12
Your Reference	UNITS	PQL	WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date extracted	-		09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021
Naphthalene	µg/L	0.1	<0.1	1.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5	<0.5
Total +ve PAH's	µg/L	0.1	<0.1	1.1
Surrogate p-Terphenyl-D ₁₄	%		101	102

Low Level OCP in water							
Our Reference	UNITS	PQL	263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference			WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		109	111	114	107	110

Low Level OCP in water							
Our Reference	UNITS	PQL	263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference			WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date extracted	-		09/06/2021	09/06/2021	09/06/2021	09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021	10/06/2021	10/06/2021	10/06/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		107	101	109	103	108

Low Level OCP in water				
Our Reference			263075-11	263075-12
Your Reference	UNITS	PQL	WB1	WR1
Date Sampled			03/06/2021	03/06/2021
Type of sample			Water	Water
Date extracted	-		09/06/2021	09/06/2021
Date analysed	-		10/06/2021	10/06/2021
Hexachlorobenzene (HCB)	µg/L	0.01	<0.01	<0.01
a-BHC	µg/L	0.05	<0.05	<0.05
Lindane (g-BHC)	µg/L	0.05	<0.05	<0.05
b-BHC	µg/L	0.05	<0.05	<0.05
Heptachlor	µg/L	0.01	<0.01	<0.01
d-BHC	µg/L	0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01
Heptachlor Epoxide	µg/L	0.01	<0.01	<0.01
g-Chlordane	µg/L	0.01	<0.01	<0.01
a-Chlordane	µg/L	0.01	<0.01	<0.01
a-Endosulfan	µg/L	0.02	<0.02	<0.02
pp-DDE	µg/L	0.01	<0.01	<0.01
Dieldrin	µg/L	0.01	<0.01	<0.01
Endrin	µg/L	0.01	<0.01	<0.01
pp-DDD	µg/L	0.01	<0.01	<0.01
b-Endosulfan	µg/L	0.02	<0.02	<0.02
pp-DDT	µg/L	0.006	<0.006	<0.006
Endosulfan Sulphate	µg/L	0.02	<0.02	<0.02
Methoxychlor	µg/L	0.02	<0.02	<0.02
Surrogate 2-chlorophenol-d4	%		99	103

PFAS in Water TRACE Extended							
Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		11/06/2021	11/06/2021	11/06/2021	11/06/2021	11/06/2021
Date analysed	-		11/06/2021	11/06/2021	11/06/2021	11/06/2021	11/06/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid	µg/L	0.0002	0.0005	0.0007	0.0009	0.0008	0.0007
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonate PFOS	µg/L	0.0002	0.0009	0.001	0.001	0.001	0.001
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid	µg/L	0.0004	<0.0004	<0.0004	0.0004	0.0004	0.0004
Perfluoroheptanoic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Perfluorooctanoic acid PFOA	µg/L	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Surrogate ¹³ C ₈ PFOS	%		101	97	94	96	96
Surrogate ¹³ C ₂ PFOA	%		99	98	91	96	91
Extracted ISTD ¹³ C ₃ PFBS	%		95	97	97	90	96
Extracted ISTD ¹⁸ O ₂ PFHxS	%		91	96	100	88	94
Extracted ISTD ¹³ C ₄ PFOS	%		95	104	100	95	99
Extracted ISTD ¹³ C ₄ PFBA	%		63	60	62	57	57

PFAS in Water TRACE Extended							
Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%		94	95	100	91	94
Extracted ISTD ¹³ C ₂ PFHxA	%		100	107	109	97	100
Extracted ISTD ¹³ C ₄ PFHpA	%		107	112	119	103	111
Extracted ISTD ¹³ C ₄ PFOA	%		121	128	135	120	128
Extracted ISTD ¹³ C ₅ PFNA	%		128	136	130	124	124
Extracted ISTD ¹³ C ₂ PFDA	%		106	113	95	101	106
Extracted ISTD ¹³ C ₂ PFUnDA	%		103	110	102	98	107
Extracted ISTD ¹³ C ₂ PFDoDA	%		100	108	101	94	110
Extracted ISTD ¹³ C ₂ PFTeDA	%		96	100	101	88	106
Extracted ISTD ¹³ C ₂ 4:2FTS	%		112	125	128	114	123
Extracted ISTD ¹³ C ₂ 6:2FTS	%		101	110	113	99	106
Extracted ISTD ¹³ C ₂ 8:2FTS	%		98	87	84	93	90
Extracted ISTD ¹³ C ₈ FOSA	%		73	80	82	71	77
Extracted ISTD d ₃ N MeFOSA	%		43	57	57	44	47
Extracted ISTD d ₅ N EtFOSA	%		39	49	50	40	46
Extracted ISTD d ₇ N MeFOSE	%		58	68	73	62	67
Extracted ISTD d ₉ N EtFOSE	%		57	67	72	60	70
Extracted ISTD d ₃ N MeFOSAA	%		102	105	116	103	105
Extracted ISTD d ₅ N EtFOSAA	%		90	91	90	80	89
Total Positive PFHxS & PFOS	µg/L	0.0002	0.001	0.002	0.002	0.002	0.002
Total Positive PFOS & PFOA	µg/L	0.0002	0.001	0.001	0.001	0.001	0.001
Total Positive PFAS	µg/L	0.0002	0.002	0.002	0.0026	0.0025	0.0024

PFAS in Water TRACE Extended

Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Date prepared	-		11/06/2021	11/06/2021	11/06/2021	11/06/2021	11/06/2021
Date analysed	-		11/06/2021	11/06/2021	11/06/2021	11/06/2021	11/06/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid	µg/L	0.0002	0.001	0.0009	0.001	0.0008	0.0008
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonate PFOS	µg/L	0.0002	0.0022	0.001	0.0020	0.001	0.001
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid	µg/L	0.0004	0.0009	0.0005	0.0005	0.0004	0.0004
Perfluoroheptanoic acid	µg/L	0.0004	0.0005	<0.0004	<0.0004	<0.0004	<0.0004
Perfluorooctanoic acid PFOA	µg/L	0.0002	0.0004	0.0004	0.0003	0.0003	0.0003
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Surrogate ¹³ C ₈ PFOS	%		96	95	102	96	97
Surrogate ¹³ C ₂ PFOA	%		91	92	89	89	88
Extracted ISTD ¹³ C ₃ PFBS	%		97	94	94	95	102
Extracted ISTD ¹⁸ O ₂ PFHxS	%		90	91	89	90	96
Extracted ISTD ¹³ C ₄ PFOS	%		98	96	88	94	101
Extracted ISTD ¹³ C ₄ PFBA	%		47	52	55	59	59

PFAS in Water TRACE Extended							
Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%		82	93	92	95	102
Extracted ISTD ¹³ C ₂ PFHxA	%		98	97	102	102	110
Extracted ISTD ¹³ C ₄ PFHpA	%		106	114	110	109	118
Extracted ISTD ¹³ C ₄ PFOA	%		128	126	129	127	136
Extracted ISTD ¹³ C ₅ PFNA	%		126	128	125	123	140
Extracted ISTD ¹³ C ₂ PFDA	%		103	101	96	108	112
Extracted ISTD ¹³ C ₂ PFUnDA	%		103	108	99	99	113
Extracted ISTD ¹³ C ₂ PFDoDA	%		108	107	99	97	108
Extracted ISTD ¹³ C ₂ PFTeDA	%		104	96	94	90	89
Extracted ISTD ¹³ C ₂ 4:2FTS	%		125	125	127	123	138
Extracted ISTD ¹³ C ₂ 6:2FTS	%		106	104	98	99	110
Extracted ISTD ¹³ C ₂ 8:2FTS	%		91	85	82	97	106
Extracted ISTD ¹³ C ₈ FOSA	%		77	76	73	78	81
Extracted ISTD d ₃ N MeFOSA	%		49	46	44	54	54
Extracted ISTD d ₅ N EtFOSA	%		45	45	43	48	48
Extracted ISTD d ₇ N MeFOSE	%		70	65	62	70	72
Extracted ISTD d ₉ N EtFOSE	%		71	62	63	64	72
Extracted ISTD d ₃ N MeFOSAA	%		117	110	115	107	124
Extracted ISTD d ₅ N EtFOSAA	%		83	90	94	85	90
Total Positive PFHxS & PFOS	µg/L	0.0002	0.0032	0.002	0.0030	0.002	0.002
Total Positive PFOS & PFOA	µg/L	0.0002	0.0026	0.001	0.0023	0.001	0.001
Total Positive PFAS	µg/L	0.0002	0.0050	0.0028	0.0038	0.0025	0.0025

PFAS in Water TRACE Extended					
Our Reference			263075-11	263075-12	263075-13
Your Reference	UNITS	PQL	WB1	WR1	WTB1
Date Sampled			03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water
Date prepared	-		11/06/2021	11/06/2021	11/06/2021
Date analysed	-		11/06/2021	11/06/2021	11/06/2021
Perfluorobutanesulfonic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluoropentanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanesulfonic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorooctanesulfonate PFOS	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanesulfonic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluoroheptanoic acid	µg/L	0.0004	<0.0004	<0.0004	<0.0004
Perfluorooctanoic acid PFOA	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid	µg/L	0.005	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.001	<0.001	<0.001
6:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004
8:2 FTS	µg/L	0.0004	<0.0004	<0.0004	<0.0004
10:2 FTS	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	0.01	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	<0.005	<0.005	<0.005
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	<0.002	<0.002	<0.002
Surrogate ¹³ C ₈ PFOS	%		99	98	96
Surrogate ¹³ C ₂ PFOA	%		102	98	104
Extracted ISTD ¹³ C ₃ PFBS	%		101	103	101
Extracted ISTD ¹⁸ O ₂ PFHxS	%		88	101	98
Extracted ISTD ¹³ C ₄ PFOS	%		86	96	99
Extracted ISTD ¹³ C ₄ PFBA	%		105	105	101

PFAS in Water TRACE Extended					
Our Reference			263075-11	263075-12	263075-13
Your Reference	UNITS	PQL	WB1	WR1	WTB1
Date Sampled			03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water
Extracted ISTD ¹³ C ₃ PFPeA	%		112	114	112
Extracted ISTD ¹³ C ₂ PFHxA	%		108	108	107
Extracted ISTD ¹³ C ₄ PFHpA	%		113	123	115
Extracted ISTD ¹³ C ₄ PFOA	%		119	129	121
Extracted ISTD ¹³ C ₅ PFNA	%		118	132	131
Extracted ISTD ¹³ C ₂ PFDA	%		89	100	105
Extracted ISTD ¹³ C ₂ PFUnDA	%		77	91	95
Extracted ISTD ¹³ C ₂ PFDoDA	%		67	97	79
Extracted ISTD ¹³ C ₂ PFTeDA	%		73	93	73
Extracted ISTD ¹³ C ₂ 4:2FTS	%		130	133	130
Extracted ISTD ¹³ C ₂ 6:2FTS	%		97	100	104
Extracted ISTD ¹³ C ₂ 8:2FTS	%		71	80	81
Extracted ISTD ¹³ C ₈ FOSA	%		89	89	88
Extracted ISTD d ₃ N MeFOSA	%		56	56	50
Extracted ISTD d ₅ N EtFOSA	%		47	51	46
Extracted ISTD d ₇ N MeFOSE	%		60	60	61
Extracted ISTD d ₉ N EtFOSE	%		59	61	58
Extracted ISTD d ₃ N MeFOSAA	%		86	90	97
Extracted ISTD d ₅ N EtFOSAA	%		81	88	90
Total Positive PFHxS & PFOS	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Total Positive PFOS & PFOA	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Total Positive PFAS	µg/L	0.0002	<0.0002	<0.0002	<0.0002

Chlorophyll a & Phaeophytin a

Our Reference			263075-1	263075-2	263075-3	263075-4	263075-5
Your Reference	UNITS	PQL	WS1-S	WS1-D	WS2-S	WS2-D	WS3-S
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Chlorophyll a	µg/L	0.1	0.9	0.8	1.0	1.0	0.9
Phaeophytin a	µg/L	0.2	0.5	0.6	0.5	0.6	0.5

Chlorophyll a & Phaeophytin a

Our Reference			263075-6	263075-7	263075-8	263075-9	263075-10
Your Reference	UNITS	PQL	WS4-S	WS4-D	WS5-S	WS5-D	WZ1
Date Sampled			03/06/2021	03/06/2021	03/06/2021	03/06/2021	03/06/2021
Type of sample			Water	Water	Water	Water	Water
Chlorophyll a	µg/L	0.1	1.4	1.2	0.8	0.9	1.0
Phaeophytin a	µg/L	0.2	0.4	0.4	0.4	0.4	0.4

Method ID	Methodology Summary
Ext-058	Analysed by The Marine and Freshwater Research Laboratory, accreditation number 10603
INORG-005	Acidity - determined by titration based on APHA latest edition, Method 2310 B. Soils reported from a 1:5 water extract unless otherwise specified.
INORG-006	Alkalinity - determined titrimetrically based on APHA latest edition, Method 2320-B. Soils reported from a 1:5 water extract unless otherwise specified.
INORG-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180±10°C
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample. The solids are dried at 104±5°C
INORG-022	Turbidity - measured nephelometrically using a turbidimeter, in accordance with APHA latest edition, 2130 B.
INORG-040	Ion Balance Calculation: Cations in water by ICP-OES; Anions in water by IC; Alkalinity in water by Titration using APHA methods.
INORG-051	Determination of sulphide by titration and/or colourimetric determination. Note, the Sulphide is termed as Total Sulphide given any Sulphide contained in any sediment present may also included in the determination.
INORG-055	NOx - determined colourimetrically. Soils are analysed from a water extract.
INORG-057	Ammonia by colourimetric analysis based on APHA latest edition 4500-NH3 F.
INORG-060	Phosphate- determined colourimetrically. Soils are analysed from a water extract.
INORG-060	Total Phosphorus by colourimetric analysis based on APHA latest edition 4500-P J.
INORG-081	Anions - a range of anions are determined by Ion Chromatography based on APHA latest edition Method 4110-B. Soils and other sample types reported from a water extract unless otherwise specified (standard soil extract ratio 1:5).
INORG-110	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection. Dissolved/Total Carbon and Dissolved/Total Organic and Inorganic Carbon by high temperature catalytic combustion with NDIR
METALS-008	Hardness calculated from Calcium and Magnesium as per APHA latest edition 2340B.
METALS-020	Determination of various metals by ICP-AES.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	For urine samples total Mercury is determined, however, mercury in urine is almost entirely in the inorganic form (CDC). Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM draft B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date prepared	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Date analysed	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Total Dissolved Solids (grav)	mg/L	5	INORG-018	<5	1	36000	[NT]		100	[NT]
Total Suspended Solids	mg/L	5	INORG-019	<5	1	<5	[NT]		100	[NT]
Turbidity	NTU	0.1	INORG-022	<0.1	1	0.8	[NT]		87	[NT]
Dissolved Organic Carbon	mg/L	1	INORG-110	<1	1	1	1	0	98	102
Acidity as CaCO ₃	mg/L	5	INORG-005	<5	1	7	6	15	96	[NT]
Sulphide in water*	mg/L	0.5	INORG-051	<0.5	1	<0.5	[NT]		107	[NT]
Fluoride	mg/L	0.1	INORG-081	<0.1	1	<5	<5	0	103	104

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	4	04/06/2021	04/06/2021		[NT]	[NT]
Date analysed	-			[NT]	4	04/06/2021	04/06/2021		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	INORG-018	[NT]	4	38000	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	INORG-019	[NT]	4	<5	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	INORG-022	[NT]	4	0.8	0.8	0	[NT]	[NT]
Dissolved Organic Carbon	mg/L	1	INORG-110	[NT]	4	1	[NT]		[NT]	[NT]
Acidity as CaCO ₃	mg/L	5	INORG-005	[NT]	4	7	[NT]		[NT]	[NT]
Sulphide in water*	mg/L	0.5	INORG-051	[NT]	4	<0.5	[NT]		[NT]	[NT]
Fluoride	mg/L	0.1	INORG-081	[NT]	4	<5	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	04/06/2021	04/06/2021		[NT]	[NT]
Date analysed	-			[NT]	10	04/06/2021	04/06/2021		[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	INORG-018	[NT]	10	39000	40000	3	[NT]	[NT]
Total Suspended Solids	mg/L	5	INORG-019	[NT]	10	<5	[NT]		[NT]	[NT]
Turbidity	NTU	0.1	INORG-022	[NT]	10	0.5	[NT]		[NT]	[NT]
Dissolved Organic Carbon	mg/L	1	INORG-110	[NT]	10	1	[NT]		[NT]	[NT]
Acidity as CaCO ₃	mg/L	5	INORG-005	[NT]	10	7	[NT]		[NT]	[NT]
Sulphide in water*	mg/L	0.5	INORG-051	[NT]	10	<0.5	[NT]		[NT]	[NT]
Fluoride	mg/L	0.1	INORG-081	[NT]	10	<5	[NT]		[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Ionic Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date prepared	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Date analysed	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Calcium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	470	[NT]		89	[NT]
Potassium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	400	[NT]		100	[NT]
Magnesium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	1500	[NT]		94	[NT]
Sodium - Dissolved	mg/L	0.5	METALS-020	<0.5	1	12000	[NT]		102	[NT]
Bicarbonate HCO ₃ as CaCO ₃	mg/L	5	INORG-006	<5	1	120	120	0	100	[NT]
Carbonate CO ₃ ²⁻ as CaCO ₃	mg/L	5	INORG-006	<5	1	<5	<5	0	100	[NT]
Total Alkalinity as CaCO ₃	mg/L	5	INORG-006	<5	1	120	120	0	100	[NT]
Chloride	mg/L	1	INORG-081	<1	1	20000	20000	0	97	72
Sulphate	mg/L	1	INORG-081	<1	1	2800	2800	0	93	103
Hardness as CaCO ₃	mg/L	3	METALS-008	<3	1	7200	[NT]		[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Nutrients in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date prepared	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Date analysed	-			04/06/2021	1	04/06/2021	04/06/2021		04/06/2021	04/06/2021
Total Nitrogen	mg/L	0.1	INORG-110	<0.1	1	<0.5	<0.5	0	106	99
NOx as N	mg/L	0.005	INORG-055	<0.005	1	<0.005	<0.005	0	105	107
Ammonia as N	mg/L	0.005	INORG-057	<0.005	1	0.013	0.014	7	100	118
Total Phosphorus	mg/L	0.01	INORG-060	<0.01	1	0.02	0.01	67	99	108
Phosphate as P	mg/L	0.005	INORG-060	<0.005	1	<0.005	<0.005	0	110	95

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Total Metals in water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date digested	-			16/06/2021	1	16/06/2021	16/06/2021		16/06/2021	16/06/2021
Date analysed	-			16/06/2021	1	16/06/2021	16/06/2021		16/06/2021	16/06/2021
Aluminium-Total	mg/L	0.01	METALS-022	<0.01	1	0.03	0.03	0	90	93
Iron-Total	mg/L	0.01	METALS-022	<0.01	1	0.03	0.03	0	106	103

QUALITY CONTROL: Total Metals in water						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date digested	-			[NT]	11	16/06/2021	16/06/2021		[NT]	[NT]
Date analysed	-			[NT]	11	16/06/2021	16/06/2021		[NT]	[NT]
Aluminium-Total	mg/L	0.01	METALS-022	[NT]	11	<0.01	<0.01	0	[NT]	[NT]
Iron-Total	mg/L	0.01	METALS-022	[NT]	11	<0.01	<0.01	0	[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Dissolved Metals in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date prepared	-			16/06/2021	1	16/06/2021	16/06/2021		16/06/2021	16/06/2021
Date analysed	-			16/06/2021	1	16/06/2021	16/06/2021		16/06/2021	16/06/2021
Silver-Dissolved Ultra Low	mg/L	0.00005	METALS-022	<0.00005	1	<0.0001	[NT]		104	[NT]
Aluminium-Dissolved	mg/L	0.01	METALS-022	<0.01	1	<0.02	[NT]		87	[NT]
Arsenic-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		102	[NT]
Cadmium-Dissolved	mg/L	0.0001	METALS-022	<0.0001	1	<0.0002	[NT]		101	[NT]
Cobalt-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		105	[NT]
Chromium-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		100	[NT]
Copper-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		101	[NT]
Iron-Dissolved	mg/L	0.01	METALS-022	<0.01	1	<0.02	[NT]		112	[NT]
Mercury-Dissolved	mg/L	0.00005	METALS-021	<0.00005	1	<0.00005	<0.00005	0	109	88
Manganese-Dissolved	mg/L	0.005	METALS-022	<0.005	1	<0.01	[NT]		100	[NT]
Molybdenum-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.013	[NT]		102	[NT]
Nickel-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		101	[NT]
Lead-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		104	[NT]
Antimony-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		102	[NT]
Selenium-Dissolved	mg/L	0.001	METALS-022	<0.001	1	<0.002	[NT]		105	[NT]
Zinc-Dissolved	mg/L	0.001	METALS-022	<0.001	1	0.003	[NT]		101	[NT]
Silicon - Dissolved	mg/L	0.1	METALS-020	<0.1	1	<1	[NT]		108	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Dissolved Metals in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	5	16/06/2021	16/06/2021		[NT]	[NT]
Date analysed	-			[NT]	5	16/06/2021	16/06/2021		[NT]	[NT]
Silver-Dissolved Ultra Low	mg/L	0.00005	METALS-022	[NT]	5	<0.0001	<0.0001	0	[NT]	[NT]
Aluminium-Dissolved	mg/L	0.01	METALS-022	[NT]	5	<0.02	<0.02	0	[NT]	[NT]
Arsenic-Dissolved	mg/L	0.001	METALS-022	[NT]	5	0.002	<0.002	0	[NT]	[NT]
Cadmium-Dissolved	mg/L	0.0001	METALS-022	[NT]	5	<0.0002	<0.0002	0	[NT]	[NT]
Cobalt-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Chromium-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Copper-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Iron-Dissolved	mg/L	0.01	METALS-022	[NT]	5	<0.02	<0.02	0	[NT]	[NT]
Mercury-Dissolved	mg/L	0.00005	METALS-021	[NT]	5	<0.00005	[NT]		[NT]	[NT]
Manganese-Dissolved	mg/L	0.005	METALS-022	[NT]	5	<0.01	<0.01	0	[NT]	[NT]
Molybdenum-Dissolved	mg/L	0.001	METALS-022	[NT]	5	0.013	0.012	8	[NT]	[NT]
Nickel-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Lead-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Antimony-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Selenium-Dissolved	mg/L	0.001	METALS-022	[NT]	5	<0.002	<0.002	0	[NT]	[NT]
Zinc-Dissolved	mg/L	0.001	METALS-022	[NT]	5	0.006	0.006	0	[NT]	[NT]
Silicon - Dissolved	mg/L	0.1	METALS-020	[NT]	5	<1	[NT]		[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Dissolved Metals in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	16/06/2021	16/06/2021		[NT]	[NT]
Date analysed	-			[NT]	11	16/06/2021	16/06/2021		[NT]	[NT]
Silver-Dissolved Ultra Low	mg/L	0.00005	METALS-022	[NT]	11	<0.00005	[NT]		[NT]	[NT]
Aluminium-Dissolved	mg/L	0.01	METALS-022	[NT]	11	<0.01	[NT]		[NT]	[NT]
Arsenic-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Cadmium-Dissolved	mg/L	0.0001	METALS-022	[NT]	11	<0.0001	[NT]		[NT]	[NT]
Cobalt-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Chromium-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Copper-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Iron-Dissolved	mg/L	0.01	METALS-022	[NT]	11	<0.01	[NT]		[NT]	[NT]
Mercury-Dissolved	mg/L	0.00005	METALS-021	[NT]	11	<0.00005	<0.00005	0	[NT]	[NT]
Manganese-Dissolved	mg/L	0.005	METALS-022	[NT]	11	<0.005	[NT]		[NT]	[NT]
Molybdenum-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Nickel-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Lead-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Antimony-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Selenium-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Zinc-Dissolved	mg/L	0.001	METALS-022	[NT]	11	<0.001	[NT]		[NT]	[NT]
Silicon - Dissolved	mg/L	0.1	METALS-020	[NT]	11	<0.1	[NT]		[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: vTRH(C6-C10)/MBTEXN in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date analysed	-			04/06/2021	[NT]	[NT]	[NT]	[NT]	04/06/2021	[NT]
TRH C ₈ - C ₉	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C ₈ - C ₁₀	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
MTBE	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	103	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate toluene-d8	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	95	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: svTRH(C10-C40) in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date extracted	-			08/06/2021	1	08/06/2021	08/06/2021		08/06/2021	08/06/2021
Date analysed	-			10/06/2021	1	10/06/2021	10/06/2021		10/06/2021	10/06/2021
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	<50	1	<50	<50	0	76	90
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	<100	1	<100	<100	0	77	92
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	<100	1	<100	<100	0	76	83
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	<50	1	<50	<50	0	79	94
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	<100	1	<100	<100	0	78	93
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	<100	1	<100	<100	0	73	88
Surrogate o-Terphenyl	%		Org-020	78	1	78	79	1	72	83

QUALITY CONTROL: svTRH(C10-C40) in water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	08/06/2021	08/06/2021		[NT]	[NT]
Date analysed	-			[NT]	12	10/06/2021	10/06/2021		[NT]	[NT]
TRH C ₁₀ - C ₁₄	µg/L	50	Org-020	[NT]	12	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	µg/L	100	Org-020	[NT]	12	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	µg/L	100	Org-020	[NT]	12	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ - C ₁₆	µg/L	50	Org-020	[NT]	12	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ - C ₃₄	µg/L	100	Org-020	[NT]	12	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ - C ₄₀	µg/L	100	Org-020	[NT]	12	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	12	80	73	9	[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date extracted	-			09/06/2021	1	09/06/2021	09/06/2021		09/06/2021	09/06/2021
Date analysed	-			10/06/2021	1	10/06/2021	10/06/2021		10/06/2021	10/06/2021
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	102
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	113
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	113
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	120
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	115
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	124
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	110
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-D ₁₄	%		Org-022/025	88	1	104	93	11	104	108

QUALITY CONTROL: PAHs in Water					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	09/06/2021	09/06/2021		[NT]	[NT]
Date analysed	-			[NT]	10	10/06/2021	10/06/2021		[NT]	[NT]
Naphthalene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluorene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Anthracene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Pyrene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-D ₁₄	%		Org-022/025	[NT]	10	101	104	3	[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Low Level OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	263075-2
Date extracted	-			09/06/2021	1	09/06/2021	09/06/2021		09/06/2021	09/06/2021
Date analysed	-			10/06/2021	1	10/06/2021	10/06/2021		10/06/2021	10/06/2021
Hexachlorobenzene (HCB)	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
a-BHC	µg/L	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	89	109
Lindane (g-BHC)	µg/L	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	[NT]	[NT]
b-BHC	µg/L	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	87	107
Heptachlor	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	99	111
d-BHC	µg/L	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	[NT]	[NT]
Aldrin	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	94	105
Heptachlor Epoxide	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	101	109
g-Chlordane	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
a-Chlordane	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
a-Endosulfan	µg/L	0.02	Org-022/025	<0.02	1	<0.02	<0.02	0	[NT]	[NT]
pp-DDE	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	103	119
Dieldrin	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	113	132
Endrin	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
pp-DDD	µg/L	0.01	Org-022/025	<0.01	1	<0.01	<0.01	0	106	111
b-Endosulfan	µg/L	0.02	Org-022/025	<0.02	1	<0.02	<0.02	0	[NT]	[NT]
pp-DDT	µg/L	0.006	Org-022/025	<0.006	1	<0.006	<0.006	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.02	Org-022/025	<0.02	1	<0.02	<0.02	0	111	115
Methoxychlor	µg/L	0.02	Org-022/025	<0.02	1	<0.02	<0.02	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	84	1	109	101	8	102	115

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Low Level OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	09/06/2021	09/06/2021		[NT]	[NT]
Date analysed	-			[NT]	10	10/06/2021	10/06/2021		[NT]	[NT]
Hexachlorobenzene (HCB)	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
a-BHC	µg/L	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	[NT]	[NT]
Lindane (g-BHC)	µg/L	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	[NT]	[NT]
b-BHC	µg/L	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	[NT]	[NT]
Heptachlor	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
d-BHC	µg/L	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	[NT]	[NT]
Aldrin	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
Heptachlor Epoxide	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
g-Chlordane	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
a-Chlordane	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
a-Endosulfan	µg/L	0.02	Org-022/025	[NT]	10	<0.02	<0.02	0	[NT]	[NT]
pp-DDE	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
Dieldrin	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
Endrin	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
pp-DDD	µg/L	0.01	Org-022/025	[NT]	10	<0.01	<0.01	0	[NT]	[NT]
b-Endosulfan	µg/L	0.02	Org-022/025	[NT]	10	<0.02	<0.02	0	[NT]	[NT]
pp-DDT	µg/L	0.006	Org-022/025	[NT]	10	<0.006	<0.006	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.02	Org-022/025	[NT]	10	<0.02	<0.02	0	[NT]	[NT]
Methoxychlor	µg/L	0.02	Org-022/025	[NT]	10	<0.02	<0.02	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022/025	[NT]	10	108	110	2	[NT]	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: PFAS in Water TRACE Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			11/06/2021	[NT]	[NT]	[NT]	[NT]	11/06/2021	[NT]
Date analysed	-			11/06/2021	[NT]	[NT]	[NT]	[NT]	11/06/2021	[NT]
Perfluorobutanesulfonic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	92	[NT]
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	85	[NT]
Perfluorohexanesulfonic acid	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorooctanesulfonate PFOS	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	103	[NT]
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	95	[NT]
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluorohexanoic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	99	[NT]
Perfluoroheptanoic acid	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	96	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.0002	Org-029	<0.0002	[NT]	[NT]	[NT]	[NT]	101	[NT]
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	79	[NT]
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	97	[NT]
4:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	99	[NT]
6:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	96	[NT]
8:2 FTS	µg/L	0.0004	Org-029	<0.0004	[NT]	[NT]	[NT]	[NT]	95	[NT]
10:2 FTS	µg/L	0.002	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	118	[NT]
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	98	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	105	[NT]
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	99	[NT]
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	100	[NT]
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	97	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	107	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate ¹³ C ₈ PFOS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate ¹³ C ₂ PFOA	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₃ PFBS	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	108	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: PFAS in Water TRACE Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD ¹⁸ O ₂ PFHxS	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	103	[NT]
Extracted ISTD ¹³ C ₄ PFOS	%		Org-029	90	[NT]	[NT]	[NT]	[NT]	102	[NT]
Extracted ISTD ¹³ C ₄ PFBA	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	108	[NT]
Extracted ISTD ¹³ C ₃ PFPeA	%		Org-029	110	[NT]	[NT]	[NT]	[NT]	112	[NT]
Extracted ISTD ¹³ C ₂ PFHxA	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₄ PFHpA	%		Org-029	112	[NT]	[NT]	[NT]	[NT]	118	[NT]
Extracted ISTD ¹³ C ₄ PFOA	%		Org-029	120	[NT]	[NT]	[NT]	[NT]	124	[NT]
Extracted ISTD ¹³ C ₅ PFNA	%		Org-029	125	[NT]	[NT]	[NT]	[NT]	138	[NT]
Extracted ISTD ¹³ C ₂ PFDA	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD ¹³ C ₂ PFUnDA	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD ¹³ C ₂ PFDoDA	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD ¹³ C ₂ PFTeDA	%		Org-029	84	[NT]	[NT]	[NT]	[NT]	70	[NT]
Extracted ISTD ¹³ C ₂ 4:2FTS	%		Org-029	120	[NT]	[NT]	[NT]	[NT]	122	[NT]
Extracted ISTD ¹³ C ₂ 6:2FTS	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	111	[NT]
Extracted ISTD ¹³ C ₂ 8:2FTS	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD ¹³ C ₈ FOSA	%		Org-029	94	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD d ₃ N MeFOSA	%		Org-029	52	[NT]	[NT]	[NT]	[NT]	45	[NT]
Extracted ISTD d ₅ N EtFOSA	%		Org-029	46	[NT]	[NT]	[NT]	[NT]	43	[NT]
Extracted ISTD d ₇ N MeFOSE	%		Org-029	57	[NT]	[NT]	[NT]	[NT]	64	[NT]
Extracted ISTD d ₉ N EtFOSE	%		Org-029	57	[NT]	[NT]	[NT]	[NT]	64	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: PFAS in Water TRACE Extended						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d ₃ N MeFOSAA	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD d ₅ N EtFOSAA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	98	[NT]

Client Reference: EEC20092.002 - Swan River Crossing

QUALITY CONTROL: Chlorophyll a & Phaeophytin a					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	
Chlorophyll a	µg/L	0.1	Ext-058	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phaeophytin a	µg/L	0.2	Ext-058	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Chlorophyll "a" and Phaeophytins subcontracted to Murdoch University, report reference MPL21-19.

PFAS performed by Envirolab Services Pty Ltd, NSW, report reference 271168.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

MeFOSA and EtFOSA Extracted Internal Standard is outside of global acceptance criteria (50-150%) for (LCS and/or MB) but within analyte specific acceptance criteria.

Note: Some results have raised pqls. In these cases the sample's high TDS required the sample to be diluted prior to analysis.

DATA QUALITY ASSESSMENT SUMMARY

Report Details	
Envirolab Report Reference	263075
Client ID	RPS Australia West Pty Ltd
Project Reference	EEC20092.002 - Swan River Crossing
Date Issued	18/06/2021

QC DATA

All laboratory QC data was within the Envirolab Group's specifications.

HOLDING TIME COMPLIANCE EVALUATION

All preservation / holding times (based on AS/ASPHA/ISO/NEPM/USEPA reference documents and standards) are compliant except:

Holding Time Exceedances					
Analysis	Sample No	Date Sampled	Date Extracted	Date Analysed	Accepted
Chlorophyll a & Phaeophytin a					
Chlorophyll a	263075-1	03/06/2021			##
Phaeophytin a	263075-1	03/06/2021			##
Chlorophyll a	263075-2	03/06/2021			##
Phaeophytin a	263075-2	03/06/2021			##
Chlorophyll a	263075-3	03/06/2021			##
Phaeophytin a	263075-3	03/06/2021			##
Chlorophyll a	263075-4	03/06/2021			##
Phaeophytin a	263075-4	03/06/2021			##
Chlorophyll a	263075-5	03/06/2021			##
Phaeophytin a	263075-5	03/06/2021			##
Chlorophyll a	263075-6	03/06/2021			##
Phaeophytin a	263075-6	03/06/2021			##
Chlorophyll a	263075-7	03/06/2021			##
Phaeophytin a	263075-7	03/06/2021			##
Chlorophyll a	263075-8	03/06/2021			##
Phaeophytin a	263075-8	03/06/2021			##
Chlorophyll a	263075-9	03/06/2021			##
Phaeophytin a	263075-9	03/06/2021			##
Chlorophyll a	263075-10	03/06/2021			##
Phaeophytin a	263075-10	03/06/2021			##

Holding Table Comments

No Extract or Analysed Dates were provided. Holding Times cannot be calculated.



Certain analyses have had their recommended technical holding times elongated by filtering and/or freezing on receipt at the laboratory (e.g. BOD, chlorophyll/Pheophytin, nutrients and acid sulphate soil tests).

COMPLIANCE TO QC FREQUENCY (NEPM)

Internal laboratory QC rate complies with NEPM requirements (LCS/MB/MS 1 in 20, Duplicates 1 in 10 samples). Note, samples are batched together with other sample consignments in order to assign QC sample frequency.

QC Evaluation	
Duplicate(s) was performed as per NEPM frequency	✓
Laboratory Control Sample(s) were analysed with the samples received	✓
A Method Blank was performed with the samples received	✓
Matrix spike(s) was performed as per NEPM frequency (Not Applicable for Air samples)	✓

Refer to Certificate of Analysis for all Quality Control data.

SAMPLE RECEIPT ADVICE

Client Details

Client	RPS Australia West Pty Ltd
Attention	Zak Langtry

Sample Login Details

Your reference	EEC20092.002 - Swan River Crossing
MPL Reference	263075
Date Sample Received	03/06/2021
Date Instructions Received	03/06/2021
Date Results Expected to be Reported	18/06/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	13 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	Yes

Comments

Nil

Please direct any queries to:

Heram Halim

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Meredith Conroy

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Fax: 08 9317 4163
Email: mconroy@mpl.com.au

Analysis Underway, details on the following page:

Sample ID	Total Dissolved Solids (grav)	Total Suspended Solids	Turbidity	Dissolved Organic Carbon	Acidity as CaCO ₃	Sulphide in water ^u	Fluoride	Ionic Balance	Nutrients in Water	Total Metals in water	Dissolved Metals in Water	vTRH(C6-C10)/MBTEXN in water	svTRH(C10-C40) in water	PAHs in Water	Low Level OCP in water	PFAS in Water TRACE Extended	Chlorophyll a & Phaeophytin a
WS1-S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS1-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS2-S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS2-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS3-S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS4-S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS4-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS5-S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WS5-D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WZ1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
WB1			✓							✓	✓	✓	✓	✓	✓	✓	
WR1			✓							✓	✓	✓	✓	✓	✓	✓	
WTB1												✓				✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Appendix C

Surface water sampling logs

Site location: Swan River Crossing - Fremantle

[illegible]

Multi-parameter meter details	Solution	Batch / lot	Batch date	Zobell B solution, for Ag/AgCl saturated KCl electrode				Calibration notes:
Manufacturer:	pH 4 buffer			T °C	mV	T °C	mV	
Model number:	pH 7 buffer			5	273	20	240	
Serial number:	EC buffer			10	262	25	229	
	Zobell B			15	251	30	218	

RPS MAKE IT COME EASY

[illegible]

Other: No boats traffic / bridge pike investigation works occurring adjacent to location

RPS MAKE IT COME EASY

[illegible]

Other: Low general boat traffic / pike investigation works occurring adjacent to location.

[illegible]

Other: No boats traffic / bridge pike investigation works occurring adjacent to location

[illegible]

Other: Low boat traffic

SURFACE WATER SAMPLING LOG



Project number: EEC20092.002	Sampling method: Niskin Flask
Site name: Fremantle Ports - Surface Water	0.45 micron filter used (Y/N): Yes
Sampling area: Fremantle Port - Jetty	Sample preservation (ice/esky): Yes
Sampling location: WS5	QAQC samples: ---
Scientist: Shae Miller-White	Tide (High/Low): High
Date: 03/06/2021	Tide Height (m): 1.05
Weather: Fine / Overcast	Water Column (m): 7.4

Sample I.D.	E/N	Depth (m)	Time	Odour (Y/N):	Staining (Y/N):	Sheen (Y/N):	Appearance	Colour	Temp. (°C)	pH	E.C. (µS/cm)	Redox. (mV)	D.O. (ppm)	D.O. (% sat)
---	382,269 / 6,454,227	0.0	2.00 am	No	No	Yes	Clear	Colourless	19.2	8.25	53,463	189	7.75	104
---	382,269 / 6,454,227	0.5	2.01 am	No	No	Yes	Clear	Colourless	19.1	8.27	53,505	188	7.76	101
WS5-S	382,269 / 6,454,227	1.0	2.02 am	No	No	Yes	Clear	Colourless	19.1	8.27	53,522	188	7.59	103
---	382,269 / 6,454,227	1.5	2.03 am	No	No	Yes	Clear	Colourless	19.1	8.27	53,574	188	7.05	92
---	382,269 / 6,454,227	2.0	2.03 am	No	No	Yes	Clear	Colourless	19.1	8.26	53,578	187	6.75	91
---	382,269 / 6,454,227	2.5	2.04 am	No	No	Yes	Clear	Colourless	18.9	8.26	53,677	187	6.11	80
---	382,269 / 6,454,227	3.0	2.04 am	No	No	Yes	Clear	Colourless	18.9	8.24	53,767	187	6.26	80
---	382,269 / 6,454,227	3.5	2.05 am	No	No	Yes	Clear	Colourless	18.8	8.22	53,801	187	6.61	88
---	382,269 / 6,454,227	4.0	2.05 am	No	No	Yes	Clear	Colourless	18.8	8.21	53,810	187	6.35	82
---	382,269 / 6,454,227	4.5	2.06 am	No	No	Yes	Clear	Colourless	18.8	8.21	53,819	187	6.01	79
---	382,269 / 6,454,228	5.0	2.06 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,821	187	5.95	80
---	382,269 / 6,454,229	5.5	2.07 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,822	187	6.08	82
---	382,269 / 6,454,230	6.0	2.07 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,824	186	6.49	86
WS5-D	382,269 / 6,454,231	6.5	2.08 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,827	186	5.41	77
---	382,269 / 6,454,232	7.0	2.09 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,828	186	5.50	72
---	382,269 / 6,454,233	7.4	2.09 am	No	No	Yes	Clear	Colourless	18.7	8.21	53,829	186	5.85	78

Additional details / comments:														
Other:	Low boat traffic. Sheen came and went													