



Northern
Territory
Government

WASTE DISCHARGE LICENCE

(Pursuant to section 74 of the *Water Act 1992*)

Licensee	Power and Water Corporation
Licence Number:	WDL150-09
Registered Business Address:	15 Iliffe Street STUART PARK NT 0820
ABN:	15 947 352 360
Premises:	Ludmilla Wastewater Treatment Plant 21 DICK WARD DR, LUDMILLA NT 0820
Commencement Date:	31 May 2024
Expiry Date:	30 May 2034
Licensed Action:	The controlled discharge of wastewater from Ludmilla Wastewater Treatment Plant into Darwin Harbour via the authorised discharge points and subject to the conditions of this licence.

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INFORMATION ABOUT THIS LICENCE

This waste discharge licence is granted pursuant to section 74 of the *Water Act 1992* (NT) (Water Act), which empowers the Controller of Water Resources to, in accordance with the Water Act, grant a licence to a person to carry out an action that would otherwise be an offence against this Act.

Responsibilities of Licensee

- In addition to the conditions set out in this licence, general responsibilities of Licensees are set out in the *Waste Management and Pollution Control Act 1998* (NT) (WMPC Act), the Water Act and the Water Regulations 1992 (NT) (Water Regulations).
- It is an offence under the Water Act, if the holder of a waste discharge licence contravene or cause, suffer or permit a person to contravene a term or condition to which the waste discharge licence is subject (s 76 Water Act).
- Except as expressly provided for in this licence or applicable law, it is an offence under section 16 of the Water Act to wilfully cause or cause, directly or indirectly:
 - waste to come into contact with water; or
 - water to be polluted.

Duration of Licence

- This licence will remain in force until its Expiry Date, it is surrendered by the Licensee, or until it is suspended or revoked by the Controller of Water Resources.
- A Licensee may surrender its licence at any time (s 94 Water Act).
- If the Licensee wishes to surrender its licence it should complete the notification form available from the Administering Agency.
- Once a licence is surrendered, the authority to allow waste to come into contact with water or water to be polluted ends, and causing waste to come into contact with water or water to be polluted is an offence pursuant to section 16 of the Water Act.

Amendment, Modification or Revocation of Licence

- As set out in section 93 of the Water Act, the Controller of Water Resources may, by notice served on the holder of the licence:
 - amend or modify the terms and conditions of a licence; or
 - where the Controller of Water Resources is satisfied that the holder of the licence has contravened or failed to comply with a term or condition of the licence or of any other licence previously held by the person for a similar purpose during the 12 months immediately preceding the grant of the first-mentioned licence, the Controller of Water Resources may:
 - revoke a licence; or
 - suspend a licence.

Transfer of Licence

- Where a waste discharge licence is granted to a person in relation to the person's use of land and, during the period of this licence, the person's interest in the land is transferred to another person,

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the waste discharge licence shall be deemed to have also been transferred to the other person (s 92 Water Act).

- The Licensee must ensure the contact details recorded with the Administering Agency for the licence are correct at all times in accordance with condition 6. Accordingly, it is recommended the transferee complete the notification of transfer of a waste discharge licence form available from the Administering Agency.

Public Register

- A copy of this Licence will be placed on the Register in accordance with section 95 of the Water Act.
- A copy of plans for environmental management, reports, submissions or documents provided at Schedule 1 Item 14 will be placed on the Register.
- The Register is freely available from the Northern Territory Environment Protection Authority (NT EPA) website.

Water Quality Standards

- The Administrator may declare, by notice in the *Gazette*, a beneficial use, quality standard, criteria or objectives which apply in relation to any waste or class of waste, or water or class of water (s 73 Water Act).
- A water or waste beneficial use, quality standard, criteria or objectives declared under s 73 of the Act and in force is an Environment Protection Objective for the purposes of the WMPC Act (s 18 WMPC Act).
- An Environment Protection Objective is a statutory instrument to establish principles on which:
 - Environmental quality is to be maintained, enhanced, managed or protected;
 - Pollution, or environmental harm resulting from pollution, is to be assessed, prevented, reduced, controlled, rectified or cleaned up; or
 - Effective waste management is to be implemented or evaluated.
- Schedule 1 Item 1 specifies the beneficial use, quality standard, criteria or objective relevant to this licence at the date of issue.

Environmental Interests

- Environmentally sensitive or significant areas may be captured by and protected under the *Environment Protection Act 2019* (NT) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). As such, and to best protect and regulate our waterways, waste discharge licences must identify the sensitivity of the environment surrounding the location of the Licensed Action.
- Schedule 1 Item 2 specifies the sites of conservation significance (if any) relevant to this licence at the date of issue.
- Schedule 1 Item 3 specifies the Ramsar wetlands (if any) relevant to this licence at the date of issue.

Cultural Interests

- Under Commonwealth and Northern Territory laws it can be an offence to enter or remain on or damage a sacred site.

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- Sites of Aboriginal significance including registered and recorded Aboriginal sacred sites may exist in the vicinity of the Licensed Action.
- It is the Licensee's responsibility to contact the Aboriginal Areas Protection Authority, appropriate land council or other governing body and ensure that any authority certificates required as a result of conducting the Licensed Action are obtained and complied with.
- Further specific advice on any cultural requirement or implication of the Licensed Action should be sought from the relevant land council and the Aboriginal Areas Protection Authority.

END NOTES

This licence is a renewal and supersedes WDL150-08.

WDL150-08 was a renewal and superseded WDL150-07. It was issued on 1 November 2020 and expired on 31 October 2022.

WDL150-07 was an amendment and superseded WDL150-06. It was issued on 9 August 2019 and expired on 31 October 2020.

WDL150-06 was a renewal and superseded WDL150-05. It was issued on 1 November 2018 and expired on 31 October 2020.

WDL150-05 was a renewal and superseded WDL15-04. It was issued on 1 November 2016 and expired on 31 October 2018.

WDL150-04 was a renewal and superseded WDL150-03. It was issued on 1 November 2014 and expired on 31 October 2016.

WDL150-03 was an amendment and superseded WDL150-02. It was issued on 2 August 2013 and expired on 31 March 2014.

WDL150-02 was a renewal and superseded WDL150-01. It was issued on 31 October 2012 and expired on 31 March 2014.

WDL150-01 was a renewal and superseded WDL150. It was issued on 1 November 2011 and expired on 31 October 2012.

WDL150 was issued on 13 August 2006 and expired on 31 October 2011.

The end notes are to assist with historical records

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SCHEDULE 1 - ITEMS

Item	Detail	
1. Beneficial uses (condition 19)	Declared beneficial uses include: Darwin Harbour Region (saline waters) declared in Gazettal notice Gazette G27 on 7 July 2010. The following beneficial uses are prescribed: i. aquaculture ii. environment iii. cultural Darwin Harbour Region (natural waterways) declared in Gazettal notice Gazette G27 on 7 July 2010. The following beneficial uses are prescribed: i. aquaculture ii. environment iii. cultural iv. rural stock and domestic	
2. Sites of conservation significance (condition 19)	Within the <i>Darwin Harbour Site of Conservation Significance</i>. (SOCS6 – <i>International Significance</i>)	
3. Ramsar wetlands (condition 19)	Not Applicable	
4. Licence Documents (condition 13)	(a) Ludmilla Wastewater Treatment Plant Improvement Plan 2022; and (b) Environmental Management Plan for Ludmilla Wastewater Treatment Plant Discharge 2022	
5. Authorised Discharge Point(s) (condition 20)	SLuEPO1 as shown on the plan at Appendix 1 and described in Appendix 2 .	Latitude: -12.40151 Longitude: 130.82233
	SLuLCDP as shown on the plan at Appendix 1 and described in Appendix 2 .	Latitude: -12.42051 Longitude: 130.8450
6. Source(s) of waste (condition 21)	Ludmilla Wastewater Treatment Plant	
7. Trigger values (condition 21)	Surface water trigger values in accordance with Appendix 3 .	
8. Compliance points (condition 21)	SLuEP02 as shown on the plan at Appendix 1 and described in Appendix 2 .	Latitude: -12.40056 Longitude: 130.82017
	SLuEP03 as shown on the plan at Appendix 1 and described in Appendix 2 .	Latitude: -12.40061 Longitude: 130.81804
	SLuLC04 as shown on the plan at Appendix 1 and described in Appendix 2 .	Latitude: -12.41232 Longitude: 130.83726
9. Limitations on discharge (condition 21)	Any discharge from SLuLCDP must: (a) Only occur when average inflows to the wastewater treatment plant during the discharge period to SLuLCDP exceed 750 L/second during wet weather events.	

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Item	Detail
10. Notifiable incidents (conditions 25 and 26)	(a) An exceedance of a trigger value specified in Item 7 at a compliance point in Item 8, on three consecutive sampling occasions; (b) An exceedance of three or more times a trigger value specified in Item 7 at a compliance point in Item 8; (c) A discharge at a point not specified in Item 5; (d) A discharge from a source not specified in Item 6; or (e) A failure to comply with condition 23.
11. Monitoring Program (condition 27)	The Monitoring Program includes: (a) Surface water monitoring in accordance with Appendix 4; (b) Sediment monitoring in accordance with Appendix 5; and (c) Biological monitoring in accordance with EPBC Approval 2009/5113.
12. Annual Return (condition 38)	The Annual Return is due on: (a) 1 November each year; and (b) the Expiry Date of this licence, for the preceding 12 month period.
13. Monitoring Report (condition 39)	The Monitoring Report is due on: (a) 1 November each year; and (b) the Expiry Date of this licence; and (c) in the event the Licensee applies to renew the licence, 90 days prior to the Expiry Date.
14. Documents placed on Register (condition 42)	The following documents will be placed on the Register: (a) The Licence Documents specified in Item 4; (b) The Monitoring Reports provided in accordance with condition 39; and (c) The Annual Returns in accordance with condition 38.
15. Special conditions (condition 43)	The Monitoring report at Item 13 must include the assessment protocols for sediment monitoring in Appendix 6.
16. Compliance with trigger values (condition 21)	For the annual reporting period, the trigger values at Item 7 shall be regarded as being complied with if: (d) For metals, not more than one measurement or, if more than 20 samples are collected, 5% of measured values, exceed the trigger values specified in Item 7; (e) For nutrients and physico-chemical parameters the median value of measurements does not exceed, or is not outside the range of, the trigger values specified in Item 7; and (f) For biotic and pathogen indicators, not more than 20% of samples exceed, or are outside the range of, the trigger values specified in Item 7.

LICENCE CONDITIONS

RULES FOR INTERPRETING THE CONDITIONS OF THIS LICENCE

- Where there is a discrepancy between the conditions of this licence and any plan, standard, guideline or other document referred to in this licence, the conditions of this licence prevail to the extent of the inconsistency.
- Any reference to any standard, guideline or code of practice (Australian or international) in this licence means the relevant parts of the current version of that standard, guideline or code of practice.
- In this licence, unless the contrary intention appears, words that are defined in the Water Act are intended to have the meaning given to them in that Act.

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4. In this licence, unless a contrary intention appears, terms are defined in the Definitions at the end of this licence.
5. In this licence a reference to an Item is a reference to an Item specified in Schedule 1.

GENERAL

6. The Licensee must ensure the contact details recorded with the Administering Agency for this licence are correct at all times.
7. The Licensee must at all times have a 24 hour emergency contact.
8. The Licensee must notify the Administering Agency prior to making any operational change that will cause, or is likely to cause, an increase in the potential for environmental harm.
9. The Licensee must display clear and legible signage, in English, in a prominent location at each public entrance to the premises of the Licensed Action that includes the following details:
 - 9.1. waste discharge licence number issued under the Water Act; and
 - 9.2. 24 hour emergency contact details.
10. The Licensee must cause a hard copy of this licence to be available for inspection, at the premises of the Licensed Action, by any person on request.
11. Unless otherwise specified, within 10 business days of a request, the Licensee must provide to the Administering Agency a copy of any record, document, monitoring data or other information in relation to the Licensed Action in electronic form by emailing environmentalregulation@nt.gov.au.
12. All notices, reports, documents or other correspondence required to be provided as a condition of this licence, unless otherwise specified as a condition of this licence, must be provided in electronic form by emailing environmentalregulation@nt.gov.au.
13. Within 10 business days of any amendment being made to a document specified in Item 4, the Licensee must provide the amended document to the Administering Agency, along with:
 - 13.1. a tabulated summary of the amendment(s) with document references;
 - 13.2. reasons for the amendment(s); and
 - 13.3. an assessment of environmental risk associated with the amendment(s).
14. **Condition 14 removed**
15. The Administering Agency may require the Licensee to revise or amend and resubmit any document provided in accordance with this licence. Where the Administering Agency requires any document to be revised or amended, the Licensee must submit it to the Administering Agency by the date specified by the Administering Agency.
16. The Licensee must operate and maintain a community feedback telephone number enabling members of the public to contact, at any time, a person or voice mail system that can accept, on behalf of the Licensee, enquiries or complaints about the Licensed Action, and to which the Licensee must respond. The community feedback telephone number must be displayed:
 - 16.1. where the Licensee has a website, in a prominent location on the Licensee's website;
 - 16.2. in the Consultation and Communication Plan; and
 - 16.3. in other publicly available documents relating to the Licensed Action.
17. The Licensee must maintain a register of complaints that records the details of each complaint received in relation to the Licensed Action and provide a copy to the Administering Agency on request. Details of the complaints must (as is reasonably practicable) include, the following information:
 - 17.1. the person to whom the complaint was made;
 - 17.2. the person responsible for managing the complaint;
 - 17.3. the date and time the complaint was reported;

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- 17.4. the date and time of the event(s) that led to the complaint;
- 17.5. the contact details of the complainant if known, or where no details are provided a note to that effect;
- 17.6. the nature of the complaint;
- 17.7. the nature of event(s) giving rise to the complaint;
- 17.8. prevailing weather conditions at the time (where relevant to the complaint);
- 17.9. the action taken in relation to the complaint, including any follow-up contact with the complainant; and
- 17.10. if no action was taken, why no action was taken.

OPERATIONAL

- 18. Without limiting the conditions of this licence, in conducting the Licensed Action, the Licensee must do all things reasonable and practicable to:
 - 18.1. minimise the likelihood of waste coming into contact with water or water being polluted as a result of, or in connection with, the Licensed Action;
 - 18.2. prevent and minimise the likelihood of environmental harm occurring as a result, or in connection with, the Licensed Action;
 - 18.3. effectively investigate, monitor and report on water being polluted as a result of, or in connection with, the Licensed Action;
 - 18.4. effectively investigate, monitor and report on environmental harm and the risk of environmental harm occurring as a result of or in connection with the Licensed Action; and
 - 18.5. apply the principles of ecologically sustainable development.
- 19. The Licensee must, without limiting any other condition of this licence, in conducting the Licensed Action do all things reasonable and practicable to minimise adverse effects to any:
 - 19.1. declared beneficial use, quality, standard or objectives declared under section 73 of the Water Act;
 - 19.2. sites of conservation significance; or
 - 19.3. designated Ramsar wetlands,including, but not limited to, those specified in Items 1, 2 and 3.

DISCHARGES

- 20. The Licensee must only discharge waste to water from the authorised discharge points specified in Item 5.
- 21. Discharges from each authorised discharge point must:
 - 21.1. consist only of waste from the source(s) specified in Item 6;
 - 21.2. not cause a non-compliance with the conditions specified in Item 16 at the compliance points specified in Item 8; and
 - 21.3. comply with the limitations specified in Item 9.
- 22. The Licensee must, for each authorised discharge point, install, operate and maintain a device to measure and record, for each discharge event:
 - 22.1. **Condition 22.1 removed**
 - 22.2. the discharge rate of flow; and
 - 22.3. the discharge volume.

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23. Discharges from each authorised discharge point must not:
- 23.1. contain any floating debris, oil, grease, petroleum hydrocarbon sheen, scum, litter or other objectionable matter;
 - 23.2. cause or generate odours which would adversely affect the use and amenity of surrounding waters;
 - 23.3. cause algal blooms in the receiving water;
 - 23.4. pollute groundwater;
 - 23.5. cause visible change in the behaviour of fish or other aquatic organisms in the receiving water;
 - 23.6. cause mortality of fish or other aquatic organisms;
 - 23.7. cause erosion or degradation to the beds and banks of a watercourse; or
 - 23.8. cause adverse impacts on plants or animals.

INVESTIGATIONS AND NOTIFICATIONS

24. Following any exceedance of a trigger value limit specified in Item 7 at the compliance point specified in Item 8, the Licensee must:
- 24.1. investigate the exceedance, including undertaking targeted monitoring, in addition to routine monitoring; and
 - 24.2. take corrective action to mitigate any environmental harm and ensure the exceedance does not reoccur; and
 - 24.3. make a record of:
 - 24.3.1. when the exceedance was detected and by whom;
 - 24.3.2. the date and time of the exceedance;
 - 24.3.3. the actual and potential causes and contributing factors to the exceedance;
 - 24.3.4. the risk of environmental harm arising from the exceedance;
 - 24.3.5. exceedances and details of the investigation and corrective action taken; and
 - 24.3.6. if no action was taken, why no action was taken.
25. If one of the incidents specified in Item 10 occurs, the Licensee must notify the Administering Agency by emailing environmentalregulation@nt.gov.au as soon as practicable after (and in any case within 24 hours after) first becoming aware of the incident, including the following information:
- 25.1. when the incident was detected and by whom;
 - 25.2. the date and time of the incident;
 - 25.3. whether discharge was occurring at the time of the incident and the source of the discharge;
 - 25.4. whether discharge is still occurring; and
 - 25.5. a date (within 10 business days of the incident) when an investigation report will be submitted to the Administering Agency.
26. Within 10 business days of notifying the Administering Agency of an incident specified in Item 10, the Licensee must provide the Administering Agency an investigation report that includes:
- 26.1. when the incident was detected and by whom;
 - 26.2. the date and time of the incident;
 - 26.3. whether discharge was occurring at the time of the incident and the source of the discharge;
 - 26.4. the actual and potential causes and contributing factors to the incident;

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- 26.5. monitoring data of the discharge, and upstream and downstream water of the incident, collected for the date the incident was detected and three sampling rounds prior;
- 26.6. available flow rates to demonstrate any influence streams and rivers may have had on the incident;
- 26.7. rainfall recorded at the site prior to the incident;
- 26.8. the risk of environmental harm arising from the incident;
- 26.9. the action(s) that have or will be undertaken to mitigate any environmental harm arising from the incident;
- 26.10. corrective actions that have or will be undertaken to ensure the incident does not reoccur; and
- 26.11. if no action was taken, why no action was taken.

MONITORING

- 27. From the Commencement Date of this licence, the Licensee must implement and comply with the Monitoring Program specified in Item 11.
- 28. The Licensee must to the extent practicable collect samples that are representative of discharge conditions that maximises the ability to detect potential impact from the Licenced Action, including collecting samples at sampling points.
- 29. In implementing the Monitoring Program the Licensee must to the extent practicable that samples collected at the sampling points are collected:
 - 29.1. on the same date as discharge event; and
 - 29.2. from the part of the waterway that provides representative (well mixed) samples.
- 30. If a sample is missed or cannot be collected at a sampling point at a frequency set in the Monitoring Program for any reason, the Licensee must revisit the sampling point to collect a sample as soon as possible after the missed collection.
- 31. The Licensee must ensure that all samples and field environmental data are collected in accordance with recognised Australian Standards and guidelines (such as AS/NZS 5667.1 1998, ANZG (2018), as updated from time to time).
- 32. For the parameters that require analysis at a laboratory, the Licensee must ensure that:
 - 32.1. all samples are analysed at a laboratory with current NATA accreditation or equivalent; and
 - 32.2. detection and reporting limits are appropriate to determine compliance with this licence.
- 33. The Licensee must ensure any samples collected in accordance with the Monitoring Program or in connection with the Licensed Action or this licence, are obtained by, or under the supervision of a qualified sampler.
- 34. The Licensee must ensure any plant and equipment used by the Licensee in conducting the Monitoring Program:
 - 34.1. is reasonably fit for the purpose and use to which it is put, including that it is properly calibrated;
 - 34.2. is maintained and operational; and
 - 34.3. is operated by a person trained to use the plant and equipment.
- 35. The Licensee must ensure that, for each sample collected in accordance with the Monitoring Program or the Licensed Action, the following information must be recorded and retained:
 - 35.1. the date on which the sample was collected;
 - 35.2. the time at which the sample was collected;
 - 35.3. the location at which the sample was collected;

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- 35.4. the name of the person who collected the sample;
 - 35.5. the chain of custody forms relating to the sample;
 - 35.6. the field measurements (if any) and analytical results (if any) relating to the sample; and
 - 35.7. laboratory quality assurance and quality control documentation.
36. The Licensee must for all land based monitoring points specified in the Monitoring Program:
- 36.1. install and maintain appropriate identification signage so that they are reasonably identifiable at all times; and
 - 36.2. maintain safe access and egress, as is reasonably practicable.

RECORDING AND REPORTING

37. The Licensee must keep records of all contraventions with this licence. These records must be adequate to enable the Licensee to comply with the notification and reporting conditions of this licence.
38. The Licensee must submit a completed Annual Return, by emailing environmentalregulation@nt.gov.au as specified in Item 12.
39. The Licensee must complete and provide to the Administering Agency a report of data and information obtained through the implementation and performance of the Monitoring Program (the Monitoring Report), as prescribed by this licence, on the dates specified in Item 13.
40. The Licensee must ensure that each Monitoring Report:
- 40.1. is prepared in accordance with the requirements of the Administering Agency 'Guideline for Reporting on Environmental Monitoring' (or any other guideline as adopted by the Administering Agency from time to time);
 - 40.2. includes a tabulation, in Microsoft ® Excel ® format or another format requested by the Administering Agency, of all monitoring data required to be collected in accordance with this licence for the preceding 12 month period;
 - 40.3. includes a tabulation of monthly and annual contaminant loads discharged from the authorised discharge point specified in Item 5 for the preceding 12 month period. Contaminant loads must be calculated for metals, metalloids, nutrients and other parameters (excluding field parameters) listed in the monitoring program specified in Item 11. The calculations must be based on the daily discharge volume and the concentration of contaminant present in the discharge on that day. On the days when a sample was not taken then the concentration of the contaminant must be estimated using Linear Interpolation methodology;
 - 40.4. includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the Licensed Action over a minimum period of three years (of part thereof);
 - 40.5. includes a summary of any investigations undertaken by the Licensee in accordance with this licence for the preceding 12 month period; and
 - 40.6. includes an assessment of environmental impact from the Licensed Action.
41. If the licence expires or is otherwise surrendered, suspended or revoked and the licence contained a condition that the Licensee provide a notice, report, record or other information after that date, the Licensee must provide any report, record, information or data available to the Licensee up to and including the date the licence expired or was surrendered, suspended or revoked.
42. A copy of the documents listed specified in Item 14 will be placed on the Register.

SPECIAL CONDITIONS

43. The Licensee must comply with the conditions specified in Item 15.

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END OF LICENCE CONDITIONS

This licence is not valid unless signed below:

A handwritten signature in blue ink that reads "Andrew Johnson".

ANDREW JOHNSON

Controller of Water Resources

Dated the 31 May 2024

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DEFINITIONS

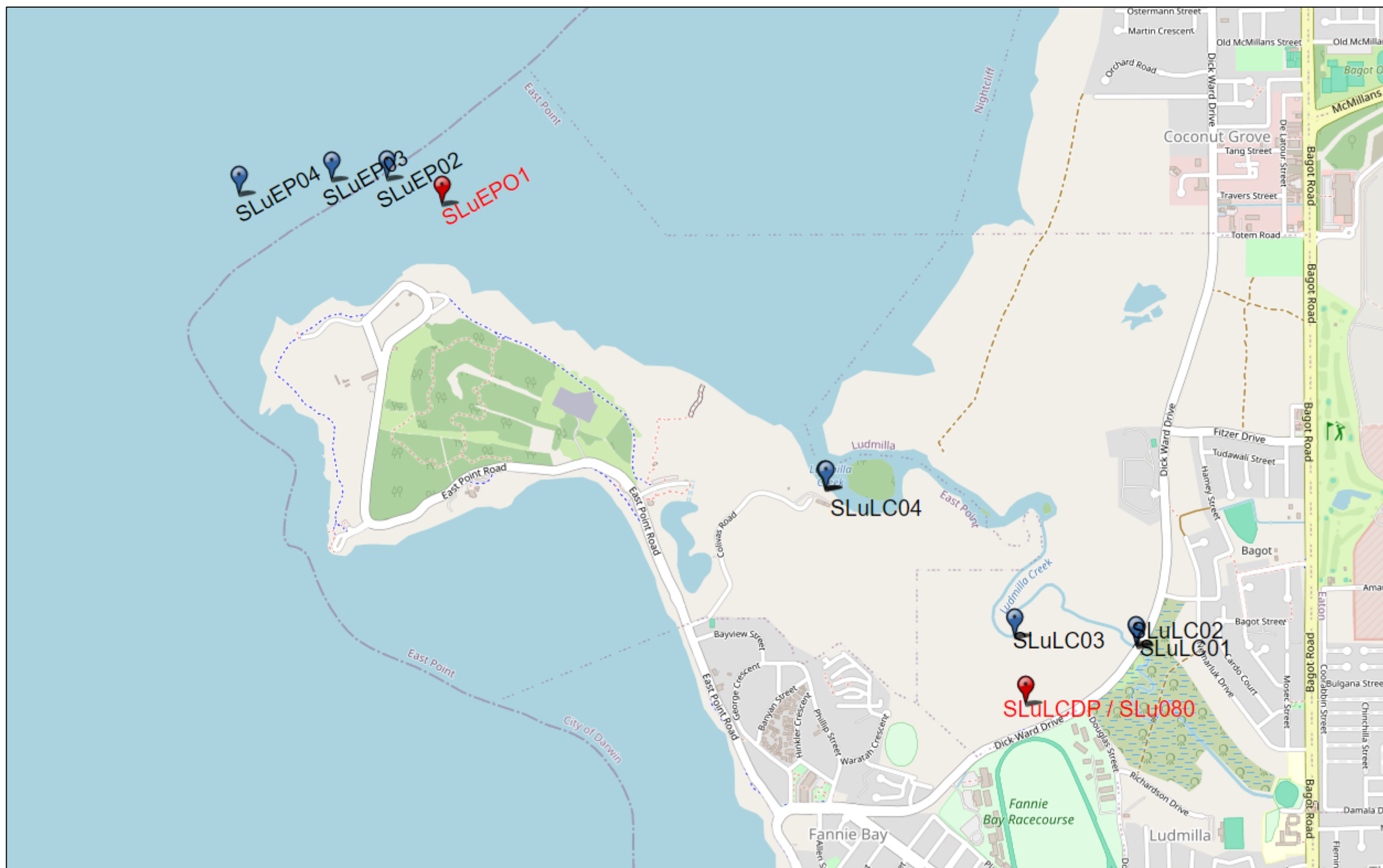
In this licence, unless a contrary intention appears:

Term	Definition
24 hour emergency contact	the phone number of a person who can be contacted at any time and be capable of responding to and providing information about any incident associated with the Licensed Action.
Administering Agency	means the NT Government Department with responsibility for administering the Water Act.
Anniversary Date	annual anniversary of the Commencement Date.
Annual Return	an Administering Agency prescribed format for demonstrating and reporting compliance with the conditions of this licence.
ANZG (2018)	Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at http://www.waterquality.gov.au/anz-guidelines .
business days	a day not Saturday, Sunday or a public holiday, in Darwin, Northern Territory.
Consultation and Communication Plan	a written plan documenting proposed consultation and communications for the Licensed Action before, during and after the Licensed Action which includes a strategy for communicating with members of the public who are likely to have a real interest in, or be affected by, the Licensed Action.
contact details	includes the 24 hour emergency contact, and name, position title and phone number of a representative of the Licensee who can be contacted about the licence and Licensed Action.
discharge	releasing or allowing a liquid, gas or other substance to flow out from where it has been confined.
Dry season	means 1 May to 31 October.
Emergency Response Plan	a written plan documenting the Licensee's procedures for responding to emergencies caused by, resulting from or associated with the Licensed Action and that may cause environmental harm.
Licensed Action	the Licensed Action as described on the covering page of this licence.
Linear Interpolation	a method to construct new data points within the range of known data points. $y = y1 + ((x - x1) * ((y2 - y1) / (x2 - x1)))$ y is the unknown concentration between known concentrations y1 and y2 y1 is the first known concentration y2 is the second known concentration x is the day of the unknown concentration y x1 is the day of the first known concentration y1 x2 is the day of the second known concentration y2
litter	litter, garbage, rubbish, refuse or waste matter, and includes the body of a dead animal.
NATA	National Association of Testing Authorities, Australia.

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Term	Definition
plant and equipment	all material items used in association with the Licensed Action, including (but not limited to) storage vessels and containers, pipe work and hosing, vehicles (including vessels), tools, and measuring equipment.
pollution	has the same meaning as <i>pollute</i> as defined in section 4 of the Water Act.
public entrance	access to the licensed premises that is utilised by the public.
qualified sampler	a person who has training and experience in obtaining samples from the relevant environmental medium.
Register	the register available at the website of the Northern Territory Environment Protection Authority (NT EPA).
wastewater	water that contains a waste.
Water Act	<i>Water Act 1992</i> (NT).
Wet season	means 1 November to 30 April.

APPENDIX 1: LOCATION MAP & MONITORING POINTS



View map online with NR Maps: <https://nrmaps.nt.gov.au/nrmaps.html#b8941e5e-bf53-499d-b275-fd1afe118b12>

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APPENDIX 2 : DESCRIPTION OF MONITORING POINTS

Type	Point name	Description	Latitude	Longitude
Monitoring Point	SLuLCDP	Ludmilla Creek emergency weir (Disturbed, Zone of Influence)	-12.42051	130.8450
Monitoring Point	SLuEP01	The East Point outfall (Disturbed, Zone of Influence)	-12.40151	130.82233
Compliance Point	SLuEP02	Darwin Harbour (Slightly to moderately disturbed, Beyond Zone of Influence)	-12.40056	130.82017
Compliance Point	SLuEP03	Darwin Harbour (Slightly to moderately disturbed, Beyond Zone of Influence)	-12.40061	130.81804
Monitoring Point	SLuEP04	Darwin Harbour (Slightly to moderately disturbed, Beyond Zone of Influence)	-12.40113	130.81443
Monitoring Point	SLuLC01	Ludmilla Creek (Upstream, Slightly to moderately disturbed)	-12.41835	130.84936
Monitoring Point	SLuLC03	Ludmilla Creek (Disturbed, Zone of Influence)	-12.41794	130.84460
Compliance Point	SLuLC04	Ludmilla Creek (Downstream, Slightly to moderately disturbed)	-12.41232	130.83726

APPENDIX 3: SURFACE SITE SPECIFIC TRIGGER VALUES

		Sample Locations^							
		Ludmilla WwTP effluent channel	East Point Outfall				Ludmilla Creek		
			ZoI	SMD Zone			ZoI	Upstream (SMD)	Downstream (SMD)
		SLuLCDP	SLuEP01	SLuEP02	SLuEP03	SLuEP04	SLuLC03	SLuLC01	SLuLC04
Indicator	Units								
pH	pH units	<7.0- >8.5	<7.0- >8.5	<7.0- >8.5 ^a		<7.0- >8.5 ^a	<7.0- >8.5 ^a		
Dissolved oxygen	% saturation	NR	<50 - >110	<80 - >110		<50 - >110	<80 - >110		
Total Suspended Solids	mg/L	NR	10 ^a	6		15 ^a	10 ^a		
Biological Oxygen Demand	mg/L	NR	5	5		5	5		
Chlorophyll-a	µg/L	NR	2 ^a	2 ^a		4 ^a	4 ^a		
NH ₃ -N (Total Ammonia as N)	µg/L	NR	1200 ^b	910 ^b		910 ^b	910 ^b		
Total Nitrogen	µg/L	NR	NR	300 ^a		NR	300 ^a		
Oxides of Nitrogen (NOx as N)	µg/L	NR	NR	20 ^a		NR	20 ^a		
Total Phosphorus	µg/L	NR	NR	30 ^a		NR	30 ^a		
Filterable Reactive Phosphorus	µg/L	NR	NR	10 ^a		NR	10 ^a		
Copper (filtered)	µg/L	NR	3	1.3 ^b		3 ^b	1.3 ^b		
Zinc (filtered)	µg/L	NR	23	8 ^b		23 ^b	8 ^b		
Escherichia coli	Cfu org/100mL or mpn org/100mL	50 ^a	50 ^a	Median >14 ^a 90 th percentile > 43 ^a		50 ^a	Median >14 ^a 90 th percentile > 43 ^a		
Enterococci		500 ^c	200 ^c	95 th percentile > 40 ^c		200 ^c	95 th percentile > 40 ^c		

Zol: Zone of Influence

SMD: slightly to moderately disturbed

^ Site locations as described in [Appendix 1](#) and [Appendix 2](#)

a Darwin Harbour Water Quality Objectives

b *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018) as current at issue of licence.

c Microbial Water Quality Assessment Limits for Category B (200 enterococci/ 100 mL) and Category C (500 enterococci/ 100 mL) as per Table 5.7 of the Guidelines for Managing Risks in Recreational Waters (NHMRC 2008).

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APPENDIX 4: SURFACE WATER SAMPLING LOCATIONS; PARAMETERS AND FREQUENCY

Sample locations*		LWwTP	East Point Outfall	Ludmilla Creek	Darwin Harbour		Ludmilla Creek	
Site Code		SLuLCDP	SLuEP01	SLuLC03	SLuEP02	SLuEP03	SLuLC01	SLuLC04
Site location		Locations as per Appendix 1 and Appendix 2						
Site Description		Effluent Discharge	Zone of Influence		Darwin Harbour beyond zone of influence		Ludmilla Creek U/S	Ludmilla Creek D/S
Management Intent		Effluent	Disturbed		Slightly to moderately disturbed zone			
Indicator	Units							
Physico-chemical parameters								
Flow	kL/day	C		NR				
pH	pH units	M						
Electrical conductivity	µScm ⁻¹							
Dissolved oxygen	%saturation							
Temperature	°C							
Turbidity	NTU							
Total Suspended Solids	mgL ⁻¹							
Biotic parameters								
Biological oxygen demand	mgL ⁻¹	M						
Chlorophyll-a	µgL ⁻¹							
Nutrient parameters								
NH ₃ -N (Total Ammonia as N)	µgL ⁻¹	M						
Total Nitrogen	µgL ⁻¹							
Oxides of Nitrogen (NO _x as N)	µgL ⁻¹							
Total Phosphorus	µgL ⁻¹							
Filterable Reactive Phosphorus	µgL ⁻¹							
Metals parameters								
Copper (filtered)	µgL ⁻¹	M						
Zinc (filtered)	µgL ⁻¹							
Pathogen Indicators								
Escherichia coli	Cfu /100 mL or MPN / 100 mL	M						
Enterococci								
Other								
PFAS^	µgL ⁻¹	Annual - Dry Season		NR				
EDCs 4-t-octylphenol; Nonylphenol; Bisphenol A; Andosterone; Etiocholanolone	ngL ⁻¹							

Key:

C = Continuous (with minimum of hourly records and 80% capture rate); **NR** = Not Required; **M** = monthly; **Annual - Dry Season** = between May and September

^ Must be analysed using the PFAS Extended Suite (28 analytes, trace level)

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APPENDIX 5: SEDIMENT MONITORING PROGRAM

Water Quality Management Zone		Zone of impact		Darwin Harbour and Ludmilla Creek SMD Zone				
Sampling Site Code		SLuEP01	SLuLC03	SLuEP02	SLuEP03	SLuEP04	SLuLC01	SLuLC04
Monitoring point		As per Appendix 1 and Appendix 2						
	Sample medium							
Indicator	Units	Sediment	Pore waters	Monitoring Frequency				
Total Organic Carbon	%	✓	✗	Annual – Dry Season				
Aluminium	mg/kg	✓	✗					
pH	pH units	✗	✓					
Chlorophyll a	mg/kg	✓	✗	Annual – Dry Season				
Total P	mg/kg	✓	✗	Annual – Dry Season				
Filterable reactive phosphorus	µg/L	✗	✓					
Total N	mg/kg	✓	✗					
NH ₃ -N (Total Ammonia as N)	µg/L	✗	✓					
Copper [#]	mg/kg µg/L	✓	✓	Annual – Dry Season				
Zinc [#]		✓	✓					
PFAS [^]	µg/L	✓	✗	Annual – Dry Season	NR			

Key:

Annual - Dry Season = between May and September; NR = Not Required

[^] Must be analysed using the PFAS Extended Suite (28 analytes)

[#] <63 µm sediment fraction analysed

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APPENDIX 6: SEDIMENT MONITORING REPORTING PROTOCOLS

Indicators	Assessment Protocol
Total Organic Carbon	Calculate C:N ratios
Aluminium	Al normalisation of metals in sediments
pH	Calculation of pH adjusted ammonia criteria
Chlorophyll a	1. Compare to reference data 2. Calculate ratio to phaeophytin-a
Total P	Annual trend assessment in comparison to loads.
Filterable reactive phosphorus	Compare to reference site data
Total N	Annual trend assessment in comparison to loads and for determining C:N ratios
NH ₃ -N (Total Ammonia as N)	1. Compare to pH adjusted SMD TV [^] 2. Compare to reference sites
Copper	1. Metals analysed as per the Munksgaard methodology [#]
Zinc	2. Compare total in sediments to ISQG low ISQG and then if exceeds compare Bioavailable metals in sediments to ISQG low 3. Compare to ANZG 2018 in sediment default trigger values* 4. Compare metals in pore water to SMD SSTV ^{c, d, e, f} 5. If ISQG low exceeded compare Total and Bioavailable metals in sediment and filtered metals in pore water to reference data 6. Compare Al normalised Total metals in sediment to reference data in that season and assess for significant difference
PFAS	Compare to NEMP 2.0 values, Section 8: 1. Table 2: Human health investigation levels for soil 2. Table 3 :Ecological guideline values for soil

Munksgaard, N. C. (2013). Recommendations for sampling and analysis of Darwin Harbour sediment. Charles Darwin University

[^] pH adjusted SMD trigger value based on in-situ pore water pH, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Ammonia in marine water).

* As per Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for sediment quality, Table 1, Copper & Zinc, <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/sediment-quality-toxicants>)

a 90% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Ammonia in marine water).

b 95% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Ammonia in marine water).

c 95% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Copper in marine water).

d 95% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Zinc in marine water).

e 90% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Copper in marine water).

f 90% level of species protection for marine water as per Table 3.4.1, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2018 (Toxicant default guideline values for aquatic ecosystem protection: Zinc in marine water).

SMD = slightly-moderately disturbed;
TV = trigger value;
ISQG = interim sediment quality guideline