

Environmental Management Plan for Ludmilla Wastewater Treatment Plant Discharge

2022

Document History

Revision	Purpose	Date	PWC
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1. Background

1.1. Overview of the Facility

Ludmilla Wastewater Treatment plant is an advanced primary treatment plant originally commissioned in 1977. Upgrades to increase capacity were completed in 2016. The process relies upon chemically assisted sedimentation as its main treatment process

Discharges occur at 2 different sites: East Point Outfall (EPO) and Ludmilla Creek. The majority of discharge occurs at the EPO and only in high flows (wet season) will there be any effluent discharged to Ludmilla Ck.

1.2. Scope

This Plan is intended to provide guidance regarding the implementation of the WDL 150-08 requirements and communication of the risks and potential environmental consequences of the discharge to the relevant personnel. This is achieved through the consolidation of a number of other documents in order to create an overarching management plan. The documents included in this Plan are:

- Environmental Risk Assessment – D2022/205561
- Communications Strategy – D2015/500627
- Emergency Response Plan – D2020/389598

A generic environmental management plan is under development for all operational wastewater facilities, addressing the other environmental risks including but not limited to contamination of soils, surface water, and groundwater; emissions of air pollutants from wastewater infrastructure; flora and fauna management and; weed and pest management. Where sites are identified as high risk (e.g. Ludmilla WwTP where chemicals are used as part of normal operation) a specific management plan will be developed. The scope of this document is strictly limited to the management of the environmental effects of the discharge from LWwTP.

2. Relevant Legislation

2.1. Power and Water Policy Statement, Guidelines and Procedures

Power and water has developed an Environmental and Sustainability Policy Statement which outlines the way in which Power and water are committed to the protection of, and minimisation of harm to the environment in which we work, and contributing to a sustainable future for the Northern Territory.

PWC will:

- Drive organisational outcomes, enhance relationships with the community and stakeholder and build environmental management capability and culture
- Foster a proactive culture of protection and risk minimisation and drive out environmental management outcomes.
- Use planning process and operations to systematically identify, assess manage and measure environmental risk
- Ensure environmental responsibilities are known, owned and acted upon by a workforce with the capability required to identify assess and minimise the risk of environmental harm from our operations

- Support appropriate mechanisms in place for monitoring, responding to change, gaining assurance and continuously improving the effectiveness of our environmental management system
- Develop and implement a stakeholder engagement plan to build and sustain positive strategic partnerships with key stakeholders and the community in support of our environmental and sustainability objectives
- Continue to implement a range of demand management, remote sustainability, and energy and water efficiency programs to support our contribution to sustainability
- Support the adoption of cleaner, and renewable energy across the Northern Territory, including increased solar energy in remote communities to reduce our reliance on diesel
- Coordinate and manage power and water system so they remain safe and reliable for all customers and participants as more renewable energy is developed across the Territory.
- Encourage the investigation of emerging technologies, such as energy storage, to keep informed about the available technologies to potentially support our system into the future

2.2. Licences and compliance obligations

The Ludmilla Creek and EPO discharges are governed, under the Water Act (1992), by Waste Discharge Licence 150. The licence was developed and has been amended over the years to specifically suit this site.

Separate to the WDL governed by the NT EPA, the East Point Outfall is also subject to conditions imposed by the federal government under the Environment Protection and Biodiversity Conservation Act. The EPBC conditions were initially imposed due to a proposed project to lengthen the outfall main beyond the intertidal area it currently sits. Although the project was deferred and is unlikely to proceed in its original form, monitoring of Benthic Infauna and water quality around the outfall is required in line with a Benthic Infauna & Water Quality Monitoring and Management Plans (BIMMP & WQMMP) in order to understand the impact of the outfall on the receiving environment.

The monitoring and reporting associated with these obligations are further discussed in Section 7

2.3. Environmental Management System

Power and water has developed an Environmental Management System (EMS) for assessing and managing environmental risk and impacts. The EMS has been developed to align with the AS/NZS ISO14001 environmental management system standard, and provides a practical framework to identify, manage and monitor environmental risks based on a PLAN, DO, CHECK, ACT cycle. The EMS provides a framework from which procedures and work instructions can be developed.

Although the system is geared toward managing risks associated with the facility (i.e. chemical spills, air and noise pollution, sewage spills) the system can still be used to project environmental risk from the discharge.

2.4. Training Requirements

In addition to the above policies and regulations, inductions and training will add another layer of environmental protection.

Inductions and training of relevance to LWwTP are:

- White Card
- Certificate of Water Treatment (III & IV)

- Environmental Awareness Course
- Water Services Level 3 Induction
- Water Services Induction – Hazards General Induction Level 3
- Water Services Induction for entering Wastewater Storage, Handling and Treatment
- Site specific induction including work instructions

Familiarity with the reporting requirements and procedures embedded within the WDL are desired for operators to have. Operators will be the first to notice any incident which may cause harm to the receiving environment and so the sooner they are able to relay the message the better.

Similarly contractors are required to hold qualifications in their respective field

3.Roles and Responsibilities

The following roles within PWC are key contributors to the environmental management of the discharge of LWwTP.

Table 1: Roles and Responsibilities

Role / Title	Responsibility
Chief Executive Officer Power and Water Corporation	<ul style="list-style-type: none"> • The licence holder for all waste discharge licences
General Manager Water Services	<ul style="list-style-type: none"> • Overall responsibility for urban sewerage infrastructure NT wide
Senior Manager Strategy and Planning	<ul style="list-style-type: none"> • Planning and Infrastructure Development
Senior Manager Asset Management	<ul style="list-style-type: none"> • Asset Management
Senior Manager Operations / Service Delivery	<ul style="list-style-type: none"> • Overall responsibility for the Ludmilla WWTP
Water Quality and Treatment Teams	<ul style="list-style-type: none"> • Technical advice on treatment, water quality monitoring • Communication with regulatory authorities as required (i.e. licence non-compliances)
Operations/Service Coordinator	<ul style="list-style-type: none"> • Coordination of works at Ludmilla WWTP • Responsibility for day to day operation of the plant
Operator	<ul style="list-style-type: none"> • Routine plant inspections • Basic maintenance and pit operations as required
Water Services	<ul style="list-style-type: none"> • WWTP Operation Management

4.Contact Register – Incident Response Plan

A plan is required in the event the discharge quality and, subsequently, the receiving environment are put at risk. The plan is applicable to any accident, operational change or other activity which changes may the nature of the discharge.

Stage	Response
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<p>Ensure the site is safe</p>	<p>The presiding operator will first consider personnel safety and then, if safe to do so, take all practicable action reduce the magnitude of the hazard and in turn the resulting environmental risk</p>
<p>Notify</p>	<p>Report to incident to Power and Water Corporation:</p> <ul style="list-style-type: none"> • Water Services Senior Manager Service Delivery • Water Services Water and Wastewater Compliance Officer • Manager HSE (Environment) • HSE Business Partner (Water Services) <p>24hr emergency response Contact Power and Water Corporation Emergency Response Line via 1800 245 090</p> <p>For environmental incidents relating to discharges or emissions from the facility, as soon as reasonably practicable, but no later than 24 hours after becoming aware of the incident, notify the Department of Environment Parks and Water Security (DEPaWS) via the Pollution Hotline 1800 064 567 and emailing Pollution Control, DENR pollution@nt.gov.au</p> <p>Note:</p> <ul style="list-style-type: none"> • In the case of a non-compliance with the WDL – the Water and Wastewater Compliance Officer will notify DEPaWS at waste@nt.gov.au. • In the case of an incident not related to the licensed activity – the Environmental Services Team will notify DENR in consultation with PWC Water Quality and Water Services. <p>PWC will notify the Adminstrating Agency prior to making any operational change that will cause, or is likely to cause, and increase in the potential for environmental harm (Licence Condition 3).</p>
<p>Follow Procedure</p>	<p>Follow PWC’s Site procedures to further mitigate risk:</p> <ul style="list-style-type: none"> • Waste Discharge Licence 150-08 • Emergency Response Procedure • PWC Ludmilla Waste Water Treatment Plan Emergency Response Plant for Dangerous Goods • Sewerage Overflow Response Work Instruction • Sewage Overflow Notification Log Sheet
<p>Report incident/non-compliance to the Administering Agency in writing</p>	<p>For an incident:</p> <p>As per section 14 of the Waste Management and Pollution Control Act, for an incident that causes, or is threatening or may threat to cause, pollution resulting in material environmental harm or serious environmental harm, the person conducting the activity must notify</p>

the NT EPA in accordance with subsection (3) as soon as practicable after (and in any case within 24hrs) first becoming aware of the incident or the time he or she ought reasonably to be expected to have become aware of the incident.

A notification to the NT EPA is to specify:

- a. The incident causing or threatening to cause pollution;
- b. The place where the incident occurred;
- c. The date and time of the incident;
- d. How the pollution occurred, is occurring or may occur;
- e. The attempts made to prevent, reduce, control, rectify or clean up the pollution or resultant environmental harm cause or threatening to be caused by the incident; and
- f. The identity of the person notifying

Section 14 notification templates can be found on the NT EPA website: <https://ntepa.nt.gov.au/waste-pollution/compliance/pollution-incidents>

For non-compliances with the licence:

As per Licence Condition 32 of WDL 150-08, The water quality team is required to notify the Administering Agency as soon as practicable and in any case within 24hrs of first becoming aware of the non-compliance by emailing waste@nt.gov.au.

The notification will require the following information (Licence Condition 33):

- When the non-compliance was detected and by whom;
- The date and time of the non-compliance;
- The actual and potential causes and contributing factors to the non-compliance;
- The risk of environmental harm arising from the non-compliance;
- The action(s) that have or will be undertaken to mitigate any environmental harm arising from the non-compliance;
- Corrective actions that have or will be undertaken to ensure the non-compliance does not reoccur;
- If no action was taken, why no action was taken; and
- A date when an incident investigation report will be submitted to the Administering Agency.

Records will be kept of all non-compliances in accordance with Condition 31.

5. Existing Environment

There are 2 distinct receiving environments to consider when developing an environmental management plan corresponding to each of the discharge points. East point outfall and Ludmilla Ck must be considered separately due to the differing discharge frequencies, beneficial uses and environmental receptors of the 2 areas. Ludmilla Creek is only discharged to during high flow events and as a result has accounted for less than 1% of the total outflow over the past 3 financial years.

5.1. East Point Outfall

The East Point outfall is located in an intertidal area which increases the risk for humans though reduces the risk for flora and fauna as there is little to no permanent habitat in the direct vicinity of the outfall.

There is an aquatic life reserve approx. 300m west of the East Point Outfall created in order to protect the ecology of the area by prohibiting the harvest of sedentary animals and juvenile fish within the reserve.

The Darwin Harbour Water Quality Objectives apply to the environment surrounding this outfall to protect and maintain the beneficial uses of the harbour.

5.2. Ludmilla Creek

Ludmilla Creek lies to the north-east of the East Point Recreation Reserve and forms part of the north and east boundary of the reserve. Ludmilla Ck and the adjacent mud flats have a cultural value. The Aboriginal population harvests and cooks shellfish on an annual basis. The usage of Ludmilla Ck for other recreational purposes (swimming, fishing etc.) is understood to be minimal.

The water quality within Ludmilla Ck, due to its large catchment, is subject to environmental runoff which must be taken into account when assessing the impact of LWwTP discharge.

Due to the smaller size of the creek, it is more sensitive to discharges than the east point outfall, hence the restriction to discharges imposed in the Waste Discharge Licence.

5.3. Conceptual Site Model

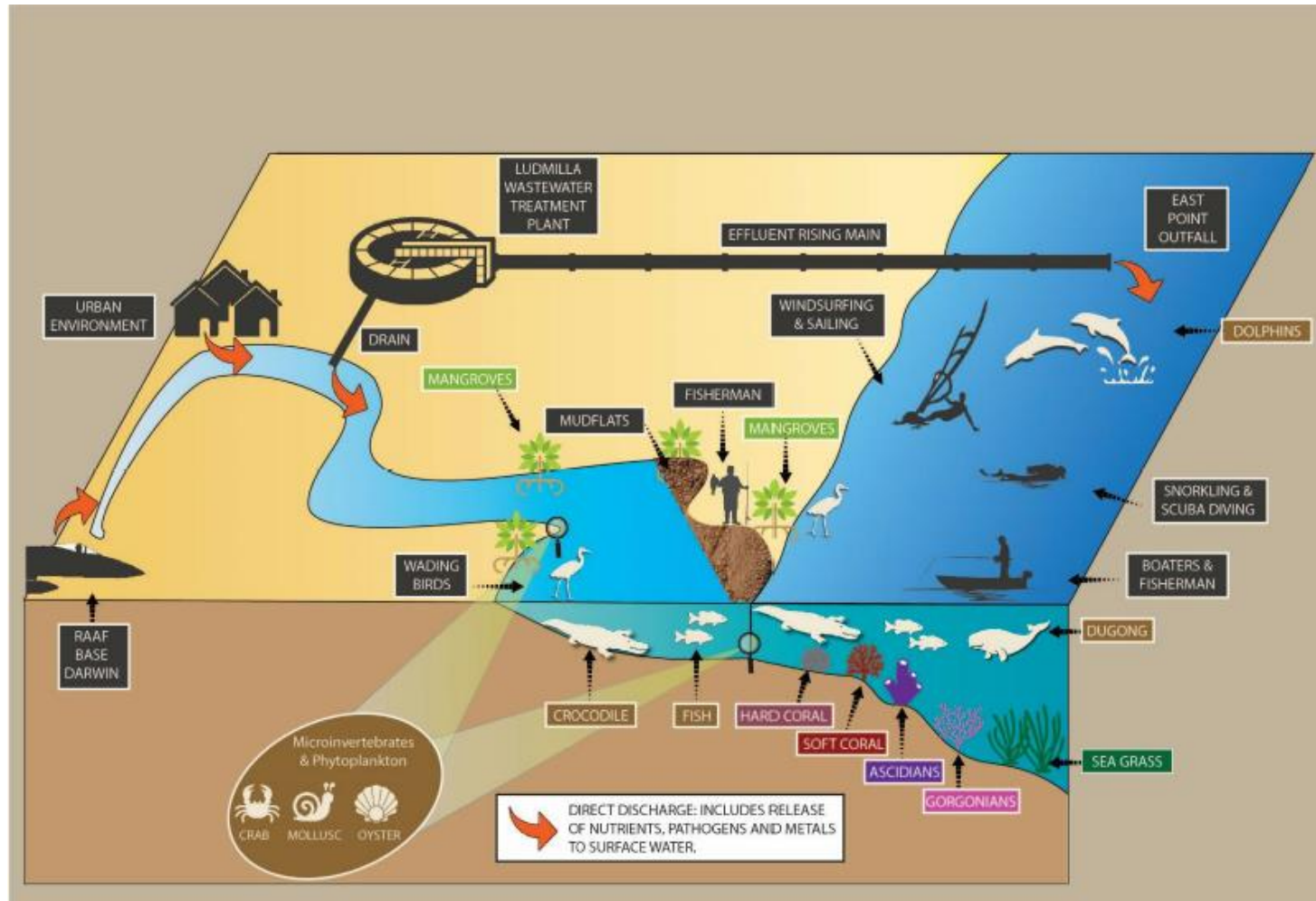


Figure 1: Conceptual Site Model

6. Risk Assessment

An updated risk assessment was completed in May 2022, incorporating 3 new studies quantifying the impact of the discharge on the surrounding environment. The quality of the discharge and the locations of each of the discharge points have not changed and thus the outcomes are similar to that of the 2019 risk assessment although it does give a good insight into how the discharge quality has changed since the plant upgrade in 2016 and how that has effected the risk profile.

Screening assessments identify human contact with pathogens as highest risk. Studies by researchers at Charles Darwin University (Neave et al 2014; Padovan et al 2017; Kaestli et al 2017, Padovan et al 2019) have identified microbiota as a sensitive environmental indicator even in the dynamic and complex environment that is Darwin Harbour. These studies have also identified that DNA associated with pathogenic bacteria is present in waterways subject to treated wastewater discharges, however the studies also found that the DNA was present in Darwin Region water ways to which there are no known wastewater of treated effluent discharges. This risk was rated as High as, although it is not a designated swimming beach, there is still a possibility people will swim in the vicinity of the East Point Outfall.

Black plume discharges, caused by low flows in the outfall rising main, have had an adverse effect on the visual amenity of the waters around East Point. This phenomena is classed as a risk to the cultural values and there has been no evidence that it has compromised the environmental values of the area.

Toxicant assessments show a marked improvement between the 2014 and 2018 due to the commissioning of the hydraulic plant upgrade in 2016. The toxicity of the effluent for organisms commonly found in the receiving environment has reduced by between 3 and 5 times. Based upon the results a dilution factor of 26 is still required for 99% species protection though the estimated dilution factor at the East Point Outfall between SLuEP01 and 02 is 200.

The toxicant assessments, along with the Ludmilla Creek ERA conducted by SLR in 2021 identifies 3 chemicals of potential concern ammonia, copper (both of which have the potential for toxicity and are found in high concentrations in the discharge) and zinc (included as it is a commonly identified toxicant in wastewater). Ludmilla Ck receptors were assessed against the concentrations of these chemicals in the discharge and their estimated toxic thresholds. Ammonia toxicity ranked as a possible risk to receptors whereas copper and zinc register a low or negligible rating following the semi-qualitative risk assessment. Though this is the case, these results were contingent on a 24hr continuous discharge which is rarity in wet season and even less likely in dry season.

The risk associated with sewage effluent discharges to Ludmilla Ck in the wet season is Low to Negligible due to the dilute nature of the effluent. The study also found, based upon water quality results comparing the sampling sites upstream and downstream of the discharge point, the wider Ludmilla Ck catchment has a larger influence on the characteristics of the creek than the discharge.

Although, largely, the risk profile of each outfall remains low, the need for maintenance and mitigation is important and ongoing. Current and ongoing mitigation measures to retain a low risk rating include:

- Routine water quality sampling including observations from samplers on a monthly basis,
- assessing the environmental outcomes of operational changes within the plant,
- maintenance of signage and other communication to reduce human activity and
- regular investigations to bolster PWC's understanding of the ever changing context of the receiving environment

Changes to the WDL were also recommended as part of the SLR assessment.

- Alterations to the flowrate qualifier for wet season discharges to Ludmilla Creek from 1000L/s inflow to 750L/s.
- The adjustment of site specific trigger values within Ludmilla Ck to more accurately take into account the upstream impact on water quality and, subsequently, gain a further understanding of the actual influence the WwTP discharge is having on the creek.
- Removal of the upstream monitoring sites SLuLC01 & SLuLC02. The water quality at these sites is more heavily influenced by the runoff from the catchment than the LWwTP

6.1. Risk methodology

The above risk assessment followed PWCs corporate risk assessment methodology

Table 2: Risk assessment consequence matrix

Area of Impact	Impact Rating				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
Health & Safety	Minor event with or without injury; and/or No on-going impact to health.	Injuries requiring first aid treatment; and/or Minor short term inconvenience.	Medical Treated injury; and/or Short term reversible disabling effect to human health; and/or Lost Time Injury <1 week lost.	Hospitalisation; and/or Injuries resulting in Lost Time Injury > 1 week lost; and/or Long term (chronic) chemical health exceedance or short term chemical exceedance of chemical with acute health impacts; and/or Long term aesthetic exceedance with health impact on supply.	One or more fatalities; and/or One or more persons seriously injured (includes long term disabling effect); and/or Widespread release of untreated water (eg due to disinfection failure).
Financial (Impact on EBITDA)	Loss less than \$500K.	Impact between \$500K-\$2M.	Impact between \$2m-\$10m.	Impact between \$10m-\$40m.	Impact greater than \$40m.
Legal/ Regulation	Legal issues managed by corporate procedures or practices; and/or Breach of internal policies or procedures without the need for formal investigation.	Matter requires legal advice to address issues; and/or Internal breach of policies or procedures requiring a formal investigation.	Required to operate under limited regulatory restrictions or orders; and/or Incident which requires legal representation resulting in court proceeding.	Required to operate under significant regulatory restrictions or orders; and/or Government inquiry/ intervention.	Criminal charges / civil litigation against the Corporation and/or Officers; and/or Operating licences revoked.

Area of Impact	Impact Rating				
Environmental	Localised low level damage controlled but no remedial action required.	Localised low level damage controlled and remedied with minimal resources.	Widespread temporary damage with extended resources to remedy.	Long-term detrimental effect on environment and once controlled results in minor permanent damage.	Substantial permanent damage to widespread and sensitive areas.
Service Delivery (external customers only)	Category 1 loss of service (refer to Appendix C of ERM Standard).	Curtailement or loss of service, restored within expected timeframes (<=2 hours). Category 2 loss of service (refer to Appendix C of ERM Standard).	Short term curtailement or loss of service outside of expected timeframes (<=12 hours). Category 3 loss of service (refer to Appendix C of ERM Standard).	Long term curtailement or loss of service with extended resources required to remedy (>12 hours< 24 hours). Category 4 loss of service (refer to Appendix C of ERM Standard).	Complete and indefinite loss of service (=>24 hours). Category 5 loss of service (refer to Appendix C of ERM Standard).
Reputation	No media attention; and/or Isolated community or individual issue-based concern; and/or Localised dissatisfaction which is managed by normal business processes; and/or Short term aesthetic exceedance.	Occasional once-off negative media attention; and/or Localised community impacts and customer concerns; and/or Localised staff dissatisfaction which requires Human Resources in resolution; and/or Long term aesthetic exceedance.	Brief adverse media attention and/or community/customer condemnation (days); and/or Limited, localized loss of confidence by the community; and/or Localised staff dissatisfaction with localised impacts to service deliver; and/or Short term chemical health exceedance.	Prolonged adverse media attention and/or community/customer condemnation (weeks); and/or Prolonged, widespread community/ customer loss of confidence (weeks); and/or Widespread dissatisfaction and loss of confidence by staff resulting in temporary service delivery issues.	Sustained adverse media attention and/or community/customer condemnation (months); and/or Irreconcilable community/customer loss of confidence; and/or Loss of stakeholder confidence in Board and/or Management; and/or Widespread dissatisfaction by staff resulting in sustained service delivery issues.

Table 3: Risk assessment likelihood matrix

Likelihood rating	Expected Likelihood	
(E) Almost Certain	Event is expected to occur on a regular basis. One or more times per annum.	Not Applicable
(D) Likely	An event is expected to occur from time to time. Once every 1 – 3 years	Probability of occurring is greater than 33%
(C) Possible	An event should occur at some time. Once every 4 – 10 years.	Probability of occurring is greater than 10% up to 33%
(B) Unlikely	An event could occur at some time. Once every 11 to 30 years	Probability of occurring is greater than 3% up to 10%
(A) Rare	An event not expected but possible. Less than once in 30 years	Probability of occurring is up to and including 3%

Table 4: risk assessment likelihood vs consequence matrix

Likelihood	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
Almost Certain (E)	Medium	High	Very High	Extreme	Extreme
Likely (D)	Low	Medium	High	Very High	Extreme
Possible (C)	Low	Low	Medium	High	Very High
Unlikely (B)	Low	Low	Medium	High	High
Rare (A)	Low	Low	Low	Medium	Medium

7.Environmental Monitoring

Monitoring of the environment is undertaken on a monthly basis at a number of sites around each of the discharge sites. The monitoring sites (Figure 2) are located to provide a good representation of the impact the effluent on the environment.

PWC will ensure all samples are:

- representative of the conditions at the time of sampling (Licence Condition 25);
- collected in accordance with recognised Australian Standards and guidelines (such as AS/NZS 5667, ANZECC/ARMCANZ) (Licence Condition 26);
- analysed at a laboratory with current NATA accreditation or equivalent, for the parameters to be measured (Licence Condition 27); and
- collected in accordance with Appendix 1, 2 and 3 of the Licence or in connection with the Licenced activity or the WDL150-06, are obtained by, or under the supervision of a qualified sampler (Licence Condition 29). For each sample, the following information will be recorded and retained (Licence Condition 30):
 - The date on which the sample was collected;
 - The time at which the sample was collected;
 - The location at which the sample was collected;
 - The name of the person who collected the sample;
 - The chain of custody forms relating to the sample;
 - The field measurements (if any) and analytical results (if any) relating to the sample; and
 - Laboratory quality assurance and quality control documentation.

PWC will for all based monitoring points specified in Appendix 1, 2 and 3 of the Licence (Licence Condition 28):

- Install, maintain and provide appropriate identification signage so that they are easily identifiable at all times; and
- Maintain safe access and egress, as is reasonable practicable.

As a part of the sampling process, samplers are required to make observational notes detailing the appearance of water and sightings of plants/animals at each sampling site.

In accordance with BIMMP, an annual monitoring program is undertaken to document the characteristics of benthic infauna communities in the vicinity of EPO to determine the extent and nature of the effluent discharge on infauna. Data is then compared against trigger values to determine appropriate management response to further protect sensitive marine ecological receptors in the region. The sampling process involves:

- Collecting known volumes of sediment at each prescribed collection site (Figure 3);
- Sieving sample through 1mm mesh transferring the retained sieve samples to labelled bags;
- Preserving the samples in 5% formalin in seawater solution prior to sorting in the lab;
- Collecting a second known volume at the same site for particle size and total organic carbon analysis.

Project, date, time, GPS position or waypoint number, sample position unique code & sampling person are recorded and retained for each sample taken.

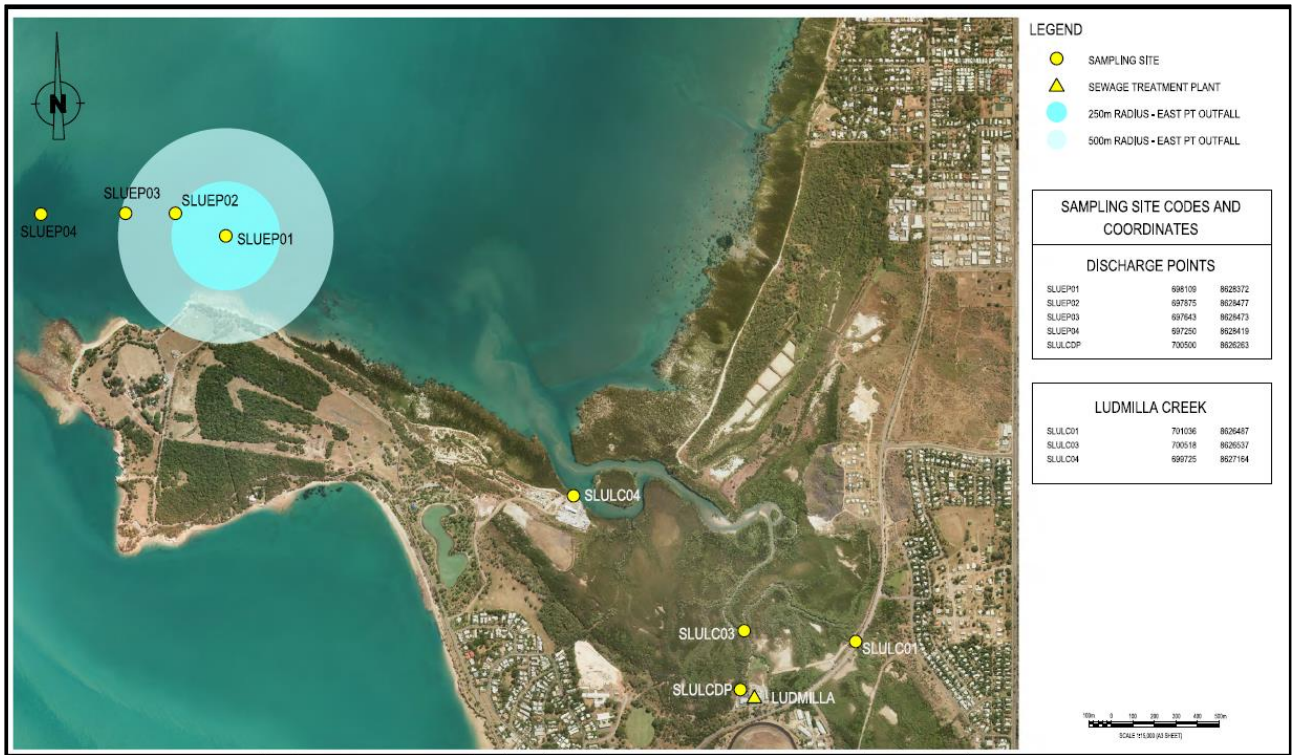


Figure 2: WDL 150-08 sampling sites

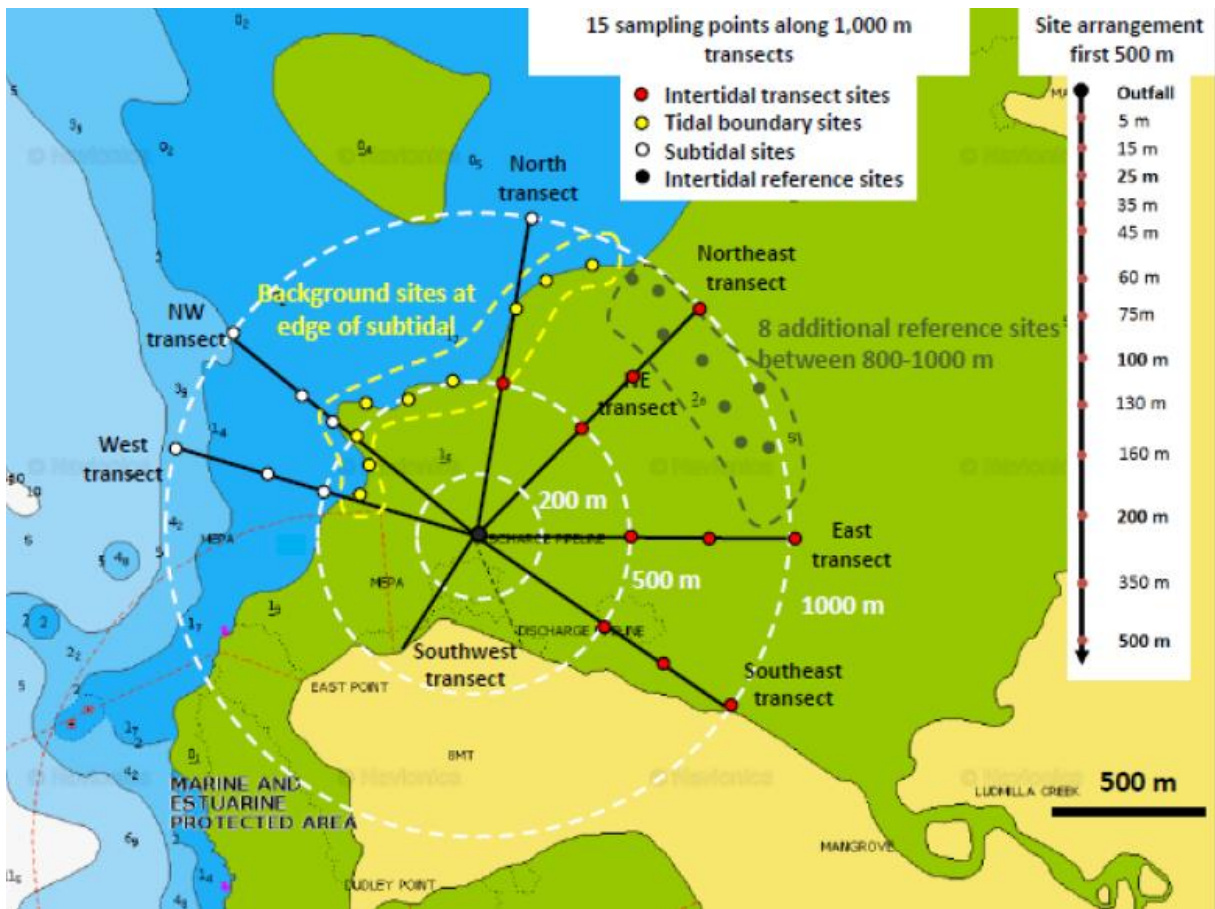


Figure 3: BIMMP sampling sites

Table 5: Monitoring frequencies as per WDL 150-08

Parameter	Monitoring Frequencies per Site Code (Figure 9 and 10)						
	Ludmilla WWTP	East Point Outfall	Ludmilla Creek	Darwin Harbour		Ludmilla Creek	
	Slu080	SAB050	SluLC03	SluEP02	SLuEP03	SLuLC02	SLuLC04
Physico-chemical parameters							
Flow	D						
pH							
Electrical conductivity							
Dissolved oxygen							M
Temperature							
Turbidity							
Total Suspended Solids (TSS)							
Biotic parameters							
Biological oxygen demand							M
Chlorophyll-a							
EDCs	S						NR
Nutrient parameters							
Ammonia (as total N)							
Total Nitrogen							
Oxides of Nitrogen (Nox as N)							M
Total Phosphorus							
Filterable Reactive Phosphorus							
Metals							
Copper (filtered)							M
Zinc (filtered)							
Pathogen Indicators							
Escherichia coli							M
Enterococci							

7.1. Reporting and review

The data obtained from the sampling is uploaded directly to PWCs database Envirosys where it is then validated and used to inform annual compliance reports.

As per the Waste discharge licence 150-08 the reporting schedule is as follows:

- The licensee must provide to the Administering Agency annual monitoring reports prepared in accordance with the Environment Protection and Biodiversity Conservation Act Referral 2009/5113 as outlined in Appendix 3 of this licence (Condition .36)
- The licensee must submit a completed Annual Audit and Compliance Report (AACR), by emailing waste@nt.gov.au, within 30 days after each anniversary date of this licence, which relates to the preceding 12 month period (Condition 37)
- The licensee must complete and provide to the Administering Agency a Monitoring Report, as prescribed by this licence, not less than 30 business days prior to the anniversary date of this licence by emailing waste@nt.gov.au (Condition 38). The licensee must ensure that each Monitoring Report(Condition 39):
 - Is prepared in accordance with the requirements of the NT EPA *Guideline for Reporting on Environmental Monitoring*;
 - Includes a tabulation of all monitoring data as required as a condition of this licence including surface water sediment and biological monitoring;
 - Includes long term trend analysis of monitoring data to demonstrate any environmental impact associated with the licenced activity over a minimum period of three years (where data is available);
 - Provides an assessment against the annual reporting criteria notes in Appendix 1 Table 2 of this licence;
 - Includes an assessment of environmental impact from the activity;
 - Contains a summary of the licence limit (site specific trigger value) exceedances that have occurred during the reporting period; and
 - Reports on annual loads discharged from SLu080 as per appendix 1 of this licence

The reports generated from the BIMMP are passed on directly to the federal government department responsible for the EPBC Act. The data presented and conclusions drawn from these reports, along with the WDL 150-08 monitoring reports, are fed back into the Environmental Risk Assessment (discussed in Section 6) in order to accurately assess the changing risk profile of the discharge.

8. Communication

8.1. Internal Communication/Management Goals

Management goals have been developed to help inform the treatment planning process and to broadly relay PWC's compliance obligations for the site. They are as follows:

- **Management Goal 1:** Beyond the immediate vicinity of the 'authorised discharge points' identified in the Waste Discharge Licence, the discharge will cause no harm to public health or to declared Beneficial Uses for which the waters may be reasonable be expected to be used
- **Management Goal 2:** The impact zone for the East Point Outfall discharge is maintained as no greater than the previously identified primary impact zone of a 250m radius around the outfall and reasonable and practical steps will be undertaken to progressively reduce the size of the impact zone.
- **Management Goal 3:** Discharges only occur via the authorised discharge points
- **Management Goal 4:** Discharges to Ludmilla Creek will only occur during periods of high wastewater inflow to the treatment plant.

8.2. External Communication

The communication plan centres on providing information to the general public which will lead to positive outcomes for both PWC infrastructure and the receiving environment. The key strategic messages are:

- Everyone is responsible for producing wastewater;
- Wastewater treatment protects both public and environmental health;
- Actions to assist in preventing blockages;
- Effluent discharge is mostly a necessary consequence of wastewater treatment unless viable reuse options can be identified;
- Power and Water is a responsible utility that is committed to managing risk (health and environment), monitoring and research (environment), meeting out service standards for operational performance (compliance and WDLs) into the future as reflected in our strategic goals
- Power and Water's vision is to be a best practice, commercially focussed and customer centric multi-utility respected by the community for our contribution to the NT economy and its pursuit of the long term interests of consumers

A number of resources are available on the Power and Water website regarding the above information. A more targeted information campaign directed at key stakeholders will be implemented during periods of operational change or major capital works.

Power and water also provides communication regarding the risk the EPO discharge poses to recreational users of the East Point tidal flats area. Signs have been erected along the shoreline identifying the location of the outfall and the risks associated with spending extended periods in its vicinity.

Complaint Handling

All complaints received in regards to the Ludmilla WWTP, whether it is a complaint about the facility itself or in regards to the licenced activity, are all recorded and follow up contact is made to the complainant by the relevant PWC staff member with the intention of resolving their issue (Licence Condition 13).

For each complaint received the following information will be recorded (Licence Conditions 14):

- The person to whom the complaint was made;
- The person responsible for managing the complaint;
- The date and time the complaint was reported;
- The date and time of the event(s) that led to the complaint;
- The contact details of the complainant if known, or where no details are provided a note to that effect;
- The nature of the complaint;
- The nature of events(s) giving rise to the complaint;
- Prevailing weather conditions at the time (where relevant to the complaint);
- The action taken in relation to the complaint, including any follow-up contact with the complainant; and
- If no action was taken, why no action was taken.

All complaints are recorded within Maximo, and complaints in regards to the licenced activity are also recorded within the Complaints Tracking spreadsheet.

For further information regarding communications see PWC's Wastewater Discharge Licence Communications Strategy (CM document D2022/254806)

Contact

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Water Services

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PowerWater