RISK MANAGEMENT PLAN

ASHBOURNE – MOSS VALE

INTERIM WASTEWATER TREATMENT SYSTEM (IWTS)

For Earth, For Life
Kubota

TRUEWATER COMMUNITY
PEOPLE • WATER • ENVIRONMENT

True Water

True Water provide sustainable sewage and wastewater treatment infrastructure solutions. Our expertise is applied to deliver capital, operational, and environmental benefit to all stakeholders.

True Water's "whole of life" focus results in reliable, versatile, and efficient infrastructure and improved wastewater management within regional and urban landscapes.

Vision

To deliver sewage and wastewater treatment infrastructure that best addresses the interests of current and future generations.

Mission

People. Water. Environment.

Through comprehensive management of wastewater True Water aims to protect the natural environment, safeguard public health, and improve quality of life.

Values

- Satisfy the needs of all stakeholders
- Maintain social and environmental awareness
- Serve future generations
- Enhance and drive innovation
- Be open and transparent

Integrated Environmental Management System (IEMS)

Sewage and water infrastructure requires the implementation of detailed planning, delivery, management, and auditing processes. For infrastructure delivery and operation to be successful it must satisfy stakeholder objectives and provide operational security throughout infrastructure life cycle. Protection of public health and the environment is paramount and neutral or beneficial impact must be secured.

True Water's Integrated Environmental Management System (IEMS) directs and informs all activities throughout the infrastructures lifecycle. The IEMS is a conclusive quality management process specifically designed to deliver stakeholder objectives, secure compliance, and protect public health and the environment. The IEMS includes management plans, polices, and guidelines:

- Environmental Management Policy
- Quality Management Policy
- Quality Management System
- Work Health and Safety Policy
- Safety Management System
- Code of Conduct
- Trade Waste Policy
- Compliance Policy
- Audit Policy
- Human Resources Policy
- Privacy Policy
- Company Operating Procedures
- Effluent Management Plan
- Risk Management Plan
- Health and Environmental Management Plan
- Installation Guideline
- Works Execution Plan - Construction
- Environmental Management Plan - Construction
- Work Health and Safety Management Plan - Construction
- Subcontractor Management Plan
- Commissioning Management Plan
- Works Execution Audit
- Sustainable Management Guideline
- Maintenance and Management Guideline
- Sampling and Testing Guideline
- WWTS Operation and Maintenance Manuals
- WWTS Owner's Manuals

RISK MANAGEMENT PLAN (RMP)

Site Address:

32 Lovelle Street and 141 Yarrawa Road, Moss Vale, NSW 2571

Lot 3 DP706194 and Lot 12 DP8660366

Client:

Prime Moss Vale Pty Ltd

Suite 30.02, Level 30, 420 George Street, Sydney NSW 2000

Prepared By:

True Water

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Document Control

Version History

Date	Version:	Revision Description	Approved By:
30.08.22	RMP-ASHBv1	Draft	Raphaela Janoni
28.10.22	RMP-ASHBv1	Final Draft	James Mahoney
31.10.22	RMP-ASHBv1	Review	Angela Villate & Michael Gordon
07.11.22	RMP-ASHBv2	Draft Review	James Mahoney

Interim Wastewater Scheme Description

Ashbourne is a master planned residential development located on the southern edge of the township of Moss Vale in the Southern Highlands of NSW. The greenfield site is not currently serviced by the municipal sewerage network. Until the capacity of the Moss Vale Sewage Treatment Plant is increased, the local water utility *(Wingecarribee Shire Council (WSC)),* cannot provide permanent sewer service to the site.

To facilitate project commencement the developer, Prime Moss Vale (PMV) consulted with WSC. It was agreed an Interim Wastewater Treatment Scheme (IWTS) dispersing effluent wholly onsite would be a suitable interim wastewater servicing solution to service Stage 1 of the development (178 Lots). The IWTS is expected to operate for a maximum period of three years.

As part of the interim servicing strategy, municipal infrastructure will be delivered by PMV, including; the reticulated sewer main, the catchments' sewer pump station, and new sewer rising main connecting the pump station to the existing municipal reticulated network. As the municipal network is at capacity, wastewater will be pumped from the pump station to the Interim Wastewater Treatment Plant (IWTP) and Effluent Dispersal System (EDS). Once the Moss Vale Sewage Treatment Plant is upgraded, wastewater will be redirected to the new rising main and to the municipal network, and the IWTS will be decommissioned.

Local government approvals have been acquired for the reticulated sewerage network, the sewage pump station including emergency storage, as well as the IWTS. Additionally, the IWTS requires a Network Operators Licence under the WIC Act. The licensed Independent Water Utility (IWU) will be True Water DTR Pty Ltd.

Executive Summary

Site Address	141 Yarrawa Road & 32 Lovelle Street, Moss Vale NSW 2571
Lot and Plan	Lot 3 DP 706194 and Lot 12 DP 866036
Local Government Authority	Wingecarribee Shire Council (WSC)
Owners/Developer	Prime Moss Vale Pty Ltd (PMV)
Contact Point	[redacted]
Contact Number	[redacted]
Block Size	Approximately 125.7 hectares
Boundaries	Yarrawa Road, Lovelle Street, Moss Vale Golf Course and other urban and rural land zoned lots.
Potable Water Supply	Wingecarribee Reservoir and Bundanoon Reservoir
Municipal Sewer Connection	Moss Vale STP at capacity and being upgraded, municipal connection expected 2026.
Network Operator Licensee (IWU)	True Water DTR Pty Ltd
Expected Interim Period	3 years
Influent Volume	Average Dry Weather Flow = 76,896Litres/day Peak Dry Weather Flow = 112,140Litres/day
Effluent Standard	Class B
Wet Weather Storage Volume	4.1 Megalitres *(>10day @ 5 x ADWF)*
Effluent Dispersal System	Spray Irrigation (9.68ha) - *Section 68 Approval acquired*
Effluent Irrigation Rate	<1mm/m^2/day

The Site

The site consists of two separate and adjoining allotments comprising a total area of 125.7 hectares. The legal description of the site is Lot 3 in DP 706194 (No 32 Lovelle Street) and Lot 12 in DP 866036 (No 141 Yarrawa Road). The site is bordered by Yarrawa Road, Lovelle Street, Moss Vale Golf Course and other urban and rural land zoned lots. Currently the site is pastoral land, with a dwelling on each of the existing lots.

There is sufficient unconstrained land for sustainable site-specific wastewater management which achieves required offsets to environmental features and property boundaries as required by legislation and guidelines.

Interim Scheme Purpose

The purpose of the Interim Scheme is to provide a sewer service to the site until the capacity of the Moss Vale Sewage Treatment Plant is increased and permanent discharge to the municipal network is available.

Interim Scheme Timeline

Commencement of the interim wastewater scheme will coincide with the occupation of the first dwelling and is expected to be late 2024. Completion of the Moss Vale Sewage Treatment Plant permanent upgrade is expected in mid to late 2025. Considering progress to date it is likely municipal service will not be available until a later date. Therefore, to address uncertainty and ensure the interim scheme is suitably funded financial planning allows for a five-year interim period, or until December 2029.

Interim Scheme Summary

The interim wastewater scheme is an effluent dispersal scheme.

All wastewater will be captured within the WSC approved reticulated sewerage network and conveyed to the ultimate sewage pump station. The ultimate sewage pump station shall be utilised to even flows and concentrations. Wastewater will be transferred via a rising main to the Interim Wastewater Treatment Plant (IWTP) for treatment. Treated effluent will be dispersed via spray irrigation at a rate of less than 1mm/m^2/day within the nominated and Section 68 approved effluent dispersal area.

The interim scheme is not a recycled water scheme and is not an effluent reuse scheme. Treated effluent dispersal will have no secondary use, and there will be no crop irrigation or agricultural use, the purpose is solely effluent dispersal.

Interim Scheme Infrastructure

The interim wastewater scheme will service Stage 1 of the greenfield development and consist of seven infrastructure components.

- Municipal reticulated sewerage network,
- Municipal sewer pump station and emergency storage,
- Municipal sewer main connecting the sewer pump station and existing municipal network,
- Interim rising main from the ultimate sewer pump station to the IWTP,
- Interim Wastewater Treatment Plant (IWTP),
- Interim influent and effluent storages,
- Interim Effluent Dispersal System (EDS).

On completion of the interim period, ownership of the three municipal components will be transferred to the local water utility, and the four interim components will be decommissioned.

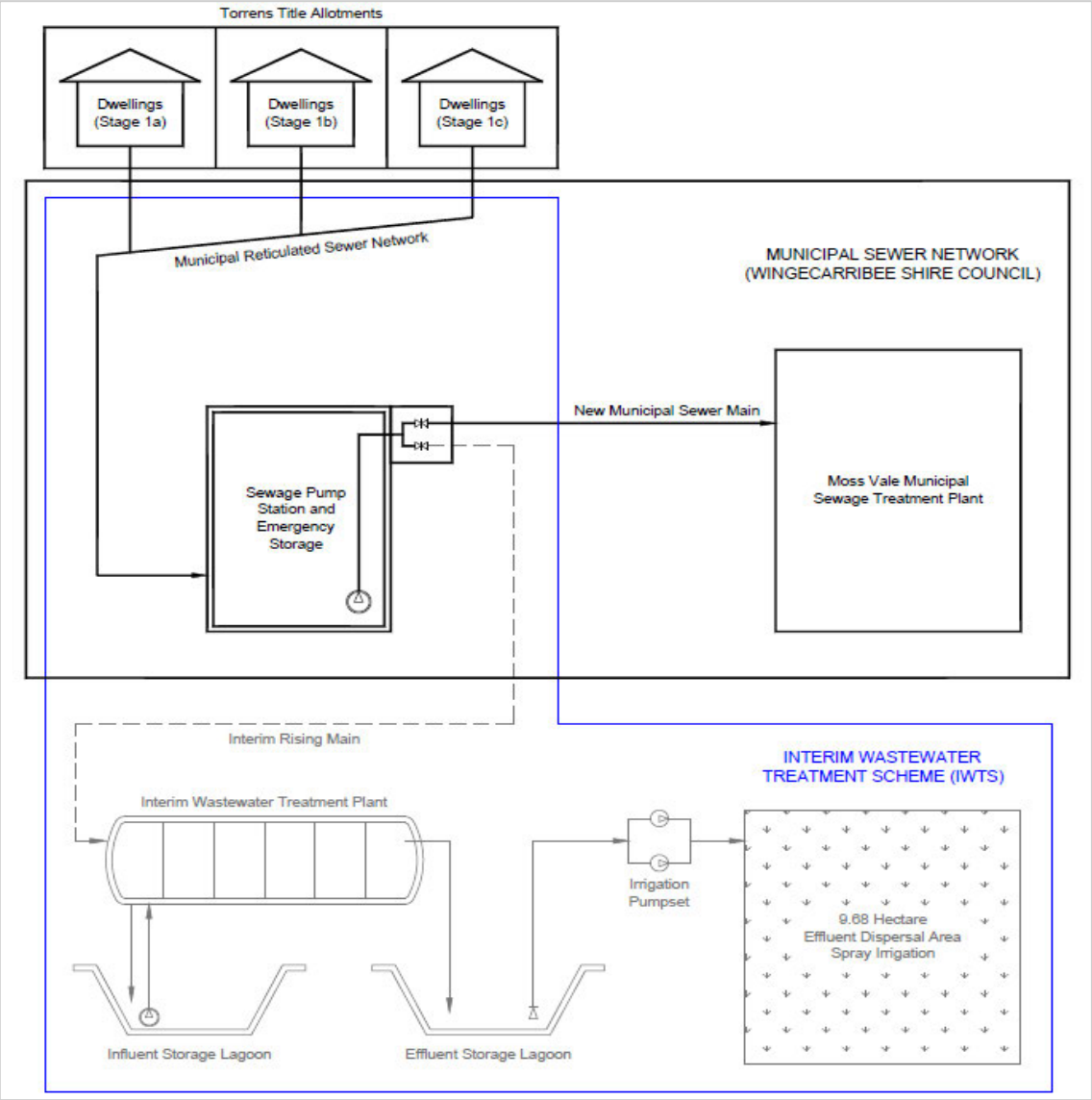


Figure 1.1 - Summary of Interim Infrastructure and future municipal network

Municipal Reticulated Sewerage Network

The approval, construction, testing, and commisioning of the reticulated sewerage network will follow established business as usual (BAU) processes. Once the interim period is complete the reticulated sewerage network will be transferred to the Local Water Utility and form part of the municipal network. The Section 68 approval for the reticulated sewerage network to service stage one of the development has been aquired from WSC and is included within the submission.

Municipal Sewer Pump Station and Emergency Storage

The approval, construction, testing, and commisioning of the sewage pump station including emergency storage will follow estabilshed business as usual (BAU) proceeses. Once the interim period is complete the sewage pump station including emergency storage will be transferred to the Local Water Utility and form part of the municipal network. The sewage pump station including emergency storage is designed to service the entire lot yeild of 1,073lots and will be installed and commissioned prior to the release of Stage 1. The Section 68 approval for the ultimate sewage pump station including emergency storage has been granted by WSC and is included within the submission.

Municipal sewer main connecting the sewer pump station and existing municipal network

The municipal sewer main connecting the sewer pump station to the existing municipal network will be installed, tested and transferred to the local water utility prior to the release of the Stage 1 lots. Connection of the sewer pump station to the existing municipal network provides a contingency failsafe and aids in mitigating risk.

Interim - rising main from the ultimate sewer pump station to the IWTP

The Rising main from the ultimate sewer pump station will be constructed, installed and marked as per municipal standards and relevant guidelines and codes.

Interim Wastewater Treatment Plant (IWTP)

The IWTP will be a Kubota biological IWTP providing Class B treatment with a nominal treatment capacity of 110kL/day and a peak treatment capacity of 137.5kL/day. The IWTP will be installed below ground and include sealed gas tight lids. Below ground installation provides favourable amenity and limits visual impact, noise, and odour. Air emissions shall be filtered through carbon filtration to prevent odour. The IWTP will be designed and constructed to provide a minimum 30year operational life. The location of the IWTP will be as per the Section 68 approval. The Section 68 approval for the reticulated sewerage network to service stage one of the development has been granted by WSC and is included within the submission.

Interim - Influent and Effluent Storage

To ensure extreme wet weather events are suitably managed influent and effluent storage will provide 4.1Megalitres of storage, which is greater than 10days peak wet weather flow storage.

Interim - Effluent Dispersal System (EDS)

The Setion 68 approved EDS is a 9.68hectare spray irrigation system located to achieve suitable buffers and offsets to environmental features and property boundaries as required by legislation, guidelines, and codes. Daily Water Balance Modelling utilising 50years of SILO weather data has been completed utilising [redacted] An extremely conservative approach to effluent dispersal will be employed Treated effluent will be dispersed via spray irrigation at a rate of less than 1mm/m^2/day within the nominated and Section 68 approved effluent dispersal area.

Independent Water Utility Funding

As the interim wastewater scheme is a temporary measure, [redacted] There will be no charges, levies, or fees to the property owner pertaining to the delivery or operation of the IWU. [redacted]

Independent Water Utility Operation

A network operators licence ensures IWU operation and management of the temporary wastewater infrastructure is in accordance with legislative and regulatory requirements. Operation and management will be in accordance with the IWU's Integrated Environmental Management System (Attachment *B.1.*) and Strategic Asset Management Policy (Attachment *B.5.*).

The IWU applicant is certified under ISO standards; 9001:2015, 14001:2015, and 45001:2018 for the *"Provision of wastewater and sewage treatment technologies to Australia and the Pacific. Services include consultancy, delivery, project management, engineering, asset management (servicing and maintenance) and operation (remote monitoring and response)."*

Contents

1 Introduction

This Risk Management Plan (RMP) for the Ashbourne – Interim Wastewater Treatment Scheme (IWTS) has been developed on behalf of the Developer, Prime Moss Vale Pty Ltd (PMV). The RMP forms part of the Integrated Environmental Management System (IEMS) which manages and mitigates risks arising from the treatment and dispersal of wastewater generated by the development.

The site is not currently serviced by a municipal sewerage network with the delivery horizon for municipal sewerage being approximately 3 years. An interim wastewater treatment scheme is required to treat and manage wastewater generated by the development wholly within the site.

To protect public health and the environment, a reliable and compliant IWTS must service the development. Although the interim period is a maximum of 5years, all wastewater infrastructure will be designed to deliver a 50-year life cycle and deliver beneficial outcomes when assessed from an economic, environmental, and social viewpoint.

The IWTS will employ Best Available Technique and Technology (BATT) for the site-specific management of wastewater. Environmental factors, public health, and work health and safety are considered as part the Safety in Design process in order to deliver infrastructure which fulfills compliance requirements and satisfies stakeholder objectives.

Purpose

The RMP identifies risks associated with the operation of the IWTS infrastructure and the long-term application of treated effluent. The RMP establishes suitable management and mitigation measures, including control and preventative measures to mitigate risk and prevent impact to public health or the environment.

1.1 Objective

The RMP is an important management tool which will provide reasonable and practicable steps to deliver best practice operational measures and satisfy environmental duty of care. Specifically, the objective of the RMP is to:

- Ensure all wastewater is safely and sustainably managed wholly within the boundaries of the site,
- Deliver public health and environmental security,
- Prevent negative impact to public health
- Prevent negative impact to environmental health,
- Drive improvements in infrastructure management and operation,
- Aid in the delivery of beneficial outcomes within the development area and surrounding environment.

1.2 Scope

The scope of the RMP includes:

- STEP 1: Confirm operating environment:
    - IWTP type, configuration, and size,
    - List site considerations,
- STEP 2: Identify risks and hazards:
    - Identify potential risks and hazards related to:
        - infrastructure operation,
        - mismanagement or failure,
- STEP 3: Assess and analyse all risks:

  - Assess the likelihood of each risk or hazard,
  - Assess the consequence of each risk or hazard,
  - Quantify the risk or hazard and confirm the risk rating.
- STEP 4: Implement controls:
  - Ensure suitable operational measures are in place to prevent potential public health or environmental impacts,
  - Establish suitable response and contingency plans for each potential public health or environmental risk.
- STEP 5: Check controls
  - Review control measures,
  - Ensure operators are aware of risks and trained in applying preventative measures, responses, and contingency plans.
- STEP 6: Maintain and continually improve controls
  - Provide basis for annual audit of:
    - operations and compliance,
    - trigger and response,
    - suitability of control measures.

1.3 The Consultants

True Water is a “whole of life cycle” wastewater management specialist. True Water specialise in the design, delivery, and operation of small scale municipal WWTSs, and small to large scale site-specific WWTSs. Our whole of life experience informs infrastructure design, providing scalable wastewater treatment systems that satisfy Utility specification and provide decades of service. True Waters experience includes:

- Acquisition of >2,000 local and state government approvals for site-specific WWTSs, including WWTSs servicing up to 4,000EP,
- Delivery of >1,500 WWTSs throughout Australia and the Pacific including single WWTSs servicing 5,000EP,
- Management of WWTSs for federal, state, and local government and multinationals throughout Australia and the Pacific.

2 Roles and Responsibilities

2.1 Licensed Entity

The Operator will be the licensed entity. The Operator shall be responsible for:

- Compliance with all conditions of approvals,
- Ensuring compliance with the Integrated Environmental Management System (IEMS) including:
  - Maintaining all operation and management measures and requirements,
  - Implementing all control measures,
  - Maintaining all monitoring and response requirements,
  - Ensuring proper record keeping, reporting and auditing,
- Payment of all regulatory fees,
- Ensuring only specialists with experience specific to the IWTS undertake management of the IWTS.

Licensed Entity - Operator:	True Water DTR Pty Ltd
ACN:	606 141 557
Address:	6 Ironbark Dr, Townsend, NSW 2463
Nominated Contact Person:	[redacted]
Position:	[redacted]
Mobile No:	[redacted]
Email Address:	[redacted]

2.2 Primary Regulator

Primary Regulator:	Wingecarribee Shire Council
Contact Number:	(02) 4868 0888
Email:	mail@wsc.nsw.gov.au
Contact Point:	TBA

2.3 Management Contractor

Management Contractor:	True Water Community
Contact Number:	[redacted]
Email:	[redacted]
Contact Point:	Works & Services Group Manager

3 Operating Environment

The IWTS shall service Ashbourne - Moss Vale, a master planned residential development consisting of 178 allotments and to be developed in stages. The site is 125.7 hectares, irregularly shaped, and bordered by Yarrawarra Road, Lovelle Street, Moss Vale Golf Course, and other urban and rural land zoned lots. The site is not serviced by the municipal sewerage network, therefore wastewater generated by the development will be managed wholly within the site by a Interim Wastewater Treatment Scheme (IWTS).

The IWTS will employ a multi barrier treatment process, and will consist of:

- Equalisation tank to regulate flows,
- Kubota IWTP utilising multi train bioreactor with integrated MBBR process,
- Disinfection system to disinfect effluent,
- An odour control system consisting of carbon filters to remove and treat odour,
- Bioreactor aeration blowers located within the control building,
- Influent and Effluent Storage Lagoons,
- Control and monitoring system including flow meter,
- Spray Irrigation - Effluent Dispersal System (EDS).

Effluent from the IWTS will conform to quality limits as outlined in *Table 3.1*.

Table 3.1 - Influent and effluent quality limits

Quality Characteristic	**Influent**	**Effluent**
Average Dry Weather Flow (L/day)	76,896	
Peak Dry Weather Flow (L/day)	112,140	
5 day BOD (mg/L)	100 - 450	<20
Suspended Solids (mg/L)	100 - 400	<30
pH (pH units)	6 – 8	6 - 8
Free Residual Chlorine (mg/L)	-	<2
E.coli (cfu/100mL)	-	<100
Total Nitrogen (mg/L)	50 - 100	<30
Total Phosphorus (mg/L)	10 - 25	<10

3.1 Operational Framework

True Water's Integrated Environmental Management System (IEMS) directs and informs all activities throughout the infrastructure's lifecycle. The IEMS is a conclusive quality management process specifically designed to deliver stakeholder objectives, secure compliance, and protect public health and the environment. Relative to risk management, the IEMS is implemented to address, manage, and mitigate risks, reduce potential for harm to public health or the environment, and maintain compliance with regulatory requirements.

3.2 Wastewater Infrastructure - Pre-Risk Assessment

The IWTS utilises tried and tested technologies in order to provide reliability, reduce risk and simplify life cycle management requirements. Each infrastructure component has been refined over many decades, ensuring surety of operation and allowing comprehensive asset management processes to be implemented.

The IWTS employs a multi barrier approach to wastewater treatment and risk management. Control and monitoring points are located throughout each section of the wastewater infrastructure and telemetry monitoring automatically reports standard and abnormal operation.

Interim wastewater infrastructure can be assigned to the following sections:

- Reticulated Sewer Network *(to be transferred to the Utility and become municipal)*
- Municipal Rising Main & Sewer
- Interim Wastewater Treatment Plant (IWTP)
- Effluent Dispersal System (EDS)

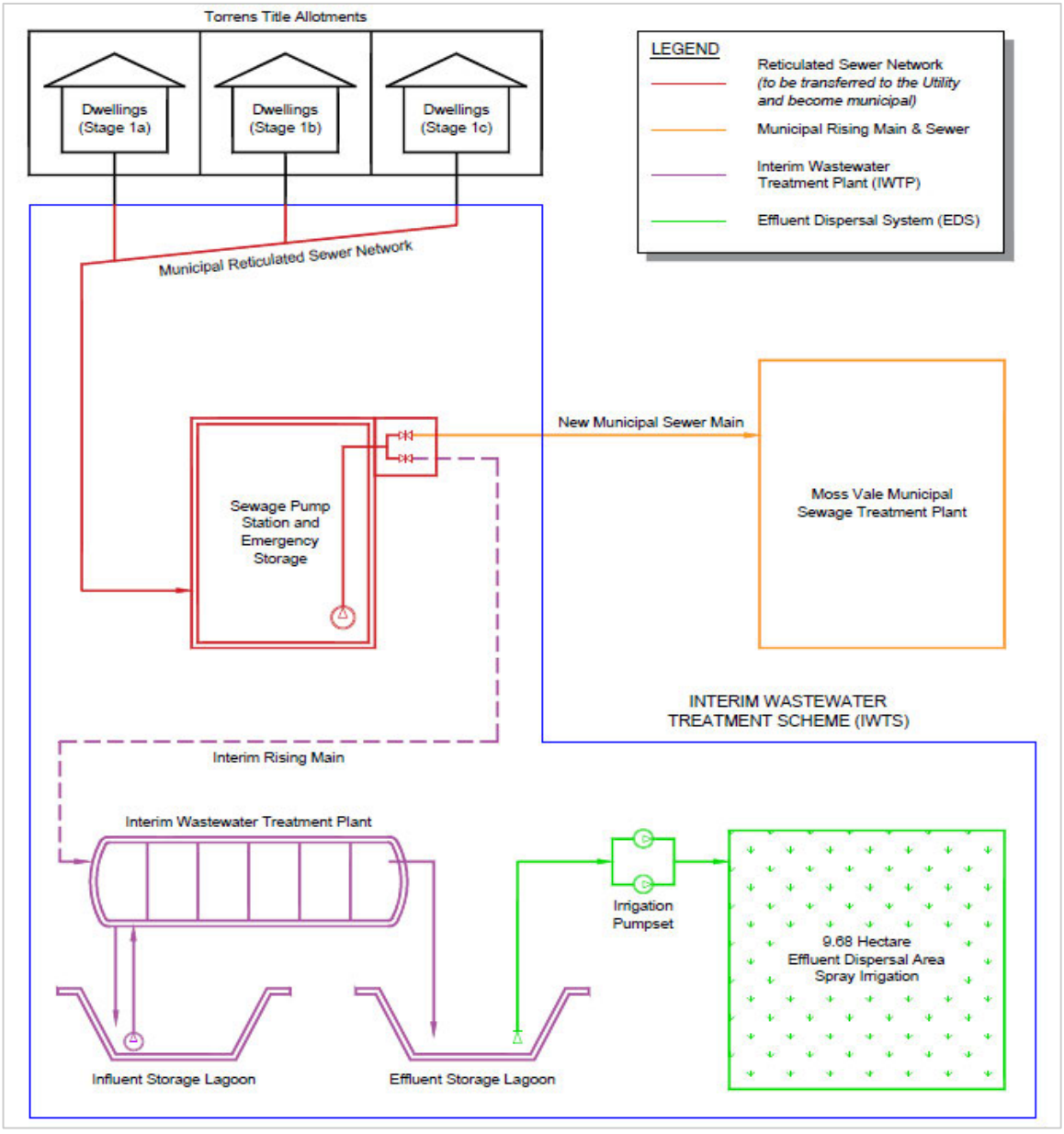


Figure 3.1 - Summary of Interim Infrastructure and future municipal network

3.2.1 Reticulated Sewer Network

The Reticulated Sewer Network captures and conveys wastewater to a central location for treatment. The approval, construction, testing, and commisioning of the sewer reticulation network will follow estabilshed business as usual (BAU) proceeses. Once the interim period is complete the sewer reticulation network will be transfer to the Local Water Utility and form part of the municipal network.

The Section 68 approval for the sewer reticulation network to service stage one of the development has been aquired from WSC and is included within the submission.

Table 3.2 - Sewer Reticulation Network component descriptions

Component	**Description**
Sewage Drainage System	The Sewage Drainage System is a network of pipes that captures and conveys raw sewage. The Sewage Drainage System shall be installed, tested and commissioned in accordance with the Section 68 approval issued by WSC, the *Plumbing and Drainage Code (AS/NZS:3500),* and all other relevant codes and guidelines. WSC will inspect and approve all drainage works. The Sewage Drainage System is outside the scope of the IWTS.
Sewage Pump Station	Sewage Pump Stations receive sewage from the sewage drainage system. The Sewage Pump Station will satisfy WSAA requirements and include duty and standby transfer pumps which discharge sewage to the sewage rising main. The Sewage Pump Stations will include an automated controller, the controller will include pump monitoring and high-level alarm. The design, delivery, management, and compliant operation of Sewage Pump Stations is the responsibility of the property owner and the LGA. Sewage Pump Stations are outside the scope of the IWTS.
Equalisation Tank (EQ Tank)	The Equalisation Tank (EQ) prevents shock loading and regulates diurnal flow. The EQ provides wastewater storage, then doses wastewater via the duty and standby EQ Pump set to the SLS Tank.
Interim Rising Main	The Interim Rising Main is a high-density polyethylene pipe installed and marked as per industry standards. The Sewage Rising Main receives raw sewage from the outlet of the sewage pump station and transfers it to inlet of the IWTP. The design, installation, management and compliant operation of the Sewage Rising Main is the responsibility of the property owner and the LGA. The Sewage Rising Main is outside the scope of the IWTS.

3.2.2 Interim Wastewater Treatment Plant (IWTP)

A Kubota Interim Wastewater Treatment Plant (IWTP) shall service the site. The Kubota IWTP employs a multi barrier approach to wastewater treatment and employs a highly refined Media Bed Biofilm Reactor (MBBR) treatment process. MBBR treatment enables reliable and efficient wastewater treatment using limited mechanisation and low energy consumption.

The Kubota MBBR process consists of various chambers, each with a separate type of specialised plastic carrier (media). Each carrier is designed to target specific types of microorganism, grow specific types of biofilms, and provide biological filtration of wastewater. Each chamber and carrier/media type undertake a specific role in the removal of contaminants from the wastewater stream.

The Kubota WWTP is a scalable treatment device that allows for the staged delivery or the increased capacity of wastewater treatment infrastructure if required. The wastewater treatment process is designed to limit technical complication and facilitate sustainable operation across infrastructure lifecycle.

Kubota Corporation is AAA rated and a global leader in water technologies who mass produce WWTPs under strict quality controls. Millions of Kubota WWTPs are in operation globally. The WWTPs are tried and tested, provide surety of installation and operation, and are guaranteed to achieve the design treatment level when operated in compliance with the manufacturer's specification.

Table 3.3 - IWTP component descriptions

Component	**Description**
Kubota IWTP Solid Liquid Separation Tank (SLS Tank)	The Solid Liquid Separation Tank (SLS) provides primary treatment through physical separation of solids from the incoming wastewater stream. Wastewater is directed to the bottom of the chamber to increase pressure and aid in solids separation. Primary treated wastewater leaves the tank via gravity drainage to the Kubota IWTP.
Kubota Wastewater Treatment Plant (IWTP)	[redacted] The manufacture and production of the Kubota WWTP is completed adhering to ISO:9001 and ISO:14001 international standards and adheres to Japanese federal

Component	Description
	legislation concerning design, structural conformity, and performance standards. Japan's onsite WWTP manufacturing industry is the world's most highly regulated, competitive, and comprehensive.
Kubota IWTP Disinfection Unit	[redacted]
Kubota IWTP Treated Effluent Chamber	[redacted]
Control Box	[redacted]
Odour control (Carbon filtration)	Wastewater treatment produces gases and odour. A carbon filtration unit (McBerns or similar) is fitted to the IWTP to remove odour from air emissions.
Flow Meter	Flow metering is coupled to the telemetry unit and records daily flows. The Flow Meter is installed on the outlet of the IWTP. Flow metering is critical in the identification of hydraulic overloading, storm water cross connection, ground water and surface water ingress.
Monitoring Unit	The Monitoring Unit monitors; chamber water levels, pump function, blower function, water meter output, power draw, and other parameters to monitor IWTP function. The Monitoring Unit is set to recognise abnormal operation or fault and immediately reports to True Water via wireless telemetry. The Monitoring Unit is programmed to send a status report each day via the telemetry unit.
Telemetry Unit	The IWTP monitoring unit communicates directly to the Telemetry Unit. The monitoring unit monitors IWTS function and reports to the wireless telemetry. The telemetry relays information to the CRM database and automatically notifies technicians and managers via SMS and email for any abnormal operation or fault.

Component	Description
	Telemetry monitoring ensures data required to assess the IWTP performance is recorded daily. Daily status reports provide the ability to track trends and function. This information is used to provide a complete understanding of infrastructure management, and to inform review and audit. Auditors consider each day of the IWTP operation to inform management decisions and drive continual improvement.
Effluent Storage Tank	The Effluent Storage Tank receives treated effluent from the Kubota IWTP. The Effluent Storage Tank provides a management point for all treated effluent prior to application. Secondary chlorination can be applied if/as required to maintain suitable FRC.

3.2.3 Effluent Dispersal System (EDS)

Disinfected treated effluent is discharged from the effluent chamber and transferred to the EDS. The EDS is located in consideration of suitable setbacks to property boundaries and environemental factors. The location, design, and size of the EDS is carefully considered to ensure the sustainable long-term application of treated effluent.

Similar to the Kubota IWTP, the EDS is a scalable system that allows for the staged delivery or the increased capacity of Wastewater Treatment System as/if required. The design of EDS components are intended to limit complexity, secure trouble-free operation and limit operational risk across infrastructure lifecycle.

Table 3.4 - Effluent Dispersal System (EDS) component descriptions

Component	Description
Effluent Pump Set	Treated effluent within the effluent storage is transferred via the Effluent Pump Set to the distribution main. The duty/standby pump configuration provides redundancy and ensures in the case of pump failure the second pump is activated, and an alarm is triggered via the monitoring unit. The duty/standby configuration provides service continuity while the faulty pump can be replaced or repaired.
Distribution Main	The Distribution Main is a high-density lilac polyethylene pipe. The Distribution Main is installed at suitable depth and marked as per industry standards. The Distribution Main transfers effluent between the effluent duty/standby pump set and the EDS.
Spray Irrigation	The EDS consists of Spray Irrigation. Spray irrigation is a common method of effluent. The risers typically sit vertically at a height of roughly one metre on a large irrigation area. Water is pumped through the main lines, distributing out to the lateral lines, and is then lifted up the laterals to sprinkler heads.

4 Risk Assessment

This section outlines the risk assessment undertaken by the True Water risk assessment team. [redacted]

The risk assessment team, and True Water as a whole, understand the importance of responsible risk management to maintain successful operation, and provide a supportive basis for ongoing risk mitigation within the IWTSs operations and the Company's general operations. These include:

- Use of high-quality components,
- Quality assurance of all components,
- Supervision and quality assurance of all installations and works,
- Automated monitoring and recording,
- Continuous training, research, and development,
- Multi barrier wastewater treatment and risk management processes,
- Multiple physical barriers to prevent human contact and protect public health and safety,
- Treatment performance and effluent quality that exceed regulatory requirements,
- Maintaining the Integrated Environmental Management System (IEMS),
- Scheduled audit.

4.1 Methodology

Effective risk management involves identifying all potential hazards and hazardous events, and assessing the level of risk each hazard presents to public and environmental health.

[redacted]

4.2 Hazard Identification

Hazard identification allows planning and mitigation processes to be implemented. A detailed assessment of all components within the infrastructure is completed. [redacted]

- Reticulated Sewer System
- Interim Wastewater Treatment Plant (IWTP)
- Effluent Dispersal System (EDS)

[redacted]

4.3 Risk Assessment

4.3.1 Qualitative Measures of Likelihood

Level	Descriptor	Example description
A	Rare	May occur only in exceptional circumstances. May occur once in 100 years
B	Unlikely	Could occur within 20 years or in unusual circumstances
C	Possible	Might occur or should be expected to occur within a 5 to 10 year period
D	Likely	Will probably occur within a 1 to 5 year period
E	Almost certain	Is expected to occur with a probability of multiple occurrences within a year

4.3.2 Qualitative Measures of Consequence or Impact

Level	Descriptor	Example description
1	Insignificant	Insignificant impact or not detectable
2	Minor	Health - Minor impact to single person Environment - Potentially harmful to ecosystem with impacts contained to immediate area
3	Moderate	Health - Minor impact for multiple people Environment - Potentially harmful to ecosystem with impacts contained to site
4	Major	Health - Major impact for single person Environment - Harmful to local ecosystem with impacts to neighbouring environment
5	Catastrophic	Health - Major impact for multiple people Environment - Harmful to regional ecosystem and threatened species, widespread impacts

4.3.3 Qualitative Risk Estimation

Likelihood	**Consequence**				
	1 Insignificant	**2 Minor**	**3 Moderate**	**4 Major**	**5 Catastrophic**
A- Rare	Low	Low	Low	High	High
B- Unlikely	Low	Low	Moderate	High	Very High
C- Possible	Low	Moderate	High	Very High	Very High
D- Likely	Low	Moderate	High	Very High	Very High
E- Almost certain	Low	Moderate	High	Very High	Very High

Source: *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks.*

4.3.4 Risk Assessment - Sewer Reticulation Network

Component	Hazardous Event	Impact	Unmitigated Risk					Control Strategy	Mitigated Risk				
			Likelihood		Consequence		Risk		Likelihood		Consequence		Risk
Sewage Drainage System	• Inappropriate discharge of, items, objects, substances or trade waste into the sewage pump station • Cracks, breaks, failures in piping resulting in stormwater and sediment ingress • Faulty installation of drainge components such as ORG's & IO's • Excessive potable water use • Cross connection of stormwater drainage • Poorly assessed or poorly regulated	• Blockage and sewage overflow to the environment • Potential human contact with raw sewage • Blockage of the sewage pump well and or IWTP • Impact to wastewater treatment process resulting in reduction of effluent quality • Hydraulic overload of the IWTS resulting in reduction of effluent quality • Danger to public and environmental safety	E	Almost Certain	4	Major	Very High	• Sized, constructed, and deliniated in accordance with regulations & codes and approved by the LGA • Flow monitoring at the IWTP to identify hydraulic overload and stormwater ingress • Solid separation process in IWTP to prevent blockage by foreign objects • Education of end users re water efficiency, and 5-star fixtures and appliances • Proper regulatory assessment/approval	B	Unlikely	4	Major	Very High
Sewage Pump Station	• Inappropriate discharge of, items, objects, substances or trade waste into the sewage pump station • Cracks, breaks, failures in piping resulting in stormwater and sediment ingress • Faulty or poor quality sizing, design, and installation of pump well and components. • Cross connection of stormwater drainage • Vehicle damage or root intrusion • Power supply interruption or electircal component failure	• Blockage and overflow to the environment • Potential human contact with raw sewage • Pump failure • Corrosion • Danger to public and environmental safety	E	Almost Certain	3	Moderate	High	• Sized, constructed, and deliniated in accordance with regulations & codes and approved by the LGA • Infrastructure inspection will: • prevent build-up of harmful substances • prevent component failure • detect stormwater discharge • Telemetry monitoring will detect component failure • Education of end users re water efficiency, and 5-star fixtures and appliances	C	Possible	2	Minor	Moderate
IWTP Equalisation Tank	• Inappropriate discharge of, items, objects, substances or trade waste into the sewage pump station • Poor management, cleaning, maintenance • Power supply interruption or electrical component failure • Damage to tank • Replacement of specified pumps or components with sub standard equipment	• Oil, grease and fat entering the wastewater stream • Failure of EQ Pumps • Impact to wastewater treatment and effluent quality • Danger to public and environmental safety	B	Unlikely	3	Moderate	Moderate	• Sized, constructed in accordance with regulations & manufacturer specifications • Strict Quality Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by a management company with high level knowledge understanding of the IWTP • Education of end users re water efficiency, and 5-star fixtures and appliances	B	Unlikely	2	Minor	Low
Sewage Rising Main	• Faulty installation of components • Damage or breakage	• Potential human contact with raw or partially treated sewage • Danger to public and environmental safety	B	Unlikely	3	Moderate	Moderate	• Sized, constructed, and deliniated in accordance with regulations & codes and approved by the LGA	A	Rare	2	Minor	Low

4.3.5 Risk Assessment – Interim Wastewater Treatment Plant (IWTP)

Component	Hazardous event	Impact	Unmitigated Risk					Control Strategy	Mitigated Risk				
			Likelihood		Consequence		Risk		Likelihood		Consequence		Risk
IWTP Solid Liquid Separation Tank	• Inappropriate discharge of, items, objects, substances or trade waste into the sewage pump station • Poor management, cleaning, maintenance • Damage to tank	• Oil, grease and fat entering the wastewater stream • Impact to wastewater treatment and effluent quality • Overflow and danger to public and environmental safety	B	Unlikely	3	Moderate	Moderate	• Sized, constructed in accordance with regulations & manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by a management company with high level knowledge understanding of the IWTP	B	Unlikely	2	Minor	Low
Interim Wastewater Treatment Plant (IWTP)	• Replacement of specified components with sub standard equipment • Inappropriate discharge of, items, objects, substances, trade waste, or influent with high contaminant concentrations • Poor management, monitoring, reporting, cleaning, maintenance, servicing • Vandalism or damage • Odour realease • Power supply interruption or electircal component failure • Substandard effluent release	• Oil, grease and fat entering the wastewater stream • Failure of treatment process • Impact to wastewater treatment and reduction of effluent quality • Overflow and danger to public and environmental safety	E	Almost Certain	4	Major	Very High	• Sized, constructed in accordance with regulations & manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by a True Water and application of high level knowledge understanding of the IWTP • Education of end users re water efficiency, and 5-star fixtures and appliances • Locate below ground in fenced compound	B	Unlikely	2	Minor	Low
Disinfection Unit and Treated Effluent Chamber	• Replacement of specified components with sub standard equipment • Poor management, monitoring, reporting, cleaning, maintenance, servicing • Incorrect setting on chlorination unit • Unauthorised Bypass • Substandard effluent	• Reduced disinfection of effluent • Excess clorination of effluent • Danger to public and environmental safety	D	Likely	3	Moderate	High	• Sized, constructed in accordance with regulations & manufacturer specifications • Maintain suitable residual chlorine level • Compliance with IEMS • Suitable monitoring and inspection processes • Management and maintenance by a True Water and application of high level knowledge understanding of the IWTP	B	Unlikely	2	Minor	Low
Control Box/Room	• Replacement of specified components with sub standard equipment • Faulty components or poor quality installation of components • Vandalism or damage	• Impacts to IWTP and danger to public and environmental safety from redcution in effluent quality	B	Unlikely	2	Minor	Low	• Sized, constructed in accordance with manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Management and maintenance by a True Water and application of high level knowledge understanding of the IWTP	A	Rare	1	Insignificant	Low
Odour Control (Carbon filtration unit)	• Replacement of specified components with sub standard equipment • Gas tight lids damaged • Gas tight lids not properly secured • Under sized carbon filtration • Vandalism or damage	• Release of odour and reduction in ammenity within immeiate proximity of the IWTP	C	Possible	2	Minor	Moderate	• Sized, constructed in accordance with regulations & manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection	B	Unlikely	2	Minor	Low

Component	Hazardous event	Impact	Unmitigated Risk					Control Strategy	Mitigated Risk				
			Likelihood		Consequence		Risk		Likelihood		Consequence		Risk
Flow Meter	• Blockage • Power supply interruption or electircal component failure • Unauthorised disconnection or removal • Replacement of specified components with sub standard equipment • Damage	• Impacts to IWTP and possible overflow resulting in danger to public and environmental safety • Failure to identify improper IWTP operation • Failure to identify hydrualic overload	D	Likely	3	Moderate	High	• Sized and installed in accordance with manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by True Water • Locate within fenced compound	B	Unlikely	2	Minor	Low
Monitoring Unit	• Replacement of specified components with sub standard equipment • Power supply interruption or electircal component failure • Unauthorised disconnection or removal • Damage • Poorly regulated	• Failure to identify improper IWTP operation • Failure to identify hydrualic overload • Failure to identify power outage • Potential for overflow or poor quality effluent release • Danger to public and environmental safety	D	Likely	4	Major	Very High	• Strict Quality Assurance Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by True Water • Within control box in fenced compound	B	Unlikely	2	Minor	Low
Telemetry Unit	• Replacement of specified components with sub standard equipment. • Power supply interruption or electircal component failure • Unauthorised disconnection or removal • Damage	• Failure to identify improper IWTP operation • Failure to identify hydrualic overload • Failure to identify power outage • Potential for overflow or poor quality effluent release • Danger to public and environmental safety	D	Likely	4	Major	Very High	• Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by True Water • Within control box in fenced compound	B	Unlikely	2	Minor	Low
Effluent Storage Tank	• Poor management, monitoring, reporting, cleaning, maintenance, servicing • Unauthorised Bypass • Damage • Substandard effluent	• Impacts to IWTP and possible overflow of effluent resulting in danger to public and environmental safety • Algal bloom and deterioration of effluent quality • Uncontrolled release of effluent and danger to public and environmental safety • Potential human contact with treated effluent	C	Possible	2	Minor	Moderate	• Sized and installed in accordance with manufacturer specifications • Maintain suitable residual chlorine level • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by a True Water • Locate within fenced compound	B	Unlikely	2	Minor	Low

4.3.6 Risk Assessment – Effluent Dispersal System (EDS)

Component	Hazardous event	Impact	Unmitigated Risk					Control Strategy	Mitigated Risk				
			Likelihood		Consequence		Risk		Likelihood		Consequence		Risk
Pumps – Power supply interruption	• Pumps stop operating • Damage to pumps • Irrigation of effluent is prevented	• Increase in storage dam levels • Potential overflow	E	Almost certain	2	Minor	Moderate	• Telemetry monitoring of infrastructure will: • detect power outages • confirm return of power supply • confirm operation of pumps • Sufficient storage in dam to allow appropriate response. • ISO provide emergency power input (small generator for prolonged power outages.	E	Almost certain	2	Minor	Low
Effluent Pump Set	• Replacement of specified components with sub standard equipment. • Poor management, monitoring, reporting, cleaning, maintenance, servicing • Unauthorised Bypass • Damage • Substandard effluent	• Impacts to IWTP and possible overflow of effluent resulting in danger to public and environmental safety • Uncontrolled release of effluent and danger to public and environmental safety • Potential human contact with treated effluent	C	Possible	2	Minor	Moderate	• Sized and installed in accordance with manufacturer specifications • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes, including telemetry monitoring • Management and maintenance by a management company with high level knowledge understanding of the IWTP • Locate within fenced compound	B	Unlikely	2	Minor	Low
Irrigation Controller	• Overflow of effluent from storage dam • Damage to pumps • Damage to irrigation controller • Irrigation of effluent is prevented	• Increase in storage dam levels • Potential overflow	E	Almost certain	2	Minor	Moderate	Telemetry monitoring of infrastructure will: • detect power outages • confirm return of power supply • confirm operation of pumps • Sufficient storage in dam to allow appropriate response. • small generator for prolonged power outages.	E	Almost certain	2	Minor	Low
Distribution Solenoid - Failure	• Mechanical failure • Pump float failure • Damage to pumps • Effluent irrigation is prevented • Over dispersal of effluent	• Increase in storage dam levels • Potential run off • Breach of regulatory approval	D	Likely	2	Minor	Moderate	• Regular inspection of infrastructure will reduce chance of component failure. • Telemetry monitoring of infrastructure will: • detect component failure • Dispersal of high quality effluent at low dispersals rates reduce environmental impact. • Annual audit of scheme infrastructure.	C	Possible	1	Insignificant	Low
Distribution Main	• Faulty installation of components • Damage or breakage	• Uncontrolled release of effluent and danger to public and environmental safety • Potential human contact with treated effluent	B	Unlikely	3	Moderate	Moderate	• Sized, constructed, and deliniated in accordance with regulations & codes • Strict Quaility Assurance • Compliance with IEMS • Suitable monitoring and inspection processes	A	Rare	2	Minor	Low

Component	Hazardous event	Impact	Unmitigated Risk					Control Strategy	Mitigated Risk				
			Likelihood		Consequence		Risk		Likelihood		Consequence		Risk
Irrigation Sprinkler	• Sprinkler stops spinning • Sprinkler is damaged allowing increased flow	• Potential run off • Over dispersal of effluent • Breach of regulatory approval • Potential human contact with effluent	C	Possible	2	Minor	Low	• Regular inspection of infrastructure will reduce chance of component failure. • Location of the sprinklers in straight lines parallel to cropping activity limits the chance of damage by machinery. • Annual audit of scheme infrastructure.	C	Possible	2	Minor	Low

4.4 Uncertainty Levels and Significant Risks

A significant risk is a risk with a high probability of occurrence which will result in major or catastrophic consequences. Based on this risk assessment, and the implementation of suitable controls, residual significant risks are associated with the Reticulated Sewer System.

Some level of uncertainty is inherent in the estimation of risk. The degree of uncertainty depends on the variability of the hazard itself. The following table lists significant hazards identified and outlines the uncertainty associated with these hazards.

Table 4.1 - Uncertainty levels and Significant Risks

Hazard	Description
Inappropriate discharge of, items, objects, substances, trade waste, or influent with high contaminant concentrations	The discharge of inappropriate items or substances (chemicals, grease, oil, or fat) has the potential to impact treatment processes, reducing treatment quality. Monitoring and inspection will reduce the likelihood of adverse impacts, however residual risk is present. True Water notify stakeholders when inappropriate items or substances are identified, however it is the responsbility of the owner and regulator to address this hazard.
Cracks, breaks, failures in piping or faulty installation of drainge components resulting in stormwater and sediment ingress or cross connection	Stormwater ingress has the potential to impact treatment processes, reducing treatment quality. Telemetry flow monitoring enables identification of flows associated with rainfall events, reducing the potential or adverse impacts, however residual risk is present. True Water notify stakeholders if stormwater ingress is identified, however it is the responsbility of the owner and regulator to address this hazard.
Excess potable water use or increases in site tenancy resulting in hydraulic overload	Excess potable water use or increased site tenancy may result in hydraulic overload with the potential to impact treatment processes, reducing treatment quality. Telemetry monitoring will immediately identify hydraulic overload and reduce the likelihood of adverse impacts however residual risk is present. True Water notify stakeholders when hydraulic overload is identified, however it is the responsbility of the owner and regulator to address this hazard.
Power outage	Telemetry monitoring immediately identifies power outage enabling immediate control and response measures to prevent adverse impacts, however residual risk is present. It is the responsibility of the owner and regulator to prevent unauthorized disconnection of the telemetry monitoring unit.
Mismanagement	Mismanagement is usually a result of engaging unqualified personnel, or organisations without suitable expertise, and presents a high residual risk. It is the responsibility of the owner and regulator to prevent mismanagement.
Poor Regulatory Conditions	A poor regulatory approval may presents a high residual risk. Failure to enforce minimum standards is frequently linked to infrastructure failure.

5 Site Controls and Preventative Measures

Site controls and preventative measures shall be implemented across the IWTS lifecycle. Site controls and preventative measures are applied to; prevent impacts to stakeholders, prevent impacts to public health, and prevent impacts to the environment.

In establishing site controls and preventative measures to mitigate risks, the key principles to be applied include; risk elimination, risk minimisation, containment, and management controls.

Site controls and preventative measures shall consider the following six factors:

- Factor 1: Water
- Factor 2: Soil
- Factor 3: Air
- Factor 4: Noise emissions
- Factor 5: Waste
- Factor 6: Hazardous Materials

5.1 Site Controls and Preventative Measures - Construction of IWTS

General

To minimise impacts to the site, to reduce risk, to improve quality, and improve safety, the majority of the IWTS construction is completed within a factory/workshop environment. The delivery of the IWTS is completed in two stages:

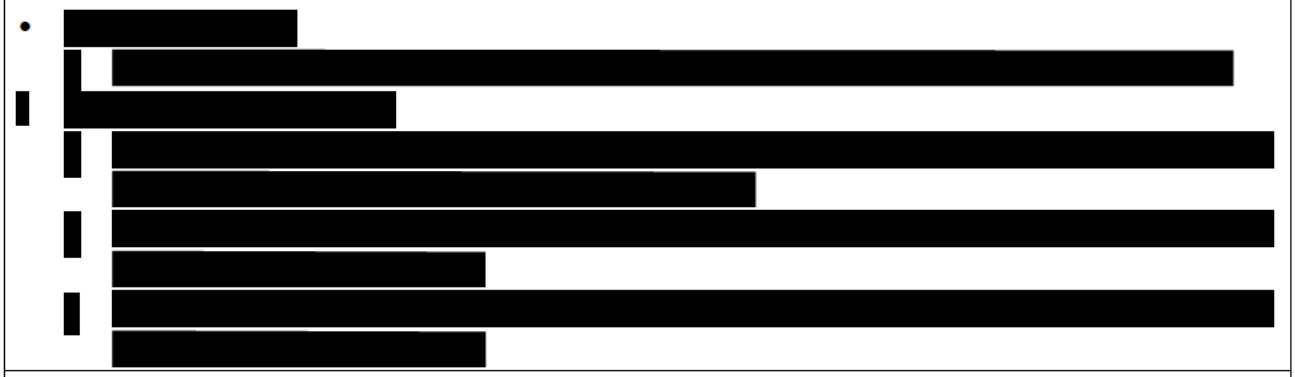
- Offsite Manufacture *(Factory/Workshop)* – approximately 90% of total man hours,
- Onsite Installation/Delivery – approximately 10% of total man hours.

Factor 1: Water

Site controls and preventative measures to prevent contamination or polution of waters *(surface water, waterways, water bodies, ground water).*

Factor 2: Soil

Site controls and preventative measures to prevent contamination or polution of soil.



Factor 3: Air

Site controls and preventative measures to prevent contamination or polution of air.

Odour

[redacted]

Airbourne Pollution

[redacted]

Airbourne Particles and Dust

[redacted]

Factor 4: Noise Emissions

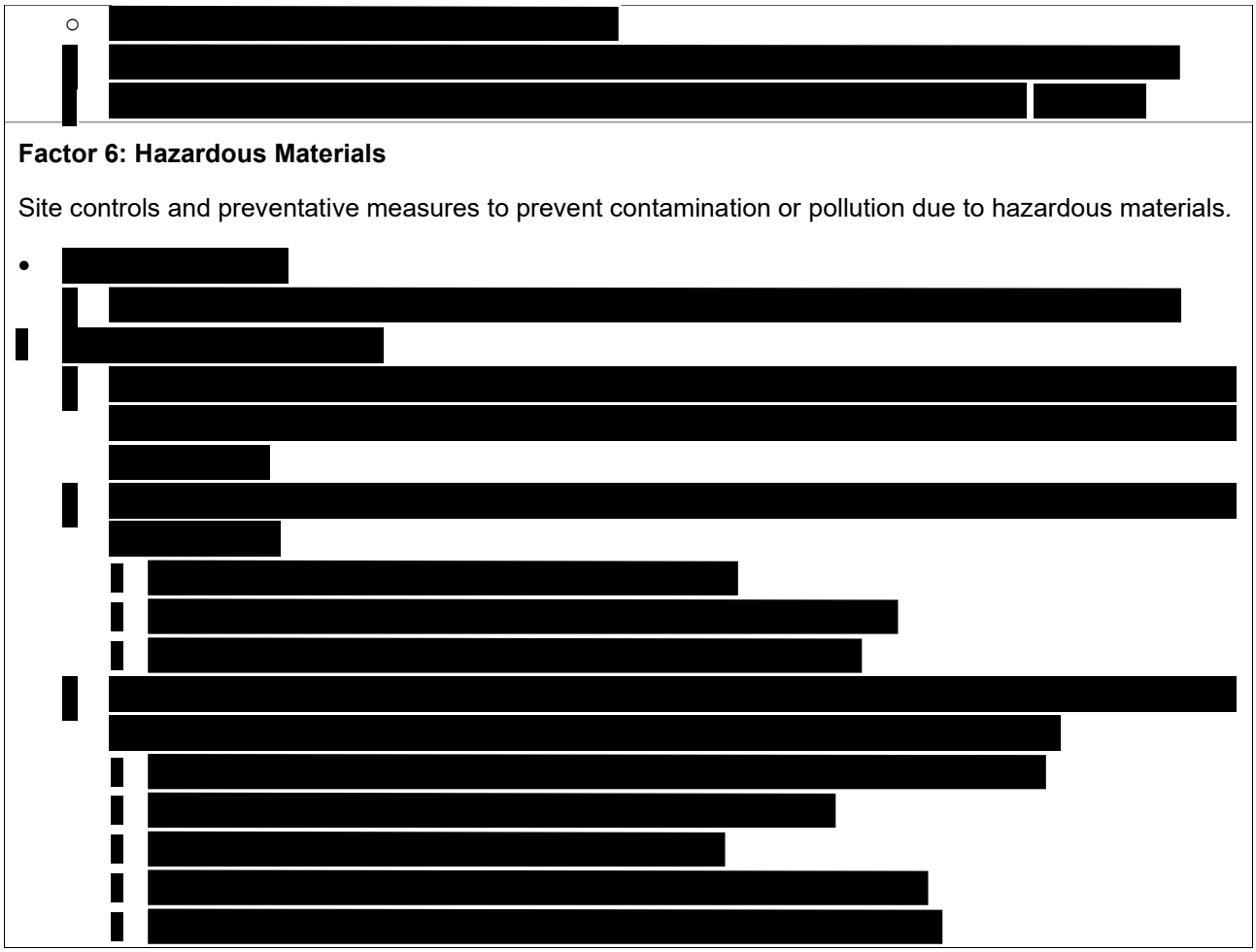
Site controls and preventative measures to limit noise emissions.

[redacted]

Factor 5: Waste

Site controls and preventative measures to prevent waste and associated pollution.

[redacted]



Factor 6: Hazardous Materials

Site controls and preventative measures to prevent contamination or pollution due to hazardous materials.

5.2 Site Controls and Preventative Measures - Operation of IWTS

General

- The IWTS consist of a Kubota IWTP and the EDS. The Kubota IWTP and the EDS have been specifically chosen to prevent impacts to stakeholders, prevent impacts to public health, and prevent impacts to the environment.
- True Waters Integrated Environmental Management System (IEMS) directs and informs all activities throughout infrastructures lifecycle. The IEMS is a conclusive quality management process specifically designed to deliver stakeholder objectives, secure compliance, and protect public health and the environment.
- [redacted]

Factor 1: Water

The operation of the IWTS will include site controls and preventative measures to prevent contamination or pollution of waters *(surface water, waterways, water bodies, ground water).*

- [redacted]

- [redacted]

Factor 2: Soil

The operation of the IWTS will include site controls and preventative measures to prevent contamination or pollution of soil.

- [redacted]

Factor 3: Air

The operation of the IWTS will include site controls and preventative measures to prevent contamination or pollution of air.

Odour

Wastewater treatment releases gases to the atmosphere, the release of these gases has the potential to create odour.
Odours must not cause nuisance to amenity or environmental values. Measures to minimise odour release include:

- [redacted]

Factor 4: Noise Emissions

Site controls and preventative measures to prevent noise polution.

- [redacted]

- [redacted]

Factor 5: Waste

The operation of the IWTS will include site controls and preventative measures to reduce waste and prevent potential impacts from waste.

General Waste

- Waste generated through IWTS activities shall be minimised. *(minimisation)*
- All waste will be stored within a single waste disposal point during construction. *(containment)*
- Waste will be disposed of appropriately using approved waste disposal facilities. *(disposal)*

Sludge

- Sludge is to be removed from site on an annual basis by a registered waste contractor. Sludge will be disposed of at a registered waste disposal centre. [redacted]

Factor 6: Hazardous Materials

The operation of the IWTS will include site controls and preventative measures to prevent contamination or pollution due to hazardous materials.

- [redacted]

6 Document Management and Reporting

True Water employs a Strategic Asset Management Plan for the management and maintenance of wastewater infrastructure throughout its lifecycle. This system includes document management and reporting capabilities which ensure document integrity is maintained, and reporting is consistent and accurate. Continuous documentation and recording of activities undertaken occurs throughout True Water's operations. All documentation is processed and stored in electronic form.

A process checklist exists for each core reoccurring activity (i.e. IWTP maintenance or EDS inspection) which will be completed using an electronic device. Each checklist is stored immediately upon completion and is attached to any relevant assets within the Asset Register. This allows personnel to retrieve documents specific to certain assets quickly and efficiently.

To maintain the validity of documentation, a continuous audit process is in place to assess existing documentation.

The Annual Audit completed by the Environmental Management Team includes review of management and maintenance documentation. The IEMS and associated management plans are reviewed and updated as required upon completion of the Annual Audit.

6.1 Document Review

This Risk Managemenet Plan (RMP) will be periodically reviewed by the Environmental Management Team to ensure the Plan remains relevant in regards to:

- [redacted]

[redacted]

6.2 Internal reporting

Internal reports are produced to ensure internal decision making is accurately informed. Reports produced internally are utilised at various levels of the organisation.

6.3 External Reporting

External reporting to regulatory bodies, customers, and other stakeholders ensures wastewater treatment and management is open and transparent. Reports will be produced annually, or in accordance with regulatory approval requirements.