

# WHY YOUR WASTEWATER TREATMENT PLANT NEEDS A RISK MANAGEMENT AND MONITORING PROGRAM

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## **ABSTRACT**

Most municipal wastewater treatment plants (WWTPs) in Victoria must be operated in accordance with a licence. These licences are issued by EPA Victoria and are in line with the requirements of the Environment Protection Act 2017 and the Environment Protection Regulations 2021.

Over the last 18 months, EPA has issued updated licences to all Victorian water utilities for individual WWTPs. A condition of these new licences is that each WWTP must have a Risk Management and Monitoring Program (RMMP). This enables the licence holder and EPA to determine compliance with the general environmental duty (GED).

The GED is a cornerstone of the Environment Protection Act. The aim of the GED is to prevent harm to the environment and human health, and therefore has a strong focus on risk management. Specifically, the GED states that businesses must “use and maintain systems for identification, assessment and control of risks of harm to human health and the environment”. EPA expects licence holders to have a robust system in place to ensure their environmental performance is adequately assessed and complies with their licence and the GED. In practical terms, this means having a site-specific RMMP.

Common environmental risks at treatment plants include spills of untreated wastewater, odours, leaking lagoons, leaching from biosolids storage, poor waste management practices, and insufficient winter storage capacity. RMMPs capture all risks and document where controls and improvements are needed, thereby driving water utilities to implement measures to reduce these risks “so far as reasonably practicable”.

Whilst RMMPs can feel like a regulatory burden and yet another bit of paperwork to administer, a good RMMP will support operators and compliance officers to better manage and improve the environmental performance of WWTPs.

## **1. INTRODUCTION**

EPA Victoria now operate within the Environment Protection Act 2017 and the Environment Protection Regulations 2021. These two pieces of legislation specify how Victorians are to care for the environment, minimise risks, and manage contaminated land and waste. Activities that are likely to cause harm to the environment or human health, such as the treatment of wastewater, require permission from EPA. These permissions mean that EPA can stipulate how sites are managed and gives EPA greater visibility on high-risk activities that are occurring throughout the State.

Over the last couple of years, all licensed wastewater treatment plants (WWTPs) have been issued with updated licences, which align the licence conditions to the new Act and Regulations. Some water authorities previously had region-wide licences. These have all

been replaced with individual, site-specific licences, that contain a list of activity-specific licence codes and conditions.

A condition that is now in all WWTP licences stipulates that sites must have a risk management and monitoring program (RMMP). This is essentially an environmental management plan, which many water authorities will have at a corporate level, but now need to be site-specific and address a range of elements that reflect obligations of the Act. This paper explores what must be included in an RMMP for a wastewater treatment site, how RMMPs can improve site operations and licence compliance, and drive better risk management.

## **2. DISCUSSION**

### **2.1 RMMP requirements**

All WWTP licences now have the following condition (OL\_G05):

*1. You must develop a risk management and monitoring program for your activities which:*

- (a) identifies all the risks of harm to human health and the environment which may arise from the activities you are engaging in at your activity site;*
- (b) clearly defines your environmental performance objectives;*
- (c) clearly defines your risk control performance objectives;*
- (d) describes how the environmental and risk control performance objectives are being achieved;*
- (e) identifies and describes how you will continue to eliminate or minimise the risks in 1(a) (above) so far as reasonably practicable (SFARP); and*
- (f) describes how the information collated in compliance with this clause, is or will be disseminated, used or otherwise considered by you or any other entity.*

*2. The risk management and monitoring program must be:*

- (a) documented in writing;*
- (b) signed by a duly authorised officer of the licensed entity; and*
- (c) made available to the Authority on request.*

These requirements reflect the General Environmental Duty (GED), which is a key principle of the Act. By implementing an RMMP, site managers can have confidence that they will be meeting many of the obligations of the GED.

For example, WWTP sites may be used for storing waste materials generated from network operations, such as sucker truck mud, however there is often little documentation of this practice. An RMMP should identify what wastes are allowed to come onto a WWTP site, how they must be stored to minimise risks such as uncontrolled leachate entering the environment, and all monitoring activities (including sampling and testing).

Water utilities will have existing compliance monitoring plans, programs for identifying capital works and environmental risk registers. These can be used to help efficiently create an RMMP and influence the format to provide consistency with these existing documents and procedures.

## 2.2 Risks at WWTPs

This example demonstrates one of the many risks that are common at WWTPs. Whilst site plant managers and operators are usually aware of the risks at their treatment plants, they may not be well-documented within the business. Table 1 provides a list of common WWTP environmental risks and potential performance objectives, which should be considered for inclusion in site RMMPs.

**Table 1:** *Common environmental risks at WWTPs and potential performance objectives*

| <b>Common risks at WWTP that can impact the environment</b>  | <b>Potential performance objectives</b>  |
|--|--|
| Overflow of inlet works leading to the uncontrolled discharge of untreated wastewater  | No untreated wastewater should leave the site boundary                                     |
| Illegal dumping in sewers that impacts treatment plant performance and treated water quality   | Any illegal dumping events are investigated  |
| Poor aeration capacity impacting treated water quality   | Treated water quality within licence limits  |
| Odours from inlet works, bioreactors and sludge handling   | No odour complaints  |
| Lagoons leaking to groundwater   | Wastewater does not contaminate groundwater  |
| Algae blooms in lagoons, impacting water quality   | Algae blooms are limited to summer periods   |
| Biosolids storage generating leachate and contaminated stormwater  | No uncontrolled discharge of leachate and contaminated stormwater                          |
| Insufficient winter storage capacity leading to unlicensed discharges or reduced freeboard in lagoons, compromising their structural integrity | Minimum lagoon freeboard levels are maintained at all times                                |
| Insufficient irrigation area leading to over-irrigation, waterlogging and over-loaded soil nutrients   | No long-term overloading of irrigation soils   |
| Uncontrolled waste storage – such as asbestos cement, alum sludge, sucker truck mud, used equipment, spent filter media                        | No unauthorised/unlicensed waste stored on the site  |
| Storm events that generate influent flows above design peak wet weather flows  | Emergency discharges only occur when rainfall exceeds 90 <sup>th</sup> percentile wet year |
| Greenhouse gas emissions from treatment processes, electricity use and vehicles  | Reduce greenhouse gas emissions to meet water utility targets                              |

### 2.3 Using RMMPs to improve WWTP performance

The foundation of a site's RMMP is a risk assessment, which identifies the risks to human health and the environment from the infrastructure and operation of a WWTP. When considering a site's risks and control measures, it should become obvious where there are high risks and therefore where further work can be focused to reduce the risk profile. The process of identifying risks and assessing current control measures can therefore be the catalyst for site improvements.

For example, the risk assessment in an RMMP identifies that there is a high risk of discharging poor-quality treated water due to insufficient aeration capacity in a bioreactor. This risk could be reduced by upgrading the existing aerators, increasing the number of aerators, or reducing the influent load. Once identified and documented in the RMMP, a water utility is obliged, under the Act, to "*minimise those risk, so far as reasonably practicable.*"

There are six questions that should be used to determine what is reasonably practicable. These are:

- How can the risk be eliminated?
- What is the likelihood of harm occurring?
- What are the potential consequences?
- Do you know enough about the risk?
- What are the options for controlling the risk?
- How much will it cost to reduce the risk compared to the harm it could cause?

In the above example, upgrading the aerators might be reasonably practicable because there are newer, more effective aerators available that will fit within the existing tanks. However, at another site, an additional aeration tank with extra aerators may be needed because the existing aerators are already installed at their maximum density. And at a third site that is extremely restricted in space, increased trade waste fees might be used to reduce influent loads. For each WWTP, consideration of the site-specific constraints, available options, extent of risk reduction and costs determined what was reasonably practicable.

By involving site managers and operators in the development of an RMMP and the risk assessment process, operations staff can contribute to risk identification, document monitoring tasks (including daily observations and sampling activities), and recommend improvements. The RMMP then becomes a valuable resource for new operations staff, links operational activities to the risks they help control, and helps to prioritise projects that minimise environmental risks.

## 3. CONCLUSION

Although water utilities may have existing compliance monitoring plans, programs for identifying capital works needs at WWTPs and environmental risk registers, it is unlikely that they will have a single document that captures all the site-specific environmental risks and controls for a WWTP site. An RMMP should accurately reflect all the environmental

risks and control measures for a site, specify performance objectives that align with EPA requirements, and clearly identify where further work is needed.

Whilst RMMPs can feel like a regulatory burden and yet another bit of paperwork to administer, a good RMMP will support operators and compliance officers to better manage and improve the environmental performance of WWTPs.

#### **4. REFERENCES**

Environment Protection Act 2017 (Vic) <https://www.legislation.vic.gov.au/in-force/acts/environment-protection-act-2017/005>

Environment Protection Regulations 2021 (Vic) <https://www.legislation.vic.gov.au/as-made/statutory-rules/environment-protection-regulations-2021>