



Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number W6180/2018/1

Works Approval Holder Water Corporation

File Number DER2018/001511

Premises Halls Creek Wastewater Treatment Plant
Lot 3001 on Plan 53871
Legal description -
Crown Reserve 40202
HALLS CREEK WA 6770

Date of Report 3 June 2019

Status of Report Final

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1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
AACR	Annual Audit Compliance Report
AER	Annual Environment Report
Category	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Cfu	colony forming units
Commissioning	means the period of testing and adjustment of operation of the plant in order to establish and verify full system functionality.
CS Act	<i>Contaminated Sites Act 2003 (WA)</i>
Decision Report	refers to this document.
Delegated Officer	an officer delegated under section 20 of the EP Act.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
mg/L	milligrams per litre
Minister	the Minister responsible for the EP Act and associated regulations
NEPM	National Environmental Protection Measure
NRA	Nutrient Risk Assessment
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Occupier	has the same meaning given to that term under the EP Act.
PM	Particulate Matter
PM ₁₀	means particulate matter that is smaller than 10 microns (µm) in diameter
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)</i>
Works Approval Holder	Water Corporation

2. Purpose and scope of assessment

2.1 Background

The Halls Creek Wastewater Treatment Plant (WWTP) (L6268/1991/10) was originally constructed in 1982 and designed to treat wastewater to a secondary standard via two facultative and two maturation ponds, discharging the treated water to China Wall Creek.

On 5 February 1998 construction of an Evaporation Pond was finalised at the WWTP to dispose of all treated wastewater from the plant. Discharges to China Wall Creek were discontinued, with the exception of emergency discharges to prevent overtopping of the ponds during extreme rainfall events. The licence was amended on 27 January 1999 to reflect this.

The Halls Creek Water Reserve was proclaimed in 2004 under the *Country Areas Water Supply Act 1947* and the Priority 1 Public Drinking Water Source Area (PDWSA) located over the Halls Creek WWTP.

The Water Corporation have been unable to demonstrate that the liners of any of the existing 5 ponds are impervious, therefore assurance cannot be given that the Priority 1 PDWSA is adequately protected from untreated wastewater seepage. The Water Corporation has investigated the potential to relocate the WWTP outside the PDWSA, however a number of factors prevent this occurring. The decision has been made to retain the current location of the WWTP and upgrade the facilities.

Table 2 lists the prescribed premises categories that are approved on licence L6268/1991/10.

Table 2: Prescribed Premises Categories in the Existing Licence

Classification of Premises	Description	Approved Premises production or design capacity or throughput
Category 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.	800 m ³ per day

2.2 Application details

The Department received an application from the Water Corporation for a works approval (W6180/2018/1) to modify the existing evaporation pond to create two lined ponds, reline the existing 4 ponds and construct 3 new lined ponds and a sludge drying bed, to increase the retention time of the system to a minimum of 25 days. Liners for all 9 ponds and the sludge drying bed are proposed to be Bituminous Geomembrane liner meeting a permeability of 1×10^{-9} m/s or lower. Stormwater management infrastructure will be installed, plus the system will be designed to accommodate flood events up to the 1 in 10 (10%) Annual Exceedance Probability (AEP).

The works will also include implementation of a Reuse Scheme where a maximum of 200 m³/day of treated water will be chlorinated and piped to the 2.1 ha Town Oval for irrigation, 4.5km northwest of the WWTP and outside the P1 PDWSA and protection zones.

The works will not increase the currently approved Premises production or design capacity that is 800 m³ per day.

Commissioning will be a staged process where new ponds are constructed, commissioned and made operational, then existing ponds will be taken off-line, modified, commissioned and then made operational. The Works Approval authorises activities necessary for the construction and commissioning (proving) of the WWTP, however approval for ongoing operation of the WWTP and the Reuse Scheme must be obtained by amendment of the Licence. Table 3 lists the documents submitted during the assessment process.

Table 3: Documents and information submitted during the assessment process

Document/information description	Date received
Craig Chaudhry to Sarah Greenwood, 04 April 2019, in <i>RE: Halls Creek WWTP Further clarification please.</i>	04 April 2019
Craig Chaudhry to Sarah Greenwood, 27 February 2019, in <i>RE: Query regarding Department of Health approval for Halls Creek Reuse.</i>	27 February 2019
Craig Chaudhry to Sarah Greenwood, 29 March 2019, in <i>RE: Queries on Halls Creek WWTP please.</i>	29 March 2019
Crystal Heydenrych and Clinton van den Bergh, 25 October 2017, in <i>RE: Halls Creek Waste Water Treatment Plant: Reconnaissance (Level 1) Flora and Fauna Assessment.</i>	06 November 2018
Field Capacity (2017) Proposed Halls Creek Effluent Reuse Scheme Irrigation Management Plan & Preliminary Nutrient Risk Assessment	24 October 2018
Garth Humphreys to Craig Chaudhry, 16 November 2018, in <i>Halls Creek Wastewater Treatment Plant and Pipeline Native Vegetation Clearing Principles Assessment.</i>	19 November 2018
GHD (2018) Engineering Summary Report (pages 1, 47-51 extracted)	02 April 2019
Richard Theobald to Rachael Miller, 02 July 2018, in <i>Halls Creek Wastewater Treatment Plant – upgrade of the existing WWTP and commissioning of new effluent reuse scheme.</i>	27 February 2019
Water Corporation (2018) Annual Environmental Report Halls Creek Wastewater Treatment Plant 1 July 2017 to 30 June 2018.	06 September 2018
Water Corporation (2018) C-S02355 Halls Creek Wastewater Treatment Plant and Treated Wastewater Management Upgrade. Works Approval Application Supporting Information	08 October 2018

Table 4: Works approval and licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
6268	17/09/1996	Licence re-issue with conditions, licensed capacity of 400m ³ /day
6268/1	27/01/1999	Licence re-issue, increase licensed capacity to 600m ³ /day, amend conditions.
6268/2	07/10/1999	Licence re-issue
6268/3	06/10/2000	Licence re-issue, increase licensed capacity to 800m ³ /day, amend conditions.
6268/4	04/10/2001	Licence re-issue, amend conditions.
6268/5	02/10/2002	Licence re-issue
6268/6	22/09/2003	Licence re-issue
6268/7	05/10/2004	Licence re-issue, add complaints & measuring cumulative volumes of treated wastewater, amend desludging & monitoring, delete maintain sample point.
L6268/8	26/10/2006	Licence re-issue
L6268/1991/9	31/10/2008	Licence re-issue, amend conditions, add AACR, add maintain sample point.
L6268/1991/10	31/10/2013	Licence re-issue, update format.
L6268/1991/10	29/04/2016	Administrative amendment to extend the duration of the Licence expiry date.
L6268/1991/10	21/07/2016	Licence amendment, amend pH in field non-NATA sampling, delete flow meter, alter reference to monitoring point to be Wellman St SPS, Improvement Program IR1.
W6180/2018/1	22/05/2019	Work Approval to divide existing & construct new ponds, implement 200kL/day recycled water reuse to town oval.

2.3 Infrastructure

The infrastructure to be modified or installed at the Halls Creek Wastewater Treatment Plant is detailed in Table 5.

Table 5: Halls Creek Wastewater Treatment Plant infrastructure

Infrastructure: Prescribed Activity Category 54	
1	Construction of Evaporation Basin A: <ul style="list-style-type: none"> • Cover an area of 3.7ha; and • To be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • Embankments adequately constructed to provide a freeboard of 500mm.
2	Modification of existing Evaporation basin: <ul style="list-style-type: none"> • The installation of an internal dividing wall to create two ponds being Evaporation Basin B to cover an area of 5.28ha, and Evaporation Basin C to cover an area of 1.82ha; • Basin B and Basin C to be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec • Embankments adequately raised to provide a freeboard of 500mm.
3	Construction of an additional Facultative Treatment Pond 1: <ul style="list-style-type: none"> • To be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • Embankments adequately constructed to provide a freeboard of 500mm.
4	Refurbishment of the existing Facultative Treatment Pond 2 and Facultative Treatment Pond 3: <ul style="list-style-type: none"> • To be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • Embankments altered to a 4:1 embankment slope; and • Embankments adequately raised to provide a freeboard of 500mm.
5	Construction of an additional Maturation Treatment Pond 1: <ul style="list-style-type: none"> • To be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • Contain baffle curtains; and • Embankments adequately constructed to provide a freeboard of 500mm.
6	Refurbishment of the existing Maturation Treatment Pond 2 and Maturation Treatment Pond 3: <ul style="list-style-type: none"> • To be lined with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec; • Embankments altered to a 4:1 embankment slope; • Embankments adequately raised to provide a freeboard of 500mm; and • Installation of baffle curtains.
7	Installation of a disposal pump station to pump treated wastewater from Maturation Pond 3 to Evaporation Basin A.
8	Installation of a Geobag staging bund: <ul style="list-style-type: none"> • to include a return drain line for leachate to be directed back to the Facultative Ponds.
9	Construction of stormwater drainage infrastructure to redirect uncontaminated stormwater away from the WWTP.
10	Installation of an access chamber on the overflow from Evaporation Basin C, including online level monitoring and a V notch weir for monitoring and quantifying discharges with a high level alarm linked to SCADA monitoring.
11	Installation of a tablet chlorination system on the emergency discharge outlet pipe to the tributary of China Wall Creek, downstream of the V notch weir.
12	Construction of a Treated Wastewater Management Compound to include: <ul style="list-style-type: none"> • two water pumps to pump treated water from Maturation Pond 3 into the Reuse Scheme • coarse screen filtration • chlorine gas disinfection system • solar power supply system • backup power system including permanent diesel generator • external self banded fuel tank that meets Australian Standard AS1692.



Figure F
Halls Creek Wastewater Treatment Plant
Proposed WWTP Site Layout

Project Number: WWT1805-011
Revision: 04
Date: 20/07/18
Scale: 1:1,000 @ A3
Client: City of Halls Creek
Project Location: Halls Creek, WA
Drawing Title: Proposed WWTP Site Layout

RPS

Figure 1: Halls Creek Wastewater Treatment Plant Premises layout and infrastructure map

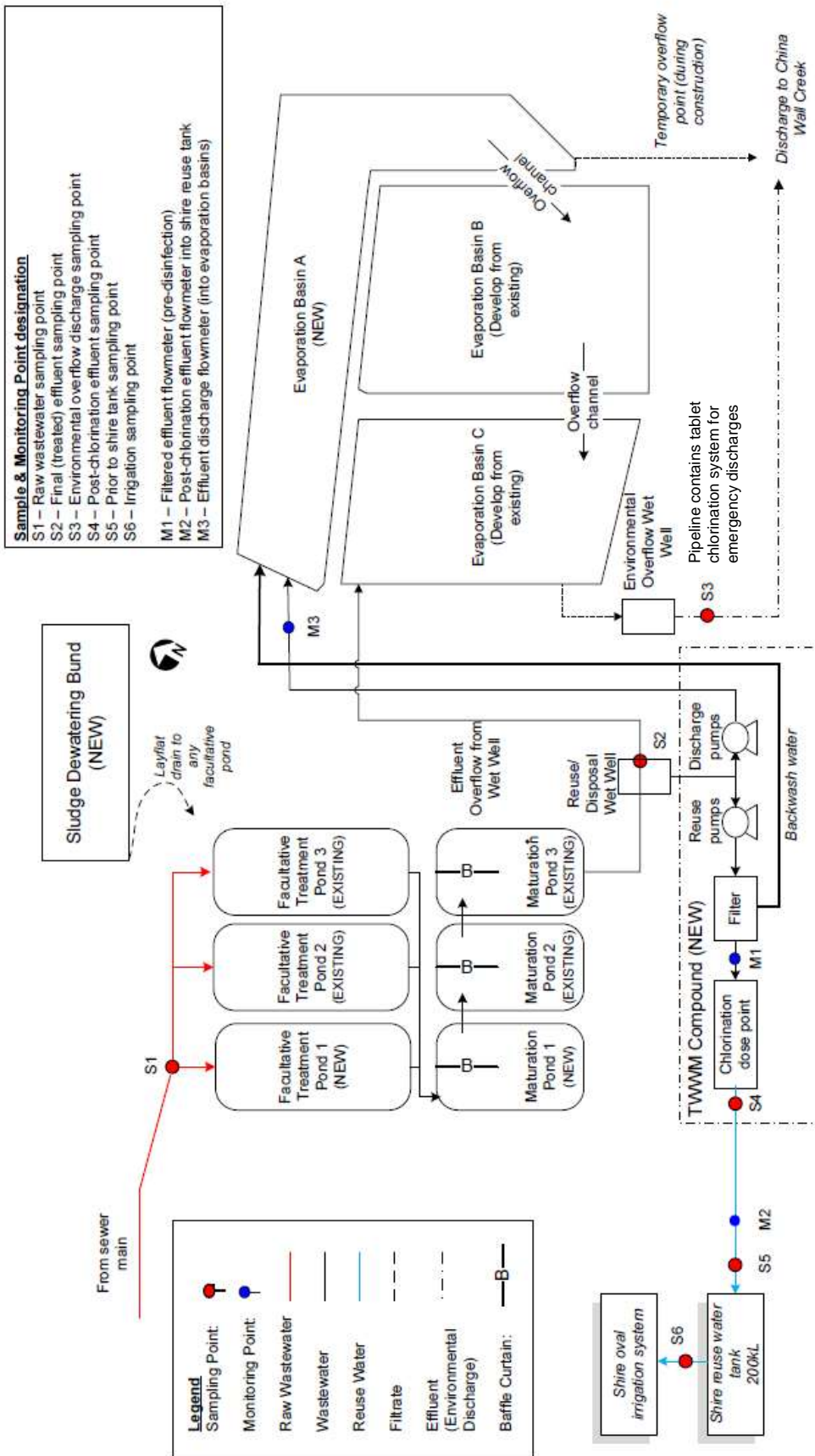


Figure 2: Halls Creek Wastewater Treatment Plant process control schematic

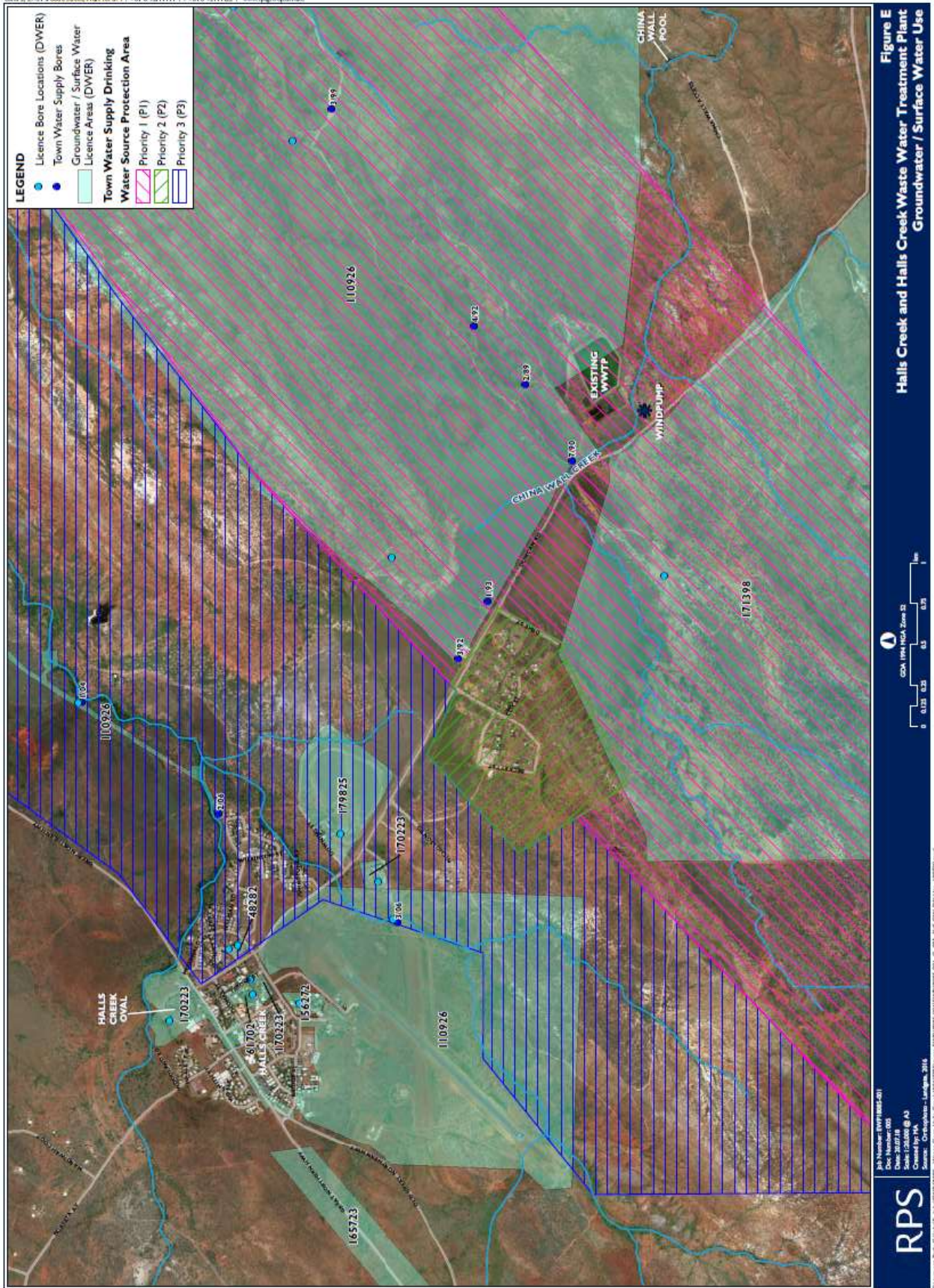


Figure 3: Halls Creek WWTP and Town Oval with Public Drinking Water Source Protection Areas

3. Legislative context

3.1 Country Areas Water Supply Act 1947

Internal advice from DWER Landuse/Water Planning is as follows:

In regards to the treatment pond upgrades, historical recommendations from DWER have been to relocate the WWTP outside of the Priority 1 Public Drinking Water Source Protection Area. In the absence of relocation, upgrades to the facility are supported to further reduce the contamination risk. Upgrading to bituminous liners will reduce risk of waste water seepage to groundwater and potential town water supply contamination issues. Increasing the number of treatment and evaporation ponds, and adding the waste water reuse scheme, will reduce overflow events and therefore reduce water quality impacts to China Wall Creek. It is recommended that best practice management and adherence to the relevant water quality protection notes is undertaken during construction works.

The Proposed Halls Creek Effluent Reuse Scheme Irrigation Management Plan and Preliminary Nutrient Risk Assessment (July 2017) (Preliminary IMP) has used Water Quality Protection Note 22 Irrigation with nutrient-rich wastewater (WQPN 22) assign the reuse scheme as Risk Category D. The Preliminary IMP states that although the phosphorus buffering index (PBI) is not greater than 100 (as required by risk category D in WQPN 22), the maximum reactive phosphorus rate of 120kg/ha/annum will still be assumed to be the upper threshold. Given the soil analysis indicates a PBI of 32 the use of the maximum reactive phosphorus rate of 120kg/ha/annum as the upper threshold may need further justification.

There is an ephemeral water course approximately 100 m to the north and east (surface water within 500 m as per risk assessment process in WQPN 22) of the site. As per WQPN 22, the eutrophication risk may also need to be considered in determining the thresholds.

The Preliminary IMP lists bore logs and monitoring data for the Halls Creek Town Water Supply Borefield, as the most relevant reference to establish depth to groundwater at the town oval (estimated at 8 to 13 mbgl). The region advises that these bores may subject to drawdown effects and thus may not represent natural conditions or levels at Town Oval.

The Shire of Halls Creek has licensed water supply bores (GWL170223) at Town Oval, which could supply site specific groundwater information.

To limit water-logging, maintain aerobic soils and foster contaminant control via soil filtration and microbial action, a minimum two metre vertical separation should be maintained between the irrigated surface and the end of the wet-season water table.

The Preliminary IMP should include further detail on monitoring parameters, locations and timeframes. Further details on best management practices and monitoring can be found in WQPN 33 Nutrient and irrigation management plans.

The Works Approval risk assessment (Table 24) indicates water is taken from a bore near town oval to supply the town pool. It is stated in Table 24 that the Shire will monitor this bore, however Water Corporation has suggested that alternative sources (e.g. town water supply) could be used to mitigate risk. Water Corporation should ensure adequate consultation is undertaken with the Shire regarding this risk, to ensure the practicality of using alternative sources for pool supply is well understood, including water licensing requirements, cost of paying for treated drinking water, extra demand on town drinking water supply and accessing/drilling an alternative bore.

3.2 Part V of the EP Act

Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015)*
- *Guidance Statement: Setting Conditions (October 2015)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Publication of Annual Audit Compliance Reports (May 2016)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

Environmental Protection (Clearing of Native Vegetation) Regulations 2004

The Works require the clearing of 32ha of native vegetation. The Applicant has contracted an external botanist to conduct an assessment of the proposed clearing, whereby the determination is that the clearing is unlikely to be at variance to the 10 clearing principals. As such, clearing will be authorised via the Statewide Purpose Permit CPS185/8 granted on 20 April 2008 and expiring on 20 April 2022.

4. Consultation

The application was advertised in the West Australian on 17 December 2018 for a comment period ending on 7 January 2019. No submissions were received.

A letter inviting comment was sent to the Shire of Halls Creek on 11 December 2018. The Shire did not make comment on the proposal.

A letter inviting comment was sent to the Jaru and Kija Aboriginal traditional owners via the Kimberley Land Council on 11 December 2018. The Kimberley Land Council, on behalf of the Jaru and Kija Aboriginal traditional owners, did not make comment on the proposal.

A letter inviting comment on the reuse scheme was sent to the Department of Health on 11 December 2018. DWER received the following advice on 30 January 2019:

The Department of Health has no objections with the proposal subject to:

1. Daily inflow and effluent volumes at the Halls Creek Wastewater Treatment Plant (WWTP) being measured.
2. Treatment capacity of the ponds being in compliance with the Mara method for demonstration of adequate retention times for pathogen removal.
3. Irrigation of the Halls Creek oval based on a Nutrient Irrigation Management Plan and land capability assessment.
4. Approval to irrigate the Halls Creek oval with recycled water after completion of the WWTP upgrades is subject to the submission to the Department of Health of the following documentation:
 - a. Recycled Water Quality Management Plan for the reuse of the treated effluent to the Halls Creek Oval.
 - b. Validation and Verification sampling report.
 - c. Signed Recycled Water Supply Agreement (RWSA) between the Water Corporation and the Shire of Halls Creek.

DWER referred the draft Works Approval and Decision Report to the Applicant on 12 April 2019. The Applicant submitted comments on 13 May 2019 and 21 May 2019, as detailed in Appendix 2.

5. Location and siting

5.1 Siting context

The Premises is located at Lot 3001 on Plan 53871, Crown Reserve 40202 within the Shire of Halls Creek.

5.2 Residential and sensitive Premises

The distances to residential receptors are detailed in Table 6.

Table 6: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential Premises	Living area located 1.1km west of the Prescribed Premises boundary; Town of Halls Creek located 1.2km north-west of the Prescribed Premises boundary; Living area located 1.5km south of the Prescribed Premises boundary;

5.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 7.

The table has also been modified to align with the *Guidance Statement: Environmental Siting*.

Table 7: Environmental values

Specified ecosystems	Distance from the Premises
Threatened or Priority Flora	The following Migratory birds protected under an international agreement have been previously identified within the Premises boundary: <ul style="list-style-type: none">• Calidris ferruginea (curlew sandpiper) (also classified as Vulnerable)• Tringa glareola (wood sandpiper)• Tringa stagnatilis• Calidris acuminata (sharp-tailed sandpiper)• Chlidonias leucopterus (white-winged black tern) Priority 4 Erythrura gouldiae (Gouldian finch) previously located 1.5km east of the Premises boundary at China Wall Creek.

5.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 8.

Table 8: Groundwater and water sources

Groundwater and water sources	Distance from Premises
Public drinking water source areas	The Premises is located within the Priority 1 Public Drinking Water Source Protection Area.
Public drinking water wellhead protection zone	The Premises is located within the wellhead protection zone for production bores 7/90, 2/80, 1/84, 3/85 and 4/92.
Major watercourses/waterbodies	China Wall Creek surrounds the Premises to the south and west, and passes inside the Premises boundary on the south-western side. China Wall Pool is located approx. 30m to the south of the Premises
Groundwater – Canning Kimberley Groundwater Area	Groundwater was measured at the Premises in October 2018 at a depth of between 31.7m and 38.4m. Water Corporation production bores are located to the north of the Premises, as close as 170-380m to the Premises boundary. Groundwater directional flow was found to be in a north-westerly direction, from the Prescribed Premises and towards the production bores.

5.5 Meteorology

Wind direction and strength

The closest weather station for wind frequency data is Halls Creek site 002021. Prevailing winds are to the east and north east in the mornings, and to the west and south west in the afternoons (Figure 4).

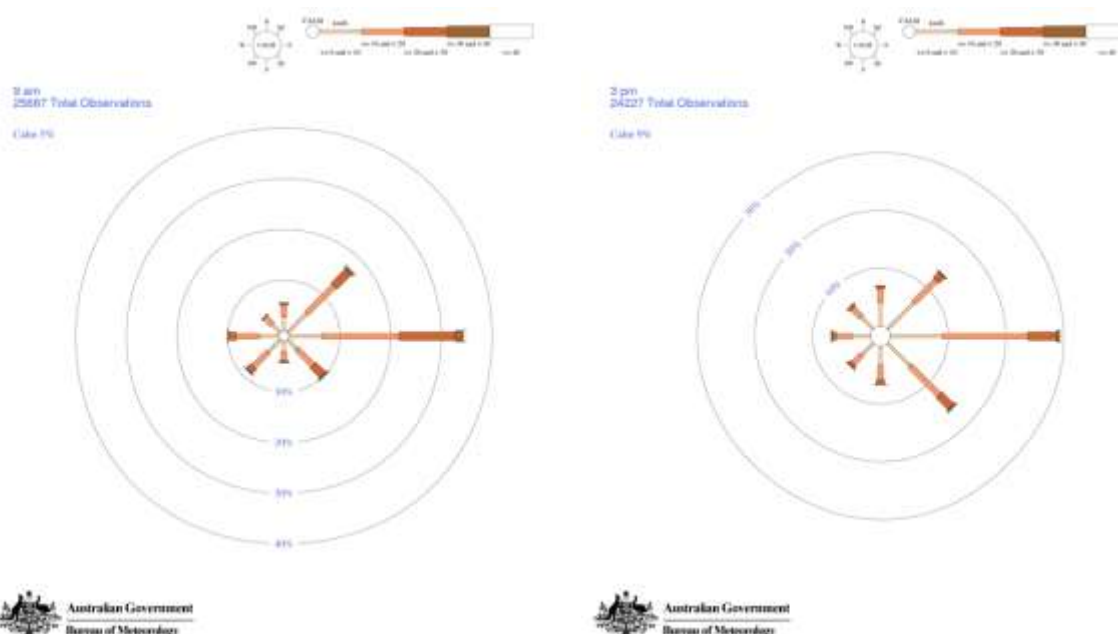


Figure 4: Annual wind rose for 9am and 3pm at Halls Creek site 002021.

Rainfall and temperature

The closest weather station for rainfall data is Halls Creek site 002012. Maximum average rainfall is received in January and February annually. Minimum average rainfall is received June to September annually (Figure 5).

Highest average temperatures are experienced October to January annually. Lowest average temperatures are experienced June and July (Figure 5).

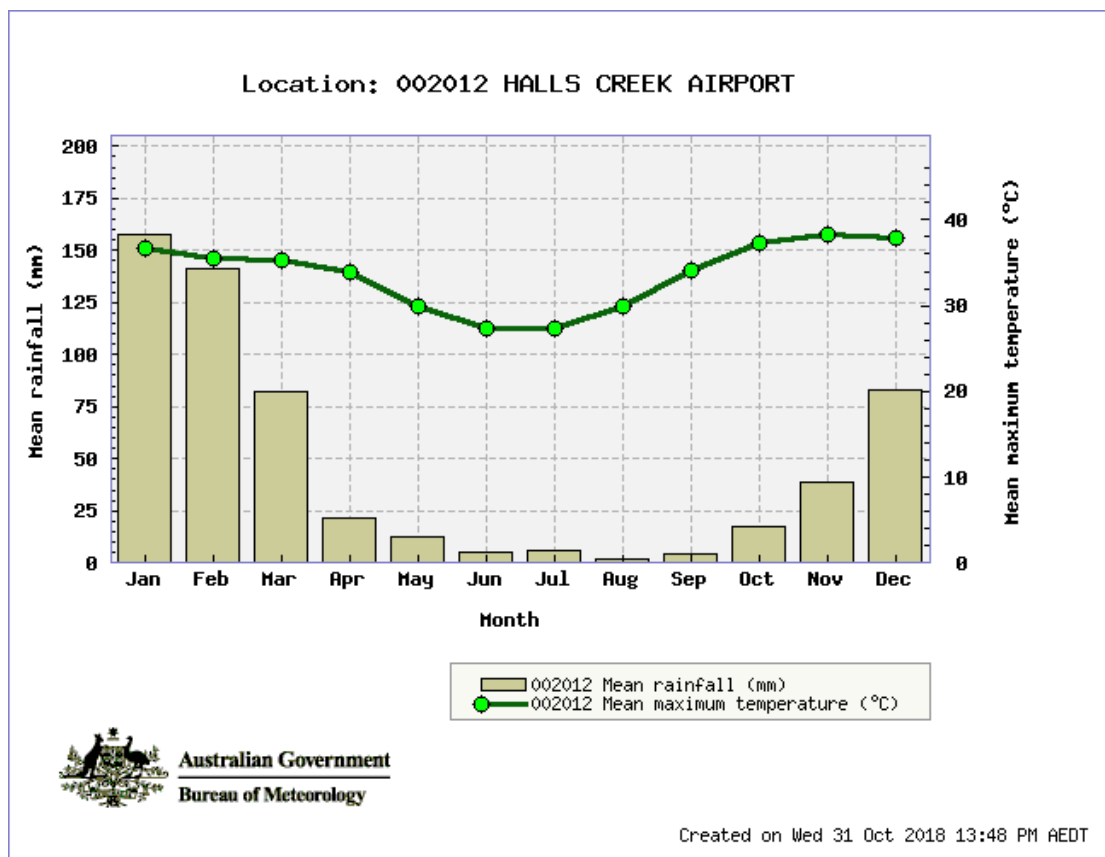


Figure 5: Average annual rainfall (mm) and temperature (°C) at Halls Creek site 002012.

Source: Bureau of Meteorology website www.bom.wa.gov.au

6. Risk assessment

6.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 9.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 9 and 10 below.

Table 9. Identification of emissions, pathway and receptors during construction

Risk Events					Reasoning	Continue to detailed risk assessment	
Sources/Activities	Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts			
Construction, mobilisation and positioning of infrastructure	Vehicle movements on unsealed access roads	Noise	Air / wind dispersion	Living area located 1.1km west of the Prescribed Premises boundary	Amenity impacts	The Delegated Officer considers a separation distance of 1.1km sufficient to ensure noise emissions will not significantly impact upon amenity. If any noise impacts arise, management under the Noise Regulations will be adequate. No further risk assessment is required.	No
	Modification of existing ponds and construction of new ponds and infrastructure	Dust			Amenity impacts	The Delegated Officer considers a separation distance of 1.1km sufficient to ensure dust emissions will not significantly impact upon amenity. No further risk assessment is required.	No
	Modification of existing ponds and construction of new ponds and infrastructure	Spills of untreated and treated wastewater	Overland flow Subsurface leaching	Surface water within China Wall Creek Groundwater sources within the P1 PDWSA	Surface water and Groundwater contamination	<p>Modification of the existing ponds poses a level of risk of spills outside the containment system. Construction will be staged whereby the new, lined ponds are constructed first, the system diverted to utilise the new ponds and finally the existing ponds are taken off-line, modified and lined.</p> <p>The Delegated Officer considers the staged approach for construction will minimise any risk of spills occurring. No further risk assessment is required.</p> <p>To ensure construction occurs via the proposed staged approach, thereby ensuring the risk is minimised, the Delegated Officer shall apply the Applicant's construction commitments as conditions on the works approval.</p>	No

Risk Events					Reasoning	Continue to detailed risk assessment
Sources/Activities	Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts		
	Spills of hydrocarbons from vehicles and equipment	Direct discharge to land and surface waters	Vegetation adjacent to Premises Surface water within China Wall Creek	Soil contamination inhibiting vegetation survival and growth Surface water contamination	<p>A temporary pumping station will be utilised during construction to pump treated wastewater from the final treatment pond into Evaporation Basin A, during modification works to the existing evaporation basin. A permanent generator will be installed to provide emergency power supply for pumps for the Reuse Scheme, for when solar power is insufficient. The fuel storage for both facilities will be contained within two self-bunded fuel tanks which meets Australian Standard AS1692.</p> <p>If vehicle refuelling is required, it will only occur over a lined, hardstand pad designed to contain any potential spills, with spill response kits available.</p> <p>The Delegated Officer considers a self-bunded fuel tank that meets AS1692 and a lined hardstand pad will adequately contain potential fuel spills to minimise the potential for direct discharge to land and surface waters. No further risk assessment is required.</p>	No

Table 10: Identification of emissions, pathway and receptors during operation

Risk Events					Reasoning	Continue to detailed risk assessment	
Sources/Activities	Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts			
Waste Water Treatment Plant	Treatment of sewage	Odour	Air / wind dispersion	Living area located 1.1km west of the Prescribed Premises boundary	Amenity impacts	Proposed works will not increase the currently Licensed throughput of 800m ³ /day, therefore the proposed works will not increase odour emissions beyond what the Premises currently emits. The Delegated Officer considers a separation distance of 1.1km sufficient to ensure odour emissions will not significantly impact upon amenity. No further risk assessment is required.	No
		Seepage of untreated sewage and treated wastewater from ponds	Overland flow Subsurface seepage	Vegetation adjacent to Premises Surface water within China Wall Creek Groundwater sources within the P1 PDWSA	Soil contamination inhibiting vegetation survival and growth Surface water and Groundwater contamination	See section 6.4	Yes
		Overtopping of ponds with treated and untreated wastewater	Direct discharge to land and surface waters Emergency Discharges to China Wall Creek	Vegetation adjacent to Premises Surface water within China Wall Creek	Soil contamination inhibiting vegetation survival and growth Surface water contamination	See section 6.5	Yes

Risk Events					Reasoning	Continue to detailed risk assessment	
Sources/Activities	Potential emissions	Potential pathway	Potential receptors	Potential adverse impacts			
		Contamination of stormwater	Direct contact during rainfall events	Vegetation adjacent to Premises Surface water within China Wall Creek	Soil contamination inhibiting vegetation survival and growth Surface water contamination	<p>A drainage channel will be constructed around the WWTP to direct stormwater away from ponds and prevent contamination. The WWTP will be designed to accommodate flood events up to the 1 in 10 (10%) Annual Exceedance Probability (AEP), all treatment ponds will have raised embankments to maintain 500mm freeboard level, and the holding capacity of the evaporation ponds will be increased by dividing the existing evaporation pond into two ponds of surface area 5.28ha and 1.82ha, and construction of a third 3.8ha evaporation pond, thereby reducing the likelihood of overtopping of ponds.</p> <p>To ensure construction occurs as specified, the Delegated Officer shall apply the Applicant's construction commitments as conditions on the works approval.</p>	No
	Onsite operational equipment	Spills of hydrocarbons from equipment	Direct discharge to land and surface waters	Vegetation adjacent to Premises Surface water within China Wall Creek	Soil contamination inhibiting vegetation survival and growth Surface water contamination	<p>A permanent generator will be installed to provide emergency power supply for pumps for the Reuse Scheme, for when solar power is insufficient. The fuel storage facility will be contained within self-bunded fuel tanks which meets Australian Standard AS1692. Vehicle refuelling is not required during operation of the WWTP.</p> <p>The Delegated Officer considers a self-bunded fuel tank that meets AS1692 will adequately contain potential fuel spills to minimise the potential for direct discharge to land and surface waters. No further risk assessment is required.</p>	No
Town Oval Reuse Scheme	Irrigation of treated wastewater	Release of pathogens	Direct contact and ingestion of irrigation mist	Humans	Public health impacts including gastroenteritis and other diseases	See section 6.6	Yes
		Nitrogen and Phosphorus	Overland flow Subsurface seepage	Vegetation at Town Oval Groundwater sources outside the PDWSA	Change in soil chemistry Inundation of the root zone Mounding of groundwater	See section 6.7	Yes

6.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 11 below.

Table 11: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 12 below.

Table 12: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
		Environment	Public health* and amenity (such as air and water quality, noise, and odour)	
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> • onsite impacts: catastrophic • offsite impacts local scale: high level or above • offsite impacts wider scale: mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance[^] • Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> • Loss of life • Adverse health effects: high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> • onsite impacts: high level • offsite impacts local scale: mid-level • offsite impacts wider scale: low level • Short-term impact to an area of high conservation value or special significance[^] • Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> • Adverse health effects: mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> • onsite impacts: mid-level • offsite impacts local scale: low level • offsite impacts wider scale: minimal • Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> • Adverse health effects: low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> • onsite impacts: low level • offsite impacts local scale: minimal • offsite impacts wider scale: not detectable • Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> • Specific Consequence Criteria (for public health) are likely to be met • Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> • onsite impact: minimal • Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> • Local scale: minimal to amenity • Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

“onsite” means within the Prescribed Premises boundary.

6.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 13 below:

Table 13: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

6.4 Risk Assessment – Seepage from ponds of untreated sewage and treated wastewater

Description of the risk event for seepage

The untreated sewage from the town of Halls Creek is received at the WWTP for treatment. During treatment (source) seepage of untreated sewage and treated wastewater from ponds (emission) have the potential to be discharged via overland flow and subsurface seepage (pathway) into vegetation adjacent to the Premises, surface waters within China Wall Creek, and into groundwater sources within the P1 PDWSA (receptors) leading to potential soil, surface water and groundwater contamination (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- ANZECC & ARMCANZ (2000) – freshwater and marine waters criteria;
- ANZECC & ARMCANZ (2000) – potable water criteria and

Applicant controls

The Halls Creek WWTP was originally constructed in 1982 and expanded in 1998 with the construction of one Evaporation Pond. To date no information has been submitted to quantify the existing liner permeability of the ponds, therefore assurance cannot be given that seepage from the ponds of untreated and treated wastewater is not contaminating the Priority 1 PDWSA. The Applicant has investigated the potential to relocate the WWTP outside the PDWSA, however a number of factors prevent this occurring. The decision has been made to retain the current location of the WWTP and upgrade the facilities.

Proposed works include relining all existing ponds and new ponds with a Bituminous Geomembrane liner with a permeability of $\leq 1 \times 10^{-9}$ m/sec. The Geobag staging bund will be

constructed under this Works Approval, however in accordance with existing Licence L6268/1991/10 condition 1.3.4 will be lined to achieve hydraulic permeability of $\leq 1 \times 10^{-9}$ m/sec prior to desludging activities occurring.

Key findings

The Delegated Officer has reviewed the information regarding seepage of untreated sewage and treated wastewater from ponds, and has found:

1. Relining the existing ponds and new ponds with a Bituminous Geomembrane liner that has a permeability of $\leq 1 \times 10^{-9}$ m/sec is sufficient to contain untreated sewage and treated wastewater within the ponds.
2. Proposed pond construction works will be subject to Construction Quality Assurance processes which will ensure a high degree of certainty as to the adequacy of construction.
3. The location of the WWTP within a P1 PDWSA is an unusual and significant factor in relation to the protection of public drinking water in the area.

Consequence

If seepage of untreated sewage and treated wastewater from ponds occurs, the Delegated Officer has determined that the impact of contamination of soil, surface water and groundwater has the potential to have high level on-site impacts, mid level off-site impacts at a local scale and low level off-site impacts at a wider scale. Therefore, the Delegated Officer considers the consequence of the impact of seepage of untreated sewage and treated wastewater from ponds to be **Major**.

Likelihood

The Delegated Officer has determined that, with the use of a Bituminous Geomembrane liner that has a permeability of $\leq 1 \times 10^{-9}$ m/sec, the likelihood of seepage of untreated sewage and treated wastewater from ponds will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of seepage of untreated sewage and treated wastewater from ponds to be **Unlikely**.

Overall risk rating of seepage from ponds

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk seepage of untreated sewage and treated wastewater from ponds is **Medium**.

6.5 Risk Assessment – Overtopping of ponds with untreated and treated wastewater

Description of the risk event for overtopping

The untreated sewage from the town of Halls Creek is received at the WWTP for treatment. During the treatment of sewage (source) overtopping of ponds of untreated and treated wastewater (emission) via direct discharge to land and surface waters and emergency discharge to China Wall Creek (pathway) may lead to vegetation adjacent to the Premises and surface waters within China Wall Creek (receptor) suffering from soil and surface water contamination (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;
- ANZECC & ARMCANZ (2000) – freshwater and marine waters criteria; and

Applicant controls

Water balance modelling has considered averaged inflow of wastewater and rainfall data compared to evaporation data, Reuse Scheme irrigation data and infiltration rates for the liner, to determine proposed reconstruction works for the WWTP as follows:

- designed to ensure 5 emergency overflow events in a 50 year model period;
- designed to accommodate flood events up to the 1 in 10 (10%) Annual Exceedance Probability (AEP);
- will include three facultative ponds, three maturation ponds and three evaporation ponds which will increase hydraulic retention of the system to 25 days;
- all treatment and evaporation ponds will have raised embankments to maintain 500mm freeboard level between the top of water level and the top of embankment;
- the holding capacity of the evaporation ponds will be increased by dividing the existing evaporation pond into two ponds of surface area 5.28ha and 1.82ha, and construction of a third 3.8ha evaporation pond;
- emergency overflow events will be controlled to divert all discharges to China Wall Creek to prevent overtopping and preserve infrastructure viability; and
- emergency overflow discharges to China Wall Creek will be chlorinated via tablets permanently installed within the pipeline, to be manually inspected and tablets replaced as necessary, to manage pathogen levels.

Key findings

The Delegated Officer has reviewed the information regarding overtopping of ponds with untreated and treated wastewater and has found:

1. Design parameters and proposed construction works will ensure a reduced incidence of overtopping of ponds and emergency overflow events to China Wall Creek.
2. Ensuring the hydraulic retention of the system is 25 days will provide further treatment time to reduce N and P concentrations in treated wastewater.
3. Tablet chlorine dosing of emergency discharges to China Wall Creek will reduce surface water and soil contamination by E.coli during emergency overflow events

Consequence

If overtopping of ponds with untreated and treated wastewater occurs, the Delegated Officer has determined that the impact of soil and surface water contamination has the potential to have mid level on-site impacts, low level off-site impacts at a local scale and minimal off-site impacts at a wider scale. Therefore, the Delegated Officer considers the consequence of overtopping of ponds with untreated and treated wastewater to be **Moderate**.

Likelihood

The Delegated Officer has determined that, with the design parameters, hydraulic retention period and tablet chlorine dosing, the likelihood of overtopping of ponds with untreated and treated wastewater could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Possible**.

Overall risk rating of overtopping ponds

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of overtopping of ponds with untreated and treated wastewater is **Medium**.

6.6 Risk Assessment - Pathogens

Description of the risk event for pathogens

The untreated sewage from the town of Halls Creek is received at the WWTP for treatment, following which up to 200kL per day may be piped 4.5km north to Town Oval for irrigation via the Reuse Scheme. The WWTP is designed to divert emergency discharges to China Wall Creek to prevent overtopping of ponds and damage to plant infrastructure.

During irrigation and emergency discharge events (source) the release of pathogens (emission) by direct contact and ingestion of irrigation mist (pathway) may lead to humans (receptors) suffering public health concerns including gastroenteritis and other diseases (adverse impact).

Criteria for assessment

Relevant land and surface water quality criteria include:

- Department of Water (2008) Water Quality Protection Note 22 Irrigation with nutrient-rich wastewater
- Department of Health (2011) Guidelines for the non-potable uses of recycled water in Western Australia.
- ANZECC & ARMCANZ (2000) – heavy metals criteria for irrigation use
- Department of Environment Regulation (2014) Assessment and management of contaminated sites: Contaminated sites guidelines

Applicant controls

Treated wastewater sent through the Reuse Scheme to Town Oval for irrigation will be gas chlorinated prior to release from the WWTP to manage pathogen levels. In addition Reuse Scheme water from the Main and Tank can be drained and disposed of back to the WWTP should the water be found insufficiently chlorinated for pathogen management.

A preliminary Recycled Water Quality Management Plan has been prepared by the Applicant and the Shire of Halls Creek and is awaiting approval by the Department of Health.

The Department of Health regulates public health impacts from the wastewater reuse scheme. The Applicant has obtained Department of Health approval for the reuse scheme.

Key findings

The Delegated Officer has reviewed the information regarding release of pathogens and has found:

1. The ability to chlorinate, drain and return Reuse Scheme irrigation water back to the WWTP for re-treatment will help ensure sufficient management of pathogenic contaminants.
2. A final Recycled Water Quality Management Plan is needed to determine the adequacy of management of pathogens during operation of the Reuse Scheme, however this does not impact construction.
3. The Department of Health approval is appropriate for the regulation of public health impacts associated with the Reuse Scheme.

Consequence

The Delegated Officer has determined that impacts from pathogens could result in a risk of specific consequence criteria for public health being exceeded and health effects requiring low-level or occasional medical treatment. Therefore, the Delegated Officer considers the consequence of the release of pathogens to be **Moderate**.

Likelihood

The Delegated Officer has determined that, with the proposed chlorination methods, the likelihood of impacts from pathogens occurring will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Unlikely**.

Overall risk rating for release of pathogens

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of the release of pathogens is **Medium**.

6.7 Risk Assessment – Nitrogen and phosphorus release

Description of the risk event for nitrogen and phosphorus release

The untreated sewage from the town of Halls Creek is received at the WWTP for treatment, following which up to 200kL per day may be piped 4.5km north to Town Oval for irrigation. During irrigation (source) the release of Nitrogen and Phosphorus (emission) by overland flow and subsurface seepage (pathway) may lead to vegetation adjacent to the Premises and groundwater sources (receptors) suffering from a change in soil chemistry, inundation of the root zone and mounding of groundwater in the local area (adverse impact).

Criteria for assessment

Relevant land quality criteria include:

- Department of Water and Environmental Regulation (2008) Water Quality Protection Note 22 Irrigation with nutrient-rich wastewater
- Department of Water (2010) Water Quality Protection Note 33 Nutrient and irrigation management plans

Applicant controls

The Applicant has ensured the location of the Reuse Scheme is outside the P1 PDWSA.

Proposed construction works at the WWTP include three facultative ponds, three maturation ponds and three evaporation ponds to increase hydraulic retention to 25 days.

The Applicant has prepared a Preliminary Irrigation Management Plan for the reuse scheme to irrigate the 2.1ha Town Oval. Whilst the current WWTP output rates meet WQPN22 Risk Category C and although the upgrade works will improve the system, the applicant has determined application rates will meet the requirement of the receiving soils, therefore will meet application rates for Risk Category D.

Table 8 WQPN 22 limit vs recycled water quality

Risk Category	WQPN Inorganic Nitrogen (as N) Limit	WQPN Filterable Reactive Phosphorous (as P) Limit mg/L	Average WWTP TWW Inorganic Nitrogen (as N) mg/L	Average WWTP TWW Filterable Reactive Phosphorous (as P) mg/L
D	30 mg/L (480kg/ha/year)	7.5 mg/L (120/kg/hectare/year)	8.5 mg/L (150kg/ha/year)	2.26 mg/L (27kg/ha/year)

Key findings

The Delegated Officer has reviewed the information regarding nitrogen and phosphorus release and has found:

1. The location of Town Oval is outside the P1 PDWSA
2. Ensuring the retention time of the system is a minimum of 25 days will provide further treatment to reduce nutrient concentrations in treated wastewater.
3. Internal DWER advice on the reuse scheme indicated that various aspects of the Preliminary IMP require revision prior to operation of the reuse scheme, however this does not impact construction and can be managed prior to commissioning.

Consequence

If impacts from nutrient loading occurs, the Delegated Officer has determined that the impact of a change in soil chemistry, inundation of the root zone and mounding of groundwater in the local area will cause low level on-site impacts and minimal off-site impacts. Therefore, the Delegated Officer considers the consequence of nitrogen and phosphorus release to be **Minor**.

Likelihood

The Delegated Officer has determined that the likelihood of impacts from nutrient loading could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Possible**.

Overall risk rating of nitrogen and phosphorus release

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of nutrient loading is **Medium**.

6.8 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 14 below. Controls are described further in section 7.

Table 14: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Potential Emissions	Receptor & Pathway	Potential adverse impacts			
1.	Seepage of untreated sewage and treated wastewater from ponds	Vegetation adjacent to Premises, Surface water within China Wall Creek, Groundwater sources within the P1 PDWSA Via overland flow & Subsurface seepage	Soil contamination inhibiting vegetation survival and growth Surface water and Groundwater contamination	<ul style="list-style-type: none"> Relining the existing ponds, new ponds and sludge drying bed with a Bituminous Geomembrane liner with a permeability $\leq 1 \times 10^{-9}$ m/sec 	Major consequence Unlikely likelihood Medium Risk	Acceptable, generally subject to regulatory controls
2.	Overtopping of ponds with treated and untreated wastewater	Vegetation adjacent to Premises & Surface water within China Wall Creek Via direct discharge to land & surface waters	Soil contamination inhibiting vegetation survival and growth Surface water contamination	<ul style="list-style-type: none"> Designed to ensure 5 emergency overflow events in a 50 year model period; Designed to accommodate flood events up to the 1 in 10 (10%) Annual Exceedance Probability (AEP); Works will increase hydraulic retention of the system to 25 days; All ponds will have raised embankments to maintain 500mm freeboard level; The holding capacity of the evaporation ponds will be increased; and Tablet chlorine dosing for emergency overflow discharge to China Wall Creek. 	Moderate consequence Possible likelihood Medium Risk	Acceptable, generally subject to regulatory controls

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Potential Emissions	Receptor & Pathway	Potential adverse impacts			
3.	Release of pathogens	Humans Via direct contact and ingestion of irrigation mist	Public health impacts including gastroenteritis and other diseases	<ul style="list-style-type: none"> Gas chlorination prior to release water to be returned to WWTP for re-treatment if required. Tablet chlorine dosing for emergency overflow discharge to China Wall Creek. The Department of Health approval obtained 	Major consequence Unlikely likelihood Medium Risk	Acceptable, generally subject to regulatory controls
4.	Nitrogen and Phosphorus	Vegetation at Town Oval & Groundwater sources outside the PDWSA Via overland flow & subsurface seepage	Change in soil chemistry Inundation of the root zone Mounding of groundwater	<ul style="list-style-type: none"> Preliminary Irrigation Management Plan prepared for the reuse scheme to irrigate at Town Oval. Proposed works will increase hydraulic retention to 25 days. The Delegated Officer notes the location of Town Oval is outside the P1 PDWSA, therefore irrigation is not a risk to protected groundwater sources. 	Minor consequence Possible likelihood Medium Risk	Acceptable, generally subject to regulatory controls

7. Regulatory controls

7.1 Works Approval controls

- Condition 1 allows construction of the infrastructure as per Table 2 in the Works Approval.
- Condition 2 allows for minor deviations from the proposed construction.
- Condition 3 requires a compliance document to be submitted to the CEO, to confirm all infrastructure has been constructed as required.
- Condition 4 relates to authorised emissions from the proposed works.
- Conditions 5 to 9 relate to staged commissioning of the WWTP and includes notification of commencement of commissioning, commissioning periods per stage, commissioning monitoring and submission of commissioning reports.
- Condition 10 requires the submission of further documentation prior to requesting to operate the Reuse Scheme.
- Conditions 11 and 12 require accurate record keeping and outlines that a Works Approval Holder must comply with a Department Request within 14 days.

8. Determination of Works Approval conditions

The conditions in the issued Works Approval in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*.

Table 15 provides a summary of the conditions to be applied to this Works Approval.

Table 15: Summary of conditions to be applied

Condition Ref	Grounds
Infrastructure and Equipment 1 – 4	These conditions are valid, risk-based and contain appropriate controls.
Authorised Emissions 5	This condition is valid, risk-based and consistent with the EP Act.
Commissioning 6 – 11	These conditions are valid, risk-based and consistent with the EP Act.
Further information 12	These conditions are valid, risk-based and consistent with the EP Act.
Record keeping 13 - 14	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the licence under the EP Act.

9. Applicant's comments

The Applicant was provided with the draft Decision Report and draft Works Approval on 12 April 2019. The Applicant provided comments which are summarised, along with DWER's response, in Appendix 2.

10. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

Based on this assessment, it has been determined that the Works Approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Steve Checker

MANAGER WASTE INDUSTRIES

REGULATORY SERVICES

Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Licence L6268/1991/10 – Halls Creek Wastewater Treatment Plant	L6268/1991/10	accessed at www.der.wa.gov.au
2.	DER, July 2015. <i>Guidance Statement: Regulatory principles.</i> Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
3.	DER, October 2015. <i>Guidance Statement: Setting conditions.</i> Department of Environment Regulation, Perth.	DER 2015b	
4.	DER, August 2016. <i>Guidance Statement: Licence duration.</i> Department of Environment Regulation, Perth.	DER 2016a	
5.	DER, November 2016. <i>Guidance Statement: Risk Assessments.</i> Department of Environment Regulation, Perth.	DER 2016b	
6.	DER, November 2016. <i>Guidance Statement: Decision Making.</i> Department of Environment Regulation, Perth.	DER 2016c	

Appendix 2: Summary of Applicant's comments on risk assessment and draft conditions

Condition	Summary of Applicant's comment	DWER response
Works Approval Expiry	Works Approval should have a valid period of 5 years from date of issue.	The Draft Works Approval did not contain a validity period. The Delegated Officer considers 5 years an appropriate validity period and will apply to the granted Works Approval.
Condition 1 Table 2 Decision Report Table 5 Geobag staging bund	Table 2, item 8 reads as if the Geobag staging bund is permanently lined. It is not. The bund will be lined only when we need to desludge.	The Delegated Officer is satisfied the requirement to line the Geobag staging bund with a bituminous Geomembrane liner, or suitable alternative, that achieves a hydraulic permeability of $\leq 1 \times 10^{-9}$ m/sec, immediately prior to the operation of the Geobag staging bund, is adequately managed under existing Licence L6268/1991/10 Condition 1.3.4. The Delegated Officer will remove reference to the liner from the Works Approval, and shall ensure this condition is applied to the Licence when it is amended after completion of the works approved under this Works Approval.
Condition 2 The Works Approval Holder must not undertake any infrastructure Works from the 01 December to 31 March annually	Other infrastructure works may occur during the wet season but not during lining. The Water Corporation will monitor weather conditions on site during all works and will adjust works based on onsite weather conditions.	<p>The decision to place a restriction on construction during the wet season was initially to minimise the risk of spills of untreated and treated wastewater, in conjunction with the staged approach to construction. The Applicant advised in supporting documentation that construction would not occur during the wet season.</p> <p>The Delegated Officer has reconsidered the importance of restricting construction during the wet season, and determined that the staged approach to construction sufficiently manages the risk of spills of untreated and treated wastewater without the need to restrict construction activities during the wet season.</p> <p>Condition 2 and reference to the wet season in the Decision Document shall be removed.</p> <p>The Delegated Officer considers the Applicant will reasonably foresee weather conditions that may affect construction of the liner, and does not consider this requires management by conditions.</p>

Condition	Summary of Applicant's comment	DWER response
Condition 8 (Table 5) Monitoring volumes to reuse scheme	S4 is a sample point, not a monitoring point. The monitoring point that measures flow will be M2.	The Delegated Officer is satisfied the use of M2 is an accurate description of the monitoring point location. Condition 8 Table 5 (now Table 6) will be modified.
Condition 8 (Table 5) Monitoring requirements for reuse scheme and China Wall Creek during commissioning (E.coli, Helminths, Total chlorine)	Discharge to China Wall Creek is not automatically disinfected- it will be manually dosed with insitu chlorine tablets (see Figure 2 of Works Approval).	There has been a misunderstanding regarding the process for chlorination of emergency discharges to China Wall Creek. As clarified by Craig Chaudhry by phone 14/05/19, the chlorination system will not be manual by person, and will not be automated by mechanics. Chlorine tablets will be installed within the pipework as a permanent fixture, and manually inspected and replaced as necessary. Figure 2 of the Works Approval and Decision Report, and all reference to automated chlorine dosing will be modified to accurately reflect this process.
	Discharge to China Wall Creek will also not be occurring over the commissioning period, as it is only during emergency situations	The Delegated Officer is satisfied there will not be discharges to China Wall Creek during commissioning. Condition 8 Table 5 (now Table 6) will be modified to remove reference to China Wall Creek. The Delegated Officer notes monitoring of these parameters during emergency discharges to China Wall Creek may be relevant to include on the subsequent Licence Amendment.
	Duplication of regulation under DoH Approval and <i>DoH Guidelines for the Non-potable Uses of Recycled Water in WA</i> . Request that the monitoring requirements for E.coli, helminths and total chlorine residual for the reuse scheme be removed.	The Delegated Officer notes the Applicant's concern over duplication of regulatory requirements between DWER and Department of Health. The Delegated Officer notes Part V section 49 of the EP Act discusses offences occurring by people who cause or emit an unreasonable emission that unreasonably interfere with, amongst other matters, the health of any person. The Delegated Officer considers the monitoring requirements for public health-based parameters placed on the Works Approval are valid, risk based and consistent with the EP Act, and as such monitoring requirements in Condition 8 Table 5 (now Table 6) will remain.
	The DoH commissioning requirements for total chlorine residual, helminths and E.coli will be monitored at S6 – the outlet of the Shire tank (as this	The Delegated Officer has reassessed the requirement for monitoring during commissioning and determines that, whilst sampling at S2 will depict effluent quality post-treatment, the

Condition	Summary of Applicant's comment	DWER response
	<p>point is representative of the sprinkler heads). To enable total chlorine residual of 0.2-2mg/L at S6, Water Corporation will likely need to provide a total chlorine residual of >2mg/L at S4. As such, request that if these requirements are to remain in (see point 1 above), the SP is amended to S6.</p>	<p>effluent found at sampling point S4 (now M2) will not be representative of the emission being discharged to the environment, therefore to require sampling at S4 would not contribute to a desired environmental outcome. Whilst sampling at S6 would provide more accurate data on the emission discharging to the environment, the Department of Health will regulate the emission to the environment. As such, the Delegated Officer has retained the need in Condition 8 Table 5 (now Table 6) to sample for the listed parameters, modified the sampling location to S6, and removed the Limits for <i>E. coli</i> and Total Chlorine.</p>
	<p>DoH commissioning requirements for total chlorine residual, helminths and E.coli will not be fortnightly- rather 6 samples need to be taken, the frequency of which will be agreed with DoH but may be over a few weeks duration. As such, to avoid unnecessary sampling, request that if these requirements are to remain in (see point 1 above), frequency is changed to 6 samples as per DoH Guideline requirements.</p>	<p>The Delegated Officer considers six samples taken at a frequency to be determined by the Applicant and Department of Health will satisfy the monitoring requirements of DWER. Condition 8 Table 5 (now Table 6) will be modified to remove the frequency requirement, and the averaging period altered to a minimum of 6 spot samples.</p>
<p>Condition 10 The Works Approval Holder shall submit a Commissioning Report to the CEO within one month of the completion of each stage of commissioning as outlined in Table 4.</p>	<p>There are two main components to the reporting – the first component is the construction and installation of the lining. The second component is the testing and commissioning of the process.</p> <p>On past projects we got an independent CQA report which confirms that the lining was installed to the specs and is compliant. This report can easily be sent to DWER within the time frame specified for Stages 1 and 2.</p> <p>This CQA reporting will also be the ONLY thing we can do for the Stages 3 and 4 (evap ponds only)</p> <p>The second component to reporting is the actual proving of the treatment process to confirm that the bugs are doing their job. I see that as a difficult thing to do for Stage 1 and 2 in isolation. Stage 1 train will form a third of the entire treatment system, and we will NOT be able to prove that Stage 1 works by</p>	<p>The Delegated Officer has considered the comments and upon review has determined that Table 4 has incorrectly combined the construction compliance requirements of Condition 4 with the commissioning requirements of Condition 7.</p> <p>The Delegated Officer has modified the Draft Works Approval to:</p> <ol style="list-style-type: none"> 1. create a new Condition 4 Table 3 containing the construction compliance requirements for Stages 1,2 3 and 4 for all nine ponds; and 2. modify Condition 7 Table 4 (now Table 5) to contain Stage 1 Treatment Process Proving with a 3 month commissioning period, and Stage 2 Reuse Scheme with a 6 weeks commissioning period.

Condition	Summary of Applicant's comment	DWER response
	itself. The commissioning testing can only be done at the end of Stages 4 for the Entire treatment train and will confirm that we are getting the nutrient reductions that were designed for.	
Decision Report China Wall Pool is located approximately 30m south of the Premises	China Wall Creek is located approximately 30m south of the premises	The Delegated Officer is satisfied China Wall Creek is the more appropriate name for the potential receptor. The Decision Report will be modified throughout.
Decision Report Section 2.2 Applicant Details Stormwater management infrastructure will be installed, plus the system will be constructed to accommodate a 1 in 10 year flood event	Stormwater management infrastructure will be installed plus the system will be designed to accommodate flood events up to the 1 in 10 (10%) Annual Exceedance Probability (AEP).	The Delegated Officer is satisfied the 1 in 10 (10%) Annual Exceedance Probability (AEP) is the more appropriate design descriptor. The Decision Report will be modified throughout.
Decision Report Section 2.2 Applicant Details The Licence must be amended after each stage of construction commissioning is complete, but prior to operation of the new ponds, and amended prior to the operation of the Reuse Scheme	The Licence must be amended after completion of all 5 stages at the WWTP.	The Delegated Officer believes the intention of this description is correct, however the wording is misleading. The intention is to inform the Applicant that this Works Approval authorises activities necessary for the construction and commissioning (proving) of the WWTP, however approval for ongoing operation of the WWTP and the Reuse Scheme must be obtained by amendment of the Licence. The Decision Report will be modified to clarify the intention.
Decision Report Section 6.5 Risk Assessment – overtopping of ponds with	Tablet Chlorine dosing for emergency discharge to China Wall Creek will reduce surface water and soil contamination by E.coli during emergency overflow events.	See above response to Condition 8 comments. The Delegated Officer considers the alteration to the chlorination process does not alter the Risk Assessment outcome for

Condition	Summary of Applicant's comment	DWER response
<p>untreated and treated wastewater</p> <p>Automated chlorine dosing for emergency discharges to China Wall Creek and Pool will reduce surface water and soil contamination by E.coli during emergency overflow events</p>		<p>emergency discharges to China Wall Creek.</p> <p>Figure 2 of the Works Approval and Decision Report, and all reference to automated chlorine dosing will be modified to accurately reflect this process.</p>
<p>Decision Report</p> <p>Section 6.6 Risk Assessment – Pathogens</p> <p>In addition the Reuse Scheme water can be 'recalled' back to the WWTP via reversal of the pumping infrastructure, should the water be found insufficiently chlorinated for pathogen management</p>	<p>The reuse water isn't recalled back via reversal of pumping infrastructure. Rather, the reuse main and tank can be drained and disposed of back to sewer.</p>	<p>The Delegated Officer considers the alteration to recalling Reuse Scheme water for retreatment does not alter the Risk Assessment outcome for pathogen management. The Decision Report will be modified to accurately reflect this process.</p>
<p>Decision Report</p> <p>Section 6.6 Risk Assessment – Pathogens</p> <ul style="list-style-type: none"> • A Recycled Water Quality Management Plan has not been prepared yet • A Recycled Water Quality Management Plan is needed to determine the 	<p>A preliminary RWQMP has been prepared by Water Corporation and Shire of Halls Creek, and has been submitted to DoH. The RWQMP will be finalised prior to the operation of the scheme</p>	<p>The Delegated Officer considers the final RWQMP necessary to determine the adequacy of management of risk during operation of the Reuse Scheme under the Licence, however this does not impact construction under the Works Approval. The Decision Report will be modified to accurately reflect the updated status of the preliminary RWQMP.</p>

Condition	Summary of Applicant's comment	DWER response
adequacy of management of pathogens during operation of the Reuse Scheme, however this does not impact construction.		

Attachment 1: Issued Works Approval W6180/2018/1
