

Katherine Waste Stabilisation Ponds Improvement Plan

2022

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Introduction

Discharges from the Katherine Waste Stabilisation Ponds (KWSP) are regulated under conditions specified in the Waste Discharge Licence 151-07, granted under section 74 of the Water Act 1992.

An Improvement Plan may be required to support a WDL application under the Guidelines on Waste Discharge Licensing under the Water Act (NTEPA 2014). According to this guideline, “The 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 Improvement Plan is provided in support of a renewal application for WDL 151-08 and outlines a range of improvement strategies to be implemented in upcoming years to improve the performance, in terms of environmental outcomes, of the KWSP. 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 the appetite of the NT community and government toward investment in various treatment improvement options. Work on a new Water and Sewerage Funding and Tariff proposal has commenced and a submission is planned for April of 2023. This submission and ultimate decision will greatly influence planning judgments about, and the capacity of Power and Water Corporation (PWC) to deliver on, the improvement strategies outlined in this plan.

Although no beneficial uses have been officially declared for the Katherine River, sensitive receptors have been identified in the recently completed Environmental Risk Assessment. Any and all improvement actions will be geared toward reducing the risks identified. The KWSP is currently operating at 50% of its maximum capacity and, following upgrades in 2012, has 70 years of asset life remaining which places it in a low risk category.

Katherine Improvement Plan actions 2022

Ongoing actions from previous plans, whilst still continuing, are not included in these actions. A shorter list of actions is presented compared to previous years to provide greater focus and attention on the priority improvement items in this list. This action list has been developed through consultation with operations and planning staff and directly reflects the lower risk category this site holds. Note some of these actions are already underway although the material improvement from them has not yet been realised.

No.	Action item	Intended outcomes	Timeframe
Capital works			
1	Lowering height of internal spillways (Irish bridges)	Increased retention between the ponds, decrease requirement for discharge	On 5 year plan
2	Drop balance pipes in between adjacent evaporation ponds	Increase storage and reduce requirement for controlled discharge during monsoonal events	On 5 year plan
3	Install elbow in M4 balance pipe to E5	Eliminates the need for actuated valve to be operated (valve previously would stay closed during power outages, increasing the risk of an overflow)	FY22/23
4	Extension of hardstand to accommodate all Katherine desludge matter	Will allow more regular desludging activities, improving hydraulic retention and treatment performance	In Progress
5	Permanent sump constructed at drying bed/hardstand	Will allow any leachate from hardstand area to be disposed of correctly rather than being released into the environment. Currently only temporary setup in place	In progress
6	Construction of new routine monitoring sampling points	Allows for more accurate sampling of inlet sewage. New sample point capture all of Katherine sewage whereas the previous state missed some incoming sewage	Completed March 2022
7	Construction of new sampling point for COVID auto-sampler	Allows for more accurate sampling of inlet sewage. New sample point capture all of Katherine sewage whereas the previous state missed some incoming sewage	Completed March/April 2022
Operational and ongoing			
8	Erosion control between wave wall and road seal	Maintain the structural integrity of the ponds and roads	Yearly Program
9	Road repair	Reliable access for operational staff	Yearly Program
10	Vegetation management including duckweed removal	Minor improvements to treatment, reduction in contamination	Ongoing
11	Sludge survey	Will give an indication of timing for the next round of desludging	To be completed during FY22/23

Appendix 1 - Risk Based Approach to Continuous Improvement

Declared Beneficial Uses of Darwin Harbour:

Environment - aquatic ecosystem protection,
Cultural – aesthetic, recreational, cultural needs.

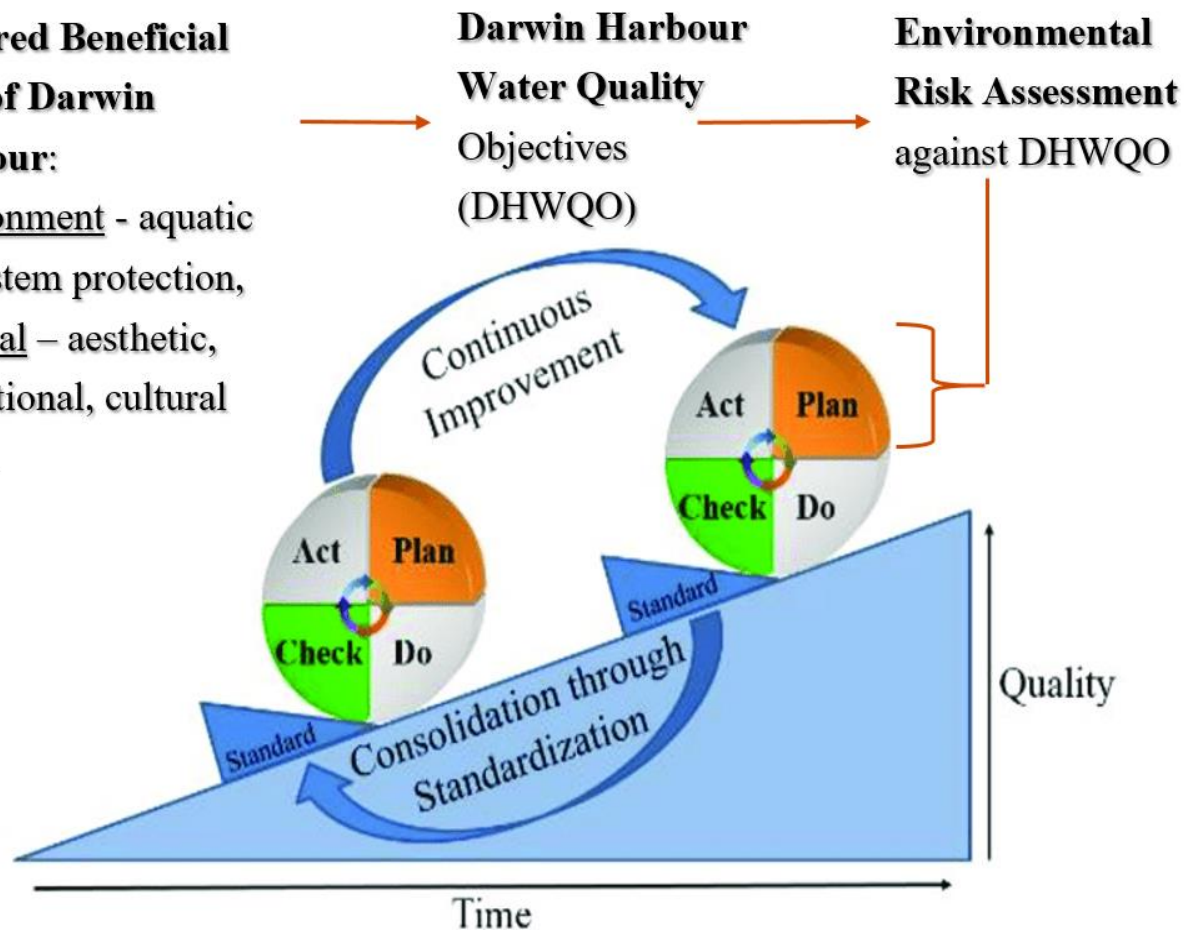


Figure 1: Plan, do, check, act continuous improvement cycle based on risk

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.

Environmental Risk of the KWSP discharge

An updated environmental risk assessment for the receiving environment of the KWSP discharge was completed by SLR in 2022 – 2022 Katherine Environmental Risk Assessment (D2022/351000). Findings of the risk assessment include:

- The discharging effluent presents a low overall risk to the receiving environment

- The risk of exposure to pathogens for users drinking untreated is rated as High although this risk rating is not effected by the treated effluent due to the already high quantities of pathogens in catchment runoff during wet season
- It was recommended the requirement for an ERA within the WDL be removed and any further risk assessments only be conducted due to adverse monitoring results

Operational Risk pertaining to the KWSP discharge

Operational risk is the risk of losses caused by flawed or failed processes, policies, systems or events that disrupt normal operations. Pond sets come with very little operation risk as by design they are very simple, being gravity fed and not relying on complex mechanical operations. The Katherine WSP however does come with some operational risk during the monsoonal season. The levels of the evaporation ponds must be managed to maximise the storage with in the pond set in order to reduce the incidence and volume of discharge to the environment. This risk is currently being managed well and some of the improvement plan items seek to reduce it even further.

Compliance and Regulatory Risk

In recent communications with PWC, the NTEPA highlighted a potential cultural change in the organisation toward more routine dispensing of infringement notices and fines available to the administering agency as regulatory instruments under the Water Act. The NTEPA indicated a much lower tolerance in the future for breaches of licence conditions, particularly in instances of repeated similar breaches. The financial implications of regulatory changes either to legislative acts or the changing culture of regulatory authorities combined with the financial implications of regulatory non-compliances must be considered when making decisions regarding improvement options at Katherine Waste Stabilisation Ponds. Failure to appropriately act on risks can have profound financial implications. In Power and Water's 2021-2022 Statement of Corporate Intent (SCI) a key performance indicator up to 2024-2025 includes a target each year of zero (0) significant environmental compliance issues.

Section 16 of the Water Act prohibits pollution and prescribes associated environmental offences, ranging from level 1 to level 4. In summary, it is an environmental offence, for a person to allow waste to come into contact with water, or to pollute water, unless it is authorised under the Act (under a waste discharge licence), or any other law in force in the Territory.

The penalty for an environmental offence is defined under the Environmental Offences and Penalty Act and is in the order of:

- for an individual between a maximum of \$11, 088 and \$55, 440 or up to 5 years imprisonment plus a victims level; or
- for a body corporate between a maximum of \$55, 440 and \$2, 770, 560 plus a victims levy.

Under section 104 of the Water Act, a default penalty may also be applied in the event that an offence continues after a complaint alleging the commission of that offence has been lodged with the court.

Under section 16 of the Act, a default penalty of \$500 for an individual, or \$2500 for a body corporate, applies.

The default penalty is applied for each day the offence continues.

Under section 76 of the Act, it is an environmental offence (level 3) for the holder of a waste discharge licence to contravene (or cause, suffer or permit a person to contravene) a term or condition to which the licence is subject.

The penalty for an environmental offence (for each offence) level 3 is in the order of:

- for an individual between \$11, 088 and \$110, 880 plus a victims level; or
- for a body corporate between \$55, 440 and \$554, 400 plus a victims levy.

A default penalty of \$500 for a person or \$2500 in the case of a body corporate may also be applied.

Appendix 2 - Cost considerations in Wastewater treatment

Decisions about wastewater treatment improvement options are not made in a bubble. Any strategy for improvement to the discharge from KWSP 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 PWC 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, urban wastewater treatment in Darwin 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.

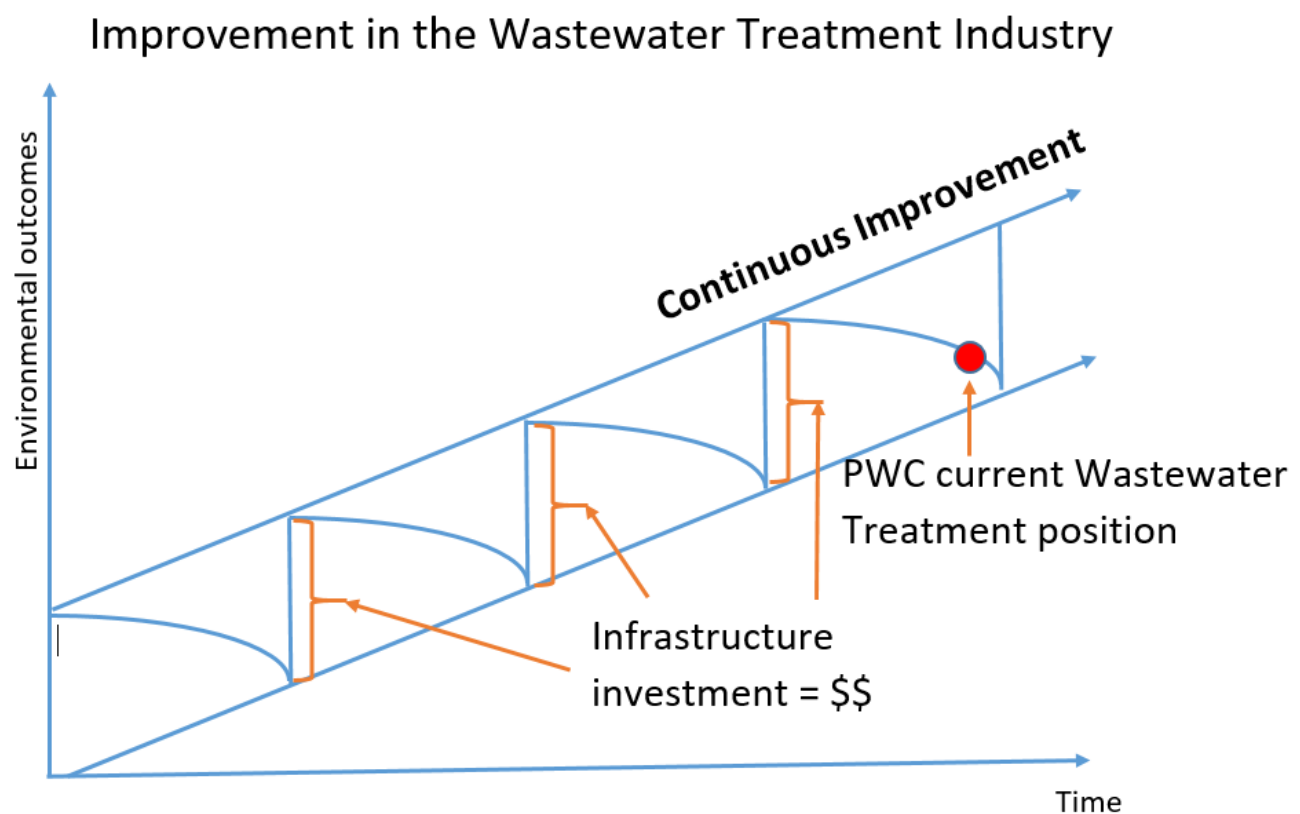


Figure 2: Improvement in the wastewater treatment industry

PWC 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 the Corporation.

Sewerage

The proposed sewerage capital program is focused on delivering capacity improvements to meet increased demand and compliance requirements. The capital program totals \$93.7 million over the four year SCI of which \$18.0 million was included in the 2020-21 budget. Based on an analysis of risk, the 2020-21 capital program included:

- Renewal/Replacement: Upgrade of current asset infrastructure to meet optimum levels of service.

Works are planned to improve the reliability of the distribution and treatment system across the NT through desludging programs, sewer pump replacement, sewer main relining, new switchboard and cabling at the Yulara Waste Water Treatment Plant and other sewer reticulation improvements.

- Service Improvement: Improve the efficiency of service delivery.
- Compliance: Meet increased regulatory and licencing requirements.