

## EPL230-02: Attachment B

**Table 1** – Authorised wastewater discharge points and monitoring locations of EPL230-02.

Location Code	Description	Authorised Discharge Point (A) or Monitoring Location (M)	Location	Discharge Source
PW-01	Authorised Discharge Point (ADP) for production Formation Water discharged via diffuser to ocean.	A	14.241506 S 129.385128 E	Produced formation water separated from whole of well stream fluid, treated to meet discharge specification.
PW-02	Monitoring location for ADP PW-01 Production Formation Water.	M	14.243388 S 129.435190 E	
WW-01	Authorised Discharge Point (ADP) for treated wastewater effluent to irrigation field.	A	14.241548 S 129.438568 E	Treated wastewater from the wastewater treatment plant. Wastewater originates from showers, wash basins, toilet facilities, laundries and kitchens.
WW-02	Monitoring location for ADP WW-01 irrigation Water.	M	14.240915 S 129.437845 E	Treated wastewater effluent.
SW-03	Authorised Discharge Point (ADP) and monitoring location for stormwater overflow from process skids into open drains sump to land.	A, M	14.243559 S 129.435987 E	Stormwater runoff from incorporated drainage controls throughout the process area, directed to the corrugated plate interceptor separator for treatment.

**Table 2** – Authorised wastewater discharge monitoring program.

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03			Treated Wastewater Effluent WW-02			Produced Formation Water PW-02		
	Unit	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency
<b>Environmental Parameters (In-situ)</b>										
pH	pH	-	6.0 - 8.0	S	-	6.5 - 8.5	M	-	6.5 - 8.5	U
Electrical conductivity (EC)	µs/cm	-	20 - 250	S	-	20 - 250	M	-	-	U
Dissolved oxygen (DO)	% saturation	-	85 - 120	S	-	85 - 120	M	-	80 - 100	U
Temperature	°C	-	-	S	-	-	M	-	-	U
Turbidity	NTU	-	15	S	-	-	M	-	20	U
Oil in Water (OIW)	mg/L	1	6	S			NR	6	25	U
<b>Environmental Indicators</b>										
Biological Oxygen Demand (BOD)	mg/L	10	20	S	10	20	M	-	25	Q
Chemical Oxygen Demand (COD)	mg/L	-	40	S	-	40	M	-	125	Q
Total Suspended Solids (TSS)	mg/L	10	30	S	10	30	M	10	50	Q
Total Dissolved Solids (TDS)	mg/L	-	-	S	-	-	M	-	-	Q
Total Organic Carbon (TOC)	mg/L	-	-	S	-	-	M	-	-	Q
<b>Nutrient Indicators</b>										
Total Phosphorus (TP)	µg/L	-	10	S	-	10	M	-	15	Q
Total Nitrogen (TN)	µg/L	-	300	S	-	300	M	-	100	Q
Oxidised Nitrogen (NOx)	µg/L	-	5	S	-	5	M	-	8	Q
Ammoniacal Nitrogen (NH <sub>3</sub> -N)	µg/L	-	10	S	-	10	M	-	10	Q
<b>Bacteriological</b>										
Faecal Coliforms (Thermotolerant Coliforms and E. coli)	cfu/100mL	100	1000	S	100	1000	M			NR

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03			Treated Wastewater Effluent WW-02			Produced Formation Water PW-02		
	Unit	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency
Enterococci	cfu/100mL	230	450	S	230	450	M			NR
<b>Per- and poly-fluoroalkyl substances (PFAS)</b>										
28 PFAS compounds – low level	µg/L	-	-	S			NR	-	-	Q
PFOS	µg/L	2	31	S			NR	-	-	Q
PFOA	µg/L	632	1824	S			NR	-	-	Q
<b>Metals<sup>1, #</sup></b>										
Aluminium	µg/L	80	150	S	80	150	B	-	-	Q
Arsenic (III)	µg/L	94	360	S	94	360	B	-	-	Q
Arsenic (V)	µg/L	42	140	S	42	140	B	-	-	Q
Barium	µg/L	-	-	S	-	-	B	-	-	Q
Boron	µg/L	680	1300	S	680	1300	B	-	-	Q
Cadmium	µg/L	0.4	0.8	S	0.4	0.8	B	5.5	14	Q
Cobalt	µg/L	-	-	S	-	-	B	14	150	Q
Copper	µg/L	1.8	2.5	S	1.8	2.5	B	3	8	Q
Chromium (III)	µg/L	-	-	S	-	-	B	48.6	90.6	Q
Chromium (VI)	µg/L	6	40	S	6	40	B	25	85	Q
Iron	µg/L	-	-	S	-	-	B	-	-	Q
Mercury	µg/L	1.9	5.4	S	1.9	5.4	B	0.7	1.4	Q
Manganese	µg/L	2500	3600	S	2500	3600	B	-	80	Q
Lead	µg/L	5.6	9.4	S	5.6	9.4	B	6.6	12	Q
Nickel	µg/L	13	17	S	13	17	B	200	560	Q

<sup>1</sup> Toxicant default guideline values, table 3.4.1 ANZECC/ARMCANZ Water Quality (2000) Guidelines, at a species protection values of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants>

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03			Treated Wastewater Effluent WW-02			Produced Formation Water PW-02		
	Unit	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency
Selenium	µg/L	18	34	S	18	34	B	-	-	Q
Zinc	µg/L	15	31	S	15	31	B	23	43	Q
<b>Radiological analysis</b>										
Radium Isotopes Ra-226	Bq/L			NR			NR	-	-	A
Radium Isotopes Ra-228	Bq/L			NR			NR	-	-	A
<b>Speciated phenols<sup>2</sup></b>										
Phenol	µg/L	600	1200	A			NR	520	720	Q
2-Chlorophenol	µg/L	630	870	A			NR	-	-	Q
4-Chloro-3-Methylphenol	µg/L	-	-	A			NR	-	-	Q
2-Methylphenol (o-cresol)	µg/L	-	400	A			NR	-	-	Q
3/4-Methylphenol (m/p-cresol)	µg/L	-	100	A			NR	-	-	Q
2-Nitrophenol	µg/L	-	-	A			NR	-	-	Q
2,4-Dimethylphenol	µg/L	-	-	A			NR	-	-	Q
2,4-Dichlorophenol	µg/L	200	270	A			NR	-	-	Q
2,6-Dichlorophenol	µg/L	-	-	A			NR	-	-	Q
2,4,5-Trichlorophenol	µg/L	-	-	A			NR	-	-	Q
2,4,6-Trichlorophenol	µg/L	40	95	A			NR	-	-	Q
2,4-dinitrophenol	µg/L	80	140	A			NR	-	-	Q
4-nitrophenol	µg/L	-	-	A			NR	-	-	Q
2,3,4,6-tetrachlorophenol	µg/L	25	30	A			NR	-	-	Q

<sup>2</sup> ANZG 2018 default guideline values for phenols and xylenols in marine water (PW-02) and freshwater (SW-03) at a species protection level of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants>

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03			Treated Wastewater Effluent WW-02			Produced Formation Water PW-02		
	Unit	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency
2-methyl-4,6-dinitrophenol	µg/L	-	-	A			NR	-	-	Q
pentachlorophenol	µg/L	17	27	A			NR	33	55	Q
<b>TRH<sup>3</sup></b>										
Total Recoverable Hydrocarbons TRH C6-C10 less BTEX (F1)	µg/L	>0	100	A			NR	-	-	M
TRH >C10-C16 (F2) less Naphthalene	µg/L	>0	100	A			NR	-	-	M
TRH >C16-C34 (F3)	µg/L	>0	200	A			NR	-	-	M
TRH >C34-C40 (F4)	µg/L	>0	200	A			NR	>0	-	M
<b>PAH<sup>4</sup></b>										
Total PAH	µg/L	-	-	A			NR	-	-	Q
Naphthalene	µg/L	37	85	A			NR	90	120	Q
Acenaphthylene	µg/L	-	-	A			NR	-	-	Q
Acenaphthene	µg/L	-	20	A			NR	-	-	Q
Fluorene	µg/L	-	-	A			NR	-	-	Q
Phenanthrene	µg/L	4	8	A			NR	4	8	Q
Anthracene	µg/L	1.5	7	A			NR	1.5	7	Q
Fluoranthene	µg/L	1.7	2	A			NR	1.7	2	Q
Pyrene	µg/L	-	-	A			NR	-	-	Q
Benzo (a) anthracene	µg/L	-	-	A			NR	-	-	Q
Chrysene	µg/L	-	-	A			NR	-	-	Q

<sup>3</sup> C6-C10 (note F1='C6-C10' less BTEX), >C10-C16 (note F2= '>C10-C16' less Naphthalene), F3 =>C16-C34, F4= >C34-C40)

<sup>4</sup> ANZG 2018 default guideline values for Polycyclic Aromatic Hydrocarbons in marine water (PW-02) and freshwater (SW-03 and WW-02) at a species protection level of 80% for limits and 90% for trigger values. Available at <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants>

Parameter	Monitoring site code	Stormwater Overflow Discharge SW-03			Treated Wastewater Effluent WW-02			Produced Formation Water PW-02		
	Unit	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency	Trigger Value	Limit	Frequency
Benzo (b,j & k) fluoranthene	µg/L	-	-	A			NR	-	-	Q
Benzo (a) pyrene	µg/L	0.4	0.7	A			NR	0.4	0.7	Q
Indeno (1,2,3-c,d) pyrene	µg/L	-	-	A			NR	-	-	Q
Dibenzo (a,h) anthracene	µg/L	-	-	A			NR	-	-	Q
Benzo(g,h,i) perylene	µg/L	-	-	A			NR	-	-	Q
2-methyl naphthalene	µg/L	-	-	A			NR	-	-	Q
3-methylcholanthrene	µg/L	-	-	A			NR	-	-	Q
Benzo (e) pyrene	µg/L	-	-	A			NR	-	-	Q
Perylene	µg/L	-	-	A			NR	-	-	Q
Coronene	µg/L	-	-	A			NR	-	-	Q
<b>BTEX</b>										
Benzene	µg/L	1300	2000	S			NR	900	1300	M
Toluene	µg/L	230	330	S			NR	230	330	M
Ethyl benzene	µg/L	110	160	S			NR	110	160	M
m+p-xylene	µg/L	100	150	S			NR	100	150	M
Xylene	µg/L	-	-	S			NR	-	-	M
Aliphatic/ Aromatic Speciation	µg/L	-	-	S			NR	-	-	M
<p><b>NOTES:</b>  - = Reportable but no established trigger values or limits; &gt;0 = Reportable if greater than the laboratory established practical quantitation limits (PQL);  # = Both dissolved and total metals sampling is required, and the trigger values and limits are only applicable to dissolved metal samples.</p> <p><b>KEY:</b>  A = Annually; B = Biannual; M = Monthly; Q = Quarterly; U = Upon Discharge; S = Seasonal (monthly over a typical Wet Season [November to May]);  NR = Not Reportable.</p>										

**Table 3 – Authorised air emission points and monitoring program.**

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Release Point Number	Source (with nominal power output)	Gas Flow Meter (FIT)	Pollutant	Concentration Limit <sup>5</sup>	Monitoring Frequency*	Annual Monitoring Parameters <sup>^</sup>
				mg/Nm <sup>3</sup>		
A01, A02	Flaring	002, 008, 007	Smoke	No visible emission other than a total of no more than 5 minutes in any 2-hour period	All events	Smoke, mass of hydrocarbons flared, VOCs, fuel/gas flow
A03, A04, A05	Gas turbine compressor (6.5MW)	161, 261, 361	SO <sub>2</sub>	100 @15% O <sub>2</sub> dry	Biannually	Temperature, efflux velocity, volumetric flow rate, fuel/gas flow, emissions of oxides of nitrogen as nitrogen dioxide, particulate matter (PM2.5 and PM10), carbon monoxide, carbon dioxide, sulfur dioxide, methane, nitrous oxide, mercury, hydrogen sulfide, total VOCs and VOCs speciated to provide individual emissions of benzene, toluene, ethylbenzene, xylenes and n-hexane
			NO <sub>x</sub> as NO <sub>2</sub>	70 @15% O <sub>2</sub> dry		
			CO	125 @15% O <sub>2</sub> dry		
			VOCs	40 @15% O <sub>2</sub> dry		
A06, A07, A08	Gas engine generator (1MW)	004	SO <sub>2</sub>	100 @15% O <sub>2</sub> dry	Biannually	Temperature, efflux velocity, volumetric flow rate, fuel/gas flow, emissions of oxides of nitrogen as nitrogen dioxide, particulate matter (PM2.5 and PM10), carbon monoxide, carbon dioxide, sulfur dioxide, methane, nitrous oxide, mercury, hydrogen sulfide, total VOCs and VOCs speciated to provide individual emissions of benzene, toluene, ethylbenzene, xylenes and n-hexane
			NO <sub>x</sub> as NO <sub>2</sub>	70 @15% O <sub>2</sub> dry		
			CO	125 @15% O <sub>2</sub> dry		
			VOCs	40 @15% O <sub>2</sub> dry		
A09	Emergency diesel generator package (1 MW)	-	Smoke	20% opacity	Upon use - up to twice yearly	Smoke, fuel/gas flow

**NOTES:** \* = Column 6 Monitoring Frequency describes monitoring (plant not each release point number) for Column 4 Pollutants.  
<sup>^</sup> = Column 7 Monitoring Parameters should be reported in the AEMR as measure of total annual emissions or estimate of total annual emissions.

<sup>5</sup> NSW EPA concentration limits for plants licenced on or after 1 September 2005 (Group 6). Available at [Protection of the Environment Operations \(Clean Air\) Regulation 2022](#).

**Table 4 – Groundwater monitoring frequency and interim concentration limits.**

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.411143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration limits^	
<b>Environmental Parameters (In-situ)</b>								
Depth	mAHD	Q	Q	Q	Q	Q		-
pH	pH	Q	Q	Q	Q	Q	7.0-8.5	5.0-6.0^
Electrical conductivity (EC)	µs/cm	Q	Q	Q	Q	Q		<200
Dissolved oxygen (DO)	% saturation	Q	Q	Q	Q	Q	80-100	30-80^
Turbidity	NTU	Q	Q	Q	Q	Q		^
Reduction Oxidation Potential (REDOX)	mV	Q	Q	Q	Q	Q		^
<b>Environmental Indicators</b>								
BOD	mg/L	Q	Q	Q	Q	Q		<2.6^
COD	mg/L	Q	Q	Q	Q	Q		^
TSS	mg/L	Q	Q	Q	Q	Q		^
TDS	mg/L	Q	Q	Q	Q	Q		^
TOC	mg/L	Q	Q	Q	Q	Q		^
<b>Nutrient Indicators NR</b>								
Total Phosphorus (TP)	mg/L	Q	Q	Q	Q	Q		^
Total Nitrogen (TN)	mg/L	Q	Q	Q	Q	Q	<0.27	^
Oxidised Nitrogen (NOx)	mg/L	Q	Q	Q	Q	Q	<0.02	^
Ammoniacal Nitrogen (NH <sub>3</sub> -N)	mg/L	Q	Q	Q	Q	Q	<0.02	<9^
<b>Major-ion chemistry</b>								
major cations: sodium, potassium, calcium and magnesium	mg/L	Q	Q	Q	Q	Q		^

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration limits <sup>^</sup>	
major anions: chloride, sulphate, bicarbonate and carbonate	mg/L	Q	Q	Q	Q	Q		^
Hardness	mg/L	Q	Q	Q	Q	Q		^
<b>Metals<sup>6</sup></b>								
Arsenic	mg/L	Q	Q	Q	Q	Q		<0.13 <sup>^</sup>
Boron	mg/L	Q	Q	Q	Q	Q		^
Cadmium	mg/L	Q	Q	Q	Q	Q	<0.0055	^
Chromium (total)	mg/L	Q	Q	Q	Q	Q	<0.0013	^
Copper	mg/L	Q	Q	Q	Q	Q	<0.0013	<0.15 <sup>^</sup>
Iron	mg/L							^
Manganese	mg/L	Q	Q	Q	Q	Q		^
Lead	mg/L	Q	Q	Q	Q	Q	<0.0044	^
Nickel	mg/L						<0.07	^
Strontium	mg/L	Q	Q	Q	Q	Q		^
Zinc	mg/L	Q	Q	Q	Q	Q	<0.015	^
<b>Per-and Polyfluoroalkyl Substances</b>								
28 PFAS compounds – low level	µg/L	Q	Q	Q	Q	Q	^Identify the source of PFAS, pathway and potential receptors (and risk to them) if concentrations above laboratory limit of reporting occur.	

<sup>6</sup> Toxicant default guideline values, table 3.4.1 ANZECC/ARMCANZ Water Quality (2000) Guidelines

Parameter	Monitoring site code	BH1*	BH2	BH4	BH5	BH7	DHWQO	Historical data estimates
	Location	14.331296 S 129.261108 E	14.344688S 129.269416 E	14.344688 S 129.269416 E	14.37117 S 129.262446 E	14.41143 S 129.435572 E		
	Unit	Frequency	Frequency	Frequency	Frequency	Frequency	Interim concentration limits <sup>^</sup>	
<b>Bacteriological</b>								
Enterococci	cfu/100mL	Q	Q	Q	Q	Q	<50	^
Escherichia coli	cfu/100mL	Q	Q	Q	Q	Q		^
<b>Volatiles and semi-volatiles</b>								
Total Recoverable Hydrocarbons NEPM <sup>7</sup>	µg/L	Q	Q	Q	Q	Q	^Identify the source of TRH or BTEX, pathway and potential receptors (and risk to them) if concentrations above laboratory limit of reporting occur. Include TPH, TRH and/or BTEX	
Benzene	µg/L	Q	Q	Q	Q	Q		
Toluene	µg/L	Q	Q	Q	Q	Q		
Ethyl benzene	µg/L	Q	Q	Q	Q	Q		
m/p-xylene	µg/L	Q	Q	Q	Q	Q		
o-xylene	µg/L	Q	Q	Q	Q	Q		
Aliphatic/ Aromatic Speciation	µg/L	Q	Q	Q	Q	Q		^
<p><b>NOTES:</b>  * = BH1 is screened at different intervals. Sampling is to target the shallowest screened interval. Sampling at deeper screened intervals is recommended if TRH, BTEX or PFAS are detected above laboratory limits of reporting.  ^ = Interim concentration limits will not be applied to determine non-compliance. Interim concentration limits are to be updated with site specific limits as per EPL230-02 licence conditions 61-63.</p> <p><b>KEY:</b>  Q = Quarterly (covering 2 wet season and 2 dry season sampling events for the 12-month reporting period).  DHWQO – Darwin Harbour Water Quality Objectives 2010</p>								

<sup>7</sup> C6-C10 (note F1='C6-C10' less BTEX), >C10-C16 (note F2= '>C10-C16' less Naphthalene), >C16-C34, >C34-C40)