

NOTICE OF MEETING

Dear Committee Members

You are requested to attend the following meeting of Council.

WATER AND WASTE STANDING COMMITTEE MEETING OF ISAAC REGIONAL COUNCIL

TO BE HELD ON
WEDNESDAY, 21 AUGUST 2024
COMMENCING AT 1.00PM
COUNCIL CHAMBERS - MORANBAH

CALE DENDLE
Chief Executive Officer

SCOTT CASEY
Committee Officer Director Water
and Waste

Committee Members:
Cr Simon West (Chair)
Mayor Kelly Ve'a Ve'a
Cr Vern Russell
Cr Rachel Anderson
Cr Viv Coleman

LOCAL GOVERNMENT ACT 2009

Local Government Regulation 2012

Chapter 8, Part 2 Local Government Meetings and Committees

Division 1A, Requirements for Local Government Meetings Generally

Section 254J Closed meetings

- (1) A local government may resolve that all or part of a meeting of the local government be closed to the public.
- (2) A committee of a local government may resolve that all or part of a meeting of the committee be closed to the public.
- (3) However, a local government or a committee of a local government may make a resolution about a local government meeting under subsection (1) or (2) only if its councillors or members consider it necessary to close the meeting to discuss one or more of the following matters—
 - (a) the appointment, discipline or dismissal of the chief executive officer;
 - (b) industrial matters affecting employees;
 - (c) the local government's budget;
 - (d) rating concessions;
 - (e) legal advice obtained by the local government or legal proceedings involving the local government including, for example, legal proceedings that may be taken by or against the local government;
 - (f) matters that may directly affect the health and safety of an individual or a group of individuals;
 - (g) negotiations relating to a commercial matter involving the local government for which a public discussion would be likely to prejudice the interests of the local government;
 - (h) negotiations relating to the taking of land by the local government under the [Acquisition of Land Act 1967](#);
 - (i) a matter the local government is required to keep confidential under a law of, or formal arrangement with, the Commonwealth or a State.
- (4) However, a local government or a committee of a local government must not resolve that a part of a local government meeting at which a decision mentioned in [section 150ER\(2\)](#), [150ES\(3\)](#) or [150EU\(2\)](#) of the [Act](#) will be considered, discussed, voted on or made be closed.
- (5) A resolution that a local government meeting be closed must—
 - (a) state the matter mentioned in subsection (3) that is to be discussed; and
 - (b) include an overview of what is to be discussed while the meeting is closed.
- (6) A local government or a committee of a local government must not make a resolution (other than a procedural resolution) in a local government meeting, or a part of a local government meeting, that is closed.

Conflict of Interest Obligations

Reference is made to Section 150EL of the Local Government Act 2009. Specifically, the obligation of Councillors when they first become aware they have a conflict of interest to make the Chief Executive Officer aware in writing or if in a meeting, ensure they declare immediately.

**WATER AND WASTE
STANDING COMMITTEE MEETING
OF ISAAC REGIONAL COUNCIL TO
BE HELD ON
WEDNESDAY 21 AUGUST 2024
COUNCIL CHAMBERS, MORANBAH**

1. OPENING OF THE MEETING
2. APOLOGIES
3. DECLARATION OF CONFLICTS OF INTEREST
4. CONFIRMATION OF MINUTES
5. OFFICER REPORTS
6. INFORMATION BULLETIN REPORT
7. GENERAL BUSINESS
8. CONCLUSION

UNCONFIRMED MINUTES

WATER AND WASTE STANDING COMMITTEE MEETING OF
ISAAC REGIONAL COUNCIL

HELD ON
WEDNESDAY, 17 JULY 2024
COMMENCING AT 1.00PM

ISAAC REGIONAL COUNCIL
UNCONFIRMED MINUTES OF THE
WATER AND WASTE
STANDING COMMITTEE MEETING
HELD IN COUNCIL CHAMBERS, MORANBAH
ON WEDNESDAY 17 JULY 2024

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ISAAC REGIONAL COUNCIL

UNCONFIRMED MINUTES OF THE

WATER AND WASTE

STANDING COMMITTEE MEETING

HELD IN COUNCIL CHAMBERS, MORANBAH

ON WEDNESDAY 17 JULY 2024 COMMENCING AT 1.00PM

ATTENDANCE

Cr Simon West, Division Four (Chair)
Cr Vern Russell, Division Two
Cr Alaina Earl, Division Five (*Alternate Member*)
Cr Rachael Anderson, Division Seven (*by Video Conference*)

**COMMITTEE
APOLOGIES**

Mayor Kelly Vea Vea
Cr Viv Coleman, Division Eight

OBSERVERS

Nil

OFFICERS PRESENT

Mr Scott Casey, Director Water and Waste
Mr Robert Perna, Director Engineering and Infrastructure
Mrs Tricia Hughes, Coordinator Executive Support, Office of the Mayor and Chief Executive Officer
Mrs Kristi Thomsen, Executive Assistant, Water and Waste

1. OPENING

The Chair welcomed all in attendance and declared the meeting open at 1.38pm and acknowledged the traditional custodians of the land on which we meet today and paid his respects to their Elders past, present and emerging.

2. APOLOGIES AND LEAVE OF ABSENCES

A Leave of Absence has been requested from Mayor Kelly Vea Vea due to attendance at the Australian Clean Energy Summit.

A Leave of Absence has been requested from Cr Viv Coleman due to attendance at the Australian Clean Energy Summit.

Resolution No.: W&W0505

Moved: Cr Rachel Anderson

Seconded: Cr Vern Russell

That the Water and Waste Standing Committee grants a Leave of Absence for Mayor Kelly Vea Vea and Cr Viv Coleman.

Carried

Resolution No.: W&W0506

Moved: Cr Vern Russell

Seconded: Cr Rachel Anderson

That the Water and Waste Standing Committee accepts Cr Alaina Earl as an Alternate Member for the 17 July 2024 Water and Waste Standing Committee Meeting.

Carried

3. DECLARATION OF CONFLICTS OF INTEREST

No conflict of interests declared this meeting.

NOTE:

Council acknowledges that Chapter 5B Councillors' Conflicts of Interest of the Local Government Act 2009 does not apply to a Councillor if the matter to be resolved relates to a corporation or association that arises solely because of a nomination or appointment of the councillor by the local government to be a member of the board of the corporation or association.

4. CONFIRMATION OF MINUTES

Confirmation of minutes from Water and Waste Standing Committee Meeting of Isaac Regional Council held at Council Chambers, Moranbah, commencing at 1.00pm on Wednesday 19 June 2024.

Resolution No.: W&W0507

Moved: Cr Rachel Anderson

Seconded: Cr Vern Russell

That the minutes from the Water and Waste Standing Committee meeting held in Council Chambers, Moranbah, commencing at 1.00pm on Wednesday 19 June 2024 are confirmed.

Carried

5. OFFICERS REPORTS

5.1 Water and Waste Directorate 2023/2024 Capital Projects Progress Report

EXECUTIVE SUMMARY

This report is to provide an update to the Water and Waste Standing Committee and Council on the progress of the delivery of the Water and Waste Directorate 2023/2024 Capital Works Program.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- Receives and notes the monthly Water and Waste 2023/2024 Capital Projects Progress Summary Report.*

Resolution No.: W&W0508

Moved: Cr Alaina Earl

Seconded: Cr Vern Russell

That the Committee recommends that Council:

1. Receives and notes the monthly Water and Waste 2023/2024 Capital Projects Progress Summary Report.

Carried

6. INFORMATION BULLETIN REPORTS

6.1 Water and Waste Information Bulletin – July 2024

EXECUTIVE SUMMARY

The Water and Waste Directorate Information Bulletin for July 2024 is provided for Committee review.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

1. Notes the Water and Waste Directorate Information Bulletin for July 2024.

Resolution No.: W&W0509

Moved: Cr Rachel Anderson Seconded: Cr Alaina Earl

That the Committee:

1. Notes the Water and Waste Directorate Information Bulletin for July 2024.

Carried

7. GENERAL BUSINESS

7.1 Clean Up Isaac Day (Clean Up Australia Day)

The Director Water and Waste raised the General Business item from the June Standing Committee Meeting and advised the Committee that a Councillor Workshop will be scheduled on Clean Up Isaac Day (Clean Up Australia Day) asked if Council has considered holding a Clean Up Isaac Day?

ACTION: DIRECTOR WATER AND WASTE

7.2 Amnesty Waste Days

The Committee has requested a briefing on Amnesty Waste Days recently held around the Region – have they been well supported?

ACTION: DIRECTOR WATER AND WASTE

7.3 Tour of Water and Waste Directorate Facilities

Cr Melissa Westcott requested Councillor tours for some of the water treatment plants, wastewater treatment plants and waste facilities so they can get an understanding of how this infrastructure operates.

ACTION: DIRECTOR WATER AND WASTE

7.4 Not for Profit Organisations – Charging of Waste Service Fees

ACTION:

8. CONCLUSION

There being no further business, the Chair declared the meeting closed at 2.35pm.

These minutes will be confirmed by the Committee at the Water and Waste Standing Committee Meeting to be held on Wednesday 21 August 2024 in Moranbah.

MEETING MINUTES

.....
CHAIR

..... / /
DATE

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1. OPENING OF MEETING

2. APOLOGIES

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4. CONFIRMATION OF MINUTES

Water and Waste Standing Committee Meeting of Isaac Regional Council held in the Council Chambers, Moranbah, commencing at 1.00pm on Wednesday 17 July 2024.

5. OFFICER REPORTS

5.1 WATER AND WASTE 2023-2024 CAPITAL PROJECTS PROGRESS REPORT

EXECUTIVE SUMMARY

This report aims to update the Water and Waste Standing Committee and Council on the delivery of the Water and Waste 2024/25 Capital Works Program.

5.2 WATER QUALITY INVESTIGATION ACTION PLAN UPDATE

EXECUTIVE SUMMARY

The purpose of this report is to update Council on the Water Quality Reliability Investigation Action Plan Deliverables following the 2021/22 Christmas Period water quality incidents.

5.3 MATERIALS RECYCLING FACILITY PROCESSING EXEPTIONS AND DEVIATIONS

EXECUTIVE SUMMARY

The purpose of this report is to obtain ongoing approval to procure services for Processing of Recyclables as an exception to the competitive bidding requirements under s235 (a) and (b) of the *Local Government Regulations 2012* for medium or large sized contractual arrangements.

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5.4 MORANBAH RECYCLED WATER IRRIGATION SCHEME

EXECUTIVE SUMMARY

Council's Environmental Authority (EA) requires that there be no discharge to the environment from Wastewater Treatment Plants (WWTPs) except in Moranbah, under specific circumstances. The failure to prevent unauthorised discharges of recycled water could result in Council facing substantial financial penalties.

In Moranbah, demand for recycled water is currently insufficient to prevent unauthorised discharges of recycled effluent to the environment. The Effluent Reuse Strategy prepared by Bligh Tanner in 2023 recommended the construction of additional irrigation and the use of mechanical evaporators as a hybrid solution to meet the dual objectives of providing community benefit and preventing unauthorised discharges to the environment.

This report recommends extension of the recycled water network in Moranbah, construction of additional irrigation and purchase of a mechanical evaporator to help control the effluent level in Council's Effluent Storage Dams and prevent release of recycled water to the environment.

6. INFORMATION BULLETIN

6.1 WATER AND WASTE INFORMATION BULLETIN – JULY 2024

EXECUTIVE SUMMARY

The Water and Waste Directorate Information Bulletin for July 2024 is provided for Committee review.

7. GENERAL BUSINESS

8. CONCLUSION

MEETING DETAILS	Water and Waste Standing Committee Meeting Wednesday 21 August 2024
AUTHOR	Amal Meegahawattage
AUTHOR POSITION	Manager Planning and Projects

5.1 WATER AND WASTE 2024-25 CAPITAL PROJECTS PROGRESS REPORT

EXECUTIVE SUMMARY

This report aims to update the Water and Waste Standing Committee and Council on the delivery of the Water and Waste 2024/25 Capital Works Program.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- 1. Receives and notes the monthly Water and Waste 2024/25 Capital Projects Progress Summary Report.**

BACKGROUND

Regular updates on the financial and physical status of projects within the 2024/25 Water and Waste Capital Works program are crucial to keep Council informed about the program's progress and associated risks.

IMPLICATIONS

The attached Water and Waste 2024/25 Capital Projects Progress Summary provides an overview of the financial and physical status of all projects, with red indicating a projected cost overrun of over 10% or completion after July 2024, yellow indicating a cost overrun of 0-10%, and green indicating no issues. Brief commentary is provided to explain the status of each project. Larger and more complex projects are sometimes delivered over multiple financial years and the exact expenditure in each year may deviate from the annual budget due to variations in the delivery schedule. This can affect expenditure in each year without exceeding the total budgeted amount for the project.

Most of the carried forward projects from the 2023/2024 financial year show a negative "remaining budget including commitments" as the carry forward review had not been adopted by Council at the time this report was created.

COMPLIANCE

Compliance with the Water and Waste 2024/25 Capital Works Program is essential to meet the identified timeframes of the 2024/25 financial year.

KEY CAPITAL PROJECTS

- 1. CW222983 – Moranbah Water Treatment Plant Roof Replacement**

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This project includes constructing a new roof for the 5.7ML water reservoir at the Moranbah Water Treatment Plant to protect and extend the lifespan of the reservoir. These improvements ensure the water reservoir remains protected and functional for years to come. Construction began in March, and key structural elements such as cleats, columns, and abrasive blasting have been completed. The project is targeted for completion by the end of September 2024, with an additional \$300,000 required due to steel price increases and the need for epoxy coating to prevent corrosion.

2. CW233141 – Nebo Water Network Augmentation

This project involves constructing a new water main in Nebo to enhance the town's water supply infrastructure. The upgrade will significantly improve water delivery reliability and capacity, addressing current and future demands. On-site work continued throughout May, with the water main upgrade at the truck-fill point successfully completed and commissioned. Pressure testing of the new network components progressed in late July, and the final site inspection is scheduled for 6 August 2024, aiming for handover and commissioning.

3. CW233150 – Clermont Water Treatment Plant Filter Media Replacement and Plant Modernisation

This project aims to modernise the plant to improve the drinking water process, including installing turbidity analysers, upgrading the switchgear, and enhancing the chemical dosing system. These upgrades are essential to meet the Isaac Regional Council (IRC) Drinking Water Quality Management Plan (DWQMP) standards and ensure safe drinking water for the community. The tender for turbidity analysers was completed in June, with some operational issues still being resolved. The switchgear upgrade contract was awarded in May, with site work commencing in July, while the chemical dosing upgrade will be re-evaluated and retendered due to dependencies in the original scope of work.

4. CW233151 – St Lawrence Raw Water Storage and Raw Water Main

This project includes constructing a new water main and water storage facility to enhance the raw water storage capacity and distribution efficiency in St Lawrence, ensuring a more reliable water supply. The new raw water main was completed and commissioned in November 2023, and the contract for the water storage component was awarded in late April. Construction is ongoing, with site clearing, environmental and cultural heritage assessments, and pipe installation in progress as of late July.

5. CW233156 – Clermont Waste Management Facility Weighbridge Installation

This project involves designing and constructing a weighbridge, gatehouse, and access road, and integrating a waste data recording system at the Clermont landfill. These enhancements will improve accuracy and efficiency in waste management operations, enabling better tracking and reporting of waste data for more effective landfill management. The Design & Construct contract was awarded in January 2024, with installation and associated works completed by 28 June 2024, and the new weighbridge began operations on 1 July 2024.

6. CW243181 – Moranbah Sewer Pump Station (SPS) Upgrades

The contract for the Moranbah SPS upgrades was awarded in June. These upgrades will enhance the sewer pumping station's efficiency and capacity, improving wastewater management infrastructure in Moranbah. Potholing was completed, and materials have been ordered by the contractor. The project is expected to be completed by the end of September.

7. CW243204 – Glenden Landfill to Transfer Station

This project involves constructing a ramp, retaining walls, and handrails to convert the Glenden landfill into a transfer station, providing a safer and more efficient waste disposal solution for the community. All works, including a concrete platform for dumping waste, concrete pads, retaining wall, fence, guard rail, compacted gravel road, and traffic signage, were completed, with practical completion achieved on 30 June 2024. The site is now operational, improving waste management practices in Glenden.

8. CW243205 – Moranbah Rectification of Landfill Cell

This project aims to rectify and stabilise the landfill cell, addressing environmental concerns and ensuring compliance with regulatory standards. A budget allocation of \$4.2 million was made for this project in the 2023/24 financial year, with completion expected in the 2024/25 financial year, carrying forward \$3.7 million. The geotechnical specialist contract was awarded in late April, with work progressing on rectification options. The project management consultant's revised program indicates the award of the construction tender in February 2025.

9. CW243239/CW243240 – Carmila and Greenhill Landfill Capping

These design-only projects focus on landfill capping for regulatory compliance in Carmila and Greenhill. The capping will address environmental concerns and ensure compliance with regulatory standards. Design and scope of work are still in progress, with no updates from Aurecon since 20 June 2024. The matter has been escalated with the consultancy package coordinator from Engineering and Infrastructure.

10. CW253266 – Dysart WMF Repurpose to Transfer Station

This project involves converting the Dysart landfill site into a transfer station, including the design and construction of access ramps, concrete platforms, retaining walls, and handrails. This project will enhance waste management in Dysart, providing a more efficient and user-friendly transfer station for residents. The concept layout has been completed, with the construction tender scope of work being prepared.

11. CW253273 – Carmila Water Treatment Plant Upgrade

This project includes various upgrade works to enhance the plant's services, improving operational efficiency and reliability to ensure better water quality and service delivery to the community. Project planning commenced in July 2024, with initial site investigation and scope development underway. Supervisory Control

and Data Acquisition (SCADA) mimics and chemical dosing system requirements are to be confirmed by Operations prior to procurement Request for Tender (RFT).

12. CW253274 – St Lawrence Water Treatment Plant Upgrade

This project includes various upgrade works to enhance plant services, modernising the plant's infrastructure to improve its ability to provide clean and safe water. Project planning commenced in July, with initial site investigation and scope development underway. SCADA mimics and chemical dosing system requirements are to be confirmed by Operations prior to procurement RFT.

13. CW253275 – Corp Sewer Relining 2025

This project includes capturing CCTV footage and subsequent sewer relining for identified sections as part of a three-year sewer network upgrade. The scope of work for the current and next two years is being prepared, and the contract will cover remaining CCTV in Moranbah and Dysart, prioritising the completion of Moranbah sewer relining based on budget availability.

14. CW253282 – Corp WN Water Meters

This project will replace water meters as part of a long-term upgrade. Upgrading water meters is vital for accurate water usage measurement and billing, contributing to better water resource management. A Request for Quotation (RFQ) is being prepared, with the scope of work for meter replacement provided by Business Services and Water Operations.

15. CW253287 – GLN – WTP Turbidity Analyser on Filters

This project involves installing turbidity analysers on filters to enhance plant services. These enhancements will improve the plant's operational efficiency and water quality monitoring. The scope of works has been prepared and forwarded to Operations for review.

16. CW253290 – Middlemount Water Network Augmentation

This project involves constructing a new water main within the Middlemount water network to improve water distribution efficiency and capacity, ensuring a reliable water supply for the community. Operations are being consulted for the scope of works, and tender documentation preparation is in progress.

BENEFITS

Council can see a monthly progress report detailing the progress of projects in the Water and Waste 2024/25 Capital Program. This report communicates risks, failures and delays that have been identified within the Water and Waste 2024/25 Capital Works program.

CONSULTATION

- Director Water and Waste
- Manager Operations and Maintenance
- Manager Waste Services
- Planning & Project Department Project Managers

BASIS FOR RECOMMENDATION

To improve business within the Water and Waste Directorate by providing more appropriate and relevant reporting, transparency, and a clear monitoring tool for Council. This report will help identify and communicate any project delays or possible project failures.

ACTION ACCOUNTABILITY

The Managers and the Director of Water and Waste oversee the scoping, procurement, and completion of the projects identified within the 2024/25 Capital Projects Progress Summary spreadsheet. Furthermore, the appropriate Managers and the Director Water and Waste are held accountable for the delivery of the project stages which are completed within the identified timeframes.

KEY MESSAGES

That Council has open communication, oversight, and transparency of the Water and Waste 2024/25 Capital Works Program, to ensure Isaac will have effective and sustainable Water and Waste infrastructure that supports the needs of the region's communities and economic sectors.

<p>Report prepared by:</p>	<p>Report authorised by:</p>
<p>AMAL MEEGAHAWATTAGE</p>	<p>SCOTT CASEY</p>
<p>Manager Planning and Projects</p>	<p>Director Water and Waste</p>
<p>Date: 05 August 2024</p>	<p>Date: 7 August 2024</p>

ATTACHMENTS

- CONFIDENTIAL Attachment 1 – Water and Waste Capital Projects Progress Summary Spreadsheet July 24

REFERENCE DOCUMENT

- Nil.

PAGES 20 - 21 HAVE INTENTIONALLY BEEN REMOVED DUE TO CONFIDENTIAL REASONS

MEETING DETAILS	Water and Waste Standing Committee Meeting Wednesday 21 August 2024
AUTHOR	Lisa Tonkin
AUTHOR POSITION	Manager Business Services

5.2

WATER QUALITY INVESTIGATION ACTION PLAN UPDATE

EXECUTIVE SUMMARY

The purpose of this report is to update Council on the Water Quality Reliability Investigation Action Plan Deliverables following the 2021/22 Christmas Period water quality incidents.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- 1. Receives and notes the Report for the Water Quality Investigation Action Plan Deliverables.**

BACKGROUND

Over the Christmas/New Year period 2021/2022 there were water quality incidents in four (4) townships across the Isaac Region, which caused disruption and impacted the water supply service levels experienced by those communities. The Chief Executive Officer (CEO) of Isaac Regional Council (IRC) committed to a thorough investigation into the incidents. The terms of reference (TOR) for the investigation were approved by Council and an internal investigation was conducted which was peer reviewed by an independent third-party consultant.

Arising from the investigation an action plan was prepared and presented to Council. At the November 2022 Ordinary Meeting (refer resolution number 8126) Council received and acknowledged the Water Quality Investigation Report received and endorsed the Water Quality Investigation Report Action Plan and requested that a regular report be presented to Council on the progress against the action plan deliverables.

IMPLICATIONS

The risk of a reoccurrence of the water quality incidents remained after the events had been resolved, and it was clear from the subsequent investigation that there was no single solution which would entirely remove the risk of such water supply failures. The investigation report gave rise to an action plan which set out a suite of actions which will address the root causes of the water quality events.

The action plan contained both short term interventions and actions that form part of a longer-term strategy. Some of the short-term interventions such as the replacement of failed equipment have already had an impact on the likelihood of a reoccurrence but will not eliminate it entirely. Expected delivery dates have been identified in the action plan so that progress may be tracked and effectively managed. It should be noted that implementation of the recommended actions has taken a significant commitment from the Water and Waste management team and Isaac Regional Council.

In the period from April 2024 to July 2024 continued progress has been made on delivery of the Water Quality Action Plan. Progress to date is shown in detail in Attachment 1 - Water Quality Investigations Action Plan - Update – July 2024 but can be summarised as follows:

Status	June 2023	October 2023	January 2024	April 2024	July 2024
Action Complete	5	12*	16*	20*	22*
Action On - Track	28	23**	16**	17**	15**
Action Needs Improvement	3	1	2	0	0
Action Yet to Commence	0	0	0	0	0
Ongoing	1	1	3	0	0

* Where actions have become embedded as business-as-usual activities they have been considered as complete.

** Some of the identified actions are scheduled to be delivered over several years.

CONSULTATION

- Director of Water and Waste
- Manager Operations and Maintenance
- Program Leader Compliance and IMS
- Water and Waste Process Engineer

BASIS FOR RECOMMENDATION

The Action Plan in Attachment 1 forms the basis of future risk mitigation measures, and its implementation significantly reduces the likelihood of similar water quality incidents occurring in the future. This report shows that progress has been made against all actions; 22 actions are now complete and 15 are on track for successful delivery. The continuing implementation of this action plan will further reduce the risk of future water quality events occurring.

The scope and nature of many of the actions in the plan are multi-year initiatives which will embed a culture of continuous improvement in the Water and Waste directorate. These continuous improvement actions are incorporated into the Water and Waste Integrated Management System where appropriate, to secure the improvements in future operations. Funding relating to some of the actions has been included in the budget submissions for the 2024/25 Financial Year.

The action plan is one mechanism being used to improve water quality in response to specific water quality events. It is complimented by broader activities such as the Water and Waste Integrated Management System (IMS) and the Drinking Water Quality Management Plan (DWQMP) which was reviewed in December 2023.

The review of the DWQMP included a targeted improvement plan Risk Management Improvement Plan (RMIP) which has informed the 2024/25 Financial Year investment strategy for the Water and Waste Directorate.

Although the continued delivery of the action plan in Attachment 1 will result in a more robust and sustainable water services it represents the actions identified at a point in time and will be complemented by further initiatives which have commenced subsequently.

ACTION ACCOUNTABILITY

The Director of Water and Waste will continue to lead the improvement in reliability of the water supply schemes across the Region.

KEY MESSAGES

The management team of Water and Waste are committed to improving performance and implementing change to minimise the risk of water quality failures in the future, both in a focused way in response to specifically identified risks and more systemically through continuous process improvement mechanisms.

Since the water quality events in December 2021/22 that triggered this investigation and action plan, the improvements made to date have enhanced the resilience of the water treatment process. Subsequent events have been identified and resolved before they have compromised water quality or the continuity of water supply to the community. These practical examples demonstrate that the initiatives captured in this action plan along with increased asset maintenance and additional staff training have led to more sustainable services.

There are several inter-related initiatives encompassed by this action plan and in complimentary business improvement frameworks. The ultimate success in preventing future water quality events will be dependent upon delivering them all, so that they complement each other.

Report prepared by:	Report authorised by:
LISA TONKIN	SCOTT CASEY
Manager Business Services	Director Water and Waste
Date: 5 August 2024	Date: 5 August 2024

ATTACHMENTS

- Attachment 1 - Water Quality Investigations Action Plan - Update – July 2024

REFERENCE DOCUMENT

- Drinking Water Quality Management Plan

WATER QUALITY INVESTIGATIONS – ACTION PLAN

Q1 UPDATE – JULY 2024

Key

Lead – Is the resource identified to lead and co-ordinate the implementation of an action.

Support – Is a resource that will be required to contribute to the delivery of an action but will support the Lead.

Input - Is a resource that will be required to contribute to achieve the successful delivery of an action but will only contribute as required.

BAU – Business as Usual

CAPEX – Capital Expenditure

DWQMP – Drinking Water Quality Management Plan

IMS – Integrated Management System

OPEX – Operational Expenditure

RMIP - Risk Management Improvement Program

SWIMS – Statewide Information Management System

WWILT – Water and Waste Influencers and Leadership Team

WTP – Water Treatment Plant

WWTP – Wastewater Treatment Plant

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
1.	System Documentation / Knowledge Management	Review existing operational documentation to identify gaps.	4 months per site (across all 8 water treatment plants) Start Jan 2023 End Dec 2024	<p>There are significant gaps in engineering documentation across both WTP and WWTP.</p> <p>The majority of engineering documentation are saved in Capital Projects folders in I: drive rather than O&M folders.</p> <p>Strategic decisions are required to address existing gaps and prevent future gaps.</p> <p>Recommend a Technical Standard for documentation is produced, that is released with all capital project tenders.</p> <p>ON TRACK</p>	<p>A strategy using IMS procedures and capital projects to manage and resolve engineering documentation gaps and inaccuracies has been recommended.</p> <p>There is a cost to this approach so needs to be well defined and endorsed.</p> <p>ON TRACK</p>	<p>Ongoing with no significant change in the preceding period.</p> <p>ON TRACK</p>	<p>Technical Standard for documentation partially completed. This shall be presented to the Capital Projects team to obtain feedback and improve.</p> <p>Investigate utilising the IMS document Management protocols to ensure Engineering documentation is relevant and remains current. Integration of operational documentation into the IMS is ongoing and will eventually form a complete operating system.</p> <p>ON TRACK</p>	<p>This is an ongoing issue.</p> <p>Ideally suitable documentation for all plants will encompass historical assets and the project delivery process will require contractors to update engineer documentation when providing improvements or replacements on treatment facilities.</p> <p>Project delivery guidelines are currently being drafted.</p> <p>ON TRACK</p>
1A	System Documentation / Knowledge Management	Develop specific SOPs for lab testing procedures (specific to the instrumentation)	2 months per site (across all 8 water treatment plants following on from action 1A)	<p>Four work instructions have been submitted for safety consultation.</p> <p>Six work instructions are in-</p>	Existing work instructions (WI) pending endorsement and publishing on Iris.	<p>Ongoing with no significant change in the preceding period.</p> <p>ON TRACK</p>	<p>Waiting for draft work instructions to be finalised in IMS.</p> <p>ON TRACK</p>	Operators using new Hach equipment, using the Hach test methods until the

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		that is at the sites).	Start Jan 2023 End April 2024	draft waiting for submission to safety consultation. Progress continues to be affected by access to I and U drive, which are currently unavailable. ON TRACK	Second phase WIs identified and awaiting commencement. ON TRACK			new IRC WIs are approved. ON TRACK
1B	System Documentation / Knowledge Management	Document procedure for how to respond to changing raw water quality etc.	5 months (across all 8 water treatment plants following on from action 1B) May need to prioritise in high-risk sites. Start Jan 2023 End December 2026	Progress continues to be affected by access to I and U drive, which are currently unavailable. ON TRACK	A procedure has been generated as part of the St Lawrence turbidity event. This procedure has been circulated. Development of the procedure has continued for raw water changes due to seasonal impacts. This will be circulated to the Supervisor North and IMS Officer once complete. ON TRACK	Ongoing with no significant change in the preceding period. ON TRACK	Ongoing with no significant change in the preceding period. Document will be within the IMS. ON TRACK	IMS procedure for "Response to Changing Raw Water Quality" is complete but awaiting final review and approval. ON TRACK
1C	Process Robustness (previously action 19)	Review processes, identify gaps or processes that	5 months (across all 8 water treatment plants	OPEX Project bid submitted for the review of the DWQMP and report	DWQMP review has been conducted by external consultant which will inform	The DWQMP review and process audits have identified areas for improvement, and	DWQMP and RMIP COMPLETE	Draft for WTP Process Audit template nearing completion.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		would provide more robust response to variability in raw water quality (e.g. the use of a coated media processes rather than potassium permanganate). Consider what additional monitoring (including on-line) to provide early warning or automated process changes. For example, pH and DO monitoring to provide early warning that coated media manganese removal might be compromised. Also, raw water turbidity monitoring with automated step change to the coagulant dose rate. Consider	following on from action 1B) May need to prioritise in high-risk sites. Start Jan 2023 End December 2026	preparation within the FY2324 budget. ON TRACK	and refresh the RMIP (Risk Management Improvement Program). These audits identify gaps and improvements prioritised on a risk basis including changes in raw water quality. Additional process audits conducted by the process engineer for all sites which will feed into the investment decision process. Project scoping underway for process improvement opportunities for Carmila WTP. Some of the RMIP actions are to investigate options for improvement and this work will be assessed in the investment decision making process.	these have been input into the FY2425 budget preparation process for future investment. ON TRACK	Next step to produce a WTP Process Standard against which each treatment plant is audited to identify improvements. ON TRACK	General technical specification for Isaac Chemical Dosing Requirements is underway with an expected delivery date of August 2024. ON TRACK

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		using on-line manages analyser results with alarms and also feed forward change to the potassium permanganate dose rate. The changes to dose rates would be based on information gathered from previous events and jar testing.			ON TRACK			
2.	System Documentation / Knowledge Management	Ensure one updated operation and maintenance manual exists for each plant with the manuals all being consistent in format to enable operators from other plants to easily find information.	3-year project (average 4 months per site) Start 1 July 2023 End June 2026	Funding for this action has been submitted as a PAG bid for the FY2324 financial year. ON TRACK	Data acquisition for water treatment sites has commenced to update the Operations and Maintenance Manuals. ON TRACK	Lucidity action 6978. Contractor has been engaged to complete the manuals. MMT and DYS water treatment plants and wastewater treatment plants will be completed this year. ON TRACK	Contractor has been engaged to complete the manuals. ON TRACK	Middlemount and Dysart Water Treatment Plant Manuals have been drafted and awaiting checking with operational team. Once this has been completed these documents will be registered. Moranbah and Nebo Water Treatment Plants are the next sites to have these documents developed.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
								ON TRACK
3.	System Documentation / Knowledge Management	Ensure manuals are electronic enabling search mechanisms to quickly find relevant information.	No timeframe – as documents are created	<p>IMS recertification was undertaken in May 23.</p> <p>Documents will be integrated into the IMS system as they are completed.</p> <p>ON TRACK</p>	<p>IMS surveillance audit completed in June 2023.</p> <p>Separate report to Council submitted to November Council meeting.</p> <p>ON TRACK</p>	<p>Capture of new documentation in IMS is routine part of the document and process control.</p> <p>Now considered BAU.</p> <p>COMPLETE - ACTION CLOSED</p>	<p>Capture of new documentation in IMS is a routine part of the document and process control.</p> <p>Now considered BAU.</p> <p>COMPLETE - ACTION CLOSED</p> <p>Remove from future reports.</p>	<p>COMPLETE - ACTION CLOSED</p> <p>Remove from future reports.</p>
4.	SCADA	The reviewers understand that a SCADA strategy is currently being prepared. It is important that this strategy addresses the lack of a centralised system, ensures all sites have similar screen layouts to facilitate operators moving from	<p>Start Jan 2023</p> <p>End June 24</p>	<p>SCADA projects for Glenden and Nebo have been out to tender and together without the general refresh of the SCADA platform are ready for award subject to approved by the W&W Standing Committee.</p> <p>COMPLETE</p>	COMPLETE - ACTION CLOSED	<p>The award of the SCADA implementation project failed to conclude due to issue with the preferred contractor. Project has been reviewed, the scope adjusted and has been re-issued to the market.</p> <p>UPDATE</p>	<p>The SCADA strategy is complete.</p> <p>COMPLETE - ACTION CLOSED</p> <p>Remove from future reports.</p>	<p>COMPLETE - ACTION CLOSED</p> <p>Remove from future reports.</p>

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		one plant to another.						
5.	SCADA	Consider having a "Head Office" SCADA that receives alarms for all important operation sites (raw water sources pump stations, key water treatment processes and monitoring results etc). These alarms should be monitored/auto matically escalated to key personnel via SMS and/or voice dialling system (eg SCADA phone) to message or call people. If no answer, call goes to the next person until acknowledged.	Start Jan 2023 End June 24 Deadline extended in line with SCADA Strategy. End Dec 2025	This item will be encompassed as one element of the Service Delivery Model Review. ON TRACK	The development of the new service delivery model is likely to take longer to implement than June 2024. However, the SCADA development projects will continue despite this. Discussions are underway through the WIM Alliance on the feasibility of regional control room options. ON TRACK	No significant development on the subject of a regional SCADA control centre in the last quarter. ONGOING	No significant development on the subject of a regional SCADA control centre in the last quarter. This opportunity has been considered and is not viable at this time. It will be reconsidered at the end of the SCADA implementation currently underway. COMPLETE ACTION CLOSED Remove from future reports.	COMPLETE - ACTION CLOSED Remove from future reports.
6.	SCADA	Ensure the SCADA system can be remotely accessed by authorised	Completed for sites that have SCADA installed.	As more sites are SCADA enabled the visibility and	COMPLETE - ACTION CLOSED	COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED	COMPLETE - ACTION CLOSED

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		personnel. Those authorised personnel should only be authorised to change set points or operate remotely within their area of expertise.	Start Jan 2023 End March 23	access will be expanded. COMPLETE			Remove from future reports.	Remove from future reports.
		Review who our authorised personnel will be	12 months (guideline?) Annual review to be undertaken each year	ON TRACK	This is embedded in BAU processes. COMPLETE - ACTION CLOSED	COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE - ACTION CLOSED Remove from future reports.
		For sites that do not have SCADA – how do we get those sites accessible	2.5 years Start Jan 2023 End July 25	SCADA projects for Glenden and Nebo have been out to tender and together without the general refresh of the SCADA platform are ready for award subject to approved by the W&W Standing Committee. ON TRACK	SCADA project was offered to preferred supplier but not accepted. Price escalation prompted a redefinition of the project scope and a return to the market for re-tender. ON TRACK	The first element of the revised SCADA project has been to the market and is in the evaluation stage. Award to technical advisor expected February 2024. NEEDS IMPROVEMENT	SCADA Technical Advisor contract has been awarded and initial meetings have been held at Glenden and Nebo. ON TRACK	The initial contractor has not fulfilled their obligations and developed the documentation as required. A second contractor is being engaged to start this process with Clermont WTP. ON TRACK
7.	SCADA	Ensure the SCADA system has the capability to put	3.5 years Start	Capital projects continue to be delivered in line	Delays experienced in tender process for SCADA projects due to disruption to	The first element of the revised SCADA project has been to the market and is in	SCADA Technical Advisor contract has been awarded and initial meetings	The initial contractor has not fulfilled their obligations and

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		logic to alert discrepancies when variance between actual and recorded information is detected. (eg if X filters on-line then expected flow is Y ML, have a discrepancy alarm)	July 2022 End Dec 25	with the SCADA Strategy ON TRACK	the preferred supplier however the project has been re-scoped and will return to market. ON TRACK	the evaluation stage. Award to technical advisor expected February 2024. NEEDS IMPROVEMENT	have been held at Glenden and Nebo. ON TRACK	developed the documentation as required. A second contractor is being engaged to start this process with Clermont WTP. ON TRACK
8.	SCADA	As part of the strategy development review systems and processes to identify gaps in monitoring and control. Ensure there is sufficient on-line instrumentation for monitoring key water quality parameters including Critical Control Points (CCPs). Related to this, there is a need to ensure there is sufficient control of the plant, such as plant	3.5 years Start July 2022 End Dec 25	PAG submission for upgrades to Carmilla WTP has been submitted for FY2324. ON TRACK	DWQMP review has been completed, report is being written. Process visits with Bligh Tanner have been undertaken; results are being collated. CCP's have been reviewed. From these activities monitoring and control requirement will be identified. ON TRACK	Risk assessments completed for 8x WTPs. 2023 Risk management improvement program (RMIP) produced as an output of the DWQMP review. ON TRACK	DWQMP Review and RMIP complete. Next step to produce a WTP Process Standard against which each treatment plant is audited to identify improvements. ON TRACK	Draft for WTP Process Audit template nearing completion. General technical spec for Chemical dosing requirements is underway. ON TRACK

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		shutdowns on breaches of CCP limits.						
9.	SCADA	The strategy should consider installing instrumentation to monitor raw and treated water quality, production and delivery with trends being monitored to alert operators in advance of the need to start adjusting their plant operation.	3.5 years Start July 2022 End Dec 25	Capital projects continue to be delivered in line with the SCADA Strategy ON TRACK	DWQMP review and process audits have assessed requirements for additional online instrumentation to monitor water quality. ON TRACK	Risk assessments completed for 8x WTPs. 2023 Risk management improvement program (RMIP) produced as an output of the DWQMP review. ON TRACK	DWQMP Review and RMIP complete. Next step to produce a WTP Process Standard against which each treatment plant is audited to identify improvements. ON TRACK	Draft for WTP Process Audit template nearing completion. ON TRACK
10.	Escalation Processes are not Working to Raise all the Critical Issues	Ensure staff receive CCP response refresher training (Apply the risk management principles of the water industry standards, guidelines and legislation) as a refresher which covers the 12 elements of the Australian Drinking Water Guidelines as	Ongoing program Start Oct 2022 End Ongoing	Operator training completed on CCP and the need to escalate issues to supervisory staff. ON TRACK	The review of the DWQMP has reduced the number of CCPs (critical control points), (no longer includes treated water turbidity or treated water pH). The CCP online analysers are within the capital plan. Department of Resource Development	2023 Review of DWQMP complete and submitted to RDMW – awaiting approval. CCPs now on traffic light charts with actions and reporting. Operator awareness training of CCPs once DWQMP has been approved.	RDMW requested clarification and amendments on four points within DWQMP. Training of CCP charts during June 2024 Operators meeting. ON TRACK	CCPs presented during June 2024 Operators meeting. RDMW have verbally accepted the DWQMP 2023. COMPLETE

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		well as critical control points, critical limits and response plans.			<p>Manufacturing and Water (DRDMW) presented to operators team meeting on events and incident reporting.</p> <p>The importance of escalation reinforced along with advice to contact - RDMW in an event for timely reporting.</p> <p>ON TRACK</p>	ON TRACK		
		Consider undertaking the Water Industry Training Package Unit of Competency NWPGEN017	<p>Stephen to confirm the training package is equivalent to Cert 3 – review the qualification.</p> <p>Start March 2023</p> <p>End Dec 2023</p>	ON GOING	ON GOING	ON GOING	<p>This is covered in the Water Industry Worker Cert III</p> <p>COMPLETE – ACTION CLOSED</p> <p>Remove from future reports.</p>	<p>COMPLETE – ACTION CLOSED</p> <p>Remove from future reports.</p>
11.	Escalation Processes are not Working to Raise all the	Display the CCP limits and response plans in each plant in poster form so levels are	Reviewed yearly. New CPP will be installed at plants by end January 2023	<p>Initial CCP review and visibility complete.</p> <p>COMPLETE</p>	COMPLETE - ACTION CLOSED	COMPLETE – ACTION CLOSED	<p>COMPLETE – ACTION CLOSED</p> <p>Remove from future reports.</p>	<p>COMPLETE – ACTION CLOSED</p> <p>Remove from future reports.</p>

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
	Critical Issues	clearly understood by any operator working in the plant. Council should review these CCP responses and limits to ensure they are in line with ADWG guidelines	Start Oct 2022 End Jan 23	Further updates to CCP will be completed as part of annual reviews.				
	Ineffective Alarms to Identify Problems and then Escalation (H2O action item 15)	Implement Critical Operating Point (COP) limits in the water supply network, covering low and high limits for free chlorine.	3.5 years – phased implementation based on risk Start July 2022 End Dec 25	Capital project for MMT Cleanwater Reservoir included in PAG submissions for FY2324. ON TRACK	MMT Cleanwater Reservoir project sent to market and prices returned were many times over budget. Operational control measures remain in place whilst alternatives options are considered for the project. NEEDS IMPROVEMENT	Evaluation of drinking water quality at MMT as part of the DWQMP review highlighted elevated risk around Chlorine contact time. This is being managed operationally but has prompted the re-submission of the capital project for the MMT reservoir main for FY2425 budget consideration. ON TRACK	PAG submission has been included for the MMT reservoir main for FY2425 budget consideration. ON TRACK	Middlemount Reservoir Main duplication SOW has been completed and tender being released to market in August 2024. \$1.4M committed in the FY24/25 budget. ON TRACK
12.	Escalation Processes are not Working to Raise all the	Review emergency response/escalation procedures. Review existing procedures and	4 months across all 8 water treatment plants to complete the	OPEX Project bid submitted for the review of the DWQMP and report	Raw water quality changes due to rain/drought/fires is covered in action 1B.	Incident and emergency management section updated in the DWQMP and is	RDMW requested clarification and amendments on four points within DWQMP.	RDMW have verbally accepted the DWQMP 2023 COMPLETE

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
	Critical Issues	identify gaps (eg Business Continuity Plans, Raw Water Quality Changes due to rain/drought/fire s/etc).	review (aligns with 1A) 5 months across all 8 water treatment plants to write the documents (aligns with 1C) Start Jan 2023 End Dec 25	preparation within the FY2324 budget. Progress continues to be affected by access to I and U drive, which are currently unavailable. ON TRACK	DWQMP review has been completed, and the final report is being prepared by external consultant. ON TRACK	currently awaiting review by RDMW. COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	
		Conduct mock incident response to these incidents, including significant incidents that require escalation and potentially need the formation of an incident response team such as boil water alert or involvement of emergency services, etc as a means of training staff.	Already have a mock trial schedule Start July 2022 End On going	An actual boil water notice was implemented in Moranbah and involved standing up the Emergency Management Committee. Additional mock trials will be conducted during the year to prepare for future events. ON TRACK	IMS surveillance audits are scheduled at multiple sites each year. ON TRACK	Preparatory meetings were held in the lead up to the Christmas period to prepare staff for possible incidents building on previous mock trials and incident debriefs. IMS surveillance audits are schedule for May 2024 at 6 sites including Glenden and Moranbah water treatment plants.	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
						These activities are now considered part of BAU. COMPLETE – ACTION CLOSED		
13.	Ineffective Alarms to Identify Problems and then Escalation	Ideally results from on-line instruments, on-site tests and external NATA lab need to be consolidated into one database with results alarmed if discrepancies are identified. The results should be regularly and promptly reviewed and acted on where necessary.	3.5 years - SWIMS Project NOTE - SWIMS will become the daily data log. NOTE – links to SCADA implementation. Start July 2022 End Dec 25	Service Delivery Model Review will consider the best resource to complete the SWIMS data capture and submission. Discussions with Mackay Laboratory and QWD continue regarding the automatic upload of lab results. ON TRACK	Discussions with Mackay Laboratory and QWD continue regarding the automatic upload of lab results. Consideration of the best resource to complete the SWIMS data capture and submission is ongoing as part of organisational changes. ON TRACK	Operational monitoring updated within the 2023 DWQMP. Log sheets to be updated to align with 2023 DWQMP. ON TRACK	Operational monitoring accepted by RDMW. Operators and Supervisors checking that testing aligns with new Operational Monitoring program. COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.
14.	Ineffective Alarms to Identify Problems and then Escalation	Trends should also be automatically calculated to alert before critical levels are reached.	3.5 years - SWIMS Project NOTE - SWIMS will become the daily data log	SCADA projects for Glenden and Nebo have been out to tender and together without the general refresh of the SCADA platform are ready for award	Delays experienced in tender process for SCADA projects due to disruption to the preferred supplier.	The award of the SCADA project failed to conclude due to issue with the preferred contractor. Project has been reviewed, the scope adjusted	SCADA Technical Advisor contract has been awarded and initial meetings have been held at Glenden and Nebo.	The initial contractor has not fulfilled their obligations and developed the documentation as required. A second contractor is being

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
			NOTE – links to SCADA implementation. Start July 2022 End Dec 25	subject to approved by the W&W Standing Committee. ON TRACK	ON TRACK	and has been re-issued to the market. The first element of he revised SCADA project has been to the market and is in the evaluation stage. Award to technical advisor expected February 2024. ON TRACK	ON TRACK	engaged to start this process with Clermont WTP. ON TRACK
15.	Ineffective Alarms to Identify Problems and then Escalation	Consider the inclusion of regular reservoir inspections to check integrity. (e.g. roof intact and prevents rainwater entering, suitable bird proofing, no vandalism breaches, etc) ACTION - Development of the program – inspection/cleaning	12 months Start Jan 2023 End Dec 23	Preventative Maintenance Program is being rolled out with initial tenders being released. OPEX project included in FY2324 budget submission. Speed of roll out is dependent upon levels of funding. ON TRACK	Additional Preventative Maintenance contracts have been let in line with the FY23/24 program. ON TRACK	Reservoir cleaning program is now released as a preventative maintenance program and is considered part of BAU. COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.
16.	Loss of Long-Term Historical	Review existing operator worksheets to	Copy details from 1A & 1C	Daily log sheets have been improved for CLM	Aeration of raw water dams is	Log sheets to be updated to align with 2023 DWQMP.	Resource allocated in organisational structure to	Data Integrity & Compliance Officer

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
	Knowledge – Staff Turnover	ensure all relevant tasks are included. Also review the frequencies of those tasks to ensure that changes are identified (e.g. algal levels) to ensure responses to changes are actioned before they become a problem.	Start Jan 2023 End BAU	<p>WTP and STL WTP.</p> <p>Water quality testing at MMT WTP has increased due to the transition to potassium permanganate.</p> <p>The current focus is on improvements in testing and monitoring at MMT WWTP due to 4 consecutive months of breaches.</p> <p>ON TRACK</p>	<p>contained in Capital Plan.</p> <p>Operational monitoring revised within the DWQMP Review.</p> <p>WTP checklists being improved by Integrated Management System (IMS).</p> <p>Transition to the Statewide Water Information Management System (SWIMS) in 6 to 8 weeks (so no requirement for updating log sheets)</p> <p>BGA Management Plan scheduled to be updated in 2024-25.</p> <p>ON TRACK</p>	<p>Transition to SWIMS is ongoing.</p> <p>ON TRACK</p>	<p>facilitate move to Statewide Information Management System (SWIMS). Recruitment has commenced.</p> <p>ON TRACK</p>	<p>Role currently advertising.</p> <p>COMPLETE</p>
		Ensure there is sufficient information available for	Ongoing action Start	Additional work needs to be undertaken in conjunction with	Training of staff in the capture and	All activities commenced in the previous quarter are ongoing an yet	Workshop between W&W and P&C occurred to investigate options	Recruitment and retention strategy is being developed.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		staff who are not fully conversant with the plant to be able to effectively complete the tasks on the worksheets.	Jan 2023 End BAU	P&C Training on boarding and on-site training. NEEDS IMPROVEMENT	recording of water data is ongoing. Discussions about improving onboarding of new staff continues with P&C. Recruitment and retention activities continue along with discussions with P&C on how this might be improved. ON TRACK	to reach a conclusion. ON TRACK	for recruitment and retention. Operations and Maintenance team have developed an onboarding pack for new staff. This has been shared across the directorate. ON TRACK	ON TRACK
		Competency review/audit – to ensure the employee understands the process	Ongoing action Start Jan 2023 End BAU	Regular IMS audits are being delivered and validated with a quarterly management reviews and annual external audits. ON TRACK	Operator training continues in operator team meetings along with quarterly IMS audits checking competency. Recent annual IMS surveillance audit and DWQMP audits have also interviewed operational staff to check their understanding of	This activity will continue as BAU. Regular training as part of operational meeting, site support for operators and routine IMS audits all support operators understanding of the treatment processes.	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
					operational processes. COMPLETE	COMPLETE – ACTION CLOSED		
17.	Loss of Long-Term Historical Knowledge – Staff Turnover	Ensure one updated operation and maintenance manual exists for each plant with the manuals all being consistent in format to enable operators from other plants to easily find information.	3-year project (average 4 months per site) Start Jan 2023 End June 24	Funding for an OPEX Project been submitted for the FY2324 financial year. ON TRACK	Recruitment of Process Engineer will be presented to Council in Q4. ON TRACK	The presentation of the Process Engineer to Council was suspended prior to Christmas but will be reinitiated. An operational project to prepare operation and maintenance manuals is underway. ON TRACK	An operational project to prepare operation and maintenance manuals is underway. ON TRACK	An operational project to prepare operation and maintenance manuals is underway. ON TRACK
18.	Loss of Long-Term Historical Knowledge – Staff Turnover	Ensure manuals are electronic enabling search mechanisms to quickly find relevant information.	No18 timeframe – as documents are created Start Jan 2023 End BAU	Documents will be integrated into the IMS system as they are completed. ON TRACK	Operating procedures continue to be integrated into the IMS. Discussions with Governance team are seeking to streamline the document control process. COMPLETE	COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
19.	Process Robustness (renumbered to action 1d)	Review processes, identify gaps or processes that would provide more robust response to variability in raw water quality (e.g. the use of a coated media processes rather than potassium permanganate). Consider what additional monitoring (including on-line) to provide early warning or automated process changes. For example, pH and DO monitoring to provide early warning that coated media manganese removal might be compromised. Also, raw water turbidity monitoring with		COMPLETE	COMPLETE	COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		automated step change to the coagulant dose rate. Consider using on-line manages analyser results with alarms and also feed forward change to the potassium permanganate dose rate. The changes to dose rates would be based on information gathered from previous events and jar testing.						
20.	Review Plant Bench Monitoring Equipment	Need better bench-scale lab equipment for operators to overcome the issue of operators using Palin test kits with the incorrect range.	Completed Start Jan 2023 End July 24	Lab equipment purchases have commenced, and additional funding has been included into the FY2324 budget. COMPLETE	COMPLETE	COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.
21.	Asset Management	An asset management system needs to be implemented to identify asset condition and	2 years Start July 2023? End	Revaluation scope does not include asset condition assessment. No resource currently available	Asset revaluation is complete. Asset management plan currently being updated.	The draft asset management plan has been reviewed. Work on the water and waste	A position description has been prepared for a new asset management position within W&W. Recruitment	Work continues with the development of this asset management position.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
		replacement schedules.	July 25?	to develop asset management plans and integrate with preventative maintenance program. This constraint will be considered as part of the Service Delivery Model Review. NEEDS IMPROVEMENT	Resources reallocated to work on asset management and long-term capital investment programs. IRC Assets team invited to work with W&W in development of investment programs. ON TRACK	investment strategy has commenced. Preparation of the 10-year capital programs has been done. All sources of recommended investment have been collated into a comprehensive list of identified need. ON TRACK	for this position will be progressed. Work continues with the asset management team to consolidate and rationalise the asset registers. ON TRACK	Condition assessments are being collated at the end of each preventative maintenance program. These condition assessments are being uploaded into the Asset Management System. Draft asset management plans have been reviewed and updated. ON TRACK
	Asset Management	Amend the draft AMPs with focus on the improvement plan	12 months from engagement of resource Start June 23 End June 24	Will be considered as part of the Service Delivery Model Review. NEEDS IMPROVEMENT	Asset management plan currently being updated. Resource allocation reviewed and existing resources reallocated to work on asset management and long-term capital investment programs.	The review of the asset management plan is complete and is just awaiting approval. Dedicated asset management resources have been identified and will be implemented over the coming periods if approved. In the meantime, existing resources	10-year investment programs are now complete in draft for water wastewater and waste functions ON TRACK	Finalisation of the AMP's and the update of the 10-year investment program is near completion. Once completed this will be submitted for approval. ON TRACK

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
					ON TRACK	are focusing on the continued development of the asset register and 10 year investment programs.		
						ON TRACK		
	Asset Management	To ensure preventative maintenance is carried out on a scheduled basis. Develop a system to enable breakdowns to be recorded and actioned appropriately to ensure critical equipment and instrumentation is working correctly with minimal downtime.	Initial development of program – 12 months Ongoing program Start Jan 23 End BAU	Preventative maintenance program is being delivered. Additional funding has been requested in the FY2324 budget. Asset failure and repair data capture and work request management will likely be included as a module in the Tech1 rollout. Initial program development complete. ON TRACK	Funding of \$750k budget for FY23/24. Tech 1 roll out for maintenance management not scheduled for a couple of years. Preventative maintenance program continues to be rolled out in line with the delivery schedule. ON TRACK	This activity will continue as BAU. Additional preventative maintenance funding will be requested in the FY2425 budget to consolidate and complete the roll out of the preventative maintenance program. Tech 1 Maintenance Management Module is part of the Digital Transformation Strategy. COMPLETE – ACTION CLOSED	This activity will continue as BAU. Additional preventative maintenance funding will be requested in the FY2425 budget to consolidate and complete the roll out of the preventative maintenance program. Tech 1 Maintenance Management Module is part of the Digital Transformation Strategy. COMPLETE – ACTION CLOSED	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
							Remove from future reports.	
22.	Workplace Culture	Continue the workplace cultural reforms that have currently been initiated.	Ongoing Start July 22 End BAU	Continuation of BAU activities and development of a Directorate staff survey. IRC Cultural Guidelines circulated to staff and discuss with OLT members. ON TRACK	Reward and recognition initiative has been implemented and reinforces IRC values and outstanding performance within the Directorate. Cultural development is discussed monthly at the WWILT meetings and future initiatives are proposed. Team development activities are delivered through WWILT in collaboration with P&C. Cultural development and improvement is embedded in BAU across the Directorate.	This activity will continue as BAU. COMPLETE – ACTION CLOSED	This activity will continue as BAU. COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
					COMPLETE			
23.	Workplace Culture	Emphasise the approach/philosophy of continuous improvement.	Ongoing Start July 22 End BAU	The WWILT group continues to meet and thrive and has identified multiple projects to provide business improvements to the W&W directorate. These activities are complimented by the structured approach of the IMS and external audits and certification. ON TRACK	The WWILT group continues to meet and thrive and has identified multiple projects to provide business improvements to the W&W directorate. These activities are complimented by the structured approach of the IMS and external audits and certification. This is complimented by ongoing training and information session at Operational team meetings. These activities are now embedded in BAU. COMPLETE	This activity will continue as BAU. COMPLETE – ACTION CLOSED	This activity will continue as BAU. COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.
24.	Drinking Water Quality	Review and audit of existing DWQMP	November 2022 Start	Budget included for DWQMP review in FY2324.	DWQMP audit is complete and final	This activity will continue as BAU.	The DWQMP will be reviewed on a 2 year cycle as per	COMPLETE – ACTION CLOSED

NO	FACTORS	ACTION	TIMELINE	PROGRESS JUNE 2023	PROGRESS OCTOBER 2023	PROGRESS JANUARY 2024	PROGRESS APRIL 2024	PROGRESS JULY 2024
	Management Plan		July 22 End BAU	COMPLETE and ONGOING	report is being prepared. COMPLETE	The DWQMP will be reviewed on a 3-year cycle. COMPLETE – ACTION CLOSED	Regulator requirements. COMPLETE – ACTION CLOSED Remove from future reports.	Remove from future reports.
	Drinking Water Quality Management Plan	Risk assessment of water supply schemes	6 years (one identified plant per year) Start July 22 End June 28	This will be a long-term cycling process where we review process at one plant each year and integrate this with reviews of the DWQMP and the continuation of the IMS. ON TRACK	Risk assessment of plant through the DWQMP review have been completed for FY23/24. COMPLETE	This activity will continue as BAU. The DWQMP will be reviewed on a 2-year cycle. COMPLETE – ACTION CLOSED	The DWQMP will be reviewed on a 2-year cycle as per Regulatory requirements. COMPLETE – ACTION CLOSED Remove from future reports.	COMPLETE – ACTION CLOSED Remove from future reports.

MEETING DETAILS

Water and Waste Standing Committee Meeting
Wednesday 21 August 2024

AUTHOR

Jason Grandcourt

AUTHOR POSITION

Manager Waste Services

5.3

MATERIALS RECYCLING FACILITY PROCESSING EXCEPTIONS AND DEVIATIONS

EXECUTIVE SUMMARY

The purpose of this report is to obtain ongoing approval to procure services for Processing of Recyclables as an exception to the competitive bidding requirements under s235 (a) and (b) of the *Local Government Regulations 2012* for medium or large sized contractual arrangements.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- Resolves it is satisfied that there is only one (1) supplier who is reasonably available that requires payment to supply services for processing and recycling of co-mingled recyclable waste due to the absence of other potential providers within reasonable travel distance of the Isaac Region.***
- Resolves that, because of the unique specialised nature of the work involved in operating a Materials Recycling Facility (MRF), it would be impractical or disadvantageous for the local government to invite quotes or tenders for an alternative replacement.***
- Endorses the following exception to enter into medium or large sized contractual arrangements as per s235 of the Local Government Regulations (2012) until 30 June 2024:***

<u>Company</u>	<u>Service provided/engaged for delivery of</u>
<i>Re.Cycle Operations (Mackay) Pty Ltd</i>	<i>Supplier of Services for processing of co-mingled recyclable waste in North Queensland</i>

BACKGROUND

Re.Cycle Operations (Mackay) Pty Ltd operates the Materials Recycling Facility (MRF) owned by Mackay Regional Council in Paget. This has been the sole processor for kerbside recyclables used by Isaac Regional Council (IRC), since the cessation of the Central Queensland (CQ) arrangements with the Rockhampton MRF in 2014. The waste collection contractor at that time bulked up the product being held at Clermont, this then because of its relative proximity made the Rockhampton option better value than Mackay at that time. Furthermore, IRC at that time was part of a Central Queensland partnership which saw collaboration on a range of waste issues at the time.

Officers consider that the Mackay MRF is now the only viable option for the foreseeable future. The current seven-year waste collection contract sees the materials bulked up in Moranbah and transported to Mackay, but there is an option in the contract to take the material elsewhere at additional cost to Council. Waste Services Officers have sought indicative prices from alternative MRFs which demonstrate that the transport costs of traveling to any alternative site, would incur additional costs, over and above the current contracted transportation costs to the Mackay MRF. A formal RFQ exercise would therefore be ineffective in attracting prices lower than the current arrangements in transporting the Region's kerbside recycling material to the Mackay MRF.

Discussion

The four MRFs at Townsville, Mackay, Rockhampton and Bundaberg are the only facilities within the surrounding regions, and between them they accept the recyclables from all Councils in the area including Cassowary Coast, Townsville, Charters Towers, Burdekin, Whitsunday, Mackay, Isaac, Central Highlands, Livingstone, Banana, Rockhampton, Gladstone and Bundaberg.

The current cost of processing the recyclables is \$169.35 per tonne, making a total annual cost of approximately \$127,000. The cost of transporting the material to the MRF in Mackay is included in the collection cost within the waste collection contract IRC/CHRC 2083-0119-138.

As stated above, historically Rockhampton was a destination for IRC recyclables, but those arrangements have ended, with the ending of the CQ arrangements. However, Rockhampton was considered as an alternative destination as part of the 2019 waste collection contract tender process. Council's waste collection contract includes a clause which enables Council to choose an alternative site for recyclables to be taken to Rockhampton. Rockhampton was considered as a viable option, however the tender process revealed that this alternative would cost an additional \$45,000 per annum. In 2021, The Rockhampton MRF ceased operations as it was destroyed by fire. The MRF has not been replaced to date and cannot be considered as an alternative, at this time.

Officers have made similar enquiries to the other MRFs within the surrounding regions including the Re.Group MRF in Townsville (520 km from Moranbah) and Bundaberg (700 km from Moranbah). The Townsville MRF would charge the same gate fee for IRC recyclables as currently prevails at Mackay; however Council would have to factor-in an additional \$100 per tonne, adding another \$75,000 per year to the cost.

The Bundaberg MRF, owned and operated by Bundaberg Regional Council, has stated that it does not have sufficient capacity to accept any more material for processing without adding additional shifts to its operation which is likely to result in a gate fee in excess of \$300 per tonne, not including transport costs over the 700 km between Moranbah and Bundaberg. Therefore, this alternative is too expensive to consider as a practical cost-effective option.

Under section 235 of *Local Government Regulation 2012*, a local government may enter into a medium-sized contractual arrangement or large-sized contractual arrangement without first inviting written quotes or tenders if:

(a) the local government resolves it is satisfied that there is only (one) 1 supplier who is reasonably available;

It is proposed that Council considers the requirement to procure as grounds to endorse the proposed exception.

IMPLICATIONS

Risk

A risk within the Isaac Regional Council Risk Register, WW0042 has been identified with a Medium 9 residual risk rating. The causes of the risk include “service already impacted following the introduction of the Container Refund Scheme (20% reduction in tonnage), overspend on budget.” The impacts / consequences of the risk are identified as: “potential need to seek alternative MRF, potential for need to review collection system / frequency, service disruption, potential negative reputational impact, potential contractual claim from collection contractor.” The existing controls are: “Budget monitoring, limited alternative MRFs, contract management” and the treatment has been identified as “monitor tonnage, costs and developments in Australian processing capacity”.

This report is therefore important to the work of mitigating this risk.

CONSULTATION

- Projects and Contracts Coordinator,
- Manager Waste Services
- Manager Contracts and Procurement
- Director Water and Waste

BASIS FOR RECOMMENDATION

Having investigated the alternatives, officers are confident that, because of the unique specialised nature of the work involved in operating a Materials Recycling Facility (MRF), it would be impractical or disadvantageous for the local government to invite quotes or tenders for an alternative replacement for the next 2 years.

ACTION ACCOUNTABILITY

- Manager Contracts and Procurement is accountable for compliance with s235 of the *Local Government Regulations (2012)*.
- Manager Waste Services is accountable for provision of waste recycling services.

KEY MESSAGES

The exceptions to the *Local Government Regulations 2012* under s235 (a) and (b) require Council resolution to ensure compliance.

Report prepared by: JASON GRANDCOURT Manager Waste Services Date: 5 August 2024	Report authorised by: SCOTT CASEY Director Waste and Waste Date: 6 August 2024
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ATTACHMENTS

- Nil

REFERENCE DOCUMENT

- Local Government Regulations 2012

- Register of Delegations – Exercise of Statutory Powers Council to Chief Executive Officer
- Environmental Protection Act 1994
- Contract IRC/CHRC 2083-0119-138 – Waste & Recycling Collection

MEETING DETAILS

Water and Waste Standing Committee Meeting

Wednesday 21 August 2024

AUTHOR

Gary Carlyle

AUTHOR POSITION

Planning Engineer

5.4**MORANBAH RECYCLED WATER IRRIGATION SCHEME**

EXECUTIVE SUMMARY

Council's Environmental Authority (EA) requires that there be no discharge to the environment from Wastewater Treatment Plants (WWTPs) except in Moranbah, under specific circumstances. The failure to prevent unauthorised discharges of recycled water could result in Council facing substantial financial penalties.

In Moranbah, demand for recycled water is currently insufficient to prevent unauthorised discharges of recycled effluent to the environment. The Effluent Reuse Strategy prepared by Bligh Tanner in 2023 recommended the construction of additional irrigation and the use of mechanical evaporators as a hybrid solution to meet the dual objectives of providing community benefit and preventing unauthorised discharges to the environment.

This report recommends extension of the recycled water network in Moranbah, construction of additional irrigation and purchase of a mechanical evaporator to help control the effluent level in Council's Effluent Storage Dams and prevent release of recycled water to the environment.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- 1. Endorses the construction of an extension to the Moranbah Recycled Water Network including:**
 - a. Separable Portion 1 (SP1) – Sarchedon Drive Recycled Water Main.**
 - b. Separable Portion 1a (SP1a) – Stage 1a Irrigation Scheme.**
- 2. Endorses the purchase of a mechanical evaporator.**

BACKGROUND

Isaac Regional Council operates WWTP's in Clermont, Dysart, Glenden, Middlemount, Moranbah and Nebo. Council's EA provides the conditions under which it must operate to comply with the Environmental Protection Act 1994. The EA requires that there be no discharge of sewage effluent to the environment from any WWTP, except in Moranbah when specific discharge conditions are met. Council is at risk of financial penalties if it breaches the conditions of its EA.

Isaac Regional Council operates a WWTP and recycled water scheme in Moranbah to allow the recycled water to be used for the benefit of the community to provide additional public amenity. Recycled water is used by Council for irrigation of median strips and parks around Moranbah. In addition, Council supplies recycled water to twelve private customers in Moranbah who use the recycled water for irrigation purposes on their

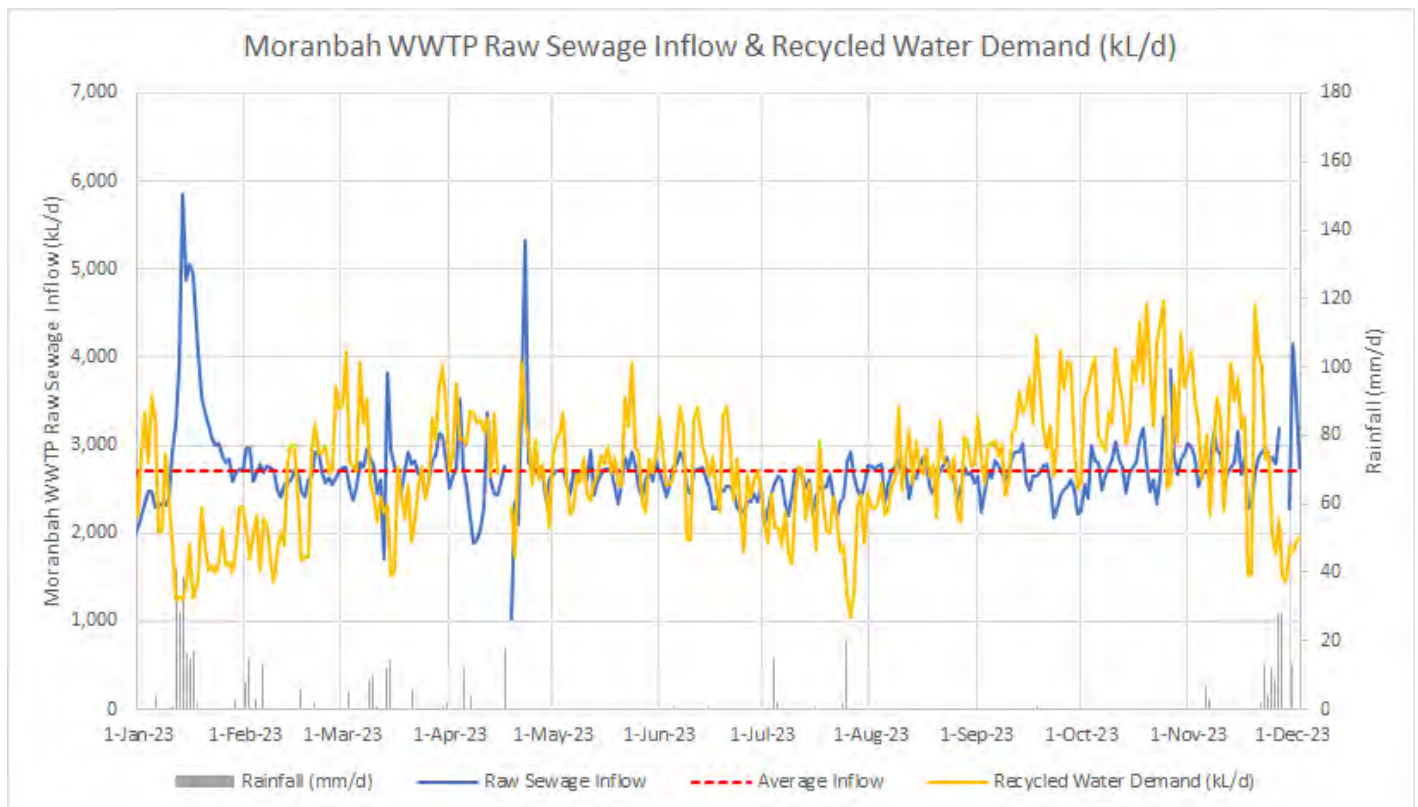
properties. Customers that use significant volumes of recycled water include the Moranbah Golf Course, Rugby League ground and the Moranbah schools.

Water use for irrigation is not consistent throughout the year or between years. In wet periods there is low demand for recycled water, but inflow to the plant may increase due to inflow/infiltration of rainfall to the sewer network. When the demand for recycled water is less than the sewage inflow to the WWTP, there is a surplus of recycled water that must be stored. This excess effluent is retained in the Effluent Storage Dam (ESD).

During extended periods of wet weather, the volume of recycled water that must be stored can exceed the capacity of the ESD, and the ESD will overflow to the environment in an uncontrolled way. The ESD at Moranbah WWTP has been overflowing intermittently since May 2022.

As an example, the graph below shows the impact of the rainfall event at Moranbah in January 2023. The rain (grey bars) causes a large increase in inflow to the plant (blue line) and a reduction in recycled water demand (orange line). The excess of inflow over demand must be stored in the ESD, and if there is insufficient storage, the ESD will overflow.

The graph shows that for one month after the rainfall, demand was much less than inflow and then until September 2023 the inflow and recycled water demand were roughly equal, so there was no drawdown in the ESD storage level. Then there was a two-month period when the demand exceeded inflow, until it rained in December 2023 and the demand once again dropped below the level of inflow.



To prevent overflow of the Moranbah ESD, Council needs to be able to dispose of recycled water when there is low irrigation demand and limited storage is available for the surplus effluent.

//////

The Effluent Reuse Strategy completed by consulting firm Bligh Tanner in 2023 recommended a hybrid solution to address this matter comprising of additional irrigation coupled with mechanical evaporators to dispose of the surplus recycled water that is not immediately needed by customers and cannot be stored in the ESD.

This report looks at the hybrid solution proposed in the Effluent Reuse Strategy. A scheme to extend and enhance the recycled water network in Moranbah including irrigation of land at Sarchedon Drive, Moranbah and the purchase of a mechanical evaporator that can be used in Moranbah and other population centres such Dysart and Middlemount as needed.

The proposed new infrastructure along Sarchedon Drive will also meet the objective to increase public amenity and use the recycled water for beneficial reuse in the community, providing the ability for the sports clubs along Sarchedon Drive (including the racecourse) to have a reliable recycled water supply.

Demand

Demand for recycled water comes from four sources:

- Third party customers (e.g. Golf Course, Schools etc.)
- Council's parks and gardens – irrigation of parks, sports fields and median strips.
- Council's WWTP –irrigation of Council's WWTP grounds.
- Effluent standpipe – for use in roadworks and dust suppression.

The location of these demand sources is shown on the figure below:

WATER AND WASTE

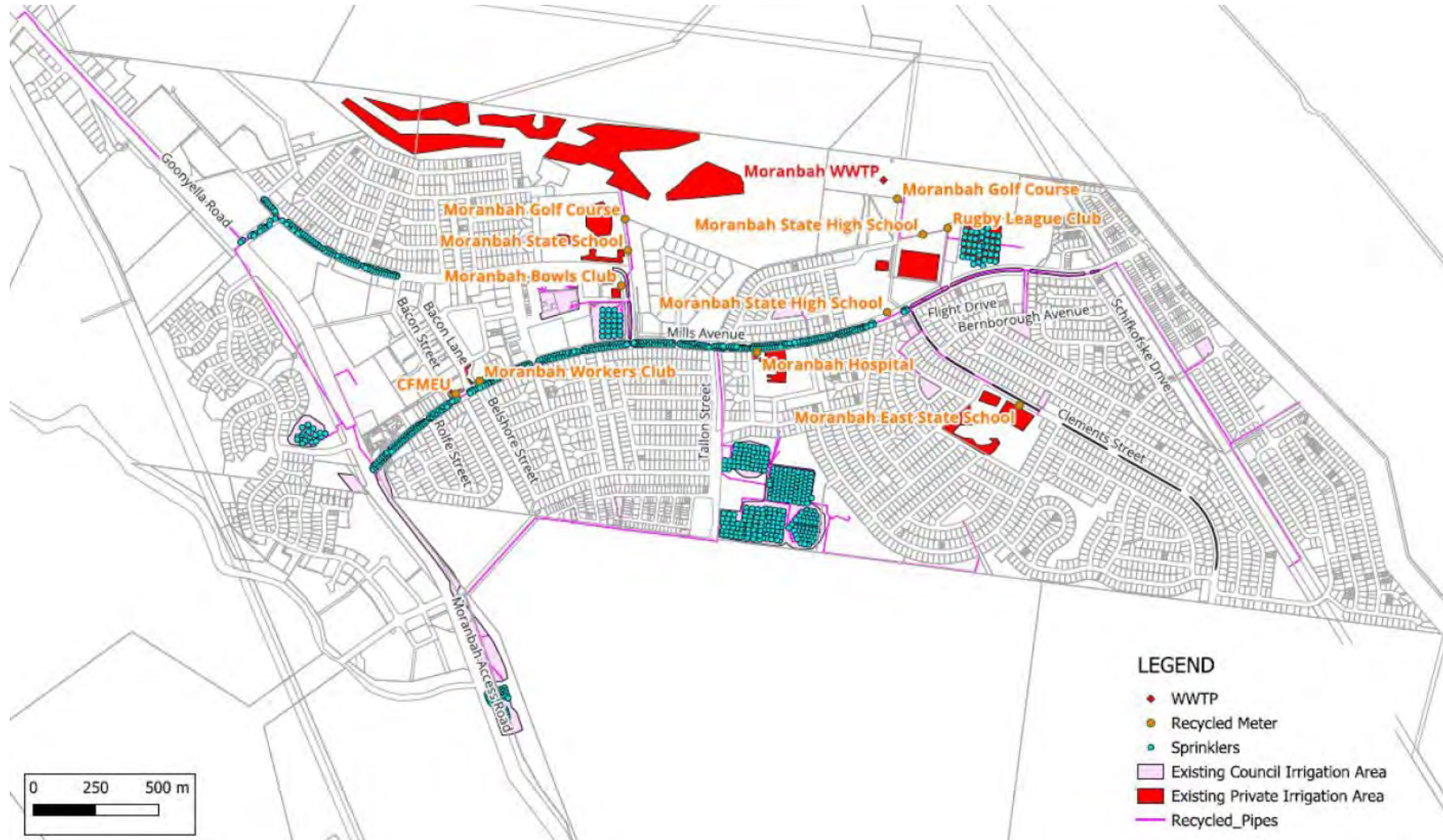


Figure 1: Existing Recycled Water Customers

Demand for irrigation is not constant and varies during the day. Peak demand usually occurs around midnight. Irrigation is undertaken at night to reduce the likelihood of the public coming into contact with the recycled water.

Hydraulic modelling was undertaken on the system and the graph below shows the modelled pressure at Mills Avenue and Tallon Street and the flow at the Effluent Pump Station in red and actual pressure and flow readings are shown as blue dots.

The graph shows that the pressure drops significantly during peak demand which restricts the ability to irrigate. Demand for recycled water is low during the day.

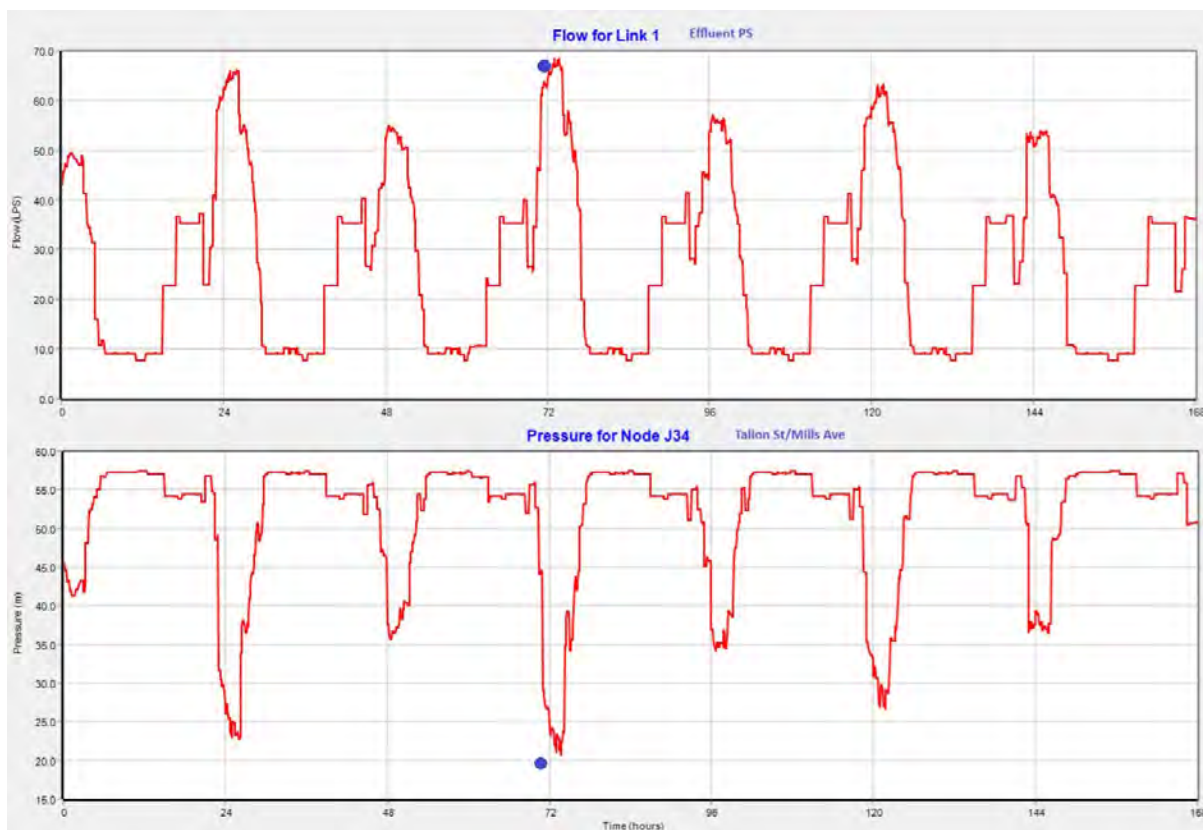


Figure 2: Modelled Pressure (at Tallon and Mills Ave, Moranbah) and Flow (at the Effluent Pump Station at the Moranbah Polishing Plant)

Proposed Scheme

The irrigation scheme proposed is on vacant Reserve land (Recreation Reserve) at Sarchedon Drive, Moranbah of which Council is the trustee. The scope of the irrigation scheme in this report includes two separable portions described below:

SP 1 - Sarchedon Drive Recycled Water Main

This recycled water main will supply the proposed irrigation scheme (SP1a) and allow all sporting clubs along Sarchedon Drive to be provided with a recycled water connection. The system has been designed to provide a minimum 30m pressure at the Sarchedon Drive boundary for each property. This main is proposed for 2024-25.

The works to be constructed are:

- 2,000 linear meters of 200mm diameter recycled water main along Sarchedon Drive from the existing main at the intersection of Goonyella Road and Sarchedon Drive, Moranbah to the proposed irrigation area.

The estimated cost of SP1 is shown in the table below:

SP 1 - Sarchedon Drive Main					
Item	Length/Number	Unit Cost	Capital Cost	2024-25	2025-26
2,000m of 200mm diameter main	2,000	500	1,000,000	1,000,000	
Preparation of Tender Documents		10,000	10,000	10,000	
Project Management		120,000	120,000	120,000	
Contingency 20%			226,000	226,000	
Total Capital - Sarchedon Drive Main			1,356,000	1,356,000	

SP 1a - Irrigation System – Stage 1a

Stage 1a of the Moranbah Irrigation Scheme is proposed for 2024-25 and will create a maximum daily demand of 930kL/d of which 897kL/d which can be supplied with the existing system. Construction of the Sarchedon Drive main is required to supply the Irrigation Scheme.

The works to be constructed are:

- It is proposed to have 76 high flow/high pressure sprinklers capable of 8.8L/s flow at an average pressure of 50m. These sprinklers have a 35m irrigation radius. It is proposed to have the sprinklers elevated to reduce the risk of vandalism and theft (approximately 2.5m).
- A total of 2,700m of 75mm diameter and 690m of 100mm diameter pipeline is required to service the proposed irrigation scheme. The 50mm diameter pipe is sized to provide the flow to one sprinkler at a time. Three sprinklers are proposed to operate at the same time, so each sprinkler operating concurrently will need to be on a separate 50mm lateral. This will need to be confirmed in detailed design.
- A Pressure Sustaining Valve is proposed for the upstream of the tank to maintain a minimum 30m pressure at the corner of Sarchedon Drive and Goonyella Road. This will prevent recycled water demand at the Irrigation Scheme from causing low pressures in the rest of the Moranbah Recycled Water Network.
- Flow meters are proposed at the inlet to the recycled water tank.
- A control system is required to enable automatic operation and control of the system.
- Operation and maintenance of the system will be carried out by Water and Waste’s Operations and Maintenance department.

The estimated cost of SP1a is shown in the table below:

SP 1a - Irrigation Scheme – Stage 1a					
Item	Length/ Number	Unit Cost	Capital Cost	2024-25	2025-26
Pressure Sustaining Valve	1	41,667	41,667	41,667	
200mm Diameter Flow Meter	1	41,667	41,667	41,667	
Sprinkler	76	333	25,333	25,333	
Sprinkler Installation	76	500	38,000	38,000	
2700m of 75mm diameter main	2,700	125	337,500	337,500	
690m of 100mm diameter main	690	250	172,500	172,500	
Control System	1	60,000	60,000	60,000	
Planning/Environmental Approvals		40,000	40,000	40,000	
Preparation of Tender Documents		10,000	10,000	10,000	
Project Management		100,000	100,000	100,000	
Contingency 20%			173,333	173,333	
Total Capital – SP1 – Irrigation Scheme – Stage 1a			1,040,000	1,040,000	

Evaporation Unit

In addition to the proposed network extension and irrigation, it is also proposed to use mechanical evaporators to supplement the effluent disposal capacity in Moranbah and also in other townships as required.

Mechanical evaporators are available for purchase as complete turnkey units with the claimed capacity to evaporate 1.6ML/d (see attached brochure as example). It is proposed to purchase one mechanical evaporator of this size to provide Council the opportunity to rapidly reduce the effluent level in an ESD to prevent overtopping in multiple townships.

Modelling shows that if Council had access to this unit in 2024, the effluent level of Dysart, Middlemount and Moranbah ESD's could have been reduced resulting in no overflow of these ESD's in 2024.

For context, Dysart ESD is 51ML, with net zero inflow to the ESD, the proposed evaporator could empty the ESD in 32 days at 1.6ML/d. The average inflow to the Dysart WWTP in 2024 is 1.2ML/d, so the proposed evaporator could theoretically dispose of all inflow to the plant.

Similarly, the Middlemount ESD is 75ML, so it can be emptied in 47 days (with net zero inflow). The average inflow to the Middlemount WWTP in 2024 is 0.7ML/d, so the proposed evaporator could dispose of all inflow to the plant.

Moranbah ESD is 176ML, so it can be emptied in 94 days (with net zero inflow). The average inflow to the Moranbah WWTP in 2024 is 2.8ML/d, so the proposed evaporator could dispose of more than half of the inflow to the plant.

The proposed mechanical evaporator will be a mobile unit (skid or trailer mounted) and be moved from plant to plant as required to reduce effluent levels in an ESD to prevent overtopping. Purchase of the evaporator will also be a trial to see if mechanical evaporators can have a greater role to help Council prevent overflow of its Effluent Storage Dams should this be needed.

Cost

Delivery of a mechanical evaporator is estimated at 3 months from when the supplier receives a purchase order. The estimated cost of a mechanical evaporator is \$340,000 comprising the purchase cost of the evaporator (\$150,000), weather station and ancillaries (\$60,000) together with impact studies (\$40,000), project management costs (\$30,000), site preparation (\$20,000) and electrical works at each plant (\$40,000).

The Effluent Reuse Strategy recommended evaporators at each WWTP; therefore, this one evaporator is not expected to solve all problems, but if it was available in 2024, calculations show it would have prevented the overflow of all ESD's.

The cost of the evaporator includes a weather station and automation to allow for automatic operation, and all cables etc for operation of the evaporator. Council will be responsible for preparing the site and any electrical or other capital works.

Estimated Irrigation Demand

Within the proposed irrigation area, the irrigation rate is a critical parameter for determining the Irrigation Demand for the Irrigation Scheme.

For the proposed disposal area, a maximum irrigation rate of 5mm/d has been adopted, which equates to an average irrigation rate of 2.25mm/d. Based on the maximum irrigation rate the maximum daily flow to the 45Ha disposal area will be 2,250kL/d. The average flow rate (allowing for no irrigation during dry periods and wet periods) will be 1,012kL/d (369ML/yr.).

Council's records show that the Moranbah ESD has overflowed a total volume of 167ML in 2024.

For context it is noted that Council's EA for irrigation of recycled water at Council's WWTP sites nominates that a maximum daily irrigation of 5mm/day, and an average irrigation of 2.8mm/day are allowed (note that the EA does not govern irrigation by private customers or Council's Parks and Gardens department).

Irrigation Area - Stage 2

There is additional Council owned land that can be irrigated in the Sarchedon Drive area if required, and this land is identified as Stage 2 on the attached plan. To allow for the irrigation of additional areas, the Moranbah Polishing Plant and Effluent Pump Station will need to be upgraded. These projects may be required at a future date but are not included within this (Stage 1) scope of works. Future works are dependent upon additional funding being available and will be considered through the standard Project Accountability Gateway (PAG) process.

Existing Recycled Water Network

It has also been identified through the efforts of the Beneficial Reuse Working Group that to optimise the beneficial reuse of recycled water to existing customers (including Council) in Moranbah there would need to be an upgrade to the existing recycled water main in Tallon Street. This work is not included within this (Stage 1) scope of works and would also be dependent upon additional funding being available and will be considered through the standard Project Accountability Gateway (PAG) process. The Tallon Street upgrade has been included as part of the Local Government Grants and Subsidies Program (LGGSP) funding application submitted in August '24 and may be able to be brought forward if the funding application is successful.

IMPLICATIONS

The implication of completing this work is that there will be additional irrigation capacity to help prevent the Moranbah ESD from overflowing, except in very wet periods (e.g. 2011) and the sporting clubs in the Western Sporting Precinct will have access to a reliable source of recycled water.

The addition of the evaporator will also provide increased flexibility in Moranbah to manage the recycled effluent disposal and will also provide a method to tackle effluent disposal in Middlemount and Dysart as well.

The purchase of a mechanical evaporator will demonstrate to the regulators that Council is taking action to prevent unauthorised discharge of effluent and will be a trial to determine if evaporators have a role in assisting Council to prevent overflow of its ESD's, compliment the extension of effluent reuse schemes.

It is proposed that the new irrigation system and evaporator should be operated for a period of time to gauge their performance and confirm operating parameters, before a decision is made to invest in additional capital works (Stage 2).

The implications for pressure in the existing network are that Stage 1 can be accommodated but there will remain pressure issues in some parts the existing network. Additional capital works (Tallon Street upgrade) will be required to address this.

RISK

The land identified for the irrigation area is Reserve for Recreation Purposes in which Council is the Trustee. It is believed that the proposed irrigation project will fit within the acceptable uses for this land, but this will be investigated as part of the planning phase of the project. Addressing the status of the land will also include considering matter relating to Native Title.

FINANCIAL IMPLICATIONS

Council has approved a budget \$1,950,000 for the Moranbah Recycled Network across 2024-25 (\$350K) and 2025-26 (\$1.6M) capital programs from depreciation funding. It is noted that as per PAG 2025 FY, there remained \$2,531,577 in unallocated sewerage depreciation.

The total cost for this proposed recommendation is \$2,736,000. It is proposed that an additional \$786,000 be drawn from unallocated depreciation to enable the purchase of an evaporation unit and commence construction of the first phase of this project, SP1 and SP1a in FY24/25 with completion in the 2025/26 financial year. Adjustments to the budget will be made at the September (Q1) Quarterly Review.

Components of Stage 1:

- SP1 - Sarchedon Drive Main - construction of 2000 lm of 200mm diameter recycled water main along Sarchedon Drive
- SP1a - Irrigation System Stage 1a - Installation of 76 high flow/high pressure sprinklers and 2700m of pipeline
- Purchase of evaporation unit.

It should be noted that an application for LGGSP funding has been submitted in August for \$4M for a scope of works that includes SP1, SP1a, preliminaries for a booster pump station to support future stages and the Tallon Street upgrade. Should this application be successful Council would potentially receive 60% grant funding (or \$2.4M). This would mean that in addition to the proposed recommendation in this report, Council

would also be able to progress the Tallon Street upgrade and no longer require utilisation of the additional \$786,000 unallocated depreciation. The project to be delivered over the 24/25 and 25/26 financial years. Notification of the LGGSP grants is anticipated to potentially occur in September.

CONSULTATION

- Manager Operations and Maintenance
- Manager Planning and Projects
- Director Water and Waste
- Beneficial Reuse of Recycled Water Working Group
- Manager Budgets and Statutory Reporting
- Manager Liveability and Sustainability
- Manager Business Services
- Director Corporate, Governance and Financial Services

BASIS FOR RECOMMENDATION

The basis for the recommendation is the Effluent Reuse Strategy prepared by consulting engineers Bligh Tanner in 2023 and discussion within the Beneficial Reuse of Recycled Water Working Group.

ACTION ACCOUNTABILITY

Manager Planning and Projects to action Design and Construction of the proposed Moranbah Irrigation Scheme.

Manager Operations and Maintenance to be responsible for operating and maintaining the scheme.

KEY MESSAGES

Council's Environmental Authority does not authorise Council to release sewage effluent from the Moranbah WWTP except under specific circumstances. Significant financial penalties can be imposed on Council if it breaches the conditions of its EA.

Recycled water is also a valuable community resource and Council seeks to use it in the provision of Increased public amenity.

To reduce the risk of unauthorised release of sewage effluent and provide recycled water to the Western Sporting Precinct it is proposed to extend the recycled water network along Sarchedon Drive and construct an irrigation system to reduce the risk of the Moranbah ESD overflowing.

The proposal in this report satisfies the objectives of the Beneficial Reuse Working Group.

Report prepared by:

GARY CARLYLE
Planning Engineer

Date: 17 July 2024

Report authorised by:

SCOTT CASEY
Director Water and Waste

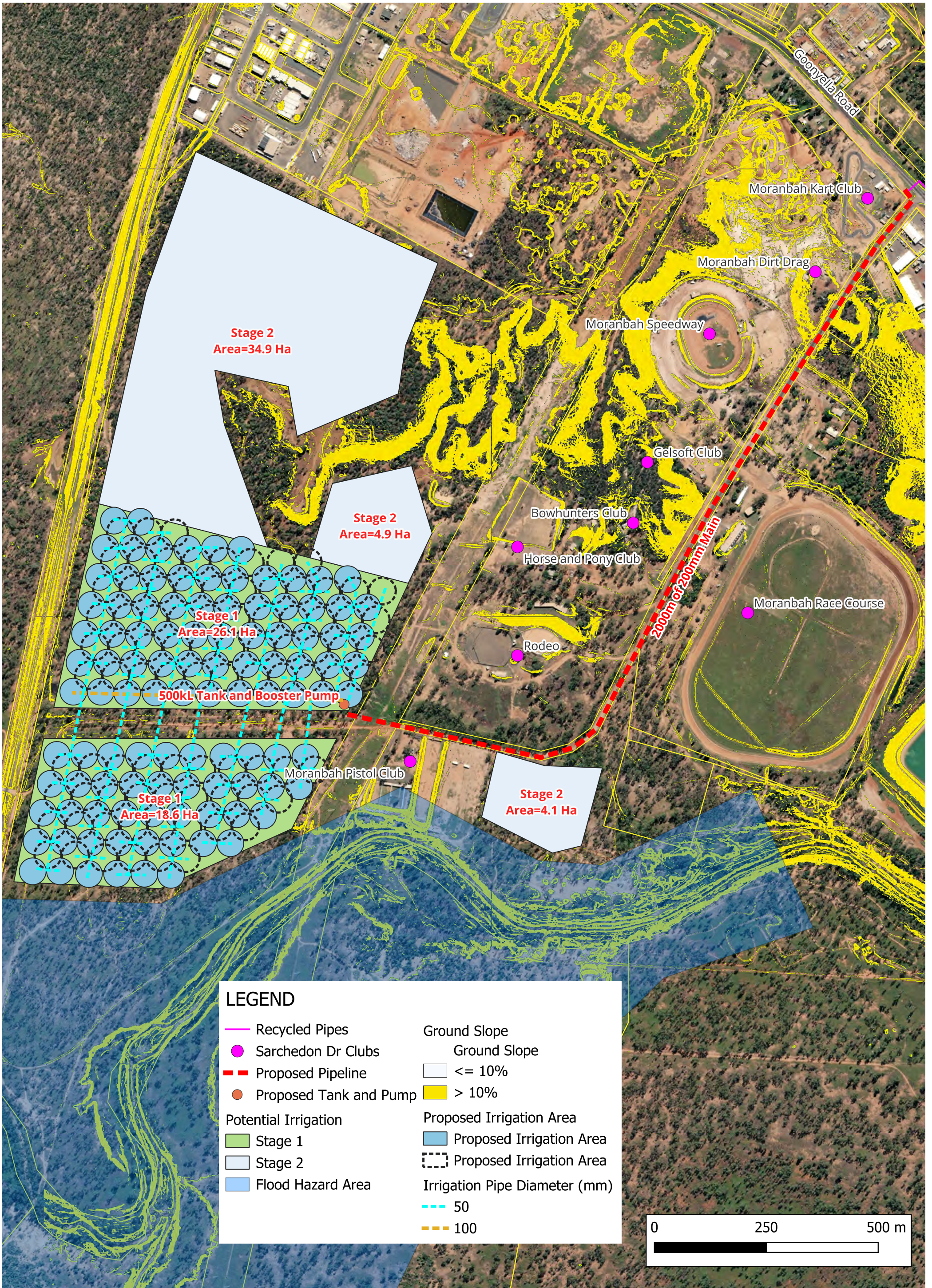
Date: 13 August 2024

ATTACHMENTS

- Attachment 1 – Sarchedon Drive Irrigation
- Attachment 2 – Sarchedon Tallon – Recycled Network Reinforcement
- Attachment 3 – Moranbah Recycled Water System – Upgrade Options 2024

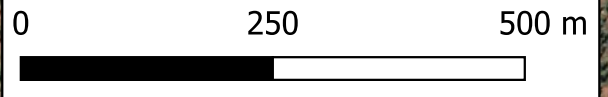
REFERENCE DOCUMENT

- Effluent Reuse Strategy. Bligh Tanner. 2023
- Moranbah Recycled Water System – Upgrade Options 2024



LEGEND

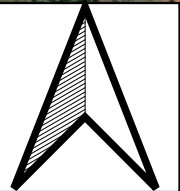
Recycled Pipes	Ground Slope <= 10%
Sarchedon Dr Clubs	Ground Slope > 10%
Proposed Pipeline	Potential Irrigation Stage 1
Proposed Tank and Pump	Potential Irrigation Stage 2
Potential Irrigation Stage 1	Flood Hazard Area
Potential Irrigation Stage 2	Proposed Irrigation Area
Flood Hazard Area	Proposed Irrigation Area
Irrigation Pipe Diameter (mm) 50	Irrigation Pipe Diameter (mm) 100



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Moranbah Recycled Water Irrigation Scheme

Created: July 11, 2024



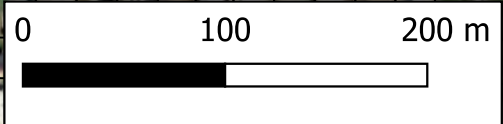


Moranbah WWTP

1600m of 300mm Dia

LEGEND

- - - Proposed Main
- Existing Effluent Mains



Tallon Street

Elliott Street

Koala Terrace

Kangaroo Drive

Mills Avenue

Bradman Street

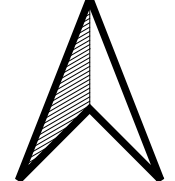
Flight Drive

Bemborough Avenue



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Proposed Recycled Water Main from Moranbah WWTP to Tallon St



MORANBAH RECYCLED WATER SYSTEM – UPGRADE OPTIONS

ISAAC REGIONAL COUNCIL

Current as at 01.08.2024

Presented by **Water & Waste Directorate**

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1 INTRODUCTION

Isaac Regional Council's Environmental Authority (EA) requires that there be no discharge of sewage effluent to the environment from the Moranbah Wastewater Treatment Plant except under specific circumstances.

Council operates a Recycled Water Scheme in Moranbah to treat the sewage effluent and distribute the treated recycled water so it can be used for the benefit of the community.

Recycled water is used by Council's Parks and Gardens department for irrigation of median strips and parks around Moranbah. In addition, Council supplies recycled water to private customers in Moranbah for irrigation purposes.

Demand for recycled water is insufficient to prevent overflow of Council's Effluent Storage Dam (ESD) at Moranbah and unauthorised discharges of sewage effluent to the environment have been occurring. These overflows place Council at risk of incurring significant financial penalties for breaching its EA.

The following three options have been identified to increase the demand for recycled water and assist Council in managing its recycled water system to prevent overflow of sewage effluent to the environment:

1. An irrigation system has been proposed to provide sufficient irrigation demand (maximum 2,250kL/d) to significantly reduce the risk of the Moranbah ESD overflowing, and hence significantly reduce the risk of Council breaching its EA.
2. Purchase of a mechanical evaporator.
3. Upgrade of the Moranbah Polishing Plant and effluent pump station.

1.1 PERFORMANCE OF THE EXISTING SYSTEM

Recycled water is used by Council for irrigation of median strips and parks around Moranbah. In addition, Council supplies recycled water to twelve customers in Moranbah who use the recycled water for irrigation purposes on their properties. Customers that use significant volumes of recycled water include the Golf Course, the Rugby League ground and the schools.

Water use for irrigation is not consistent throughout the year or between years. In wet periods there is low demand for recycled water, but inflow to the plant may increase due to inflow/infiltration of rainfall to the sewer network. When the demand for recycled water is less than the sewage inflow to the WWTP, there is a surplus of recycled water that must be stored in the Effluent Storage Dam (ESD).

During extended periods of wet weather, the volume of recycled water that must be stored can exceed the ESD capacity, and the ESD will overflow to the environment. Council's Environmental Authority (EA) prohibits the discharge of recycled water to the environment except under specific conditions. Council is liable for a substantial fine if it breaches the conditions of its EA. The ESD at Moranbah WWTP has been overflowing intermittently since May 2022.

As an example, Figure 1-1 below shows the impact of the rainfall event at Moranbah in January 2023. The rain (grey bars) causes a large increase in inflow to the plant (blue line) and a reduction in recycled water demand (orange line). The excess of inflow over demand must be stored in the ESD, and if there is insufficient storage, the ESD will overflow.

The graph shows that for one month after the rainfall, demand was much less than inflow and then until September 2023 the inflow and recycled water demand were roughly equal, so there was no drawdown in the ESD storage level. Then there was a two month period when the demand exceeded inflow, until it rained in December 2023 and the demand once again dropped below the level of inflow.

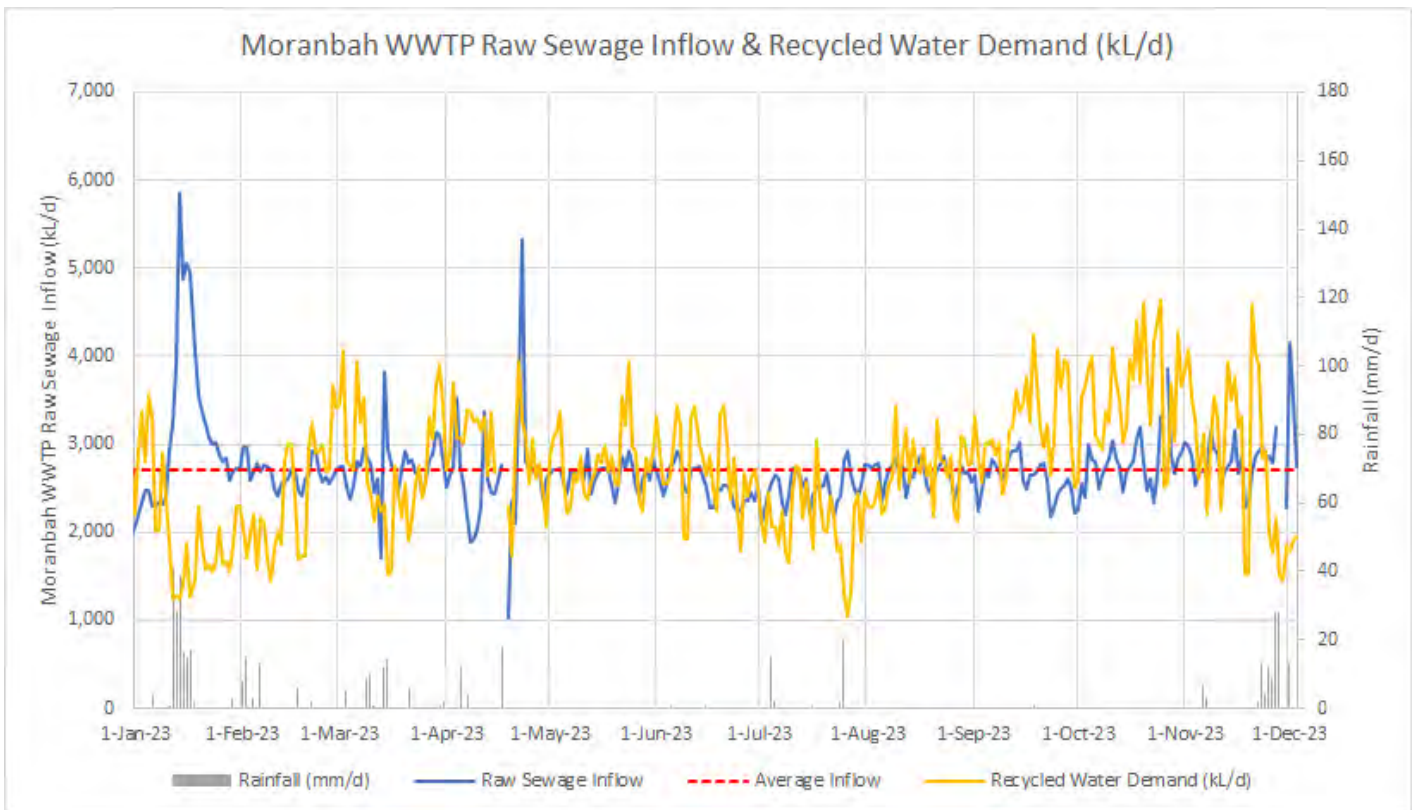


Figure 1-1 Moranbah WWTP Flows

There are two problems inhibiting the management of Council’s recycled water system:

1. There is insufficient overall average demand to use the effluent produced by the Moranbah WWTP, and
2. There is a variation in demand between periods when the weather is wet and dry, and Council needs a demand for recycled water that it can control and dispose of the surplus recycled water that is not immediately needed by customers, and there is insufficient storage to keep the effluent for use when demand is high.

To prevent overflow of the Moranbah ESD, Council needs to be able to dispose of recycled water when there is low irrigation demand and limited storage is available for the surplus effluent.

The Effluent Reuse Strategy completed by consulting firm Bligh Tanner in 2023 recommended a hybrid solution of additional irrigation and mechanical evaporators to dispose of the surplus recycled water.

This report looks at the following options to increase recycled water demand in Moranbah:

1. Do nothing.
2. Install irrigation at Council owned land at Sarchedon Dr, Moranbah.
3. Purchase a mechanical evaporator.
4. Upgrade the Moranbah Recycled Water Network and the Moranbah Polishing Plant.

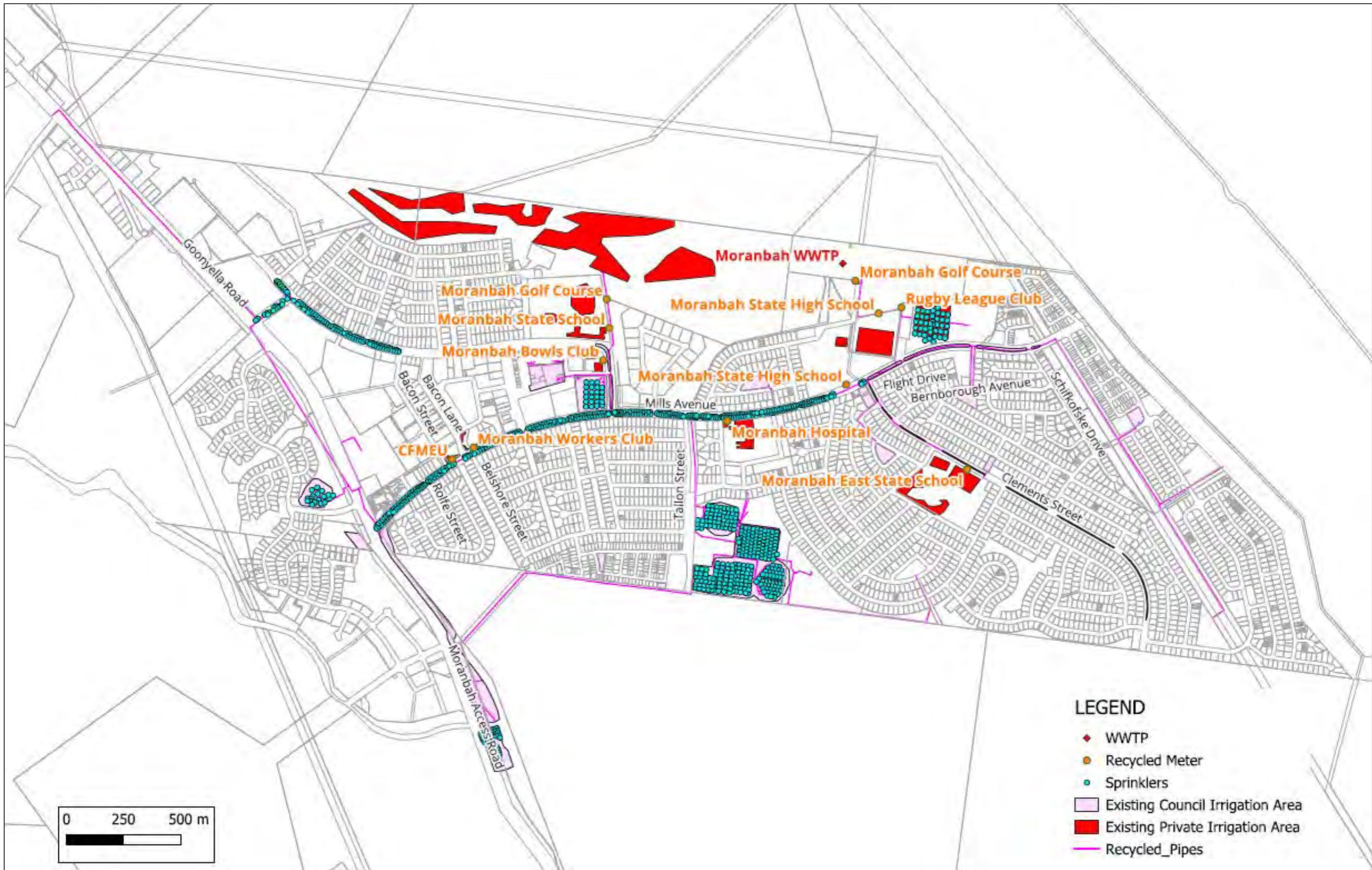


Figure 1-2 Moranbah Water Recycling Network

2 EXISTING RECYCLED WATER DEMAND

Demand for recycled water comes from four sources:

1. Third party customers (e.g. Golf Course, Schools etc.).
2. Council's Parks and Gardens – sprinkler use in parks and gardens, including sports fields.
3. Council's WWTP.
4. Effluent Standpipe.

2.1 THIRD PARTY CUSTOMERS

Third party customers in Moranbah are listed below and shown on Figure 1-2.

- Moranbah Golf Course.
- Moranbah Bowls Club.
- Moranbah Workers Club.
- CFMEU.
- Moranbah State School.
- Moranbah East State School.
- Moranbah High School.
- Rugby League Club.
- Moranbah Hospital.

Each third-party customer is allocated a specified volume of water they can take during specified times. Appendix 1 show the allocations for each customer.

There are five categories of allocations depending on the availability of recycled water:

- Low Low.
- Low.
- Normal.
- High.
- High High.

Council informs customers which level of allocations are currently in force. The level of allocations are typically based on the level of the ESD, with the lowest allocations in force when the ESD is at a low level, and the highest allocations when the ESD is at a high level.

The allocations are a maximum amount the customer can take, but the customers are not required to take any of their allocation.

Figure 2-1 shows the maximum demand for the Normal allocation in Moranbah assuming the customer takes the water at a flat rate during their allocation period.

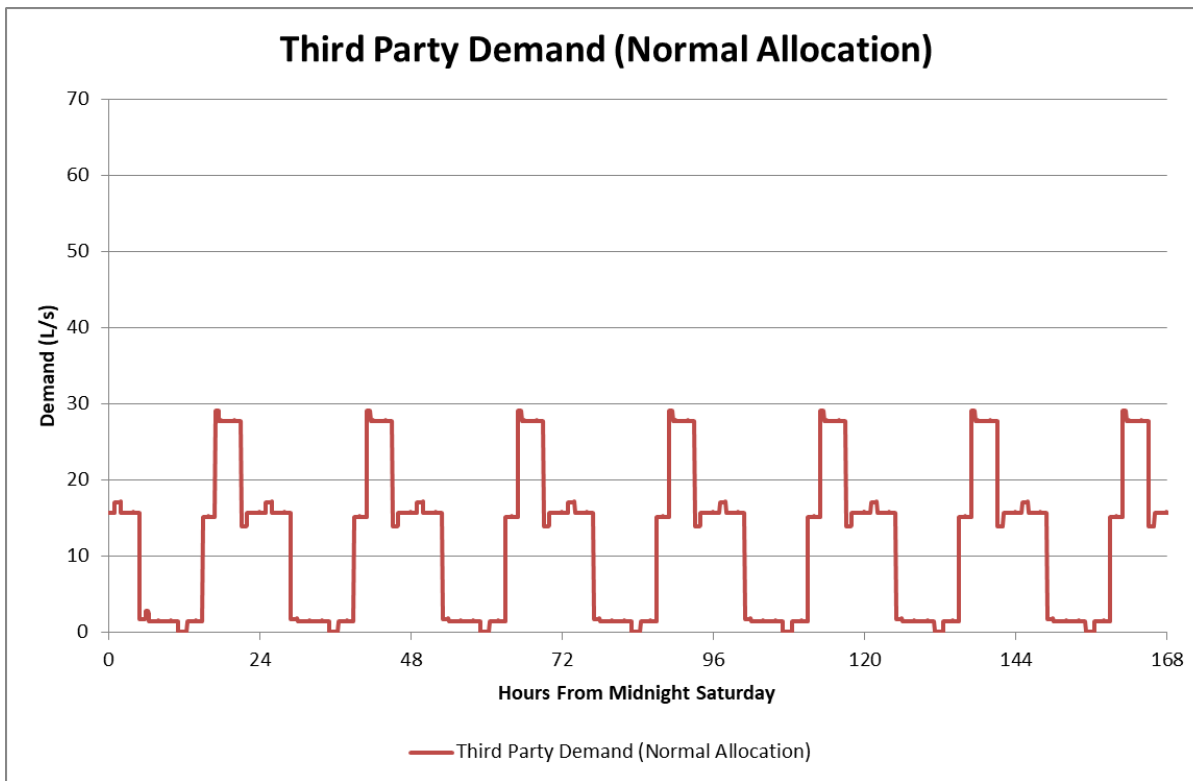


Figure 2-1 Third Party Demand Normal Allocations

2.2 COUNCIL'S PARKS AND GARDENS

Council's Parks and Gardens department uses recycled water to irrigate median strips, parks, gardens and sports fields.

Council is the largest user of recycled water in Moranbah. Council's irrigation system is automatically operated. An example of the control available for Council's irrigation system is shown in Appendix 5. The demand at the sprinkler is a function of the pressure according to the relationship below:

$$Q = \text{sqrt}(P) * C_v$$

Where Q = Flow in L/s

P = Pressure in metres

C_v = coefficient specific to each sprinkler

Manufacturers publish the C_v values for their sprinklers.

Sprinklers Council currently uses include:

- Hunter i20 (see Appendix 2)
- Toro T5 (see Appendix 3)
- Toro FLX55 (Ted Rolfe Oval) (see Appendix 4)

The Hunter i20 and Toro T5 have similar performance with an operating range of 17m to 45m and a typical flow of 8 to 13 Litres per minute depending on pressure.

The Toro FLX55 has a minimum pressure requirement of 55m (550kPa). Council's existing network cannot meet this minimum pressure requirement in most of the network except during periods of no or very low

demand. The sprinklers at Ted Rolfe Oval are therefore not suitable for their intended purpose and should be replaced. Each augmentation option considered in this report recommends replacing these sprinklers.

Sprinklers do not have a set demand, because the demand according to the pressure. Hydraulic analysis of the system undertaken at maximum demands calculated the demand for the Council irrigation shown in Figure 2-2. Council irrigation shows a peak during a 6 to 8 hour period at night. Night time irrigation is undertaken to reduce the risk of people coming into contact with recycled water.

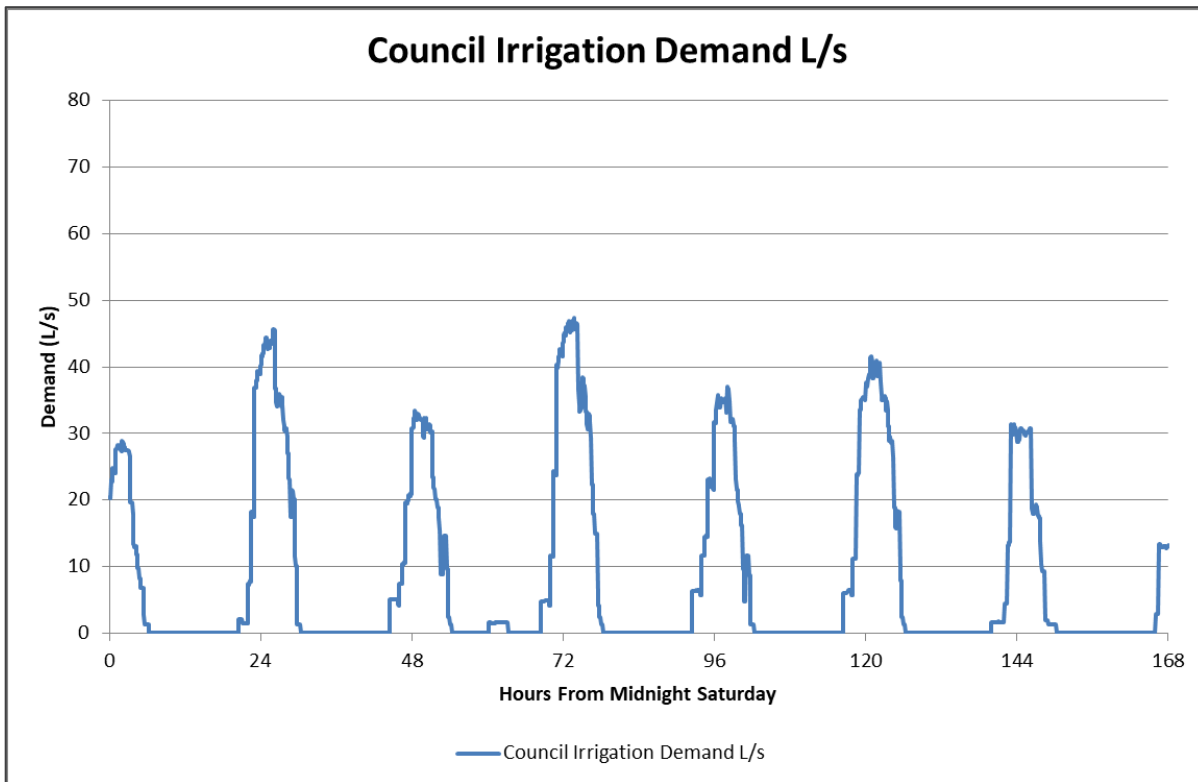


Figure 2-2 Council Irrigation Demand

2.3 MORANBAH WWTP

Council's Moranbah WWTP uses approximately 200kL/d a day for irrigation and process water. Process water is not consumed in the treatment process but is typically recycled in the wastewater process, however it provides an increased load on the Effluent Pump Station and Effluent Polishing Plant.

2.4 EFFLUENT STANDPIPE

A standpipe is located at the entrance to the Moranbah WWTP. Water tankers can take recycled water from this location and the recycled water is typically used for dust suppression on roadworks.

3 HYDRAULIC MODELLING

Hydraulic modelling was undertaken to determine the capacity of the recycled water network.

The maximum theoretical demand in the system from the timetable of irrigation and the maximum "Normal" allocation is shown in Figure 3-1 (in red). The Measured Flow in August 2023 is also shown (in blue). The measured flow shows a good correlation between the modelled flow and the measured flow, except at peak periods.

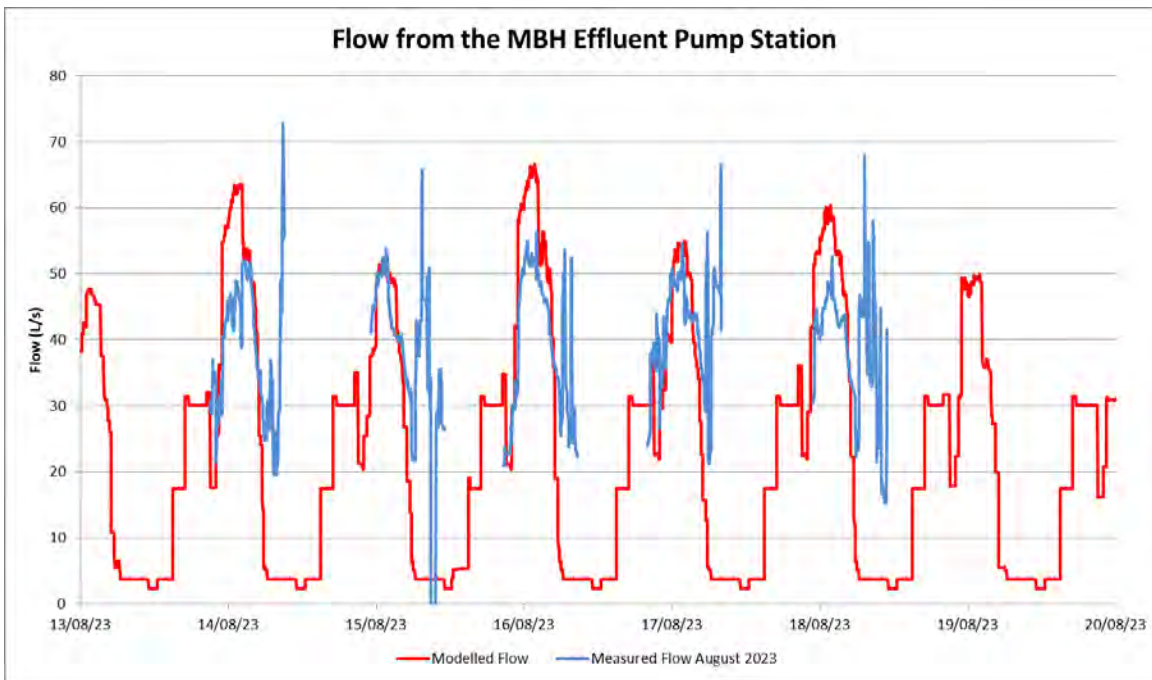


Figure 3-1 System Demand

The residual pressure at the corner of Tallon St/Mills Avenue Moranbah is shown in Figure 3-2 (bottom graph) and the theoretical maximum flow from the Effluent PS is shown in the top graph. Actual recorded flow is shown at hour 72 and the recorded pressure at Mills/Tallon St is seen to be accurately modelled.

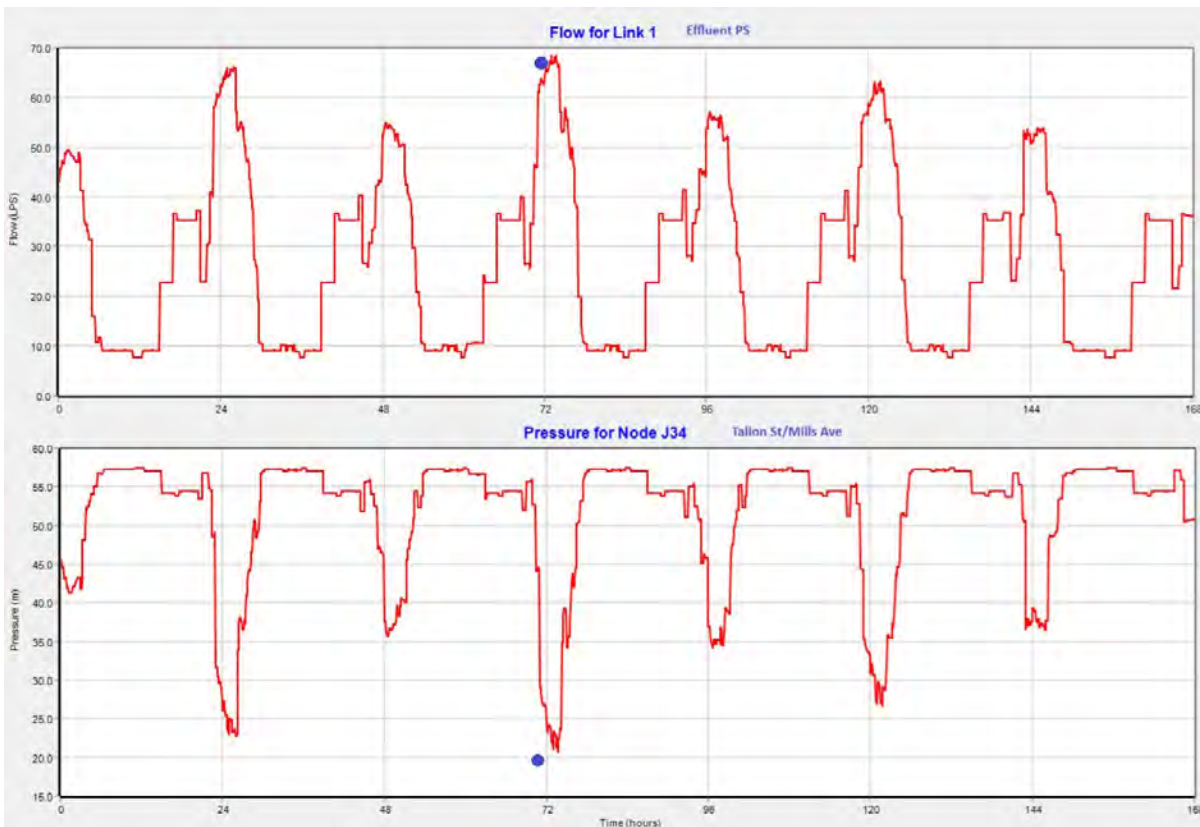


Figure 3-2 Modelled Residual Pressure and Flow – Moranbah Recycled Water Network.

Tallon St/Mills Ave was chosen as a location to compare residual pressure between options. This location is an elevated location far enough into the system to observe the headloss, and at the offtake to the sports

fields where the flow in the main along Mills Avenue is substantially reduced because of the flow to the sports fields.

4 OPTIONS

The following options were considered to provide increased recycled water demand in the Moranbah Recycled Water Network.

4.1 OPTION 1 – BUSINESS AS USUAL (BAU).

This option retains the existing system and system performance.

This option is considered unsuitable because pressure in the system is insufficient to operate sprinklers during peak times.

This option has zero capital cost and zero additional Operation and Maintenance (O&M) cost.

Table 4-1 Advantages and Disadvantages– Option 1

Advantages	Disadvantages
Zero capital and zero additional O&M Cost.	Performance of the Recycled Water System does not meet Council’s requirements. Pressure is too low to irrigate during peak times at high demand.

4.2 OPTION 2 – CONSTRUCT A RECYCLED WATER SCHEME AT SARCHEDON DR, MORANBAH.

The irrigation scheme has been proposed for vacant Council owned land at Sarchedon Dr Moranbah. The scheme consists of a main along Sarchedon Dr, a 500kL tank, a pump station and 193 sprinklers with connecting mains. The scheme is based on the Effluent Reuse Strategy prepared by consulting firm Bligh Tanner that recommended an additional 45Ha of irrigation land for Moranbah.

The proposed scheme is shown in the attached plan and consists of the following items.

Sarchedon Dr Main

1. 2,000 linear meters of 200mm diameter recycled water main along Sarchedon Dr from the existing main at the intersection of Goonyella Rd and Sarchedon Dr, Moranbah to the proposed irrigation area.

This main will allow all sporting clubs along Sarchedon Dr to be provided with a recycled water connection. The system has been designed to provide a minimum 30m pressure at the Sarchedon Dr boundary for each property.

Irrigation System

1. A 500kL reservoir is proposed to store recycled water at the irrigation site. This will allow high flow/high pressure sprinklers to be operated at a consistent and reliable pressure and flow. This will allow simple and consistent operation of the irrigation. Without the tank, the flow to the sprinklers will vary depending on the upstream demand in the system and reduce the reliability of the system and make management of the system complex.
2. A booster pump station that will pump from the tank to the irrigation network. A connection to the electricity system will be required to service the pumps, and a building will be required to house the pumps to prevent vandalism.

3. A Pressure Sustaining Valve is proposed for the upstream of the tank to maintain a minimum 30m pressure at the corner of Sarchedon Dr and Goonyella Rd. This will prevent recycled water demand at the Irrigation Scheme from causing low pressures in the rest of the Moranbah Recycled Water Network.
4. Flow meters are proposed at the inlet and outlet of the Recycled Water Tank.
5. The concept design is based on 193 high flow/high pressure sprinklers capable of 8.8L/s flow at a pressure of 50m. These sprinklers have a 35m irrigation radius. It is proposed to have the sprinklers elevated to reduce the risk of vandalism and theft (approximately 2.5m). This will be confirmed in detailed design.
6. A total of 8000m of 75mm diameter and 900m of 100mm diameter pipeline is required to service the proposed irrigation scheme. The 50mm diameter pipe is sized to provide the flow to one sprinkler at a time. Three sprinklers are proposed to operate at the same time, so each sprinkler operating concurrently will need to be on a separate 50mm lateral. This will need to be confirmed in detailed design.
7. A control system is required to enable automatic operation and control of the system.
8. Operation and Maintenance of the System will be carried out by Water and Waste's Maintenance and Operation section.

Tallon St

1. A total of 1,600m of 300mm diameter main from the Moranbah Polishing Plant to the corner of Mills Avenue and Tallon St, Moranbah.

Hydraulic modelling estimates that the existing recycled water network can supply 1,250kL/d to the Sarchedon Dr area, without adversely impacting pressure to existing customers. The maximum irrigation demand to the irrigation area on a peak day is 2,250kL/d. Augmentation of the recycled water main between Moranbah WWTP and Tallon St is required to meet the maximum recycled water demand at the Irrigation area.

Stage 2

There is additional Council owned land that can be irrigated in the Sarchedon Dr area if required, and this land is identified as Stage 2 in Figure 4-2. To allow for the irrigation of additional areas, the Moranbah Polishing Plant and Effluent Pump Station will need to be upgraded.

Cost Estimate

The estimated cost of these items is summarised in the table below.

Table 4-2 Capital Cost of Option 2

Sarchedon Dr Main			
Item	Length/Number	Unit Cost	Cost
1. 2,000m of 200mm diameter main	2,000	500	1,000,000
2. Preparation of Tender Documents			10,000
3. Project Management			120,000
4. Contingency			226,000
SUB-TOTAL - Sarchedon Dr Main			1,356,000
Irrigation Scheme – Stage 1			
Item	Length/Number	Unit Cost	Cost
5. 500kL Tank (including installation and fittings)	1	125,000	125,000
6. Pump Station (45L/s vs 60m)	1	320,000	320,000
7. Pressure Sustaining Valve	1	41,667	41,667
8. 200mm Diameter Flow Meter	2	41,667	83,333
9. Sprinkler	193	333	64,333
10. Sprinkler Installation	193	500	96,500
11. 8,000m of 75mm diameter main	8,000	83	1,000,000
12. 900m of 100mm diameter main	900	250	225,000
13. Control System	1	125,000	125,000
14. Planning/Environmental Approvals			40,000
15. Preparation of Tender Documents			10,000
16. Project Management			200,000
17. Contingency 20%			466,167
SUB-TOTAL – Irrigation Scheme – Stage 1			2,797,000
Tallon St Main			
Item	Length/Number	Unit Cost	Cost
18. 1,600m of 300mm main	1,600	625	1,000,000
19.			10,000
20.			120,000
21. Contingency 20%			226,000
SUB-TOTAL – Tallon St Main			1,356,000
TOTAL			5,509,000

O&M Costs

Ongoing O&M will be funded from Council's operational budget. Table 4-3 shows the estimated O&M costs for this option.

Table 4-3 Additional O&M Cost of Option 2

Item	Cost (\$,000/yr)
1. Electricity costs at Moranbah WWTP	30
2. Electricity Costs at the Proposed PS	30
3. Pump Station Maintenance	10
4. Sprinkler O&M	25
5. Control System O&M	5
6. Management	15
TOTAL	115

Estimated Irrigation Demand

The irrigation rate is a critical parameter for determining the irrigation demand for the irrigation scheme.

For the existing customers a maximum irrigation rate of 3.16mm/d has been adopted, which results in an average irrigation rate of 2.1mm/d.

For the proposed disposal area, a maximum irrigation rate of 5mm/d has been adopted, which results in an average irrigation rate of 2.25mm/d. Based on the maximum irrigation rate the maximum daily flow to the 45Ha disposal area will be 2,250kL/d and the average flow rate will be 1,012kL/d (369ML/yr).

Council's records show that the Moranbah ESD has overflowed a total volume of 167ML in 2024.

For context it is noted that Council's Environmental Authority for irrigation of recycled water at Council's WWTP sites nominates that a maximum daily irrigation of 5mm/day, and an average irrigation of 2.8mm/day are allowed (note that the EA does not govern irrigation by private customers or Council's Parks and Gardens department).

Implications

The implication of completing this work is that for the current design capacity of the Moranbah WWTP (2,800kL/d), there will be sufficient irrigation capacity to ensure the Moranbah ESD does not overflow, except in very wet periods (e.g. 2011).

The graph below shows modelling of the Moranbah ESD level including the increased demand from the proposed Irrigation Scheme taken from a spreadsheet model prepared by Bligh Tanner for the Effluent Reuse Strategy and adapted for this report.

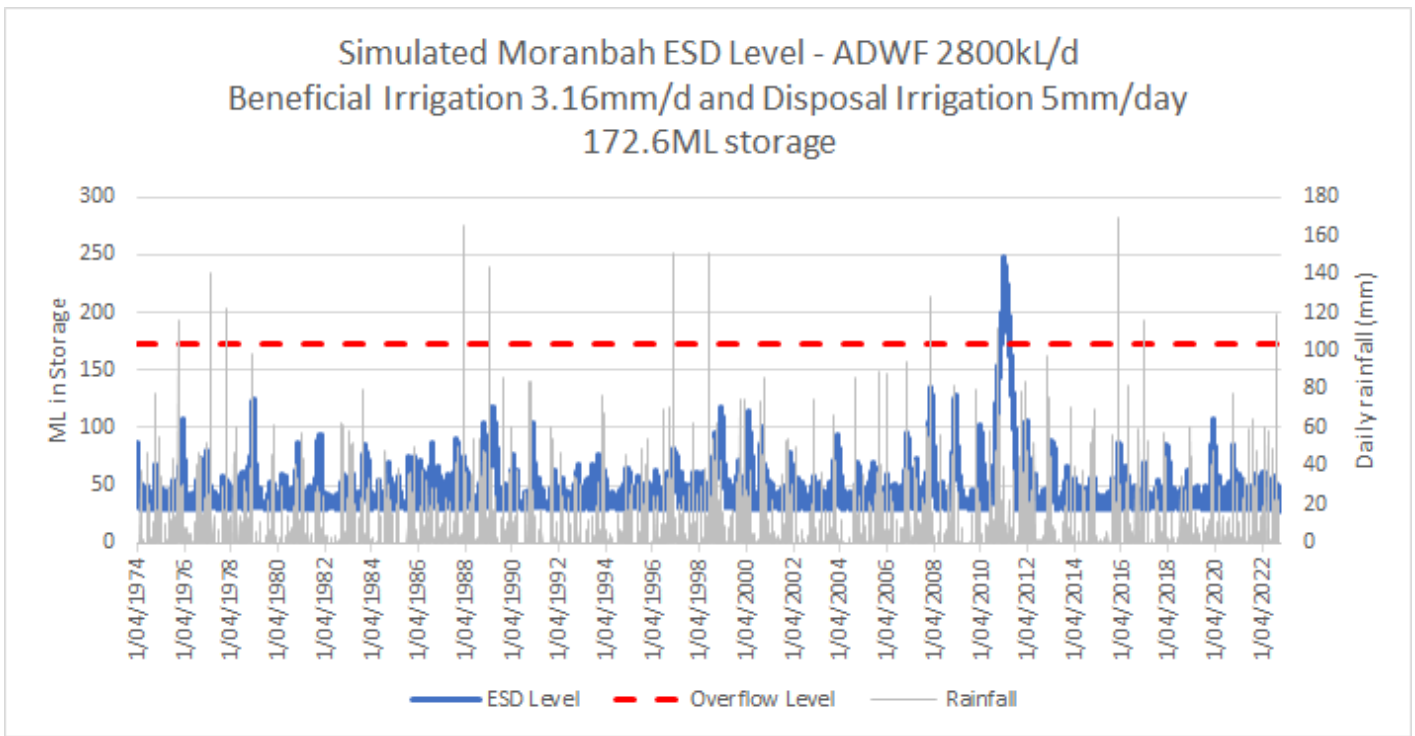


Figure 4-1 Residue on the inside of a Recycled Water Pipe at Middlemount.

The graph shows that the ESD does not overflow during the 48 year study period, except for a brief period of 158 days during 2011, which was exceptionally wet for several months. This is considered acceptable due to the accuracy of the model and the uncertainty of how the system will perform in practice and the infrequent return period of the wet weather experienced in 2011.

To prevent overflow of the ESD in even the wettest periods, the options are:

- construct an additional 176ML of storage at an estimated cost of \$8,700,000 as recommended by the Effluent Reuse Strategy, or
- operate a mechanical evaporator when the level in the Moranbah ESD rises above 60%.

It is NOT recommended that additional capital works be implemented immediately to prevent overflow in the wettest periods, and instead the proposed system should be operated to gauge its performance and confirm operating parameters.

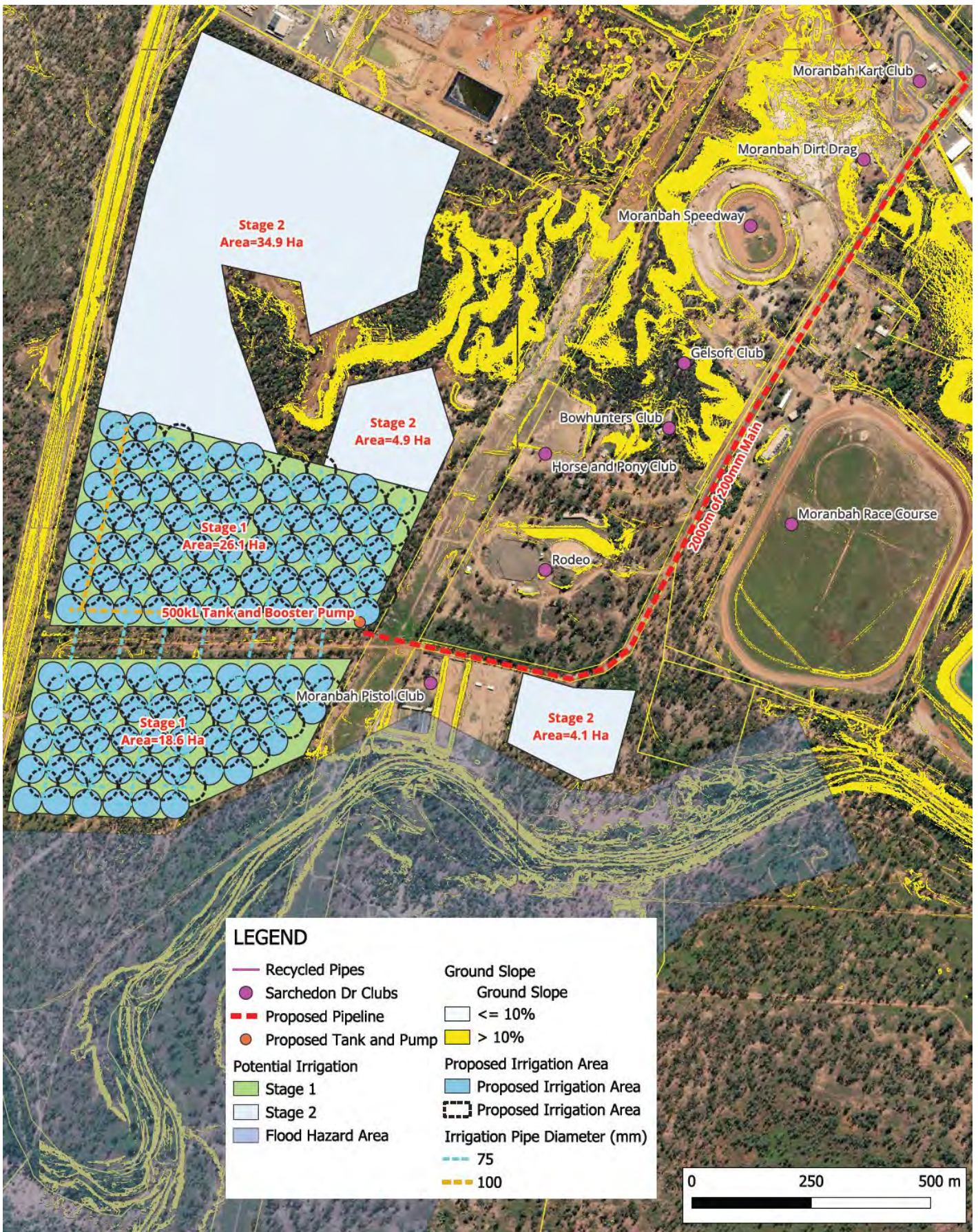


Figure 4-2 Proposed Moranbah Irrigation Scheme – Option 2.

4.3 OPTION 3 – PURCHASE A MOBILE MECHANICAL EVAPORATOR.

The Effluent Reuse Strategy completed by consulting firm Bligh Tanner in 2023 identified that additional sources of demand were needed to prevent overflow of the ESD's, and recommended a hybrid solution of additional irrigation and mechanical evaporators to dispose of the surplus Recycled Water that is not needed by existing customers.

Mechanical evaporators are available for purchase as complete turnkey units with the claimed capacity to evaporate 1.6ML/d (see attached brochure). It is proposed to purchase one mechanical evaporator of this size to provide Council the opportunity to rapidly reduce the effluent level in an ESD to prevent overtopping.

Modelling shows that if Council had access to this unit in 2024, the effluent level of Dysart, Middlemount and Moranbah ESD's could have been reduced such that there would have been no overflow of these ESD's in 2024.

For context, Dysart ESD is 51ML, with net zero inflow to the ESD the proposed evaporator could empty the ESD in 32 days at 1.6ML/d. The average inflow to the Dysart WWTP in 2024 is 1.2ML/d, so the proposed evaporator could theoretically dispose of all inflow to the plant.

Similarly, the Middlemount ESD is 75ML, so it can be emptied in 47 days (with net zero inflow). The average inflow to the Middlemount WWTP in 2024 is 0.7ML/d, so the proposed evaporator could dispose of all inflow to the plant.

Moranbah ESD is 176ML, so it can be emptied in 94 days (with net zero inflow). The average inflow to the Moranbah WWTP in 2024 is 2.8ML/d, so the proposed evaporator could dispose of more than half of the inflow to the plant.

The proposed mechanical evaporator will be a mobile unit (skid or trailer mounted) and be moved from plant to plant as required to reduce effluent levels in an ESD to prevent overtopping. Purchase of the evaporator will also be a trial to see if mechanical evaporators can have a greater role to help Council prevent overflow of its Effluent Storage Dams.

Cost

Delivery of a mechanical evaporator is estimated at 3 months from when the supplier receives a purchase order, therefore a mechanical evaporator could be delivered by January 2025 if the procurement process commences in September 2024. The estimated cost of the mechanical evaporator is shown in Table 4-4.

Table 4-4 Capital Cost of Option 3

Mechanical Evaporator			
Item	Length/Number	Unit Cost	Cost
1. Minetek 600/300 Mechanical Evaporator (or similar). Capacity to evaporate 1.6ML/d.	1	125,000	125,000
2. Weather station and ancillaries	1	50,000	50,000
3. Impact Assessment Studies	1	33,333	33,333
4. Project Management	1	25,000	25,000
5. Site Preparation.	1	16,667	16,667

6. Electrical Works	1	33,333	33,333
7. Contingency 20%			56,667
SUB-TOTAL – Irrigation Scheme – Stage 1			340,000

The Effluent Reuse Strategy recommended evaporators at each WWTP therefore, this one evaporator is not expected to solve all problems, but if it was available in 2024, calculations show it would have prevented the overflow of all ESD's.

The cost of the evaporator includes a weather station and automation to allow for automatic operation, and all cables etc for operation of the evaporator. Council will be responsible for preparing the site and any electrical or other capital works.

O&M Costs

Ongoing O&M will be funded from Council's operational budget. Table 4-5 shows the estimated O&M costs for this option.

Table 4-5 Additional O&M Cost of Option 3 – Mechanical Evaporators

Item	Cost (\$,000/yr)
1. Electricity costs (2169kWh/d * 50% operation @ 20c/kWh)	31
2. Management (10%)	15
TOTAL	46

Implications

The implication of purchasing a mechanical evaporator is that Council will have the ability to reduce the effluent level in its ESD's to help prevent overtopping. This will reduce the risk that an overflow occurs at one of Council's ESD's.

The evaporator has a claimed capacity of 1.6ML/d.

The purchase of a mechanical evaporator will demonstrate to the regulators that Council is taking action to prevent unauthorised discharge of effluent.

The purchase and operation of a mechanical evaporator will be a trial to determine if evaporators have a role in assisting Council to prevent overflow of its ESD's.

4.4 OPTION 4 – UPGRADE THE MORANBAH RECYCLED WATER NETWORK AND POLISHING PLANT.

To maximise irrigation of green spaces the upgrades proposed in Table 4-6 are recommended as they will ensure that adequate pressure for irrigation is available during peak demand periods.

Table 4-6 Capital Cost of Option 4

Tallon St Main and Upgrade of Moranbah Polishing Plant			
Item	Length/Number	Unit Cost	Cost
1. 1. A total of 1,600m of 300mm diameter main from the Moranbah Polishing Plant to the corner of Mills Avenue and Tallon St, Moranbah. This main is also required to meet demand for the proposed Moranbah Recycled Water Irrigation Scheme	1	1,000,000	1,000,000
2. 2. Replace the Moranbah Polishing Plant. The plant essentially consists of Amiad Disc Filters and UV disinfection contained with a steel structure. The plant is in poor condition with the following identified problems: a. the filters have been leaking for more than 2 years, b. the polishing plant roof has rust damage, and c. the UV disinfection units are not operational. Photos of the polishing plant are attached to this report. It is proposed to install a polishing plant of a similar design to those installed at Dysart and Middlemount in 2018. This will allow for consistency of equipment and operations across the Isaac Region. The capacity of the proposed plant is 89L/s (7,690kL/d), the same as the existing plant.	1	833,333	833,333
3. 3. Install a 300kL balance tank at the Moranbah Polishing Plant. This will allow the system to meet peak demand without having to construct a Polishing Plant to treat peak instantaneous flow.	1	83,333	83,333
4. 4. Construct a new pump station to pump from the proposed balance tank to the recycled water network. The pumps are proposed to have a capacity of 170L/s to allow for peak demand and growth. Relocate existing pumps to this new pump station.	1	208,333	208,333
5. 5. Demolish the existing Polishing Plant.	1	25,000	25,000
6. Contingency 20%			430,000
SUB-TOTAL – Tallon St Main and Upgrade of Moranbah Polishing Plant			2,580,000

O&M Costs

Ongoing O&M will be funded from Council's operational budget. Table 4-7 shows the estimated O&M costs for this option.

Table 4-7 Additional O&M Cost of Option 4 – Tallon St Main and Polishing Plant Upgrade

Item	Cost (\$,000/yr)
1. Reservoir O&M at 5%of Capital Cost	5
TOTAL	5

Implications

The implication of completing this work is that the system will have sufficient pressure to meet peak irrigation demand in Moranbah. The graph below shows the difference in residual pressure for the existing system and the proposed upgraded system.

The green line shows the pressure in the system after the system is augmented, and there is very little headloss in the system compared to the existing system (yellow line).

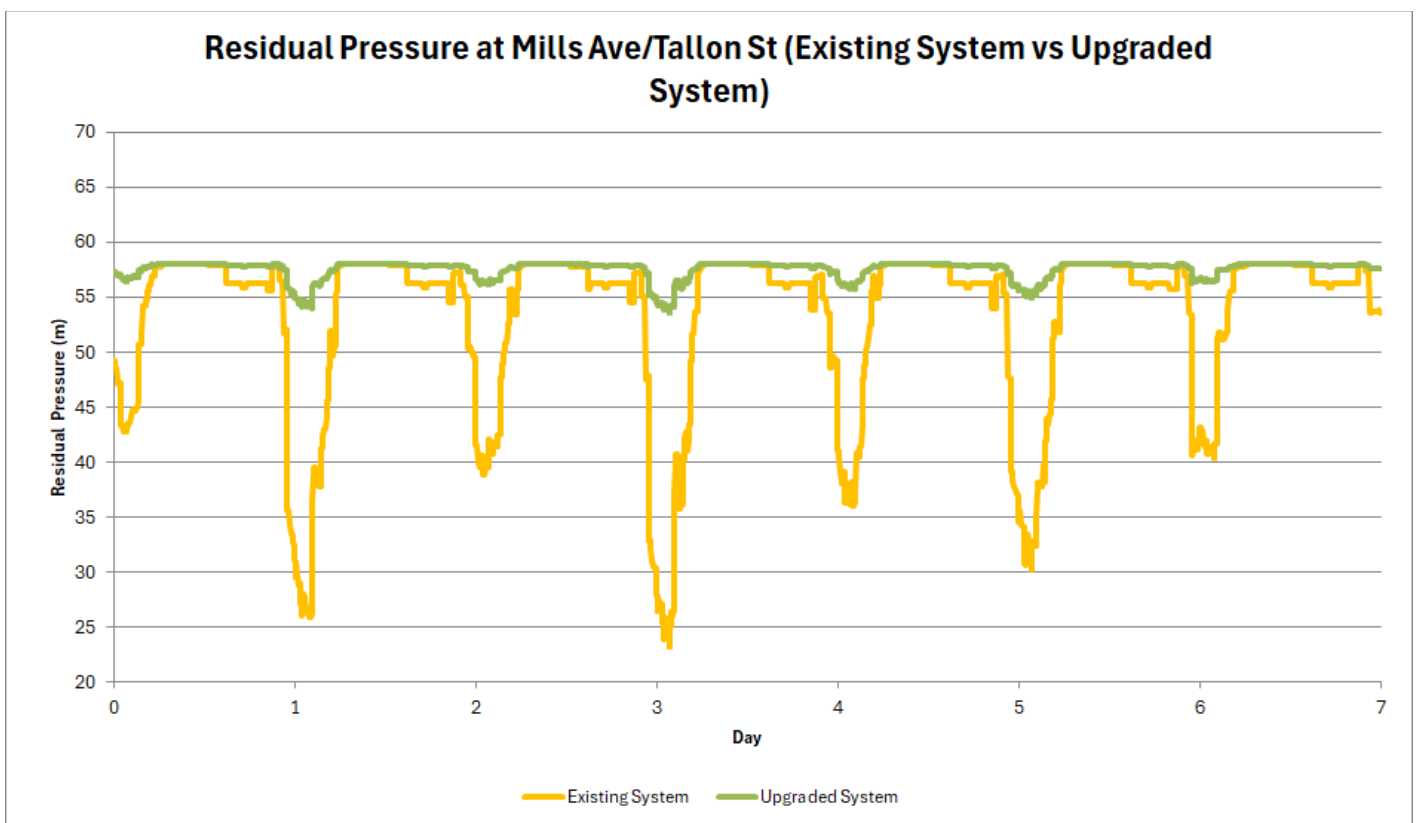


Figure 4-3 Modelled Pressure and Flow – Existing System and Upgraded System.

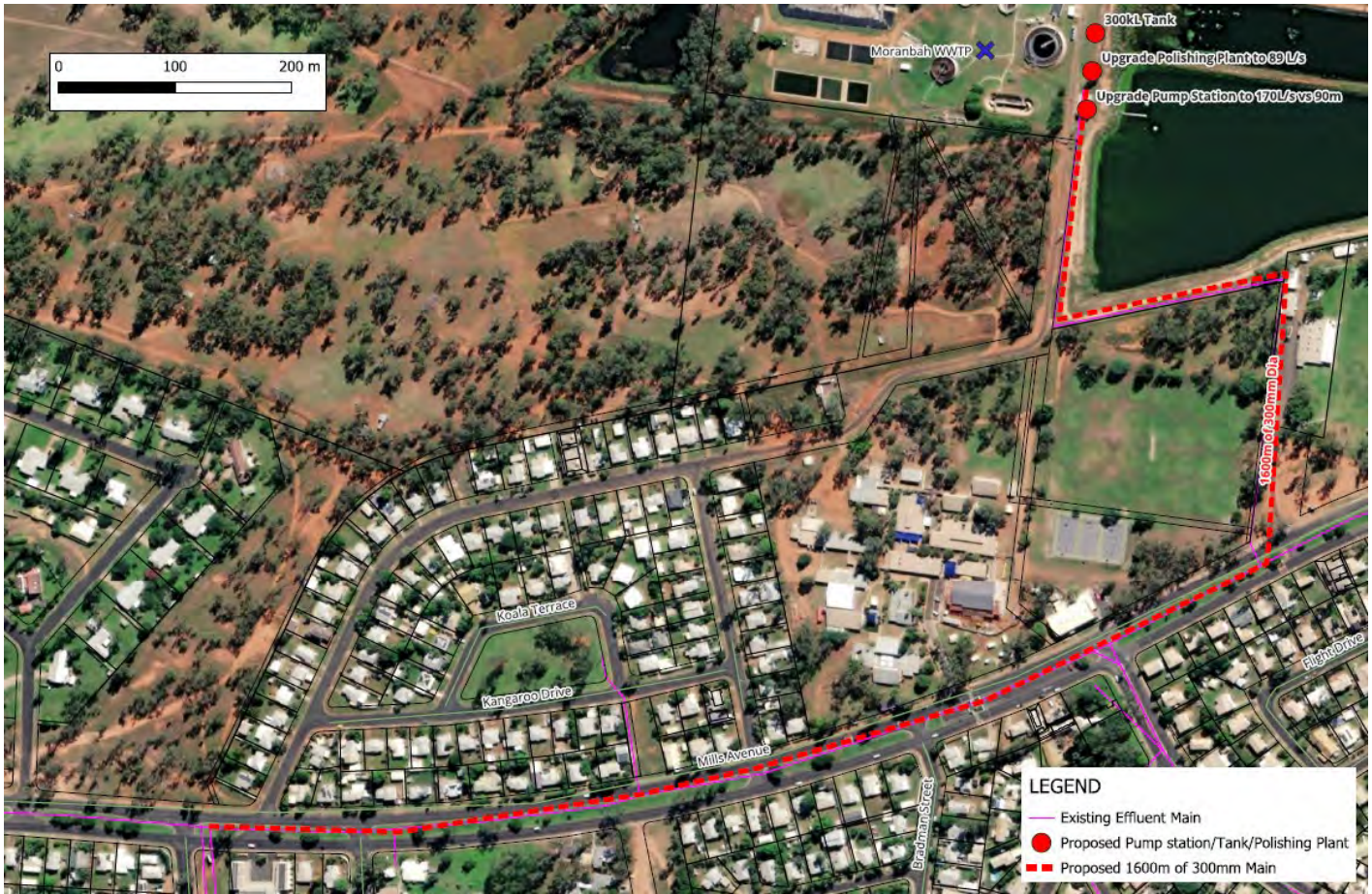


Figure 4-4 Proposed Works – Option 4.

4.5 SUMMARY OF OPTIONS' COST

The cost of each option is summarised in Table 4-8. The mechanical evaporator has a substantially lower cost

Table 4-8 Summary of Costs

Option	Capital Cost (\$000)
Option 1	0
Option 2	5,509
Option 3	340
Option 4	2,580 (includes the Tallon St main which is also included in Option 2). 1,380 (Excluding the Tallon St Main.)

5 CONCLUSIONS

The following conclusions of this report:

1. Implementation of Option 2 – The proposed Moranbah Irrigation Scheme will increase the demand on the system and help Council to manage the level in its Effluent Storage Dams.

2. Implementation of Option 3 – The purchase of a Mechanical Evaporator will enable Council to quickly reduce the level in an Effluent Storage Dam to prevent overflow of the Dam.
3. Implementation of Option 4 – Irrigation demand is clustered in a small period around 11pm to 4am and the existing system cannot meet the peak demands in the system. Construction of Option 4 will enable the recycled water system to meet peak demand in Moranbah, increasing the use of Recycled Water.

6 RECOMMENDATIONS

This report makes the following recommendations:

1. Implement Option 2 of this report (Moranbah Irrigation Scheme) to augment the recycled water network to meet current demand and prevent overflow of the Moranbah ESD.
2. Implement Option 3 of this report (purchase a mechanical evaporator) to help prevent overflow of ESD's throughout Council's Recycled Water Systems.
3. Implement Option 4 of this report (upgrade the Moranbah Recycled Water Network and Moranbah Polishing Plant) to maximise the irrigation of recycled water in the Moranbah Recycled Water system. If Option 2 is constructed, exclude the Tallon St main from Option 4 as this is included in Option 2.

7 REFERENCES AND RELATED DOCUMENTS

DOCUMENT NAME	LOCATION LINK
Effluent Reuse Strategy.	ECM 5085019

Appendix 1 Recycled Water Allocations - Moranbah

RECYCLED WATER ALLOCATION – MORANBAH

LOW LOW ALLOCATIONS – PLANT FLOW 2200KL/DAY

END USER	WATERING TIMES	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL ALLOCATION
Parks and Rec	10.00pm – 7.00am	800KL/day	800KL/day	800KL/day	800KL/day	800KL/day	500KL/day	500KL/day	5000KL
Golf Club	6.00pm – 6.00am	400KL/day	400KL/day	400KL/day	400KL/day	400KL/day	100KL/day	400KL/day	2500KL
Golf Club	11.00am – 3.00pm	Dam fill		Dam fill		Dam fill			
Bowls Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Football Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Workers Club	6.00am – 2.30am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL
Hospital	1.00am – 2.00am	50KL/day	50KL/day	50KL/day	50KL/day	50KL/day	50KL/day		300KL
State School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
East School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
High School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
IRC Standpipe	N/A	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	
Union Office	1.00am – 2.00am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL/day

Total allocation 15400KL. Usage per week 10240KL. Retained in ESD 5160KL. Above figures are in Kilolitres

LOW ALLOCATIONS – PLANT FLOW 2200KL/DAY

END USER	WATERING TIMES	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL ALLOCATION
Parks and Rec	10.00pm – 7.00am	1000KL/day	1000KL/day	1000KL/day	1000KL/day	1000KL/day	1000KL/day	1000KL/day	7000KL
Golf Club	6.00pm – 6.00am	500KL/day	500KL/day	500KL/day	500KL/day	500KL/day	500KL/day	500KL/day	3500KL
Golf Club	11.00am – 3.00pm	Dam fill		Dam fill		Dam fill			
Bowls Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Football Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Workers Club	6.00am – 2.30am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL
Hospital	1.00am – 2.00am	50KL/day	50KL/day	50KL/day	50KL/day	50KL/day	50KL/day		300KL
State School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
East School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
High School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
IRC Standpipe	N/A	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	
Union Office	1.00am – 2.00am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL/day

Total allocation 15400KL. Usage per week 13240KL. Retained in ESD 2160KL. Above figures are in Kilolitres

NORMAL ALLOCATIONS – PLANT FLOW 2200KL/DAY

END USER	WATERING TIMES	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL ALLOCATION
Parks and Rec	10.00pm – 7.00am	1200KL/day	1200KL/day	1200KL/day	1200KL/day	1200KL/day	1200KL/day	1200KL/day	8400KL
Golf Club	6.00pm – 6.00am	600KL/day	600KL/day	600KL/day	600KL/day	600KL/day	600KL/day	600KL/day	4200KL
Golf Club	11.00am – 3.00pm	Dam fill		Dam fill		Dam fill			
Bowls Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Football Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Workers Club	6.00am – 2.30am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL
Hospital	1.00am – 2.00am	50KI/day	50KI/day	50KI/day	50KI/day	50KI/day	50KI/day		300KL
State School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
East School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
High School	4.00pm – 10.00pm	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	100KL/day	700KL
IRC Standpipe	N/A	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	
Union Office	1.00am – 2.00am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL/day

Total allocation 15400KL. Usage per week 15340KL. Retained in ESD 60KL. Above figures are in Kilolitres

HIGH ALLOCATIONS – PLANT FLOW 2200KL/DAY

END USER	WATERING TIMES	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL ALLOCATION
Parks and Rec	10.00pm – 7.00am	1300KL/day	1300KL/day	1300KL/day	1300KL/day	1300KL/day	1300KL/day	1300KL/day	9100KL
Golf Club	6.00pm – 6.00am	700KL/day	700KL/day	700KL/day	700KL/day	700KL/day	700KL/day	700KL/day	4900KL
Golf Club	11.00am – 3.00pm	Dam fill		Dam fill		Dam fill			
Bowls Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Football Club	7.00am – 11.00am	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	20KL/day	140KL
Workers Club	6.00am – 2.30am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL
Hospital	1.00am – 2.00am	50KI/day	50KI/day	50KI/day	50KI/day	50KI/day	50KI/day		300KL
State School	4.00pm – 10.00pm	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	840KL
East School	4.00pm – 10.00pm	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	840KL
High School	4.00pm – 10.00pm	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	120KL/day	840KL
IRC Standpipe		Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	Monitoring required	
Union Office	1.00am – 2.00am	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day	5KL/day		30KL/day

Total allocation 15400KL. Usage per week 17160KL. Removed from ESD 1760KL. Above figures are in Kilolitres

HIGH HIGH ALLOCATIONS – PLANT FLOW 2200KL/DAY

**No restriction on amount of water used. Please note restrictions on times are still applicable.

END USER	WATERING TIMES	MON	TUE	WED	THUR	FRI	SAT	SUN	TOTAL ALLOCATION
Parks and Rec	10.00pm – 7.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Golf Club	6.00pm – 6.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Golf Club	11.00am – 3.00pm	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Bowls Club	7.00am – 11.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Football Club	7.00am – 11.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Workers Club	6.00am – 2.30am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to

Hospital	1.00am – 2.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
State School	4.00pm – 10.00pm	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
East School	4.00pm – 10.00pm	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
High School	4.00pm – 10.00pm	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
IRC Standpipe	N/A	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to
Union Office	1.00am – 2.00am	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to	No restriction but watering times must be adhered to

Total allocation 15400KL. Usage per week as much as possible Removed from ESD as much as possible.

Appendix 2 Sprinkler Performance – Hunter i20

I-20

The I-20 is loaded with upgraded features such as FloStop™ control, check valves, and efficient nozzles that make it the perfect choice in a range of applications.

KEY BENEFITS

- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalised; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part-and full-circle in one model is flexible for all landscapes and decreases inventory
- Headed and slotted setscrew allows radius adjustment with a Hunter Wrench or flat-blade screwdriver
- FloStop™ closes the flow of water from individual sprinklers for nozzle changes or repairs
- Flat-top nozzles allow fast, easy insertion
- QuickCheck™ Arc Mechanism for fast arc adjustment
- Available stainless steel riser for extra durability
- Drain Check Valve prevents low-head drainage (up to 3 m of elevation)



Operating Specifications

- Nozzle choices: 34
- Radius: 4.9 to 14.0 m
- Flow: 0.07 to 3.23 m³/hr; 1.2 to 53.8 l/min
- Recommended pressure range: 1.7 to 4.5 bar; 170 to 450 kPa
- Operating pressure range: 1.4 to 7.0 bar; 140 to 700 kPa
- Precipitation rate: 10 mm/hr approximately
- Nozzle trajectory: standard = 25°, low-angle = 13°
- Nozzle racks: 1.5 to 8.0 blue, 2.0 to 4.5 low-angle grey, 0.50 to 3.0 black, 6.0 to 13.0 green, MPR-25, MPR-30, MPR-35
- Warranty period: 5 years

Factory-Installed Options

- No Drain Check Valve (NCV models)
- Reclaimed water ID
- Blue 1.5–4.0 nozzles

Appendix 3 Sprinkler Performance – Toro T5



The Toro T5 RapidSet rotor can be set in seconds. Engineered to use the slip clutch to adjust the arc, the T5 RapidSet rotor requires NO TOOLS for arc adjustments. This multi purpose rotor features a full 125 mm pop up height and Toro's exclusive Airfoil™ nozzles that deliver unmatched distribution uniformity. For installations where convenience and reliability are key, the T5 RapidSet is the only rotor you'll need.



Features & Benefits:

RapidSet Arc Adjustment

Arc adjustments from 40° to 360° can be made quickly with a few twists of the turret – no tools required. The RapidSet slip clutch also provides protection against gear damage from vandalism or abuse.

125 mm Pop-Up Height

Easily replaces many competitive units with the same footprint but delivers an extra 25mm of pop-up.

Airfoil Technology Nozzles

The T5 RapidSet comes with a full set of 8 standard nozzles (25°) and 4 low angle (10°) that utilize proprietary Airfoil technology, which creates a zone of low pressure just below the main stream to gently guide water downward for unmatched uniformity, without forcefully washing out seeds.

Stainless Steel

The stainless steel riser and nozzle base provide strength and protect the rotor from wear due to vandalism or sandy soil conditions, resulting in fewer replacements over time.

Check Valve

An optional check valve is available with a hold back strength of 2.1m of elevation change.

Design Flexibility

Designed to suit a variety of applications T5 RapidSet rotors are available in Effluent, Shrub and High Pop models.



RapidSet™ arc adjustment requires **NO TOOLS!**



Effluent Options Available



Check Valve Options

T5 RapidSet™ Performance Data

Nozzle	Pressure (kPa)	Radius (m)	Flow (Lpm)	Precipitation Rate (mm/hr)	
				■	▲
1.5	170	10.1	4.4	5.16	5.96
	200	10.2	4.7	5.44	6.29
	250	10.4	5.3	5.90	6.82
	300	10.6	5.9	6.27	7.25
	350	10.7	6.3	6.69	7.73
	400	10.8	6.7	6.99	8.07
2.0	170	10.7	5.5	5.79	6.68
	200	11.0	6.0	6.20	7.16
	250	11.0	7.0	6.89	7.96
	300	11.2	7.8	7.46	8.62
	350	11.3	8.4	7.94	9.17
	400	11.3	9.0	8.52	9.83
2.5	170	10.7	6.6	6.98	8.07
	200	10.8	7.3	7.53	8.70
	250	11.0	8.5	8.41	9.71
	300	11.2	9.5	8.99	10.39
	350	11.3	10.2	9.62	11.11
	400	11.3	10.9	10.27	11.86
3.0	170	11.0	8.3	8.30	9.58
	200	11.2	8.9	8.52	9.84
	250	11.7	10.1	8.88	10.25
	300	12.1	11.3	9.25	10.68
	350	12.2	12.6	10.15	11.72
	400	12.2	13.6	11.01	12.72
4.0	170	11.3	11.2	10.54	12.17
	200	11.6	12.1	10.69	12.34
	250	12.2	13.7	10.92	12.61
	300	12.7	15.2	11.30	13.04
	350	12.8	16.3	11.92	13.77
	400	12.9	17.3	12.49	14.42
5.0	170	11.9	15.9	13.50	15.59
	200	12.4	17.4	13.65	15.76
	250	13.2	20.1	13.79	15.92
	300	13.9	22.4	13.96	16.12
	350	14.2	24.2	14.42	16.65
	400	14.4	25.9	14.93	17.24
6.0	170	11.0	21.8	21.69	25.05
	200	11.8	23.8	20.43	23.59
	250	13.3	27.3	18.65	21.54
	300	14.1	29.9	17.96	20.74
	350	14.5	32.4	18.51	21.37
	400	14.8	34.7	18.99	21.93
8.0	170	11.9	15.9	13.50	15.59
	200	12.4	17.4	13.65	15.76
	250	13.2	20.1	13.79	15.92
	300	13.9	22.4	13.96	16.12
	350	14.2	24.2	14.42	16.65
	400	14.4	25.9	14.93	17.24

T5 RapidSet™ Low Angle Nozzle Performance Data

Nozzle	Pressure (kPa)	Radius (m)	Flow (Lpm)	Precipitation Rate (mm/hr)	
				■	▲
1.0 LA	170	7.6	2.8	5.79	6.68
	200	8.0	3.1	5.84	6.74
	250	8.5	3.6	5.93	6.84
	300	8.5	3.8	6.29	7.26
	350	8.7	4.1	6.52	7.53
	400	8.8	4.4	6.82	7.88
1.5 LA	170	8.2	4.2	7.38	8.52
	200	8.6	4.5	7.38	8.52
	250	9.2	5.2	7.39	8.53
	300	9.4	5.7	7.68	8.87
	350	9.5	6.3	8.41	9.71
	400	9.5	6.8	9.13	10.55
2.0 LA	170	8.8	5.3	8.14	9.40
	200	9.1	5.8	8.41	9.72
	250	9.5	6.7	8.89	10.27
	300	9.7	7.6	9.64	11.14
	350	9.9	8.2	9.98	11.52
	400	10.1	8.7	10.37	11.98
3.0 LA	170	8.8	8.3	12.79	14.77
	200	9.3	8.9	12.32	14.23
	250	10.1	10.1	11.84	13.67
	300	10.3	11.3	12.73	14.70
	350	10.7	12.3	12.87	14.86
	400	11.0	13.2	13.17	15.21

1. Precipitation rates based on half-circle operation
2. ■ square spacing based on 50% diameter of throw
3. ▲ equilateral triangular spacing based on 50% diameter of throw

Specifications

Dimensions	Lawn Pop	Shrub	High Pop
Body Diameter:	57 mm	57 mm	57 mm
Cap Diameter:	67 mm	N/A	67 mm
Height:	190 mm	196 mm	429 mm

Operating Specifications

- Radius: 7.6 - 15.2 m
- Flow Rate: 2.8 - 36.7 Lpm
- Operating Pressure Range: 170 - 450 kPa (Max. 517 kPa)
- Trajectory: 25° standard, 10° low angle
- Pop-up to nozzle: 125 mm (Lawn), 300 mm (High Pop)
- Inlet: 20 mm
- Factory installed with a #3.0 nozzle

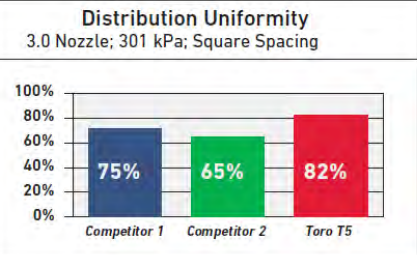
Options Available

- Check valve
- Stainless steel riser
- Effluent

Warranty

- Five years

Distribution Uniformity chart based on publicly available performance profiles from the Center for Irrigation Technology



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Appendix 4 Sprinkler Performance – Toro 800 FLX55 (Ted Rolfe Oval)



FLX800™ SERIES GOLF ROTORS FLX35/FLX55

FLX35 Performance Data—25° – (Metric)

Front Nozzle Positions	Nozzle Set 30		Nozzle Set 31		Nozzle Set 32		Nozzle Set 33		Nozzle Set 34		Nozzle Set 35		Nozzle Set 36		Nozzle Set 37		
	(White Plug)		(Yellow)		(Blue)		(Brown)		(Orange)		(Green)		(Gray)		(Black)		
	102-2208		102-6906		102-0726		102-6907		102-0728		102-6955		102-6935		102-6936		
	102-5670	102-6942	102-5670	102-5671	102-5670	102-6884	102-5670	102-6884	102-5670	102-6884	102-5670	102-6885	102-6531	102-6885	102-6531	102-6885	
Back Nozzle Positions																	
Psi	kPa	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM
50	340	13.1	31.0	16.2	52.2	17.1	69.3	18.6	82.1	—	—	—	—	—	—	—	—
65	450	13.7	37.9	16.2	58.7	18.0	77.6	19.5	92.4	20.7	106.7	22.0	129.1	—	—	—	—
80	550	14.0	43.5	17.4	65.5	18.9	85.9	20.4	102.6	21.7	117.7	22.9	143.1	23.8	152.5	24.4	166.5
100	690	14.3	50.7	18.0	72.3	19.8	94.2	21.4	112.8	22.6	129.1	24.1	154.8	24.7	165.8	25.3	179.0
Stator		102-1939 Yellow						102-1940 White									
Conversions		FLX35-3134						FLX35-3537									

FLX55 Performance Data—25° – (Metric)

Front Nozzle Positions	Nozzle Set 51		Nozzle Set 52		Nozzle Set 53		Nozzle Set 54		Nozzle Set 55		Nozzle Set 56		Nozzle Set 57		Nozzle Set 58		Nozzle Set 59	
	(Yellow)		(Blue)		(Brown)		(Orange)		(Green)		(Gray)		(Black)		(Red)		(Beige)	
	102-6906		102-0726		102-6907		102-0728		102-6955		102-6935		102-6936		102-6909		102-4259	
	102-5670	102-5671	102-5670	102-6884	102-5670	102-6884	102-5670	102-6884	102-5670	102-6885	102-6531	102-6885	102-6531	102-6885	102-6531	102-6885	102-6531	102-6885
Back Nozzle Positions																		
Psi	kPa	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	Radius	LPM	
50	340	16.7	53.4	17.3	70.0	18.9	84.4	20.1	97.6	—	—	—	—	—	—	—	—	
65	450	17.4	59.8	18.2	79.1	19.8	95.0	21.0	108.6	22.3	135.8	—	—	—	—	—	—	
80	550	18.0	66.2	18.5	87.4	20.7	105.2	21.9	119.9	23.1	150.3	24.4	163.2	25.2	182.5	25.9	189.3	
100	690	18.6	73	19.2	95.7	21.7	114.7	22.8	130.6	24.4	164.6	25.2	185.5	26.8	194.9	27.4	204.0	
Stator		102-1939 Yellow						102-1940 White						102-1941 White				
Conversions		FLX55-5154						FLX55-5558						FLX55-59				

Not recommended at these pressures. Radius shown in meters.
 Toro recommends the use of a 30mm swing joint at flows over 95 LPM. Sprinkler radius of throw per ASAE standard S398.1.
 All sprinklers are equipped with the fixed pilot valve at pressure settings 65 or 80 psi

FLX35 Nozzle Apex—(Metric)

Pressure	Nozzle	Apex at 15°	Apex at 25°
450 kPa	31	1.8m @ 15.5m	4m @ 16.4m
	32	1.8m @ 15.5m	3.4m @ 19.5m
	33	2.1m @ 18m	4m @ 20.7m
	34	2.4m @ 19m	4.6m @ 22.6m
	35	2.7m @ 20m	4.6m @ 23m
550 kPa	36	2.4m @ 22.9m	5.5m @ 25.3m
	37	2.7m @ 22.5m	5.8m @ 25m

FLX55 Nozzle Apex—(Metric)

Pressure	Nozzle	Apex at 15°	Apex at 25°
450 kPa	51	1.8m @ 15.5m	4m @ 16.4m
	52	1.8m @ 15.5m	3.4m @ 19.5m
	53	2.1m @ 18m	4m @ 20.7m
	54	2.4m @ 19m	4.6m @ 22.6m
	55	2.7m @ 20m	4.6m @ 23m
550 kPa	56	2.4m @ 22.9m	5.5m @ 25.3m
	57	2.7m @ 22.5m	5.8m @ 25m
	58	3m @ 25m	5.5m @ 26.5m
	59	3.4m @ 24.6m	6.4m @ 27.7m

Appendix 5 Example Page from Council's Irrigation Control Program

The image on the next page shows a screen shot of Council's Irrigation Control System.

On the left is a list of all available Stations numbered sequentially from 001 [Town Square Shop Fronts] to 019 [Ted Rolfe – Skate Park]

Detail is currently shown for Station 006- [Hockey].

The middle window shows the 11 sub stations available in Station 006.

The right most window shows the schedule data for the Station.

The program is set to start at 11:00PM, and Station 1 (Hockey Box 10) will run for 40minutes. After Station 1 runs for 40 minutes, then Station 2 (Hockey Box 8 & 14) will run for 40 minutes. The program will continue running each station for the specified time as shown in the timetable.

Sentinel WMS - Isaac Regional Council

Main Menu Window Communications

Setup User Manager Manage Scheduler Log Receive All Send All Close All Help Exit

Unit: 006

Satellites Systems Weather Sources

System Global

- 001- [Town Square Shop Fronts]
- 002- [Town Square Park]
- 003- [Athletics / AFL]
- 004- [Soccer]
- 005- [Touch]
- 006- [Hockey]

Setup

- Satellite Settings
- Time & Day
- Station Settings

Programming

- Scheduled Watering
- Synchronize

Reports

- Graph
- Hydro Report

Operations & Status

- Activity/Alarm Monitor
- Rain Days
- Percent Adjust

- 007- [Binda Park]
- 008- [Red Bucket Park]
- 009- [Federation Walk]
- 010- [Cemetery]
- 011- [Civic Centre]
- 012- [Lions Park]
- 013- [Gilchrist Park]
- 014- [Sunshine Park]
- 015- [Nolan Park]
- 016- [Bernborough Park]
- 017- [Coughlan Park]
- 018- [Belyando Ave/Curtin St]
- 019- [Ted Rolfe - Skate Park]

Station Settings 006- [Hockey]

Receive Send Save Refresh Print

Hide/Show Editor Quick Setup Learn Current

Excel Close

Show/Hide Column Groups -> Descriptions Flow

Str. Mapping Current All Columns

Drag a column header here to group by that column.

Str.	Str. Desc.	Str. Type Desc.	In Programs
1	Hockey	Box 10	1
2	Hockey	Box 8 & 14	1
3	Hockey	Box 4 & 5 & 11	1
4	Hockey	Box 6 & 12	1
5	Hockey	Box 7 & 9	1
6	Hockey	Box 15	1
7	Hockey	Spare	
8	Hockey	Box 1	1
9	Hockey	Box 3	1
10	Hockey	Box 13	1
11	Hockey	Box 2	1
12			

Unit 006- [Hockey] - Program 1 []

Checkup Receive Send Save Refresh Description Erase Help Print Close

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Start Times

11:00 PM

Percent Adjust: 100

Cycle Delay: 0

Repeats: 0

Water Window

From:

To:

Selected Schedule: 11

6 Week | Calendar | Schedule Type |

Schedule 11

Summer

	S	M	T	W	T	F	S
wk 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wk 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wk 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wk 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wk 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wk 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Click to Apply Pattern

program ok

water window duration is entire day

start duration 06:40

water usage per run day = 0 (liters)

Volumetric Shutdown Irrigation Program

Moisture Control DMPL Dates

Sensor 1 alarm: Stop

Sensor 2 alarm: Stop

Slots - Station order and run times for one cycle.

Station Search Clear Slots Compact Slot Editor Start Now Stop Now

1	40	2	40	3	40	4	40	5	40	6	40	11	40	8	40	9	40	10	40	0		0	
0		0		0		0		0		0		0		0		0		0		0		0	
0		0		0		0		0		0		0		0		0		0		0		0	
0		0		0		0		0		0		0		0		0		0		0		0	

Appendix 6 Extract from Effluent Reuse Strategy

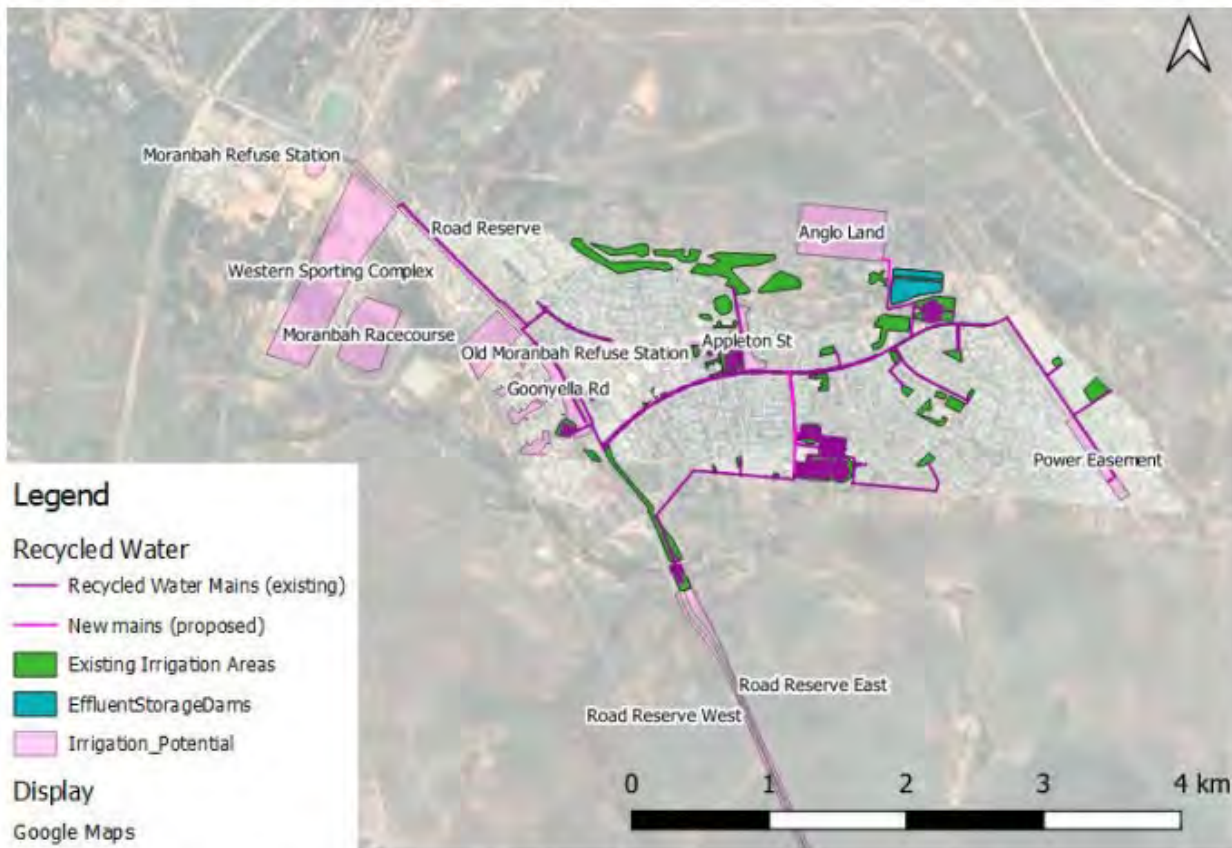


Figure 87 New recycled water irrigation opportunities - Moranbah

Table 21 Moranbah recycled water opportunities – Irrigable areas and assessment of community benefit

Potential site	Category	Total Site Area (ha)	Assumed Irrigable Area	Community benefit
Western Sporting Complex	Council irrigation	47	2.5 (small areas onsite)	Moderate-High
Anglo Land	Private irrigation/ Disposal	21	21	Low
Moranbah Racecourse	Private irrigation	16	16	Moderate-High
Goonyella Rd	Council irrigation	14	7 (significant area lost to buffer distances)	Moderate-High
Road Reserve East	Disposal	13	12	Low-moderate
Road Reserve West	Disposal	11	10	Low-moderate
Old Moranbah Refuse Station	Disposal	10	10	Low
Power Easement	Council irrigation	5	4	Low
Road Reserve	Disposal	4.6	4	Low-moderate
Appleton St	Council irrigation	3.8	1.9 (buffer distances limit area)	Moderate-High
Moranbah Refuse Station	Disposal	1.9	1.9	Low

For the 22ha of community benefit recycled water irrigation, the following sites were determined to be optimal:

- + **Goonyella Road** – reasonable area, moderate to high community benefit, irrigation under Council control, existing recycled water infrastructure in close proximity
- + **Appleton St** - moderate to high community benefit, irrigation under Council control, existing recycled water infrastructure in close proximity
- + **Western Sporting Complex** - moderate to high community benefit, irrigation under Council control, existing recycled water infrastructure in close proximity
- + **Moranbah Racecourse** - moderate to high community benefit, large area, however recycled water supply may need to be limited to avoid over-allocation (i.e. 10ha of 16ha total area could be irrigated at the typical rate, or a lower irrigation rate applied to the entire area).

For the 23ha of effluent disposal area, the following sites were determined to be optimal:

- + **Anglo Land** – large site, capable of taking almost all required effluent for disposal, very close proximity to ESD
- + **Road reserve** – only ~2ha of area required, pipeline already in place to service road reserve along Goonyella Road

Costs were estimated using unit rates compiled by Bligh Tanner through work on similar projects, some of which were confirmed and/or further refined with IRC to better reflect local market conditions. The up front capital costs, annual operational costs, and 20-year Net Present Costs are summarised in Table 22. Additional information is provided in Appendix A3.

Table 22 Moranbah recycled water scheme expansion – cost estimates

Item	Basis	Costs
ESD Expansion		
Earthworks – excavation	Excavate 173,000m ³	\$2,400,000
Earthworks – disposal	Dispose of 173,000m ³	\$3,500,000
ESD lining	Re-lining at 78,000m ²	\$780,000
Pipes and Pumps		
Effluent pump station augmentation	Additional 90L/s capacity	\$300,000
New main to Anglo Land	220m at 150mm diameter	\$66,000
New main to Western Sport Complex	800m at 200mm diameter	\$320,000
Disposal pipework augmentation	800m at 200mm diameter	\$320,000
Irrigation systems	35ha total area, assumed Racecourse would fund their own	\$1,300,000
Additional		
Survey, investigation, design	At 20% of subtotal	\$1,800,000
Contingency	At 30% of subtotal	\$2,700,000
Total Capital Cost		\$13,500,000
Annual Operating Costs (additional)		\$150,000
Net Present Cost (20-year)		\$15,900,000

Appendix 7 Mechanical Evaporators



200E Floating Evaporator.

Water flow rate	190 gallons / minute
	12 litres / second
	43.2 m ³ / hour
	1.04 megalitres / day

Evaporator power	15 kW
	20 HP

Submersible pump	18.5 kW
	25 HP





Water management solutions.



Water

For over 35 years, Minetek has provided innovative water management solutions to many mining, industrial, utility and oil and gas clients. We offer the world's most extensive and cost-effective range of water evaporation technology, designed to reduce risks associated with excess water and ensure environmental compliance.

Minetek's evaporation technology has been engineered from the ground up using the first principles of fan engineering and airflow. This patented water management technology was designed to evaporate wastewater efficiently, cost-effectively, and sustainably, enabling operators to focus on production and profitability.

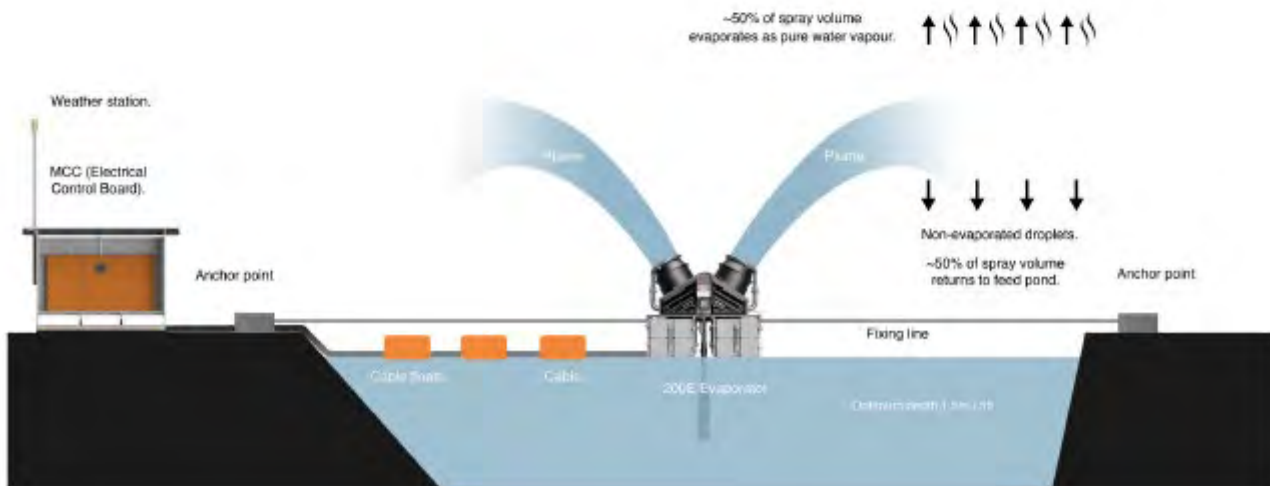
Our mobile, flexible solutions have been scientifically proven in the most challenging industrial landscapes, with over 500+ projects successfully delivered across 25+ countries in varying climates worldwide. Minetek's global team stands behind its reputation as the leader in mechanical enhanced evaporation technology, enabling environmentally sustainable water management outcomes.





Diverse range of applications.

- Pit dewatering.
- Tailings dams.
- Process and produced water disposal.
- Legacy and mine closure.
- Emergency response management.
- Acid water management.
- Brine and saline water disposal.
- Coal ash pond dewatering.
- Landfill and leachate management.
- Zero liquid discharge.
- Dam risk mitigation.
- Any industry or organisation who manages water.
- Implement across a range of industries & applications.

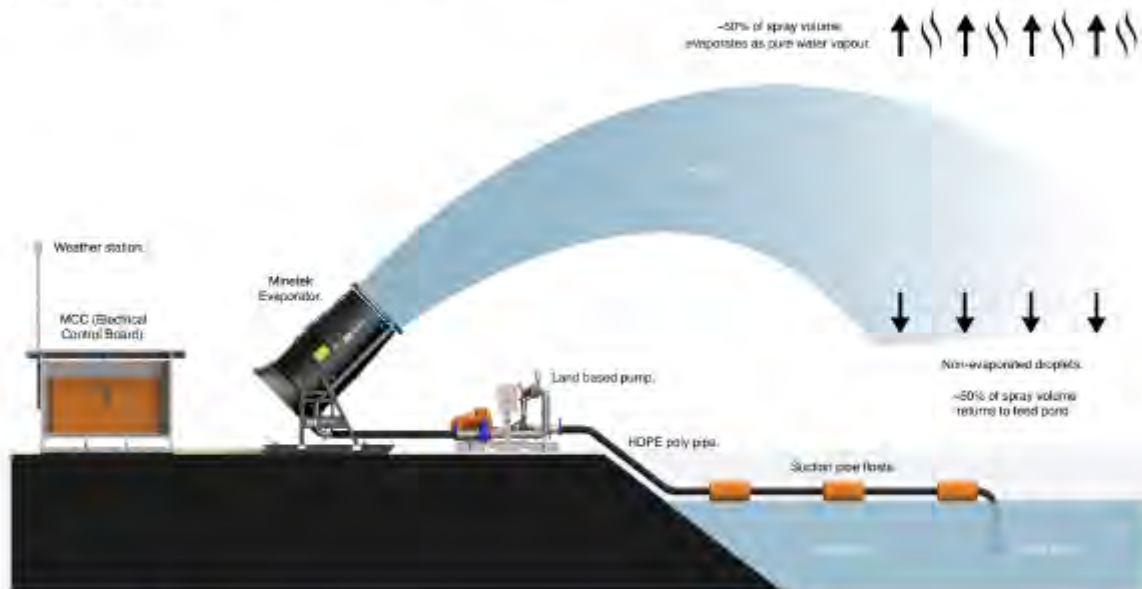


Evaporation technology.

Minetek's Water Evaporators were engineered to process a vast range of varying water qualities, delivering an efficient, cost-effective and sustainable water management solution. Our units can process up to 4.0mm in diameter solids and evaporate water with a pH level ranging from 1.8 to 14+.

Minetek mechanical Evaporation systems work by pumping a high volume of water at high pressure through specially configured nozzles. The nozzles atomize the water into tiny droplets, and these atomized water droplets are forced up into the atmosphere to evaporate. During this process, a percentage of the water will evaporate, and a percentage will fall back into the water source. Any solids, salts, heavy metals or contaminants that are contained within this water will typically not evaporate; they will fall out along with the non-evaporated droplets.

Minetek's innovative technology has revolutionised the way industries deal with their wastewater. With over 500+ systems installed worldwide, Minetek Water is the industry leader in sustainable wastewater management solutions.



Evaporator applications.

- Pit dewatering.
- Tailings dams.
- Process & produced water disposal.
- Legacy & mine closure.
- Emergency response management.
- Acid water management.
- Brine & saline water disposal.
- Coal ash pond dewatering.
- Landfill & leachate management.
- Zero liquid discharge.
- Dam risk mitigation.
- Any industry or organisation who manages water.
- Implement across a range of industries & applications.



Evaporation efficiency.

Minetek can model the results and/or overall predicted efficiency of our evaporators in your specific operating climate. Minetek's world-class proprietary evaporation efficiency modeling program enables us to provide a site-specific analysis. Our detailed modeling is based on specific data inputs such as humidity, rainfall, elevation, pan evaporation, Total Dissolved Solids (TDS), and temperature. This model enables us to understand the evaporation rates we will be able to achieve over 12 months in any specific climate. Get in touch with a Minetek Water technical specialist to determine the efficiency of our units with a site-specific analysis.

600/300 Evaporator

Water flow rate	37.5 litres / second 135 m ³ / hour 3.2 megalitres / day
-----------------	---

Unit power consumption	90kW / 120 HP
------------------------	---------------

400/200 Evaporator

Water flow rate	25 litres / second 90 m ³ / hour 2.16 megalitres / day
-----------------	---

Unit power consumption	75kW / 100 HP
------------------------	---------------

200/100 Evaporator

Water flow rate	12.5 litres / second 45 m ³ / hour 1.08 megalitres / day
-----------------	---

Unit power consumption	37kW / 50 HP
------------------------	--------------

200E Floating Evaporator

Water flow rate	12 litres / second 43.2 m ³ / hour 1.04 megalitres / day
-----------------	---

Evaporator power	15kW / 20 HP
------------------	--------------

Submersible pump	18.5 kW / 25 HP
------------------	-----------------

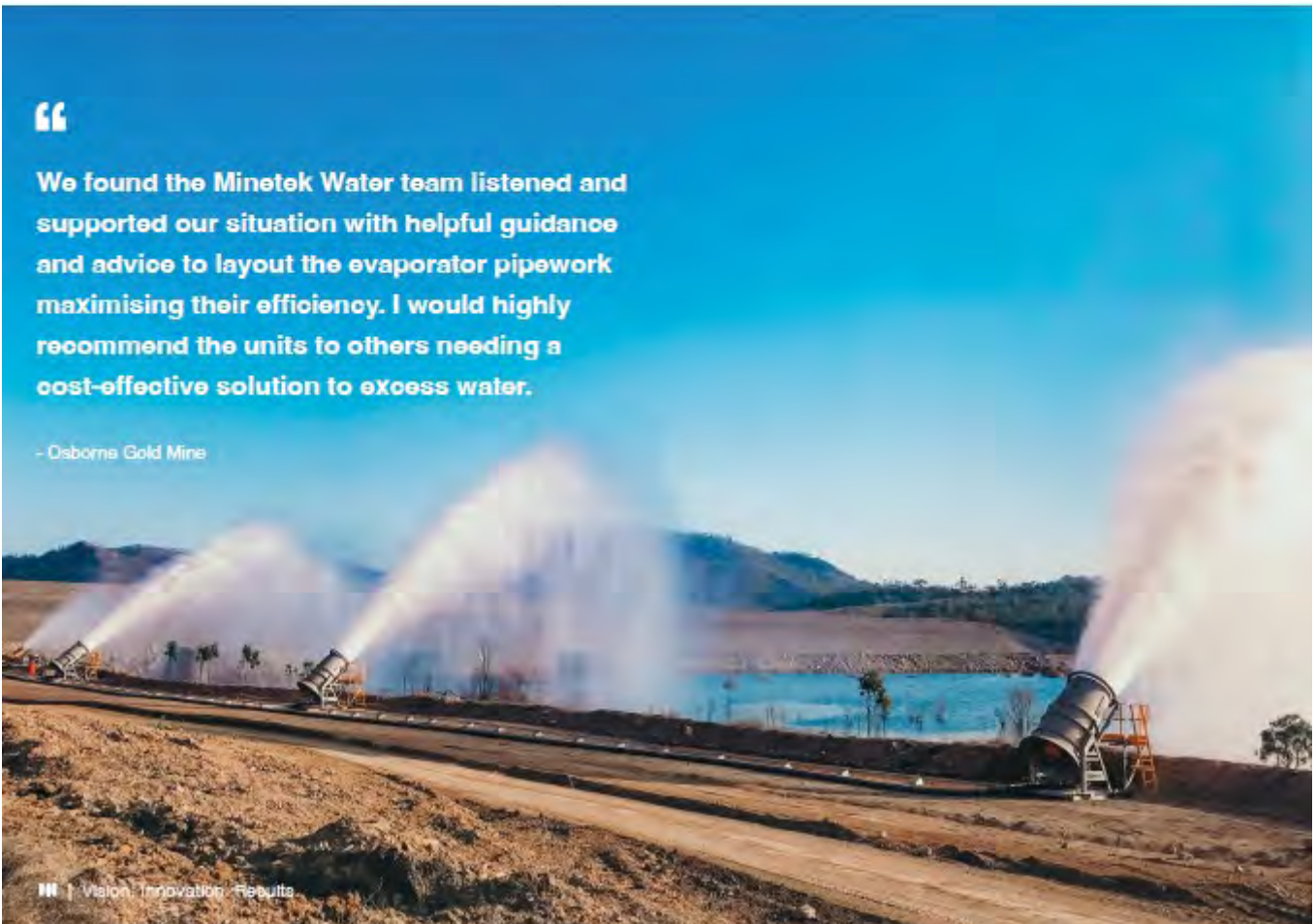
Advantages & capabilities.

- Broad range of volume capacity. Systems operating in excess of 2,160 m³/hour.
- Low maintenance units.
- 24/7 automated operation.
- Automatic & manual unit angle adjuster.
- Low-fouling, high-pressure atomizing stainless steel nozzles.
- Unique ability to process water with high TDS & high TSS.
- Not susceptible to changes in feed water quality.
- Environmentally sustainable solution.
- Rapid deployment.
- Process & evaporate large volumes of water.
- Ability to process all water qualities.
- Proudly Australian made.
- Mobile & modular systems.
- Minimal footprint & power required.
- Proven performance in all climates.
- Land-based, floating & skid-mounted evaporation units.
- Epoxy, stainless and/or galvanised steel construction materials.
- Fully integrated Environmental Management System (EMS).
- Cost effective solution – 5 x more cost effective when compared to traditional methods.

“

We found the Minetek Water team listened and supported our situation with helpful guidance and advice to layout the evaporator pipework maximising their efficiency. I would highly recommend the units to others needing a cost-effective solution to excess water.

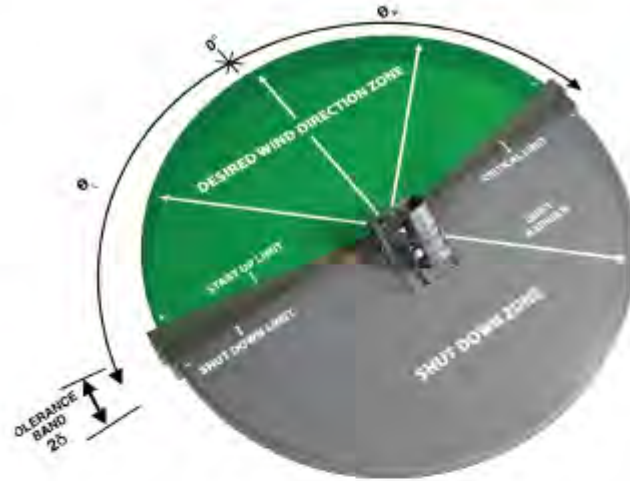
- Daborna Gold Mine



IN | Vision. Innovation. Results

Environmental Management System (EMS).

Monitor and respond to changes in environmental conditions in real-time with Minetek's Environment Management System (EMS). Communicating wirelessly via a remote PLC, our adaptable EMS solution provides our clients with flexibility and peace of mind. When switched to fully automatic mode, the system is governed by a weather station that optimises operation according to a broad range of adjustable parameters, including optimum sun-up/downtimes, relative wind speed, and direction, humidity and temperature, system water flow, and pressure. The EMS logs all operating times and condition data for further optimisation to deliver improved operating efficiency. This automated technology enables operators to stay ahead of the curve with an automated response to changes in environmental conditions such as humidity, rain, and wind.



Automatic Angle Adjuster (AAA).

Minetek's Water Evaporation units have advanced capabilities of our proprietary Environmental Management System (EMS) to optimise performance in prevailing weather conditions. The Automatic Angle Adjuster (AAA) works by automatically adjusting the angle of the evaporation unit based on different wind speeds. This feature works in conjunction with the EMS system, providing flexibility for the operation in various weather conditions.

MEETING DETAILS	Water and Waste Standing Committee Meeting Wednesday 21 August 2024
AUTHOR	Scott Casey
AUTHOR POSITION	Director Water and Waste

6.1 WATER AND WASTE INFORMATION BULLETIN – JULY 2024

EXECUTIVE SUMMARY

The Water and Waste Directorate Information Bulletin for July 2024 is provided for Committee review.

OFFICER'S RECOMMENDATION

That the Committee recommends that Council:

- 1. Notes the Water and Waste Directorate Information Bulletin for July 2024.*

BACKGROUND

The attached Information Bulletin for July 2024 provides an operational update for Committee review on the Water and Waste Directorate.

IMPLICATIONS

Any specific implications or risks will be outlined in the Information Bulletin

CONSULTATION

Water and Waste Directorate Managers and Staff.

BASIS FOR RECOMMENDATION

This is an information only report.

ACTION ACCOUNTABILITY

Information only report.

KEY MESSAGES

Operational update to the Elected Members.

<p>Report prepared by: SCOTT CASEY Director Water and Waste Date: 6 August 2024</p>

ATTACHMENTS

- Attachment 1 – Water and Waste Information Bulletin – July 2024

REFERENCE DOCUMENT

- Nil

PAGES 117 - 136 HAVE INTENTIONALLY BEEN REMOVED DUE TO CONFIDENTIAL REASONS