

Maningrida Wastewater Treatment Plant WDL 203-04 Performance Improvement Plan

2025

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1. Introduction

Discharge from the Maningrida Wastewater Treatment Plant (WwTP) is regulated under conditions specified in Waste Discharge Licence WDL203-04, granted under Section 74 of the Water Act 1992.

Item 15 (Condition 43) of WDL203-04 states, “by February 2025, the Licensee must submit to the Administering Agency an updated Performance Improvement Plan”. According to the Guidelines on waste discharge licensing under the Northern Territory Water Act 1992 (NTEPA 2014), “an Improvement Plan must be submitted as a demonstration of commitment to the reduction and/or elimination of discharge(s) through improved waste quality and processes. The Improvement Plan must focus on reducing the zone of impact or any declared mixing zone and progressively move towards the discharge quality not compromising any beneficial use declaration or relevant water quality criteria for the receiving waters.”

This updated Performance Improvement Plan outlines actions to be implemented in upcoming years to improve the performance of Maningrida WwTP, and in turn improve environmental outcomes. It is important to understand the context in which this improvement plan has been developed and that the implementation of the suggested improvement strategies are subject to many factors, not least of which is funding.

The Maningrida WwTP is not situated within a Water Control District and at present there are no beneficial uses declared under the *Water Act*. Decisions about wastewater treatment improvement should be informed by risks to the surrounding environment and water quality objectives described in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000). This risk-based approach is the foundation for decisions on improvement strategies outlined in this Performance Improvement Plan.

2. Scope

The performance improvement plan will identify measures as necessary to reduce or otherwise manage the impacts associated with a discharge in order to maintain the relevant environmental values. This includes the development of appropriate commitments, such as schedules for:

- Implementation of measures to rectify any non-compliance(s);
- Design studies for the improvement of wastewater treatment and discharge strategies and infrastructure; and
- Further monitoring and impact assessment.

The emphasis for Power and Water for the immediate future at wastewater treatment sites that discharge to the environment is on:

- Providing appropriate infrastructure to remove, collect and treat centralised wastewater generated by communities;
- Operating and maintaining wastewater systems to protect the public from microbiological pathogens that can cause disease in the community and to minimise impacts of wastewater on the environment;
- Minimising adverse effects on the environment from the disposal of effluent to land, water and or water recycling, through prevention and continual improvement in accordance with the relevant legislation, regulation, guidelines and Power and Water documentation; and
- Improving our understanding of the water cycle flows through the wastewater

systems and the impacts of these on the waste stabilisation pond treatment performance.

An environmental risk assessment undertaken on the Maningrida WwTP indicates:

- Risks to the assessment end-points, associated with the source, were assessed as having low to high risk rankings. These rankings were associated with the low discharge volumes into a tidal marine environment, while higher risk rankings were associated with impacts to cultural values including human health risks through primary and secondary contact and aquatic food safety.
- The risk rankings may change as uncertainties associated with current assessments are addressed. A range of recommendations have been made in this risk assessment to address knowledge gaps and identify reasonable and practicable measures for improvement.

3. Environmental Values

Beneficial Use Declarations (BUD's) maybe declared under section 73(1) of the Water Act. No BUD's are in place for this site. In the absence of BUD's, Environmental Values have been identified.

Environmental Values are particulate values or uses of the environmental that are important for a healthy ecosystem or for public benefit, welfare, safety or health which require protection from the effects of pollution, waste discharges and deposits.

The receiving water body for this discharge is directly into the Liverpool River mouth where it meets the Arafura Sea via a 350m long pipeline.

The environmental values are:

- Environment;
- Cultural/Human Health; and
- Aquaculture.

4. Management Objectives

The Power and Water 2024-2025 *Statement of Corporate Intent* was tabled in parliament detailing Power and Water's commitment to government in setting out the Corporation's objectives, scope of business, strategies, funding mechanisms, approach to risk management and financial performance targets. Under the *Statement of Corporate Intent* (Power and Water 2024), Power and Water will continue to deliver on our objective of providing safe and reliable services to our customers, while maintaining a focus on commercial sustainability.

Long-term goals of relevance to the licensed activity include:

- **Safety** – reach a proactive safety culture to achieve zero harm to our people, contractors and the public.
- **Operational performance** – to be a best-practice multi-utility that continuously improves the services we provide and asset management practices and leveraging synergies across our lines of business.
- **Environment** – to be a solid performer in environmental management.

4.1. Power and Water Statement of corporate Intent

In accordance with the Government Owned Corporations Act, Power and Water's objectives are to:

- Operate at least as efficiently as any comparable business; and
- Maximise the sustainable return to the Northern Territory Government on its investment in Power and Water.

5. Improvement Plan Actions

Under this Improvement Plan, Power and Water will ensure that in order to minimise impacts associated with the licensed activity that:

- The discharge of treated effluent from the Maningrida WwTP will be undertaken within the legal framework provided by the licence; and
- Power and Water will progress the management actions identified in Table 1 within budgetary and resource constraints.

Table 1. Maningrida Improvement Action Plan - informed by input from across all of Water Services.

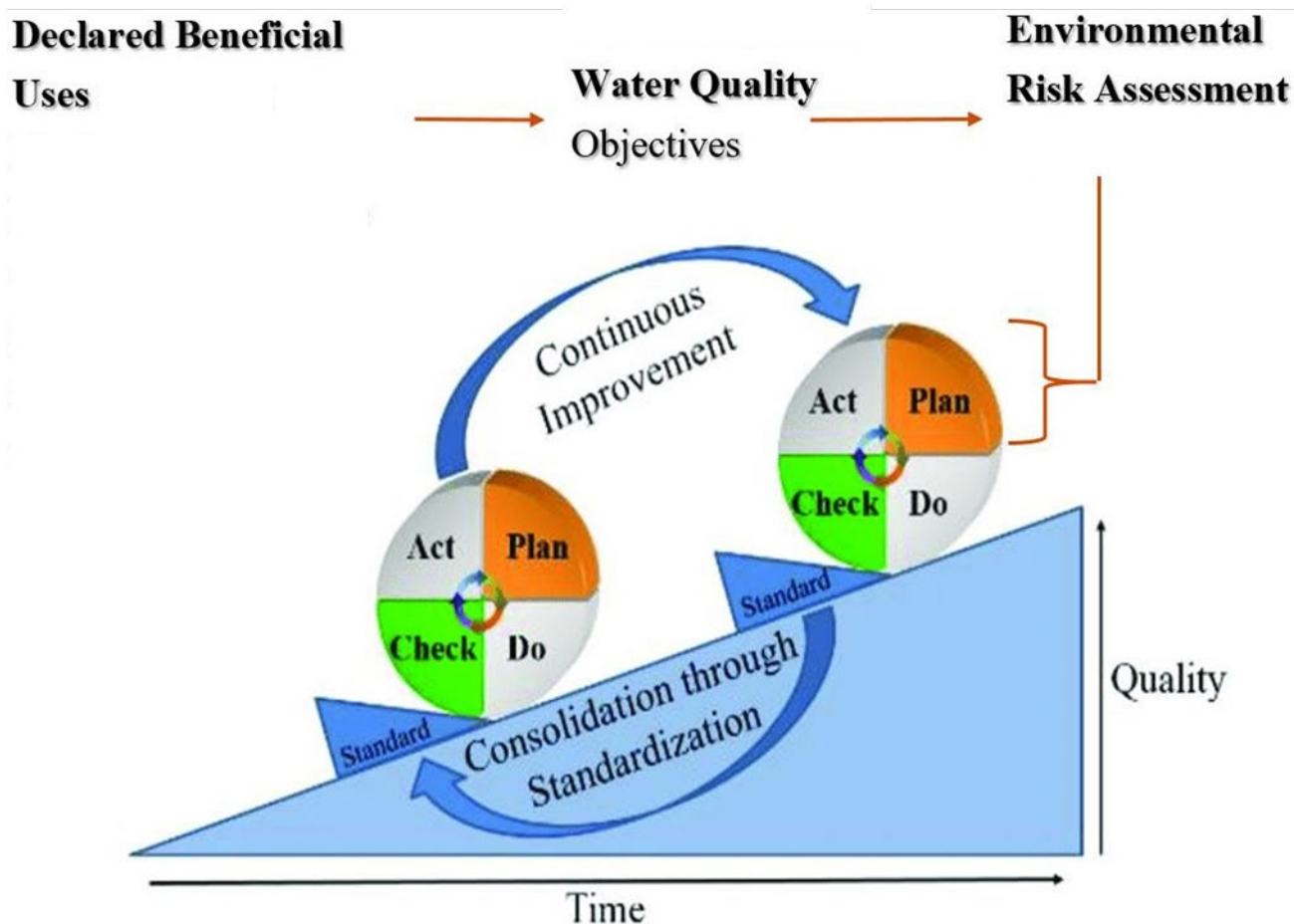
Action No.	Action Identified	Action Progress	Timeframes	Status
				Completed = ✓
				In Progress = ✓
				On hold = !
				No progress = ✗
1	Characterise the risks associated with the discharge through continued monitoring of wastewater discharged to the environment.	Routine wastewater quality monitoring programs have been developed, implemented and refined. • Review sampling and handling processes to ensure confidence in wastewater quality data collected.	2027	✓
2	Undertake a more robust Waste Stabilisation Pond process modelling assessment in line with the Power and Water Waste Stabilisation Pond Design Manual. This is an updated assessment of pond performance.	Conduct assessments at selected communities where population growth is expected - Maningrida is listed under the Remote Housing Project for population growth – an assessment has been completed at this site.	To be finalised at the end of licence	N/A

3	Develop an action plan to address “very high” or above level risks* as identified in the risk assessment. The action plan is to include an assessment of the discharge water quality in relation to factors that may affect discharge water quality (i.e. pond design, operational and maintenance factors) with respect to environmental values.	No Very High level risks identified in environmental risk assessment.	N/A	Not Required
4	Implement options to accurately quantify the volume of treated wastewater discharged to the environment.	Develop a risk-ranked program for installation of flow monitoring improvements. Flow meters have been installed progressively based on priority and budget availability. Flows at non-metered sites are estimated using water balances and climatic data as per the methodology in the Power and Water environmental risk assessments. - Flow meter is installed at Maningrida. - Discharge flow data is available – QA process required.	Completed – Magflow meter is installed	✓
		Implement regular maintenance schedule to service and calibrate flow meters.	2026	✓
5	Develop and implement a desludging program for all remote communities to inform a desludging works prioritisation list	Schedule work orders per financial year based on funding availability. - Maningrida ponds were deslugged in 2012 and 2015. - Conduct sludge surveys to inform the desludging program.	Ongoing	✓

References

- ANZECC, and ARMCANZ. 2000a. Australian and New Zealand Guidelines for Fresh and Marine Water Quality Volume 1 - The Guidelines. National Water Quality Management Strategy., Australian and New Zealand Environment and Conservation Council and Agriculture Resource Management Council of Australia and New Zealand.
- ANZECC, and ARMCANZ. 2000b. Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 2 - Aquatic Ecosystems Rationale and Background Information. National Water Quality Management Strategy., Australian and New Zealand Environment and Conservation Council and Agriculture Resource Management Council of Australia and New Zealand. Department of Health, Northern Territory Government, Darwin.
- Department of Territory Families, Housing and Communities (DTFHC). (2022). Indigenous Community Engineering Guidelines. Northern Territory Government, Darwin.
- DOH. 2011. Guidance Notes for Recreational Water Quality in the Northern Territory.
- NHMRC. 2008. Guidelines for Managing Risks in Recreational Water. National Health and Medical Research Council, Australian Government, Canberra.
- NTEPA. 2014. Guidelines on Waste Discharge Licensing under the Water Act. Northern Territory Environment Protection Authority, Northern Territory Government.
- Power and Water. 2024. Power and Water Corporation 2024-25 Statement of Corporate Intent. Power and Water Corporation, Darwin.

Appendix 1 – Risk Based Approach to Continuous Improvement



Power and Water’s Environmental Management System (EMS) is maintained as per international standard ISO 14001 which advocates a plan, do, check and act cycle for continuous improvement.

Plan: Recognize an opportunity and plan a change.

Do: Test the change. Carry out a small-scale study.

Check: Review the test, analyse the results, and identify what you've learned.

Act: Take action based on what you learned in the study step.

Improvement strategies, which fall within the “plan” stage of the continuous improvement cycle for the discharge, are informed by risk to the Declared Beneficial Uses, guided and assessed by the Water Quality Objectives (ANZG 2018).

Appendix 2 - Cost considerations in wastewater treatment

Decisions about wastewater treatment improvement options are not made without due consideration. Any strategy for improvement to the discharge comes with an associated cost that must be ultimately paid by taxpayers through water and sewerage tariffs. As such, all options for improvements to the discharge should be assessed against the risks to the declared beneficial uses and taking into consideration the cost to taxpayers. This cost vs benefit informed by risk is a balancing act that specialist treatment engineers at Power and Water must manage. In terms of environmental outcomes, improvements in the wastewater treatment industry are not linear. There is a tendency for large gains after significant upgrades to or replacement of, ageing infrastructure, followed by a period of decline as the infrastructure ages and approaches or exceeds design capacity with increasing population. But the overall trend should be toward improved environmental outcomes, providing appropriate funds are committed, as displayed in figure 2 below. Considered in the broader context, across the various treatment sites, wastewater treatment in Maningrida is currently positioned toward the latter end of one of these cycles and significant investment will be required in the near future to ensure continuous improvement.

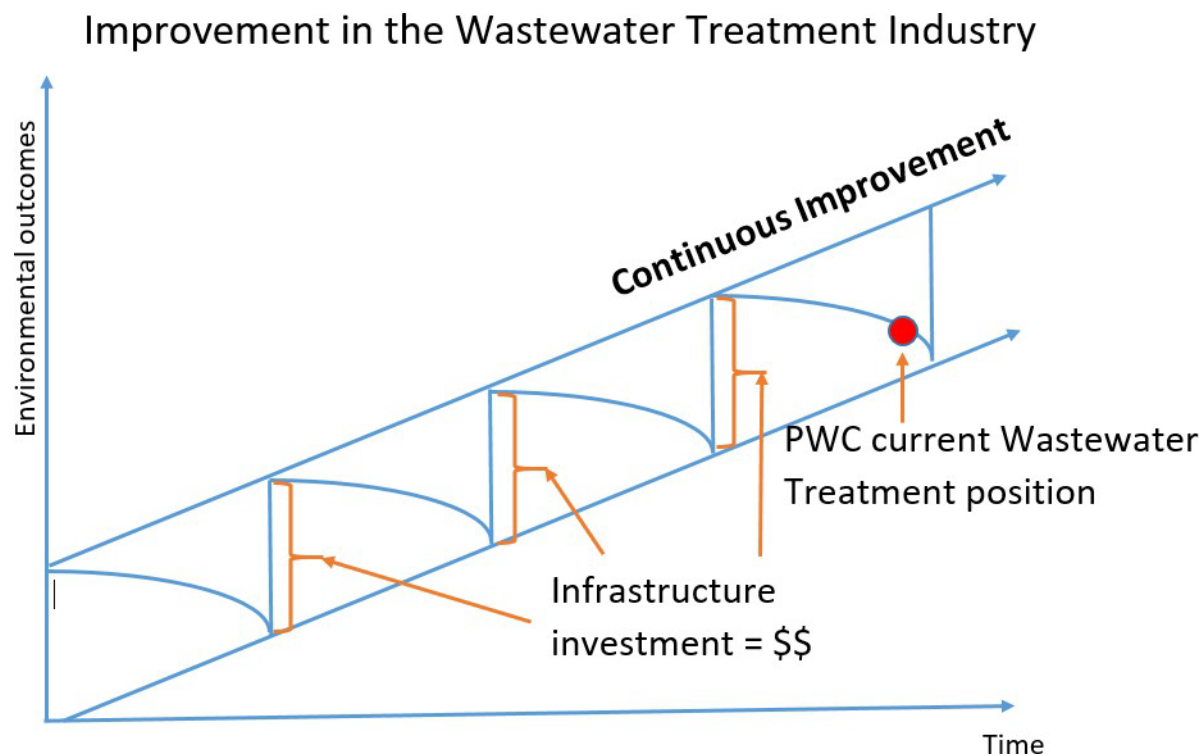


Figure 2: Improvement in the wastewater treatment industry

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