Government of Western Australia
Department of Environment Regulation

Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: Water Corporation

Works Approval Number: W5571/2013/1

Registered office: Level 3
629 Leederville Street
LEEDERVILLE WA 6007

Premises address: Perth Groundwater Replenishment Scheme
Ocean Reef Road
CRAIGIE WA6025
Being Part of Lot 8278 on Plan 30778

Bound by the following points:

	Easting	Northing
1	384140.00m	6483117.24m
2	384344.35m	6483127.53m
3	384359.85m	6482819.44m
4	384260.60m	6482813.19m
5	384264.48m	6482738.16m
6	384165.20m	6482733.28m

(as depicted in Schedule 1)

Issue date: Thursday, 10 April 2014

Commencement date: Monday, 14 April 2014

Expiry date: Thursday, 13 April 2017

The following category/s from the *Environmental Protection Regulations 1987* cause this Premises to be a prescribed premises for the purposes of the *Environmental Protection Act 1986*:

Category number	Category description	Category production or design capacity	Approved premises production or design capacity
54	Sewage facility: premises – (a) On which sewage is treated (excluding septic tanks); or (b) From which treated sewage is discharged onto land or into waters	100 cubic metres or more per day	70,000 cubic metres per day

Conditions
Subject to this Works Approval and the conditions set out in the attached pages.

Date signed: 10 February 2016
.....
Alan Kietzmann
Manager Licensing (Waste Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Works Approval Conditions

1 General

1.1 Interpretation

1.1.1 In the Works Approval, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 In the Works Approval, unless the contrary intention appears:

'the Act' means the *Environmental Protection Act 1986;*

'annual period' means the inclusive period from 1 January to 31 December in each year;

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

'Commissioning' means the process of operation and testing that verifies the works and all relevant systems, plant, machinery and equipment have been installed and are performing in accordance with the design specification set out in the works approval application;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;

Chief Executive Officer
Department Administering the Environmental Protection Act 1986
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au

'NATA' means National Association of Testing Authorities;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Works Approval;

'Schedule 1' means Schedule 1 of this works approval unless otherwise stated;

'Works Approval' means this Works Approval numbered W5571/2013/1 and issued under the *Environmental Protection Act 1986;*

'Works Approval Holder' means the person or organisation named as the Works Approval Holder on page 1 of the Works Approval;

1.1.3 Any reference to an Australian or other standard in the Works Approval means the relevant parts of the current version of that standard.

1.1.4 Any reference to a guideline or code of practice in the Works Approval means the current version of the guideline or code of practice.

1.2 General conditions

1.2.1 The Works Approval Holder shall construct the works in accordance with the documentation detailed in Table 1.2.1:

Table 1.2.1: Construction Requirements[1]		
Document	**Parts**	**Date of Document**
Works Approval Application Form	All	10 December 2013
Works Approval Application – 14 GL/year Groundwater Replenishment Scheme 2013 (Revised) #10566643	All, including Drawings and Appendices	28 February 2014
Appendix A -GWRT Final Report	All	10 December 2013
Appendix B- Communication Strategy 2013-2016	All	10 December 2013
Appendix C- Review Impacts Marmion Marine Park	All	10 December 2013
Appendix D – GWRS IAWG Regulatory Framework	All	10 December 2013
P4 Works Approval Amendment – 14 GL/year Groundwater Replenishment Scheme letter to DER	All	26 February 2015
Amendment to Works Approval W5571/2013/1 – Additional information	All	26 February 2015

Note 1: Where the details and commitments of the documents listed in condition 1.2.1 are inconsistent with any other condition of this works approval, the conditions of this works approval shall prevail.

1.2.2 The Works Approval Holder shall install and maintain permanent markers along the boundary of the Premises so it can be identified on the ground.

1.2.3 The Works Approval Holder shall confirm commencement of commissioning in writing to the CEO one week prior to starting commissioning.

1.2.4 The Works Approval Holder shall commission the Groundwater Replenishment Scheme, for a period not exceeding 4 months.

2 Emissions

2.1 Point source emissions to surface water

2.1.1 The Works Approval Holder shall undertake the monitoring specified in Table 2.1.1 during the commissioning period.

Table 2.1.1: Monitoring of effluent quality

Monitoring point reference	Parameter	Units	Averaging period	Frequency[1]
S on Reject water line as shown in the process flow diagram, as depicted in Schedule 1	pH	pH units	Spot sample	Weekly
	E.coli	cfu/100ml		
	Total Nitrogen	mg/L		
	Total Phosphrous	mg/L		
	Effluent flow rate	kL/day	24 hours	Continuous

3 Monitoring

3.1.1 The Works Approval Holder shall ensure that:
(a) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(b) all laboratory samples are submitted to a laboratory with current NATA accreditation for the parameters to be measured unless indicated otherwise in relevant table.

4 Improvements

4.1.1 The Works Approval Holder shall undertake a construction noise assessment of the premises and prepare a Noise Management Plan (NMP) prior to commencing construction works. The NMP shall be prepared in accordance with Regulation 13 (6) of the *Environmental Protection (Noise) Regulations 1997*. The NMP shall be submitted to DER and shall include:
(i) methods used for the noise modelling/assessment;
(ii) noise management measures and noise monitoring programme to be implemented; and
(iii) proposed measures to reduce noise emissions from the premises if the assigned levels are exceeded and the noise impact is significant with time scales to implement the proposed measures.

4.1.2 The Works Approval Holder shall undertake a noise assessment of the premises during commissioning. A report on the assessment shall be prepared and submitted to the DER and shall include:
(i) methods used for noise measurement and /or noise model verification; and
(ii) evidence that noise emissions from the premises as installed comply with the assigned levels defined in the Noise regulations.

5 Information

5.1 Reporting

5.1.1 The Works Approval Holder shall submit a compliance document to the CEO, following the construction of the works and prior to commissioning of the same.

5.1.2 The compliance document shall:
(a) certify that the works were constructed in accordance with the conditions of the works approval;
(b) be signed by a person authorised to represent the Works Approval Holder and contain the printed name and position of that person within the company.

5.1.3 The Works Approval Holder shall submit a commissioning report for the Groundwater Replenishment Scheme, to the CEO for approval within one month of the completion of commissioning.

5.1.4 The Works Approval Holder shall ensure the report referred to in condition 5.1.3 includes;

(a) a summary of the monitoring results recorded under condition 2.2.1;
(b) a list of any original monitoring reports submitted to the Licensee from third parties for the commissioning period;
(c) a summary of the environmental performance of the plant as installed, against the design specification set out in the works approval application;
(d) a review of performance against the works approval conditions; and
(e) where they have not been met, measures proposed to meet the design specification and/or works approval conditions, together with timescales for implementing the proposed measures.

5.2 Notification

5.2.1 The Works Approval Holder shall ensure that the parameters listed in Table 5.2.1 are notified to the CEO at the Contact Address and in accordance with the notification requirements of the table.

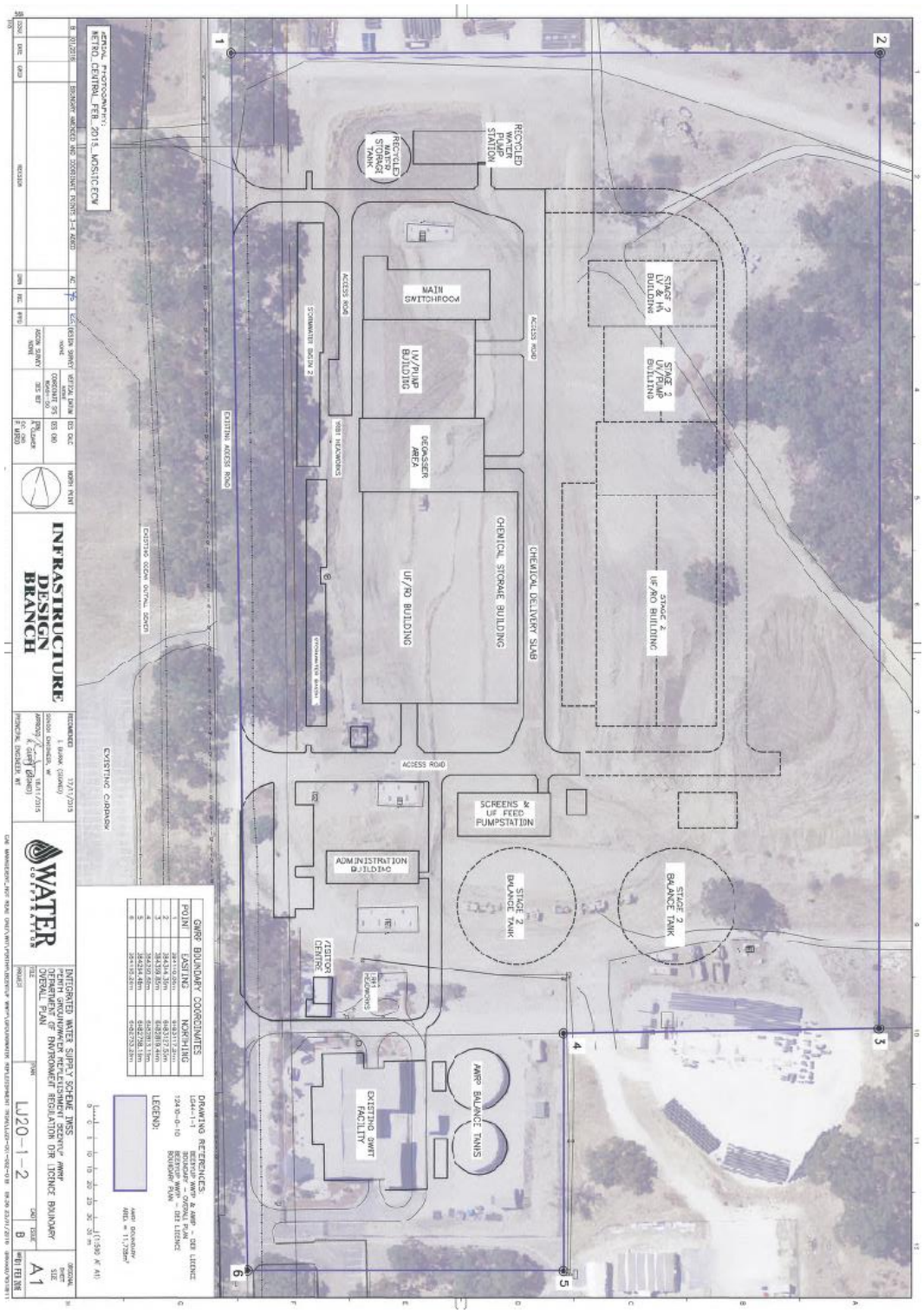
Table 5.2.1: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement	Format or form
1.2.4	Commencement of commissioning	7 days prior to start	None specified
	Completion of commissioning	7 days after completion	
4.1.1	Prior to commencing construction		None specified
4.1.2	After the commissioning period		None specified

Schedule 1: Maps and Figures

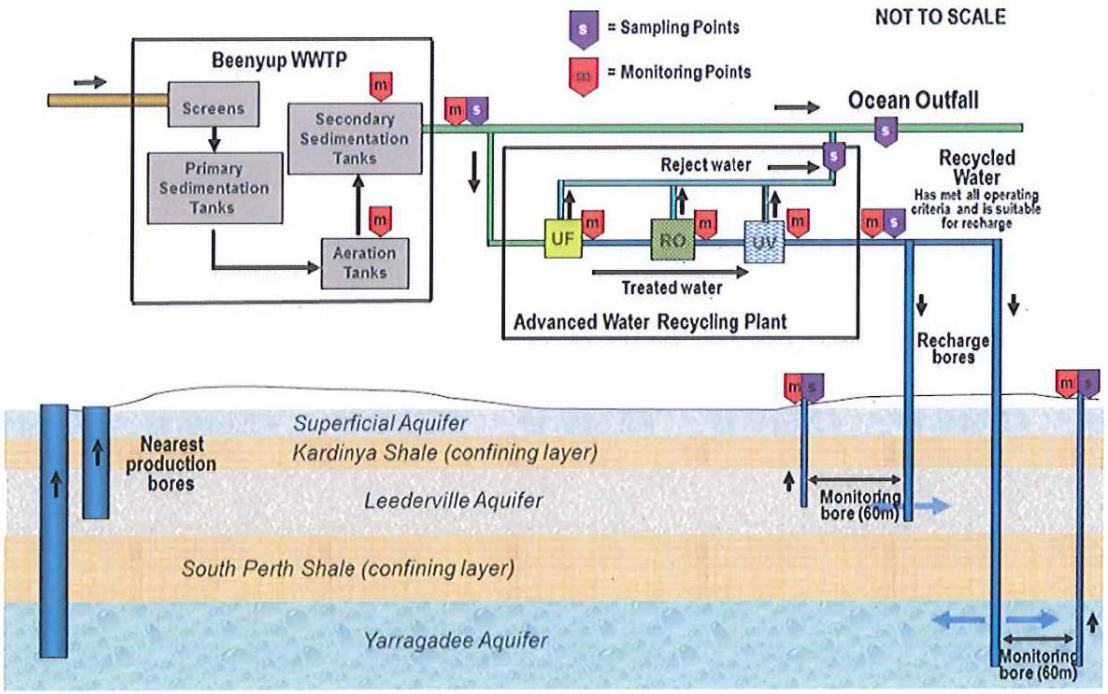
Premises map

The Premises is shown in the map below. The blue line depicts the Premises boundary.



Process flow diagram

The process flow diagram for the Premises is shown in the figure below.



Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

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Works Approval: W5571/2013/1

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(as depicted in Schedule 1 of the Works Approval)

Issue date: Thursday, 10 April 2014

Commencement date: Monday, 14 April 2014

Expiry date: Thursday, 13 April 2017

Decision

Based on the assessment detailed in this document, the Department of Environment Regulation (DER), has decided to issue a works approval. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements, that the Works Approval and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision document prepared by: Melissa Chamberlain
Licensing Officer

Jarrod Abrahams
Senior Licensing Officer

Decision Document Authorised By:

Alan Kietzmann
Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application for a works approval or licence, and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative Summary

Administrative Details		
Application Type	Works Approval ☐ New Licence ☐ Licence Amendment ☐ Works Approval Amendment ☒	
Activities that cause the premises to become prescribed premises	**Category Number(s)**	**Assessed design Capacity**
	54	70 000 cubic metres per day
Application Verified Application Fee Paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes ☐ No ☐ N/A ☒ Yes ☐ No ☐ N/A ☒	
Commercial-in-confidence claim	Yes ☐ No ☒	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes ☐ No ☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes ☒ No ☐	Referral Decision No: Managed under Part V ☒ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes ☐ No ☒	Ministerial Statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes ☐ No ☒ Department of Water consulted Yes ☒ No ☐	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes ☐ No ☒		
Is the Premises subject to any EPP requirements? Yes ☐ No ☒		

Executive summary of proposal

The Water Corporation has successfully completed the Groundwater Replenishment Trial (GWRT) in December 2012, demonstrating that groundwater replenishment is a sustainable water source option for Perth in Western Australia. Based on the success of the trial, the Corporation has applied for a works approval to construct and operate a full scale Groundwater Replenishment Scheme (GWRS) to produce up to 14 gigalitres per year of recycled water for recharge to the deep Leederville and Yarragadee aquifers.

The GWRS plant will be located on a larger Part of Lot 8278 on Plan 30778 (approximately 83 hectares of Crown land vested to the Water Corporation), Ocean Reef Road, Craigie WA 6025 adjacent to the existing Beenyup Wastewater Treatment Plant (WWTP) on the same Lot. The proposed process will take up to 70 ML/day of secondary treated wastewater from the Beenyup WWTP to treat by an advanced tertiary treatment process including ultra-filtration, reverse osmosis and ultra-violet disinfection as used in GWRT to produce recycled water. Recycled water will meet the Australian guidelines for drinking water quality (Australian Drinking Water Guidelines 6, 2011 updated 2013, National Health and Medical Research Council of Australian Government) and defined environmental values prior to being recharged to aquifer for later use as a drinking water source. Environmental values are defined as the "particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and that require protection from the effects of pollution, waste discharges and deposits".

The proposed site is bounded by the Mitchell Freeway to the east, Ocean Reef Road to the north, the residential suburb of Craigie to the west and a significant bushland to the south. The proposed location for GWRS is heavily disturbed and only a minimal fauna habitat is expected to be disturbed during construction works. As proposed, no works will disturb any areas in the Bush Forever site 303 located approximately 100m east of the proposed site. The nearest residents will be within 200m to the west of the site.

February 2016 Amendment

This decision document relates to an amendment request to update the scope of works with regards to the number of proposed injection bores to be installed as part of the project. Previously Water Corporation proposed to install two injection wells however, four injection wells will now be installed. There will be no associated increase in the total volume of water discharged to groundwater (14 GL/yr). The capacity of the two original injection bores was not sufficient to achieve the desired recharge rate of 14 GL/yr.

As part of the amendment Water Corporation also provided an updated premises map for the site including GPS coordinates of which the premises is bounded. Previously the GWRS was included within the premises boundary for Beenyup WWTP however, the physical premises boundary for the WWTP has been updated to cover only the immediate area of the plant rather than the entire lot. These changes will allow both facilities to be licensed separately.

Further background on the updated proposed scope of works is provided in Appendix A.

As part of the licence amendment DER has also made a number of administrative changes to the licence including changes to definitions in line with DER's current licensing processes, and the removal of conditions relating to the storage of environmentally hazardous materials and fugitive dust emissions. As a result of these changes numbering of works approval conditions has also changed. Justification for the removal of conditions is provided in the Decision Table in Section 4.

With regards to the risk profile of other potential emissions and discharges from the premises DER has determined that these have not significantly changed since the previous works approval was granted. Therefore any conditions that relate to other emissions and discharges have not been amended and DER has not re-visited any related existing emission control measures or levels.

4 Decision Table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence Section	**Condition Number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference Documents**
General	N/A	Definitions for Director have been replaced with CEO. References to Director within the licence have also been changed.	N/A
General conditions	L1.2.1 – 1.2.4	**Construction** L1.2.1, which requires the licensee to construct the Groundwater Replenishment Plant in accordance with the works approval application and supporting documents, has been updated to make reference to the amendment application dated 26 February 2015. As mentioned in the Executive summary of proposal, Water Corporation has updated the scope of works with regards to the number of proposed injection bores to be installed as part of the project. Previously Water Corporation proposed to install two injection wells however, four injection wells will now be installed. **Construction and Operation.** *Storage of chemicals and hydrocarbons* Previous condition L1.2.2, relating to the storage of environmentally hazardous materials, has been removed from the works approval as part of this amendment. <u>Emission Description</u> Emission: Potential failure in containment infrastructure which may cause leaks or spillage. Impact: Contamination of surrounding land, surface water drainage systems and groundwater. Controls: During construction the proponent's contractor will use bunds for the storage and handling of fuels, and/or other contaminants to minimise spillage or contamination. The proponent	Application supporting documentation General provisions of the *Environmental Protection Act 1986* *Environmental Protection (Unauthorised Discharges) Regulations 2004*

DECISION TABLE			
Works Approval / Licence Section	**Condition Number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference Documents**
		has also committed to ensure that the storage of environmental hazardous chemicals during the operational phase will be in accordance with *AS 3780 The storage and handling of corrosive substances*. Risk Assessment Consequence: Minor Likelihood: Unlikely Risk Rating: Moderate Regulatory Controls No regulatory controls will be imposed on the amended licence. DER considers that any related failure in containment infrastructure or spillages can be adequately regulated by the General provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Unauthorised Discharges) Regulations 2004.* Residual Risk Consequence: Minor Likelihood: Unlikely Risk Rating: Moderate	
Premises operation	N/A	Premises operation heading has been removed as there are no conditions in this section.	N/A
Emissions – Fugitive dust	N/A	**Construction** Previous conditions L2.1.1 and L2.1.2, relating to the control of fugitive dust emissions, have been removed from the works approval as part of this amendment. Emission Description Emission: Dust from truck and vehicle movements and general construction activities Impact: Nuisance quantities of dust and potential human health	

DECISION TABLE			
Works Approval / Licence Section	**Condition Number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference Documents**
		issues associated with respirable dust fractions. The closest part of the site is approximately 100 m east of the closest residence. The majority of works will be located at least 250m east of this residence. Controls: Visual dust monitoring and appropriate control measures will be implemented. The contractor responsible for the works will be contractually bound by the proponent to take all reasonable and practical measures to prevent or minimise the generation of wind-borne dust. Risk Assessment Consequence: Minor Likelihood: Possible Risk Rating: Moderate Regulatory Controls No regulatory controls will be imposed on the amended licence. DER considers that fugitive dust emissions, should they become an issue, can be adequately regulated by the General provisions of the *Environmental Protection Act 1986.* Residual Risk Consequence: Minor Likelihood: Possible Risk Rating: Moderate	
Information – notification requirements	L5.2.1	References to condition numbers have been updated to account for removal of conditions in Section 1 – 'General' and to account for a reference error.	N/A
Schedule 1	N/A	Updated premises map included.	N/A

5 Advertisement and Consultation Table

Date	Event	Comments received/Notes	How comments were taken into consideration
15/01/2016	Proponent sent a copy of draft instrument	Comments received on 5/2/2016. Updated premises map provided.	Premises map updated

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A – Summary of proposal

GWRS Stage 1

The proposed construction works for GWRS stage 1 and associated infrastructure will include the following:

1. Feed water system (including feed water pumps and feed water storage);
2. Mechanical screening system;
3. Ultrafiltration system;
4. Reverse Osmosis (RO) system;
5. Ultra Violet (UV) disinfection system;
6. Pre and post conditioning for the feed and recycled water;
7. Recycled water holding tank;
8. Four injection bores and pumping systems;
9. Adjacent monitoring bores;
10. Ancillary site facilities (e.g.switch room, admin and operations building, process plant buildings, interconnecting pipework, small intermediate storage tanks, roadways, fencing);
11. Chemical storage, dosing and dilution facilities and
12. Waste and residuals management facilities.

A schematic process flow diagram of the proposed Advanced Water Recycling Plant (AWRP) stage 1 including injection bores, monitoring bores and sampling point locations are shown in Figure 1.

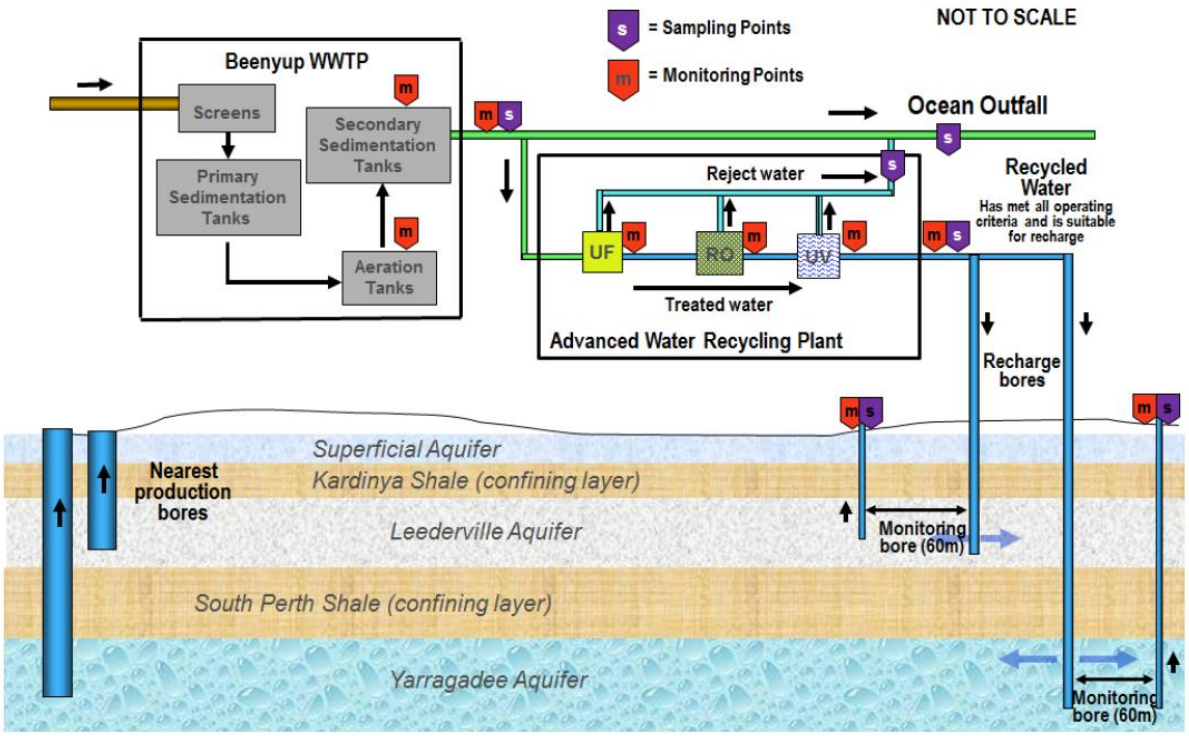

Figure 1: Schematic process flow diagram

Feed water
The feed water system will draw up to 70 ML/day of secondary treated wastewater from the Beenyup ocean outfall. The system will consist of a feed water intake structure and associated pumps, pipe work and storage. This will have a capacity of up to 12 ML or over 4 hours storage in order to provide a continuous feed stream to the AWRP.

Pre Treatment
The feed water will be pre-treated by filtering through screens and pre-treatment filters. The drinking water disinfectant chloramine will be dosed to protect the UF and RO membranes from biofouling. The pH of the feed water will be adjusted to minimise scaling potential and a drinking water approved anti-scalant will be dosed to the RO feed water to inhibit scaling.

Ultrafiltration
Ultrafiltration will remove suspended solids and colloidal material from the feed water.
Ultrafiltration is a low-pressure membrane process for separating colloidal and suspended particles in the range of 0.05 - 0.10 microns.

Filtrate storage tanks will feed the RO system pumps and the membrane backwash pumps. The filtrate from this process will be further treated by reverse osmosis.

The UF membranes will need to be chemically cleaned during operation approximately every 1-2 weeks. Membrane cleaning will incorporate the use of a hot water tank, recirculation pump and chemical dosing system. The cleaning chemicals will be relatively dilute acid and alkaline reagents and will be dependent on the membrane type and the type of fouling. After cleaning, the solution will be neutralised and pumped to the Waste Retention Tank.

Reverse Osmosis (RO)
Reverse osmosis is a desalination process in which a portion of pressurised feed water passes through a semi-permeable membrane, leaving dissolved salts behind. The RO plant will be fed with filtrate drawn from the filtrate tanks. The RO system will comprise:
• high pressure pumps
• two stage array of RO membrane racks energy recovery devices
• chemical clean-in-place (CIP) system

The RO membranes will need to be chemically cleaned during operation approximately every 2-4 weeks. Membrane cleaning will incorporate the use of a hot water tank, recirculation pump and chemical dosing system. The cleaning chemicals will be relatively dilute acid and alkaline reagents and will be dependent on the membrane type and the type of fouling. After cleaning, the solution will be neutralised and pumped to the Waste Retention Tank.

UV Disinfection
Permeate from the RO system will be passed through a bank of UV disinfection units.

Post-treatment
The pH and buffering capacity of the recycled water will be adjusted prior to storage in the recycled water tank.

Recycled water
The recycled water produced from the AWRP will be stored in a holding tank. The water will then be piped a short distance to the adjacent recharge bores for injection into the Leederville and Yarragadee aquifers. Three injection bores will target the Leederville aquifer between 120 - 220 metres below ground level (mBGL) and one will target the Yarragadee aquifer between approximately 390 – 744 mBGL.

Reject Water

The advanced water treatment process produces waste stream with concentrated contaminants called reject water. Reject water will be discharged into Beenyup Ocean Outfall where it will be combined with the remaining treated wastewater from the Beenyup WWTP before being discharged into the ocean.

Waste Stream and assessment
The waste stream from AWRP will comprise residuals from screen filters, ultra-filtration membranes, reverse osmosis brine and neutralised cleaning solutions. The chemicals used will be neutralised so any impact will be negligible. These waste streams will be pumped to the Beenyup ocean outfall where it will be mixed with treated wastewater flows discharged from the Beenyup WWTP prior to discharge to the Ocean Reef ocean Outlets.

The Ocean Reef Outlets are currently comprehensively monitored through the voluntary Perth Long Term Ocean Outlet Monitoring (PLOOM) program. The results of the PLOOM monitoring demonstrates that the Environmental Quality Criteria (EQC) for Ecosystem Integrity and Primary Contact Recreation are met in the vicinity of the Ocean Reef ocean outlets. These results indicate that the disposal of treated wastewater to the ocean 1.5 km west of the Ocean Reef is having no detectable adverse effects on marine water quality, or to marine flora and fauna.

Modelling of combined BWWTP and AWRP waste streams for the three stages against the base case of there being no AWRP has concluded that:

- the higher contaminant concentrations of the post-recycling discharge are largely offset due to decrease in flow resulting in increasing dilution;
- the EPA (2005) High Protection guideline (99% species protection) is met for the 95th percentile concentrations of contaminants of concern (ammonium, copper and zinc) under both pre-recycling discharge and post-recycling discharge stages;
- the ARWP process significantly reduces pathogen counts in the ocean discharge having a net benefit with regard to pathogen concentrations after discharge to the ocean compared to the existing discharge; and
- the AWRP will not alter the total nutrient loads discharged to Ocean Reef and nutrient concentrations after initial dilution will not change under typical conditions.

(Ref: Beenyup Advanced Water Recycling – “Impact assessment of water recycling reject stream discharge, November 2011 prepared for Water Corporation by Oceanica Consulting Pty Ltd)

Any future proposal beyond 14 GL per annum will be referred to the Environmental Protection Authority and the Corporation commits to undertake the studies necessary to inform the delineation of the ecological protection zones and monitoring and management plans for the ultimate capacity at that time.

The Plant Layout is shown Figure 2.

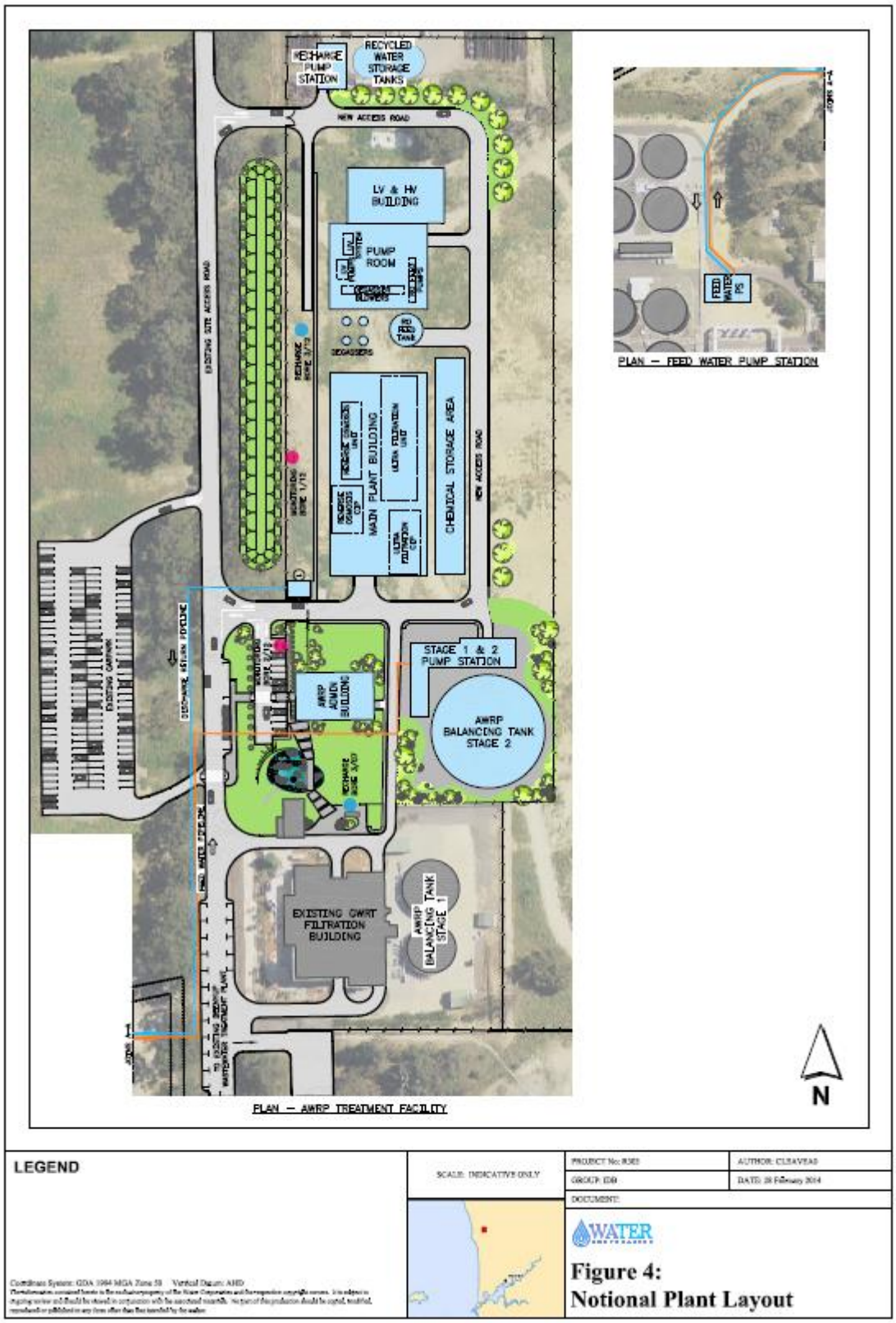

Figure 2: Notional Plant Layout

Main potential emissions during construction and operation

Dust

Potential impacts of dust emissions from construction activities on site to the sensitive receptors is considered to be significant unless an effective dust management plan is implemented. The Corporation has advised that the contractor responsible for construction of works will be contractually bound with the Water Corporation to take all reasonable and practical measures to prevent or minimise the generation of wind borne dust and to comply with DER's *"A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other related activities 2011"*.

Noise

Noise will be generated on site from the construction of the plant, earth moving machinery, equipment, power tools and vehicle beeper. It is considered that the amenity of the nearby residents may be impacted during the day because the residents are within 200 metres away from the site.

Due to the nature of Water Corporation contractual requirements for installation of large project capital works, final technical design and equipment procurement is finalised through the tendering process for the construction and installation. Noise assessments and Nosie management plans will be completed once the final design has been finalised with the project contractor.

Prior to any construction activity being undertaken the Water Corporation has committed to developing a noise management plan and undertaking noise modelling and verification. Verification of noise monitoring to demonstrate compliance with the noise regulations prior to the commencement of construction of the plant will be required. Through the tendering process of site works and construction of the plant the contractor will also demonstrate compliance with noise regulations prior to construction being undertaken. The works approval will encompass these requirements to ensure noise issues can be managed during and after the works have been completed.

Noise assessment will be undertaken during commissioning to demonstrate noise emissions from the plant as installed comply with the assigned levels defined in the *Environmental Protection (Noise) Regulations 1997.*

Emissions to surface water

There is no emission to surface water during construction. The recycled water produced from the AWRP will be stored in a holding tank. The water will then be piped a short distance to the adjacent recharge bores for injection into the Leederville and Yarragadee aquifers. Three injection bores will target the Leederville aquifer between 120 - 220 metres below ground level (mBGL) and one will target the Yarragadee aquifer between approximately 390 – 744 mBGL.

As described above, the waste stream from AWRP will be combined with the remaining treated wastewater from the Beenyup WWTP before being discharged into the ocean outfall.