



Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6930/2024/1
Applicant	South West Irrigation Management Co-Operative Limited
ABN	54 498 176 490
File number	DER2023/000758
Premises	Harvey Dam Legal description – Part lots: Lot 622 on Deposited Plan 31967. Certificate of Title Volume 2532 Folio 383 Lot 637 on Deposited Plan 31967. Certificate of Title Volume 2532 Folio 390 Lot 3004 on Deposited Plan 38418. Certificate of Title Volume 2639 Folio 252 Lot 642 on Deposited Plan 44762. Certificate of Title Volume 2596 Folio 12 As defined by the premises maps attached to the issued works approval
Date of report	27 November 2024
Decision	Works approval granted

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an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and time limited operations of the premises. As a result of this assessment, works approval W6930/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary

On 19 December 2023, the South West Irrigation Management Co-Operative Limited (the applicant) submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application relates to the construction of a pipeline, diffuser and related infrastructure to discharge up to one megalitre a day (ML/day) of treated wastewater from the Lactalis (trading as Harvey Fresh) wastewater treatment plant (operating under Licence L4404/1991/15) to the Harvey Dam (the premises). This decision report includes the assessment of time-limited operations.

The proposed discharge pipeline is designed with a minimum of DN180 pipe, and a single diffuser positioned 1 m beneath the typical baseline water level and approximately 28 m below the water level when at full capacity. The diffuser has been designed to enhance mixing efficiency in the mixing zone. The pipeline route and diffuser location have been chosen to provide separation distance and minimise impacts to high use recreational use areas.

The premises relates to the category and assessed production capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6930/2024/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6930/2024/1.

2.3 Exclusions

The wastewater treatment plant (WWTP) and conveyance infrastructure have not been assessed as part of this works approval application. The WWTP is regulated under Licence L4404/1991/15.

In May 2023, the Department of Health provided a two-year “approval in principle” for the project, subject to conditions relating to infrastructure and installation requirements, wastewater treatment, sampling programs, and incident management. To avoid regulatory duplication, the conditions contained within the Department of Health “approval in principle” have not been included as part of the works approval. The Department of Health will only issue a final approval where the applicant can demonstrate compliance with the conditions imposed to ensure that public health will not be compromised.

3. Legislative context and other approvals

3.1 Occupancy

South West Irrigation Management Co-Operative Limited holds a Discharge Agreement with the Water Corporation that approves the discharge of treated wastewater into Harvey Dam, signed on 1 May 2024, a termination date of 30 June 2026, and with a 10 year extension clause. DWER considers Harvey Water to have demonstrated occupancy of the premises for the purposes of Part V of the EP Act.

3.2 Planning approvals

Planning/development approvals relating to the activities at the Premises are outlined below:

- P17/23 granted on 1 September 2023 relating to the pipeline constructed; and
- P142/23 granted on 25 July 2023 for ground works and the installation of storage tanks at the Harvey Fresh premises.

4. Background

4.1 Harvey Dam

The Harvey River catchment is 1921 km² and located approximately 100 km south of Perth. The Harvey River is approximately 80 km in length, from its headwaters to the confluence with the Peel-Harvey Estuary. It includes the Harvey River and three main tributaries (Drakes, Samson and Logue brooks) which all originate on the Darling Plateau and flow down the scarp to the Swan Coastal Plain. Once on the coastal plain, the Harvey Diversion Drain conveys water from the Harvey River to the ocean. Downstream from the confluence with the diversion drain, water in the Harvey River and the three main tributaries flows into the Peel-Harvey Estuary.

Flows in the Harvey River system are highly regulated, with seven large dams that are managed for different purposes:

- Harvey Dam, Logue Brook Dam, Waroona Dam (on Drakes Brook), Drakes Brook Dam and the Wokalup Creek Pipehead Dam. Water from these dams is used to supply the Harvey and Waroona irrigation districts, as managed by South West Irrigation Management Cooperative Ltd. Releases of water from the dams are managed in accordance with the Harvey-Waroona Irrigation Water Resource Management Operating Strategy (WRMOS) (Strategen 2013).
- Stirling Dam and Samson Dam. Water from these dams is used to supply the Intergarted water supply scheme, managed via the Stirling and Samson WRMOS.

The two dams on the main branch of the Harvey River, the Stirling Dam and the Harvey Dam, were completed in 1948 and 2002 respectively, although flow regulation dates back to 1916 at the Harvey Weir (close to the site of the current Harvey Dam). The originally constructed weir has been upgraded over the years, allowing for a current storage capacity of 56,000 ML over a water surface area of 553 hectares.

There is limited information about the Harvey River's natural flow regime before the dams were built. Streamtec (2001) used a catchment area-rainfall model to estimate flow prior to the arrival of European settlers. The report suggests that the natural flow regime of the upper Harvey River was perennial and would have followed a seasonal pattern, with the highest mean monthly flow in August (12 700 ML/month) and the lowest in March (514 ML/month).

Between the Stirling and Harvey dams, the flow regime has varied over time based on water use. Between 1948 and 2001 water was used for irrigation resulting in large volumes being

released from the dam in summer to meet irrigation needs, and for recreational canoeing between 1979 and the late 1990s. In 2001, the primary use of Stirling Dam changed from irrigation to public water supply. This led to a reduction in summer flows to the Harvey Dam (although occasional high volumes were still released for irrigation). The flow regime in this part of the river is currently managed via the Stirling and Samson WRMOS and includes releases to maintain the aquatic ecosystem.

Approximately 3 km downstream from Harvey Dam flows are directed into the Harvey Diversion Drain (at a structure known as Larsen's Cut) which was built in the 1930s to manage flooding. The flow regime in the river below Harvey Dam and below Larsen's Cut is managed via the Harvey-Waroona Irrigation WRMOS (Strategen 2013). A dynamic approach is taken to releases at both the dam and Larsen's Cut, where if levels are running low (even when no release is required) water will be released to encourage flow (Harvey Water, 2017).

The Harvey Dam provides public access for recreational purposes, which include both primary and secondary contact activities.

- Primary contact recreation includes swimming & wading, seasonal recreational fishing (including marron snaring)
- Secondary contact recreation includes canoeing and other paddle crafts; however, power boats are not permitted.

The Department of Primary Industries and Regional Development (DPIRD) annually restocks Harvey Dam with marron, rainbow trout and brown trout. This restocking program has been instrumental in establishing a recreational freshwater fishery within Harvey Dam, thereby enhancing its social and economic value.

Smooth marron (*Cherax cainii*) is commonly found and stocked in the Harvey Dam. In general, populations are under pressure with declining range and abundance. Key factors contributing to pressures include salinisation, habitat degradation, and fishing pressures. Smooth marron is not classified as vulnerable or threatened.

Carter's freshwater mussel has also been surveyed within the Harvey Dam reservoir Carter's freshwater mussel (*Westralunio carteri*) are listed as vulnerable under the *Biodiversity Conservation Act 2016*, and the *Environment Protection and Biodiversity Conservation Act 1999*.

Other freshwater and benthic species may also be present within the Harvey Dam.

5. Overview of premises

5.1 Wastewater source and quality

The applicant proposes to receive 1 ML/day of treated wastewater from the nearby Harvey Fresh dairy and juice processing facility operated by Harvey Fresh (1994) Ltd. The Harvey Fresh WWTP encompasses several key components and processes designed to ensure the effective treatment of the wastewater, enabling it to meet regulatory standards and environmental guidelines. The typical treatment process for the Harvey Fresh WWTP is outlined in Table 1 below.

Table 1: Harvey Fresh WWTP treatment process and description

Treatment process	Description
Preliminary Screening	Rotary screen removes coarse solids.
Equalisation Tank	A 500kL aerated balance tank stores screened wastewater and allows operational control of hydraulic loads through the WWTP, which is vital for stabilising the feed fluctuations that occur during the processing operations.
Dissolved Air Flotation (DAF)	Removal of suspended solids, fats, oils, and greases. Sludge from this process is removed and transferred to a sludge dewatering system.
Sequencing Batch Reactors (SBR)	Two SBR units are used for the removal of organics, nitrogen, and phosphorus compounds via nitrification, denitrification, and biological phosphorus processes. Operational cycles are optimised to manage long term changes and seasonal fluctuations in wastewater loads. Excess sludge is wasted and processed via a sludge thickening system.
Additional Storage	Additional storage is used to satisfy the holding time requirements for disinfection of the wastewater prior to being transferred to Harvey Dam.
Disinfection System	Disinfection is achieved via an ultraviolet disinfection unit followed by a chlorination system that ensures 0.2-2.0 mg/L of free chlorine residual is achieved at the discharge point in Harvey Dam.
Sludge Thickening	Waste sludge from the SBR is thickened in a Huber RoS2s disk thickener increasing solid content from approximately 0.2-0.5% to approximately 2-4% solid content, before being sent to the sludge dewatering system.
Sludge Dewatering	Sludge from both the DAF and thickener is combined and fed into a Huber RoS3 Dewatering Screw Press, where it is dewatered to a solid content of 8-15% prior to off-site disposal.

Table 2 below provides an overview of the Harvey Fresh WWTP water quality. Harvey Fresh monitors the WWTP daily to determine the performance of their WWTP and to determine the water quality of the treated wastewater. Monitoring data detailed below for BOD, FRP, TP, NH₄⁺ and NO_x is based on approximately 185 samples collected between 2018 to 2023 with additional sampling undertaken to further characterise the WWTP water quality to support the application.

Table 2: Quality of treated wastewater

Parameter	Average SBR quality (2018-2023)	Harvey Fresh WWTP discharge (Sept 2023)
pH	7.65	7.8
Dissolved Oxygen	-	7.1 mg/L
Total dissolved solids	-	1500 mg/L
Turbidity		3.8 NTU
Biochemical oxygen demand	7.89 mg/L	21 mg/L
FRP	0.62 mg/L	0.0098 mg/L
TP	1.61 mg/L	0.33 mg/L
NH ₄ ⁺	1.06 mg/L	0.016 mg/L
NO _x	6.98 mg/L	1.7 mg/L
TN	11.78 mg/L	3.3 mg/L
<i>E.coli</i>	510 cfu/100 mL	24 cfu/100 mL
Residual chlorine	0.2 – 2.0 mg/L	0.2 – 2.0 mg/L

The applicant also undertook multiple sampling campaigns to monitor the treated wastewater for pesticides, phthalates, hydrocarbons, organics, heavy metals, and metalloids, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances, dioxins and furans. All samples (with the exception of copper and ammonium) reported concentrations below the ANZECC & ARMCANZ (2000) guideline values and the updated toxicant guidelines provided by Warne et al. (2018).

5.2 Water balance

The applicant states that flows in the Harvey River system is expected to reduce in the future. Climate modelling predicts that mean annual runoff in the Harvey to Preston region will reduce by between 7% and 40% in 2030 compared to the period 1975-2007 (scenarios C-wet and C-dry respectively, CSIRO 2009).

The applicant developed a water balance assessment to estimate water storage within the dam for a 30 year period as depicted in Figure 1 below. The model used quantitative predictions to determine water sources/sinks within the Harvey Dam reservoir.

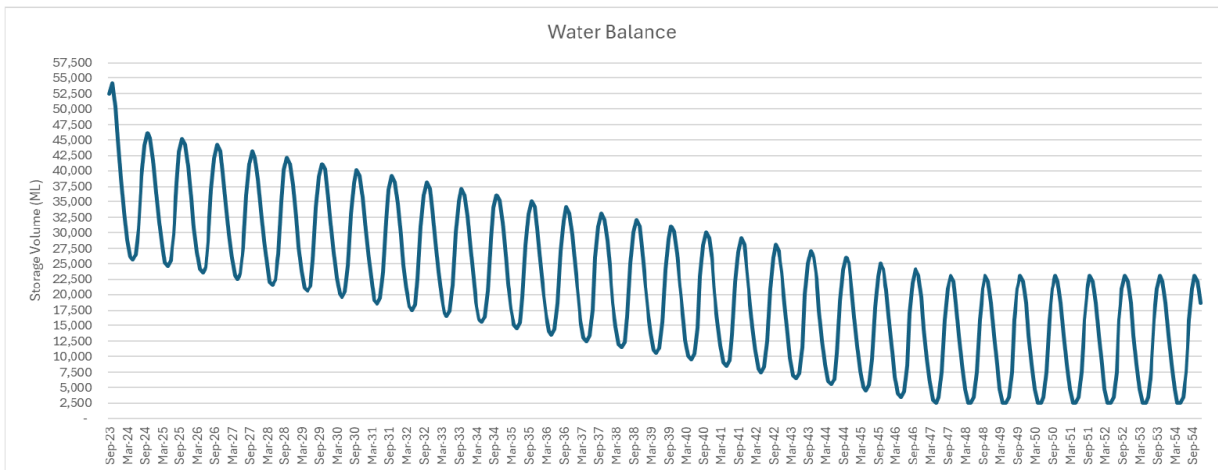


Figure 1: Water balance assessment

In order to capture seasonal change in rainfall and evaporation, the applicant adopted a “monthly” time step for the model. The modelled total storage volume after the first month was calculated using the known storage volume at end of August.

The applicant states that the water balance predictions are aimed at long-term forecasting to provide guidance for developing effective management strategies. The applicant has stated that the water balance will be reviewed and updated with new data on a 5 yearly basis to recalibrate the model and provide adaptive measures and improved data outcomes.

Many parts of South West Western Australia, have seen a drying trend since the 1970s, reflected in reduced runoff and a widely reported reduction in streamflow (DWER. 2021; Silberstein *et al.* 2012; Zhang *et al.* 2016; Wasko *et al.* 2021). Water Corporation historical data shows an inflow reduction of 60% to Perth metropolitan dams post-1975 (Water Corporation 2023), with the lowest flows recorded in the last decade. Future climate projections indicate higher temperatures, increased evaporation, and from 2030 onwards declining soil moisture across all seasons, with further reductions in streamflow and groundwater recharge (Turner *et al.* 2022).

DWER has developed updated guidelines for using future climate projections for water management (DWER 2024). The guide recommends using climate projections from the Australian Water Outlook – the Bureau of Meteorology’s National Hydrological Projections (NHP) (BoM 2022) as the current up-to-date, application-ready projections. The Bureau of Meteorology’s NHP Dataset provides a range of plausible climate futures to assess climate risk to water resources. Interactive maps of these datasets are available from the Australian Water Outlook. In assessing these maps for the Harvey River catchment, it can be seen that:

- Rainfall in the Harvey region is projected to decrease between 4 to 15% by 2030 compared to the 1976-2005 reference period; and
- Runoff in the Harvey region is projected to decrease by between 10 to 50% by 2030 compared to the 1976-2005 reference period.

Key findings

The Delegated Officer notes that it is not possible to accurately predict with high certainty the water balance for the Harvey Dam. The applicant's plan to review and update the assessment every 5 years is supported. The water balance developed by the applicant is supported by climate predictions and the updated guidelines for using future climate projections for water management (DWER 2024).

It should be noted that the future licence application may be subject to further regulatory controls for reviewing and updating the water balance assessment.

5.3 Monitoring

Water quality monitoring of the Harvey Dam currently occurs biannually, typically during the months of January/February and again during September/October. The timing of these monitoring periods captures the seasonal variability of water quality of the dam. Grab samples are taken from a sample tap at the bottom of the dam wall or directly from the dam's edge behind the wall, if the sample tap doesn't produce a sample.

In order to monitor the discharge of the TWW, the applicant has proposed to undertake further monitoring as outlined in the Harvey Water Quality Management Plan (WQMP) and Risk Assessment (Tessele Consultants, 2024) to gather ongoing data to assess and ensure the discharge of TWW meets the water quality objectives and to guide management actions (if required). The applicant selected monitoring locations were strategically chosen, with consideration given to seasonal variations and sampling frequencies.

The applicant has used the ANZECC (2000) water quality guidelines to derive appropriate levels of species protection for the disposal of the wastewater. The levels of species protection default guideline values (DGV's) typically derived are 99%, 95%, 90%, or 80%, depending on the current or desired ecosystem condition and associated level of protection.

Given the extent of human disturbance of the natural river system, the primary and secondary activities in the dam, agricultural development and historical clearing practices and the restocking programs alter the natural biodiversity of the dam. The applicant therefore considers the ecosystem to be moderately disturbed and has adopted a 95% species protection value with a 99% species protection applied to toxicants that have a bioaccumulating nature and for the protection of key species from acute and chronic toxicity.

The ANZECC (2000) Guidelines have developed default guideline values (DGV) for physical and chemical stressors in slightly disturbed ecosystems within the Southwest region of Australia. The applicant has proposed the DGV as outlined in Table 3 below. Where background concentrations are naturally above the default guideline values, the applicant has proposed to use an 80th percentile site-specific trigger value to compare median data.

Table 3: Default guideline values for physical and chemical stressors for slightly disturbed ecosystems for south-west Australia

Parameter	Units	ANZECC (2000) DGV	80th percentile Trigger Values	NHMRC (2008) GV for recreational contact
pH	pH Unit	6.5 – 8.0	-	6.5 – 8.5
Temperature	°C	-	-	>16 - <34
Dissolved Oxygen	%	>80	-	>80
Turbidity	NTU	10 – 100	-	-
Salinity	µs/cm	300 – 1500	-	-
BOD	mg/L	15	-	-
FRP	mg/L	0.005	-	-
Total phosphorus	mg/L	0.01	0.025	-
Total Nitrogen	mg/L	0.35	0.68	-
NH ₄ ⁺	mg/L	0.01	0.04	-
NO _x	mg/L	0.01	0.344	-

The DGV's outlined in the ANZECC (2000) guidelines are more stringent than the trigger values set out in the NHMRC (2008) for primary and secondary recreational activities. Therefore, the applicant has proposed to adopt the ANZECC (2000) DGVs for inland reservoir waters within the Southwest region of Australia.

Where background concentrations are naturally above the ANZECC (2000) DGVs for inland reservoir waters within the Southwest region of Australia, an 80th percentile (site specific) trigger value has been adopted in line with the requirements of ANZG (2018) slightly to moderately disturbed ecosystem.

6. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

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.

6.1 Source-pathways and receptors

6.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and time limited operations which have been considered in this decision report are detailed in Table 4 below. Table 4 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 4: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of pipeline and diffuser, earthworks and vehicle movements.	Air / windborne pathway	Water tank trailer to be used for dust suppression and firefighting purposes.
Noise	Construction of pipeline and diffuser, earthworks and vehicle movements.	Air / windborne pathway	Noise emissions and vibration are expected to be contained within the localised project footprint. As part of the Recycled Water Quality Management Plan, the applicant has proposed to develop a noise management plan. Construction activities will occur during daylight hours 0700 – 1500 hrs.
Spills/Leaks	Construction of pipeline and diffuser, earthworks and vehicle movements.	Overland flow and infiltration to soil and groundwater	Spill management will form part of personnel induction to the job. Spill prevention will form part of the vehicle pre-start and observation checks to ensure that any leaks are found and fixed early. All vehicles deployed to the site have current service logs and are maintained in accordance with operating manuals. An onsite spill kit will be available in the unlikely event of a fuel or oil spill. Soil contaminated by any spills is to be removed and disposed of appropriately.
Sediment laden stormwater	Construction of pipeline and diffuser, earthworks and vehicle movements.	Overland flow	None proposed
Operation			
Noise	Operation of infrastructure Receipt and discharge of treated wastewater	Air/windborne pathway	As part of the Recycled Water Quality Management Plan, the applicant has proposed to develop a noise management plan.
Odour	Accidental spills or loss of containment Wastewater discharge to the	Air/windborne pathway	As part of the Recycled Water Quality Management Plan, the applicant has proposed to develop an odour management plan.

Emission	Sources	Potential pathways	Proposed controls
	Harvey Dam		
Spills/Leaks	Accidental spills or loss of containment Leaks from machinery/vehicles	Overland flow and infiltration to soil and groundwater	None proposed
Treated wastewater	Wastewater discharge to the Harvey Dam	Direct discharge to Harvey Dam via the diffuser	<p>Development of a Water Quality Management Plan in line with the framework set out in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)</p> <p>Monitoring will be undertaken from the outlet of the Harvey Fresh WWTP as outlined in the Harvey Fresh Recycled Water Quality Management Plan. Additionally, continuous online monitoring will be undertaken for pH, temperature and residual chlorine.</p> <p>A single diffuser positioned 1m beneath the typical baseline water level and approximately 28 m below the water level to enhance mixing efficiencies.</p> <p>The diffuser location ensures sufficient separation from areas designated for recreational uses.</p> <p>Monitoring will be undertaken to ensure the discharge of treated wastewater meets the water quality objectives and to guide any management actions (if required).</p>

6.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant’s employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 5 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 5: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential Premises	<p>The town of Harvey is located 900m southwest from the Harvey Dam</p> <p>25 residential properties located within 1km of the prescribed premises boundary.</p>
Stirling Dam Dosing Plant	Water Corporation plant supplying drinking water to regional and metro users. Located 350m from Harvey Dam
Recreational users of Harvey Dam	<p>The Harvey Dam provides public access for recreational purposes, which includes both primary and secondary contact activities. These activities include, but are not limited to:</p> <ul style="list-style-type: none"> • Primary contact recreation includes swimming & wading, boating, kayaking and recreational fishing; • Secondary contact recreation includes canoeing and other paddle crafts; and • Visitors and sightseers of Harvey Dam.
Aboriginal Sites and Heritage Places	The Harvey River and Harvey Dam are both registered as holding aboriginal and heritage value. The sites include Ceremonial, Mythological, Camp, Hunting Place, Natural Feature, Water Source, and Artefacts / Scatter.
Environmental receptors	Distance from prescribed activity
<i>Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992</i>	Located approximately 1600 m west northwest from the prescribed premises boundary.
Aquatic species of the Harvey Dam	<p>Smooth marron (<i>Cherax cainii</i>) is commonly found and stocked in the Harvey Dam. Smooth marron is not currently classified as a vulnerable or threatened species.</p> <p>Carter's freshwater mussel (<i>Westralunio carteri</i>) has been surveyed within the Harvey Dam. Carter's freshwater mussel is listed as vulnerable under the <i>Biodiversity Conservation Act 2016</i>, and the <i>Environment Protection and Biodiversity Conservation Act 1999</i>.</p> <p>Other freshwater and benthic species may be present.</p>
Threatened Ecological Communities	Three areas of Endangered Banksia Woodlands of the Swan Coastal Plain ecological communities exist within 1 km of the prescribed premises boundary. These are located to the west and west northwest of the prescribed premises boundary.
Threatened Fauna	<p>Seven species of Threatened Fauna have been observed within 1 km of the prescribed premises boundary. These include:</p> <ul style="list-style-type: none"> • <i>Zanda baudinii</i> • <i>Zanda latirostris</i> • <i>Westralunio carteri</i>

	<ul style="list-style-type: none"> • <i>Isoodon fusciventer</i> • <i>Phascogale tapoatafa wambenger</i> • <i>Hydromys chrysogaster</i>; and • <i>Pseudocheirus occidentalis</i>.
Geomorphic Wetlands	<p>A multiple use palusplain wetland is mapped approximately 850m to the west of Harvey Dam. The wetland would receive water from the Harvey Dam during flows and overtopping events.</p> <p>The Harvey Dam is listed as an artificial basin (lake)</p>
Haris River State Forest	Located to the immediate north of the prescribed premise boundary
Falls Brook Nature Reserve	Located approximately 300 m the east of the prescribed premise boundary.
Korijekup Conservation Park	Located approximately 600 m the southeast of the prescribed premise boundary.
RIWI Act – Surface Water Areas	The premises is located within the proclaimed Harvey Irrigation District.
Surface water licence	There are 5 surface water abstraction licenses within 1 km of the prescribed premises boundary.

6.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 6.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 6.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 6.

Works approval W6930/2024/1 that accompanies this decision report authorises construction only. The conditions in the issued works approval, as outlined in Table 6 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required to authorise emissions associated with the operation of the premises i.e. disposal of treated wastewater to Harvey Dam. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 6: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Construction								
Construction earthworks Installation of pipeline and diffuser Vehicle movements	Dust	Air / windborne pathway causing impacts to health and amenity	Residential properties located within 1km of the prescribed premises boundary. Recreational users of Harvey Dam	Refer to Section 6.1.1	C = Slight L = Unlikely Low Risk	Y	N/A	The Delegated Officer considers dust emissions can be effectively regulated by the general provisions of the EP Act.
	Noise/vibration				C = Slight L = Unlikely Low Risk			The location of the proposed construction works is considered to be effective in mitigating the impact of noise emissions from the premises on sensitive receptors during construction. The delegated officer considers noise emissions can be effectively regulated by the <i>Environmental Protection (Noise) Regulations 1997</i> .
	Hydrocarbon spills/leaks	Overland flow and infiltration to soil and groundwater causing ecosystem disturbance	Groundwater beneath the premises Harvey Dam Harvey River Aquatic species Recreational users of Harvey Dam	Refer to Section 6.1.1	C = Minor L = Unlikely Medium Risk	Y	Condition 1	Emission to be regulated under the general provisions of the EP Act and the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> Condition 1 requires all pipelines and associated infrastructure to be free of leaks and defects
	Sediment laden stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Harvey Dam Harvey River Aquatic species Recreational users of	Refer to Section 6.1.1	C = Minor L = Possible Medium Risk	Y	Condition 1	Emission to be regulated under the general provisions of the EP Act

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Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
			Harvey Dam					
Time limited operations								
Time limited operation of pipeline and diffuser Vehicle movements Receipt and discharge of treated wastewater	Noise	Air/windborne pathway causing impacts to health and amenity	Residential properties located within 1km of the prescribed premises boundary. Recreational users of Harvey Dam	Refer to Section 6.1.1	C = Slight L = Rare Low Risk	Y	N/A	The environmental siting of the premises is considered to be effective in mitigating the impact of noise emissions from the premises on sensitive receptors during time limited operations. The delegated officer considers noise emissions can be effectively regulated by the <i>Environmental Protection (Noise) Regulations 1997</i> .
	Odour	Air/windborne pathway causing impacts to health and amenity	Residential properties located within 1km of the prescribed premises boundary. Recreational users of Harvey Dam	Refer to Section 6.1.1	C = Minor L = Unlikely Medium Risk	Y	Conditions 8 – 14, 21	The discharge of treated wastewater is not likely to generate odour as the discharge point is below the water level. On this basis the delegated officer considers odour emissions can be effectively regulated by the general provisions of the EP Act. Stringent controls and reporting requirements have been added to the works approval to ensure water quality is of acceptable quality.
	Wastewater discharge to the environment	Direct discharge to Harvey Dam via the diffuser causing ecosystem disturbance Discharge of water from the Harvey Dam to the Harvey River and Harvey	Harvey Dam Harvey River Aquatic species Recreational users of Harvey Dam Palusplain	Refer to Section 6.1.1	Refer to detailed risk assessment in 6.3			

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		Diversion Drain causing ecosystem disturbance	wetland is mapped approximately 850m to the west of Harvey Dam					
Accidental spills or loss of containment of treated wastewater	Spills/Leaks of treated wastewater	Overland flow and infiltration to soil and groundwater causing ecosystem disturbance	Soil profile Harvey Dam Harvey River Aquatic species Recreational users of Harvey Dam	Refer to Section 6.1.1	C = Minor L = Unlikely Medium Risk	Y	<u>Condition 8, 9, 21</u>	Condition 7 requires all pipework, fittings and valves to be hydraulically tested to the required pressure and deemed fit for purpose prior to use and for all pipeline and associated infrastructure to be free of leaks and defects Emission to be regulated under the general provisions of the EP Act and the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i>

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

6.3 Detailed risk assessment for discharge of treated wastewater

6.3.1 Hazard characterisation and potential impacts

Treated wastewater from the Harvey Fresh dairy and juice processing facility has the potential to contain nutrients, metals, salts and other soluble or suspended components.

Without effective treatment of the wastewater and adequate monitoring measures, treated wastewater has the potential to lead to adverse environmental impacts or affect the beneficial use of the Harvey Dam and the Harvey Dam water source (irrigation purposes). Beneficial use means a use of the environment, or of any portion thereof, which is conducive to public benefit, public amenity, public safety, public health or aesthetic enjoyment and which requires protection.

6.3.2 Criteria for assessment

The applicant developed water quality objectives (WQO) to ensure an appropriate level of protection of the identified receptors outlined in section 6.1.2. Table 7 below details the water quality objectives as developed by the applicant.

Table 7: Water quality objectives

Receptor	Objective
<p>Aquatic ecosystem health</p> <p>Refers to both the health and integrity of the ecosystem within the waterway.</p>	<p>WQO1 - Maintain the health and integrity of the waterway's ecosystem:</p> <p>Safeguard the health and integrity of the freshwater ecosystem to suitable levels by considering its structure, including biodiversity, biomass, and abundance of biota, as well as its function, such as food chains and nutrient cycles.</p>
<p>Cultural and spiritual</p> <p>Recognises the importance of water and place for indigenous peoples</p>	<p>WQO 2 - Protect the cultural and spiritual values of the freshwater environment:</p> <p>Preserve the cultural and spiritual values of the indigenous peoples.</p>
<p>Industrial water</p> <p>Refers to waters suitable for industry use</p>	<p>WQO 3 - Maintain water quality for industrial use:</p> <p>Ensure the water quality is suitable for industrial use.</p>
<p>Primary industries</p> <p>Refers to waters suitable for use in agriculture, irrigation, livestock drinking water, aquaculture and human consumption of aquatic foods.</p>	<p>WQO 4 - Maintain water quality for primary industry use:</p> <p>Ensure the water quality is suitable for irrigation, livestock drinking water, aquaculture, and consumption of aquatic foods for humans.</p>
<p>Recreation and aesthetics</p> <p>Refers to waters suitable for use in agriculture, irrigation, livestock drinking water, aquaculture and human consumption of aquatic foods.</p>	<p>WQO 5 - Maintain primary contact recreation values:</p> <p>Ensure it is safe to undertake primary contact activities such as swimming, wading, fishing and marroning.</p>
	<p>WQO 6 - Maintain secondary contact recreation values:</p> <p>Ensure it is safe to undertake secondary contact activities such as canoeing and paddle boarding.</p>

Receptor	Objective
	WQO 7 - Maintain aesthetic values: Protect the aesthetics values

In order to assess potential impacts on the identified sensitive receptors and whether the water quality objectives are being met, the following guidelines are considered appropriate assessment criteria for water quality.

- Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guideline for Fresh and Marine Water Quality*.
- Australian and New Zealand Guidelines (ANZG, 2018) for Fresh and Marine Water Quality;
- Guidelines for the Non-Potable Uses of Recycled Water in Western Australia. Government of Western Australia (2011) and
- Site specific 80th Percentile Trigger Values.

As part of the assessment of the proposed water quality and trigger values, the department internally reviewed the water quality, proposed trigger level values and the selected assessment criteria, and determined that the use of the following values were appropriate:

- ANZECC (2000) toxicant guidelines for the protection of aquaculture species and the trigger values for freshwater based on the slightly to moderately disturbed ecosystem classification (95% species protection);
- default trigger values for physical and chemical stressors for south-west Australia for slightly disturbed ecosystems with the following exceptions:
 - That an 80th percentile trigger value be used for salinity (EC), Total suspended solids (TSS) and turbidity (NTU) noting that the Harvey Dam water quality was generally 'fresher/clearer' than rivers used to derive the DGV's for the Southwest region of Australia; and
- 80th percentile trigger value as per the ANZG (2018) slightly to moderately disturbed ecosystem where background concentrations are naturally above the ANZECC (2000) DGVs for inland reservoir waters within the Southwest region of Australia.

6.3.3 Applicant controls

Section 6.1.1 (Table 4) details the control measures the applicant has proposed.

6.3.4 Key findings

Modelling was undertaken to estimate future concentrations of critical parameters, including Total Dissolved Solids (TDS), nitrogen, copper, and phosphorous. The applicant selected these parameters due to their significant ecological and health implications for aquatic life and water quality. Total Nitrogen modelling indicates that a potential non-compliance with the calculated 80th percentile trigger values of 0.68 mg/L in May 2044, with Total Phosphorous modelling predicting a potential non-compliance with the calculated 80th percentile trigger values of 0.025 mg/ in May 2047. The dilution modelling plots for Total Nitrogen and Total Phosphorus are depicted in Figure 2 and Figure 3 below.

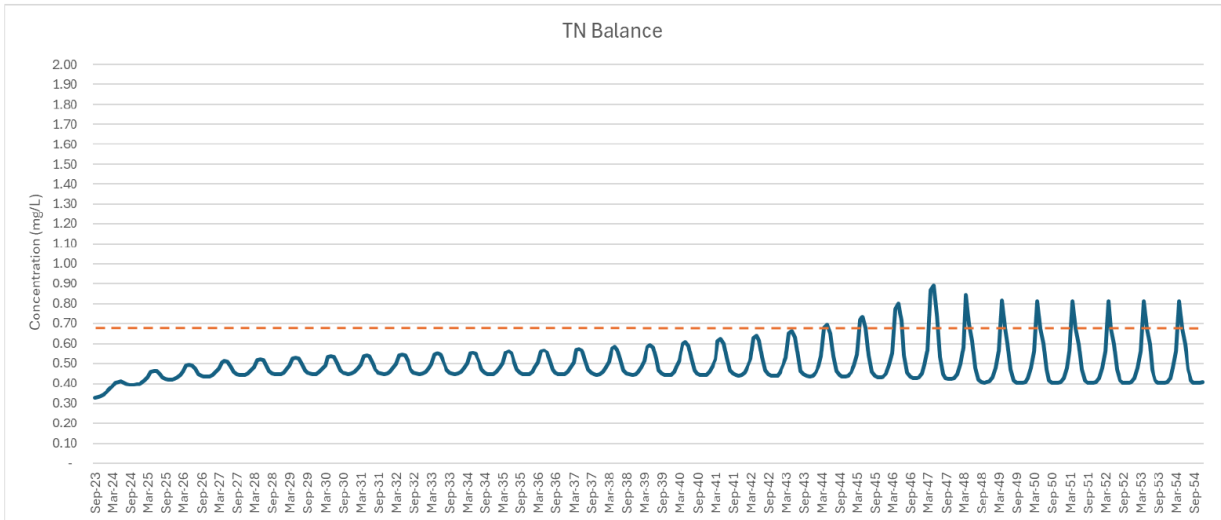


Figure 2: Dilution modelling for Total Nitrogen

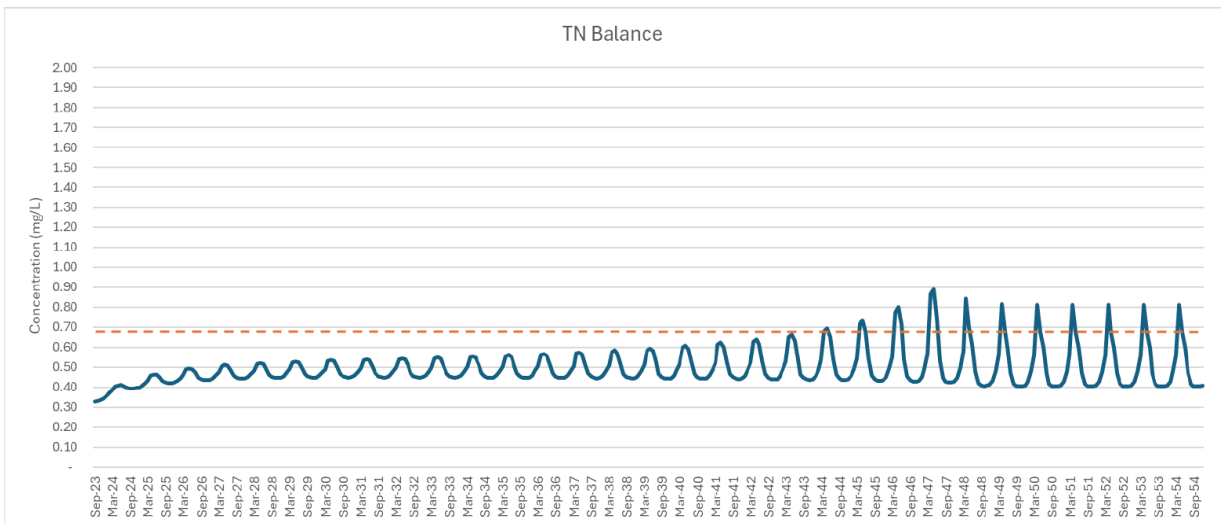


Figure 3: Dilution modelling for Total Phosphorus

The dilution modelling calculations in the WQMP assume the treated wastewater will be well mixed within the entire Harvey River dam, however the department note that this is unlikely given the close proximity between the treated wastewater diffuser and the outlet point. Additional nutrient load assessment may be included for any licence application received for the ongoing operation of the premises.

The Delegated Officer notes that the Department of Health requires the applicant to comply with the ‘High Exposure’ Risk Level water quality objectives as defined in the *“Guidelines for the Non-Potable Uses of Recycled Water in Western Australia 2011”*. This includes the requirement to undertake disinfection of the wastewater prior to discharge to Harvey Dam.

The applicant has proposed chlorine dosing to remove pathogenic micro-organisms that pose a potential risk to the health of humans and livestock. Chlorine dosing reduces potentially harmful micro-organisms in wastewater to a level consistent with achieving the water quality objectives. However, residual chlorine, even at low concentrations may lead to an acute response of aquatic organisms, ranging from avoidance to death. The ANZECC (2000) toxicant guidelines for the protection of aquaculture species and the trigger values for freshwater (95% species protection) is 0.003 mg/L and that dichlorination of the treated wastewater may be required.

The Delegated Officer notes that it is the works approval holders responsibility to meet the

DoH residual chlorine limits prior to any dichlorination and discharge to the dam. The Delegated Officer notes that further treatment of the wastewater may be required if the assigned discharge limits in the works approval cannot be met.

The Delegated Officer notes the feedback received from the DPIRD and direct interest stakeholders regarding the dam levels and the 1 megalitre per day discharge representing a substantial contribution to the overall dam volume should low dam levels eventuate in the future. The Delegated Officer notes that it is not possible to accurately predict with high certainty the water balance for the Harvey Dam and the applicants plan to review and update the assessment every 5 years is supported. The water balance developed by the applicant is supported by climate predictions and the updated guidelines for using future climate projections for water management (DWER 2024).

The Delegated Officer identified the need for water samples be collected from close to the dam substrate to represent the likely accumulation zone and location where aquatic species are living, feeding and interacting with sediments. This sampling will also be beneficial to monitor for any potential stratification occurring within the dam.

Key findings:

The Delegated Officer considers:

- Treated wastewater from the Harvey Fresh dairy and juice processing facility has the potential to contain nutrients, metals, salts and other soluble or suspended components if not managed appropriately.
- Total Nitrogen modelling indicates that a potential non-compliance with the calculated 80th percentile trigger values of 0.68 mg/L in May 2044;
- Total Phosphorous modelling predicting a potential non-compliance with the calculated 80th percentile trigger values of 0.025 mg/ in May 2047;
- Calculations in the WQMP assume the treated wastewater will be well mixed within the entire Harvey Dam, however this is unlikely given the close proximity between the treated wastewater diffuser and the outlet point.
- Additional nutrient load assessment may be included for any licence application received for the ongoing operation of the premises; and
- It should be noted that the future licence application may be subject to further regulatory controls for reviewing and updating the water balance assessment

6.3.5 Consequence

Based on the sensitivity of receiving environment, proposed residual chlorine concentrations, and the modelled total nitrogen and total phosphorus levels exceeding the specific 80th percentile trigger value in 2044 and 2047 respectively, the Delegated Officer has determined that treated wastewater emissions could cause specific consequence criteria to be exceeded. Therefore, the Delegated Officer considers the consequence to be **major**.

6.3.6 Likelihood of Risk Event

Based on the applicant's proposed controls, the Delegated Officer has determined that impacts from treated wastewater could occur at some time. Therefore, the Delegated Officer considers the likelihood of impacts to the human and environmental health to be **possible**.

6.3.7 Overall risk rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix and determined that the overall rating for the risk of treated wastewater emissions from operations is **high**.

6.3.8 Acceptability of Risk Event

As per Guideline: Risk Assessments (DWER 2020) the Delegated Officer has determined that the risk event from the discharge of treated wastewater may be tolerated and subject to multiple regulatory controls. Regulatory controls relating to construction and time limited operations are defined in works approval W6930/2024/1.

6.3.9 Regulatory controls

The Delegated Officer has determined that the proposed applicant controls and additional regulatory controls will be required to manage the risk of the disposal of treated wastewater to the Harvey Dam. The Delegated Officer considers that conditions need to be added to the works approval for:

- Design and construction requirements for the inclusion of an isolation valve capable of preventing discharge to the dam (if required), to ensure adequate separation distance is maintained between the diffuser and the typical baseline water level, and to ensure adequate mixing is occurring at the diffuser;
- Submission of an Environmental Compliance Report following the completion of construction requirements, including certification by a suitably qualified professional engineer;
- Requirement to notify the CEO in writing at least one (1) week prior to the commencement of time limited operations;
- Infrastructure and operational requirements (including discharge limits);
- Provision of chlorine discharge limits in line with ANZECC (2000) toxicant guidelines for the protection of aquaculture species and the trigger values for freshwater (95% species protection).
- Provision of a stringent monitoring program to ensure discharge and trigger levels are met throughout time limited operations;
- Provision of a report on the time limited operations;
- An assessment of the performance and effectiveness of the diffuser to ensure adequate mixing is being achieved within the dam;
- Records and reporting requirements; and
- Notification requirements, including the requirement to undertake an investigation into the cause of any non-compliance, what action was taken, and what action will be taken to prevent the non-compliance occurring again.

7. Consultation

The application was advertised on the department's website on 17 May 2024. A total of 4 submissions were received from direct interest stakeholders within the advertisement consultation period. All submissions that have been considered in the Department's assessment with a summary of the items raised and DWERs response set out in Appendix 1, Table 8 and Table 9.

8. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

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Appendix 1: Summary of public consultation period submissions

Table 8: Summary of public consultation period submissions

Summary of public consultation submission	Department response
<p>Potential accumulation of salt and chemical residues in the Harvey Dam over time is a concern. Due to the incompatibility of saltwater and freshwater, salt tends to settle at the bottom of the dam.</p>	<p>The Delegated Officer identified data gaps in the proposed monitoring program and the potential for stratification to occur within the dam. Conditions have been added to the works approval to ensure sampling is undertaken in proximity to the substrate and likely accumulation zone for salinity. Reporting conditions have also been added to review the performance and effectiveness of the diffuser to achieve adequate mixing.</p>
<p>Lactalis, a major dairy company based in France, has faced criticism for its environmental record.</p>	<p>DWER will continue to undertake periodic inspections at the premises (and at the Harvey Fresh licenced premises) to assess compliance with the granted instruments.</p>
<p>Information and some planning have been altered from the initial scope given to the public.</p>	<p>The Delegated Officer notes that it is possible for some elements to be altered from the initial proposal prior to the application being received by the department. It should also be noted that DWER sent the applicant two requests for further information (RFI) relating to the provision of a water quality management plan and the proposed prescribed premises boundary. As a result of responding to these RFI's, some information and aspects of the initial proposal may have been altered.</p>
<p>Farmers and residence west of Fourth Street utilize this water for household purposes, and Harvey Fresh and Harvey Beef use the water for food processing. Hundreds of households across the district use this water, unless treated to higher stranded it will be a potential health risk.</p>	<p>As outlined within this decision document, the treated wastewater meets the trigger levels for the protection of aquatic species and human health.</p>

Summary of public consultation submission	Department response
<p>The current testing regime is self-regulated. To ensure impartiality, an independent organization should be engaged solely to report the results. Daily testing is essential to maintain water quality standards. Will testing points be installed along the pipeline route? It is crucial for local environmental health officers and of the shire to have access to these tests.</p> <p>Where the samples are tested (the independent organisation) and the frequency of testing should be open and transparent</p>	<p>Samples are required to be collected and preserved in accordance with AS/NZS 5667.1 and AS/NZS 5667.6, with laboratory samples to and tested by a laboratory with current NATA accreditation for the parameters being tested. The frequency and analytes required to be tested are detailed within the works approval.</p>
<p>The works had been done prior to approvals.</p>	<p>The Delegated Officer confirms that the pipeline between the Harvey Fresh premises and the Harvey Dam is not considered to be a prescribed premises under Schedule 1 of the <i>Environmental Protection Regulations 1987</i> and, accordingly, does not require a works approval for its construction.</p> <p>The pipeline was constructed under development approval (P17/23) granted by the Shire. The Shire granted a further development approval (P142/23) for ground works and the installation of storage tanks at the Harvey Fresh premises.</p>
<p>The impact of the project on the heritage listed river needs indigenous consideration.</p>	<p>The applicant consulted with the Gnaala Karla Booja Aboriginal Corporation and the South West Aboriginal Land Sea Council Aboriginal Corporation on 5 June 2024. Both parties responded on 5 July 2024 stating that they have resolved their questions directly with Harvey Water and have no comment to make in relation to the works approval application.</p>
<p>The application outlines the treatment processes on the Harvey Fresh site using chlorine to address micro bacteria, however, more detail is needed about the salt and chlorine composition of wastewater to enter the dam.</p>	<p>The Delegated Officer has added discharge limits and monitoring conditions for chlorine in the works approval.</p>
<p>Fats from dairy production can be problematic. More detail in the application is needed as to the fat composition in the proposed wastewater and if any fat is</p>	<p>The Delegated Officer has added monitoring conditions for TDS, TSS, COD, BOD and oils and grease to the works approval. The applicant will be required to sample the treated wastewater and Harvey dam monthly for these parameters.</p>

Summary of public consultation submission	Department response
present. If so, what are implications on dam species (flora & fauna) or irrigation value?	
What is the composition of the 'solids' entering the dam stated in the application?	There is no authorised discharge of solids to the Harvey Dam. The composition of the treated wastewater, discharge limits and monitoring requirements are outlined within the works approval.
The interests of the Harvey River Restoration Group nor the properties immediately adjacent to the dam seem to be addressed in supporting documents.	The Delegated Officer confirms that no submissions were received from these groups during the public consultation period.
The application should include direct consultation with these interested parties and include statements of impact on recreational value to the general public such as fishing, marroning, boating, etc..	The application was sent to direct interest stakeholders including Gnaala Karla Booja Aboriginal Corporation; South West Aboriginal Land and Sea Council; Water Corporation; Tourism Western Australia; Recfishwest; OzFish Unlimited; and the Shire of Harvey (Shire). Their responses are outlined in Table 9.
Harvey Water stated that the dilution factor (treated wastewater with high salt levels, from Harvey Fresh) was not of concern. But this 'flies' against the fact that, in some years, there may be limited rainfall into the Harvey Dam, so the dilution ratio (Harvey Fresh wastewater to the Dam's Capacity) may vary from year to year.	The Delegated Officer notes that ongoing monitoring will continue to assess the quality and suitability of the discharge to the Harvey Dam. It should also be noted that any future licence application may be subject to further regulatory controls for reviewing and updating the water balance assessment.
Harvey Fresh has a problem with their wastewater. Harvey Fresh should be responsible for treating their own saline/contaminated wastewater.	This application assesses the proposal to receive treated wastewater to the premises. It is outside of the remit of the assessment to assess the responsibility of Harvey Fresh to dispose of their wastewater. The Delegated Officer notes that the Harvey Fresh licence contains conditions relating to the discharge of treated wastewater via irrigation. This proposal will not remove the disposal option via irrigation for the Harvey Fresh premises.
The graphs presented in the application package depict a declining trend in water balance. The water balance depicted shows a water balance developed from a narrower period (2013-2022) than the complete data set 2002-2024 as released by the Water Corporation.	<p>The Delegated Officer notes that it is not possible to accurately predict with high certainty the water balance for the Harvey Dam and the applicants plan to review and update the assessment every 5 years is supported. The water balance developed by the applicant is supported by climate predictions and the updated guidelines for using future climate projections for water management (DWER 2024).</p> <p>It should be noted that future licence application may be subject to further regulatory controls for reviewing and updating the water balance assessment.</p>

Table 9: Summary of direct interest stakeholders comments

Direct interest stakeholder comment	Comments received	Department response
Local Government Authority (Shire of Harvey) advised of proposal on 22 May 2024	The Shire of Harvey replied on 12 September 2024 confirming that the Shire granted Development Approval for the project on 1 September 2023 (P17/23).	Noted
DoH advised of proposal on 28 May 2024	<p>DoH replied on 28 May 2024 stating that:</p> <p>The Department of Health considers the proposed wastewater recycling of treated wastewater from Harvey Fresh's dairy and juice operations into Harvey Dam to present a 'high exposure', risk level based on the "Guidelines for the Non-Potable Uses of Recycled Water in Western Australia 2011".</p> <p>The applicant will need to demonstrate the in-principal approval conditions prior to issuance of the final approval. These conditions include (but are not limited to) Harvey Water demonstrating their community and stakeholder engagement commitments, an upgrade to the Harvey Fresh wastewater treatment process to achieve stringent recycled water quality objectives, and proof that the water quality objectives are met during the commissioning of the wastewater treatment upgrade before any recycled water can be released into Harvey Dam.</p> <p>In addition to the conditions listed in the "in-principal approval", the Department of Health has requested the following documents/information from the applicant before issuing the final approval:</p> <ul style="list-style-type: none"> • Approval from the Department of Water and Environmental Regulation, that nutrient loads/water quality objectives can be achieved as part of Part V licensing requirements; and • Updated RWQMP addressing the following (but are not limited to): <ul style="list-style-type: none"> ○ A signed supply agreement between Harvey Fresh (as the supplier of recycled water) and Harvey Water (as the recipient) which includes the 	Noted. The Department of Health will issue the final approval only if the applicant can demonstrate compliance with the in-principal approval conditions, ensuring public health will not be compromised.

Direct interest stakeholder comment	Comments received	Department response
	<p>quality and quantity of recycled water to be supplied at a designated handover point.</p> <ul style="list-style-type: none"> ○ Evidence that the community involvement and consultation commitments made by the Harvey fresh. ○ How microbiological hazards present in the source wastewater will be mitigated across the different wastewater recycling treatment components and demonstration that chemicals used in the wastewater treatment process or present within the wastewater source do not represent a significant human health risk. ○ Finalised human health risk assessment in accordance with the principals outlined in Appendix E of the Department's RWQMP template. ○ Further information to demonstrate how public health risks associated with algae growth in open storages will be managed and monitored. 	
DPLH advised of proposal on 5 June 2024	<p>A review of the Register of Places and Objects as well as the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Database concludes that the proposed pipe and pipe diffuser intersects with lodged Aboriginal Heritage Place Harvey River (ID 39727), the boundary of which includes the high water mark of the waterway and embankment contours.</p> <p>Based on the current information held by DPLH, approvals under the <i>Aboriginal Heritage Act 1972</i> are required where the proposed pipeline intersects with the waterway. Please refer the proponent to the DPLH website at Aboriginal Heritage Approvals (www.wa.gov.au) for information on 'Land use under the <i>Aboriginal Heritage Act 1972</i>' for the types of approvals available under the act and how to apply.</p>	Noted. The applicant consulted with the Gnaala Karla Booja Aboriginal Corporation and the South West Aboriginal Land Sea Council Aboriginal Corporation on 5 June 2024. Both parties responded on 5 July 2024 stating that they have resolved their questions directly with Harvey Water and have no comment to make in relation to the works approval application.
DBCAs advised of proposal on 28 May 2024	The Department of Biodiversity Conservation and Attractions (DBCAs) responded on 25 June 2024.	The Delegated Officer notes that the construction of the pipeline does not trigger the requirement to be regulated under Part V of the EP Act and that the regulation of the prescribed activities under Part V of the EP Act does not exempt an occupier from the need to obtain relevant approvals and meet the

Direct interest stakeholder comment	Comments received	Department response
	<p>No information was provided to indicate that dieback surveys have been undertaken. The CEMP states that “the project footprint is considered to occur in an area at risk of <i>Phytophthora cinnamomi</i>; however, spread of dieback to adjacent vegetation is not likely to be significant.”. This is considered to be an inaccurate statement given the proposed pipeline will traverse TEC vegetation. It is not sufficient to assume an areas dieback status and DBCA South West Region suggests that dieback surveys be undertaken of the alignment. A subsequent hygiene management plan is then developed to ensure that any uninfested areas that may be identified are appropriately protected, including consideration to runoff and water management during construction activities.</p>	<p>requirements of other legislation and regulatory functions.</p>
<p>DPIRD advised of proposal on 28 May 2024</p>	<p>DPIRD responded on 22 August 2024.</p> <p>The Water Quality Management Plan (WQMP) identified seasonal recreational fishing as a primary contact recreational activity. While recreational fishing activity for stocked trout species (rainbow and brown) peaks during the winter and spring month, it is an activity that is permitted year-round, with no closed season observed.</p>	<p>Noted</p>
	<p>Chlorine levels and toxicity do not appear to be considered in the WQMP. This should be addressed, and chlorine added to the suite of other water quality parameters being measured.</p> <p>The level of chlorine in the 1 ML of water that will be delivered daily to the single deepwater discharge point is likely to be toxic to some freshwater species, in particular trout. There needs to be consideration of the impacts of chlorine levels to other freshwater species.</p> <p>DPIRD have concerns that the single deepwater outlet is inadequate for dispersing, diluting and mixing the chlorinated water sufficiently to reduce the chlorine to a suitable level below chronic and possibly even toxic levels to aquatic species. A single point discharge as proposed is unlikely to adequately mix and dilute the Harvey Fresh wastewater vertically and horizontally over sufficient area in the dam, resulting in localized areas of toxic levels of chlorine.</p>	<p>Additional regulatory controls have been added to the works approval for chlorine. A residual chlorine limit of 0.003 mg/L discharge limit has been conditioned in line with both the ANZECC Toxicant guidelines for the protection of aquaculture species and the 95% species protection level.</p>

Direct interest stakeholder comment	Comments received	Department response
	<p>DPIRD recommend that Harvey Fresh wastewater outflow water into Harvey Dam be additionally treated in one of the following manners:</p> <ul style="list-style-type: none"> • Prior to entry into the dam discharge water to be treated with an appropriate dosage of sodium thiosulphate in an appropriate manner to neutralize chlorine prior to entering the dam; or • Prior to entry to the dam, discharge water to be put through an aeration process, such as a baffle tower, to off-gas chlorine to acceptable limits; or • The single deepwater discharge point be changed to a floating delivery system 0.5 – 1m below surface with multiple venturi outlets spaced along the pipeline to aerate for off gassing and mix/disperse any residual chlorine more effectively. 	
	<p>As the wastewater is being released (proposed) at depth DPIRD recommends bottom (1 m) samples also be taken at the in-dam sites.</p>	<p>The Delegated Officer identified data gaps in the proposed monitoring program and the potential for stratification to occur within the dam. Conditions have been added to the works approval to ensure sampling is undertaken in proximity to the substrate and likely accumulation zone for salinity. Reporting conditions have also been added to review the performance and effectiveness of the diffuser to achieve adequate mixing.</p>
	<p>Given mixing is likely to be highly seasonally affected, DPIRD recommend that monthly sampling for the first year be undertaken, as opposed to the six months.</p>	<p>The Delegated Officer has added conditions requiring the works approval holder to undertake monthly monitoring during time limited operation. Monitoring to be undertaken during the licence will be assessed up receipt of a licence application.</p>
	<p>The proposed treated wastewater (TWW) inputs are unlikely to be harmful to marron and trout at the stated input concentrations, but salts are likely to build up in deeper waters of the dam over time. If water levels stay at their current volume, then this shouldn't pose an issue given the relatively low TWW input of</p>	<p>The water balance developed by the applicant is supported by climate predictions and the updated</p>

Direct interest stakeholder comment	Comments received	Department response
	<p>365 ML/year. But if dam water levels were to drop in the future, then this 365M/L could represent a substantial contribution to the overall dam volume.</p> <p>Section 5 of the risk assessment document contains modelling of water levels and dilution of inputs. It is unclear what starting values were used in these models and how they predicted dam inputs (e.g. rainfall/surface water and other water sources) and outputs (e.g. water usage) into the future.</p>	<p>guidelines for using future climate projections for water management (DWER 2024).</p> <p>It should be noted that the future licence application may be subject to further regulatory controls for reviewing and updating the water balance assessment.</p>
Tourism WA advised of proposal on 14 June 2024	Tourism WA considers that there will be minimal impact on the tourism experience at Harvey Dam from this proposal. Therefore, Tourism WA has no objection.	Noted
OzFish advised of proposal on 22 May 2024	<p>OzFish responded on 12 July 2024.</p> <p>The potential impact to water quality in Harvey Dam from waste discharge is of particular concern to marron populations. Water quality is widely noted as a critical bottleneck in marron abundance (<i>de Graaf et al., 2010</i>). There are a number of unknowns in the specifics surrounding water quality and its exact impact/s on wild marron populations. Marron populations within the dam are already subject to several stressors, including fishing pressure and a limitation of complex habitat (Beatty et al., 2019). The construction of supporting infrastructure and subsequent wastewater discharges has the potential to further reduce the spatial area of suitable habitat in the dam. Generally, the introduction of wastewater discharges will only add to the pressure on the marron population. Accordingly precautionary principle should be heavily considered when assessing the environmental acceptability of this proposal.</p> <p>A considerable amount of government and community resources have been allocated to improving Harvey Dam as a marron and trout fishery (especially through stocking programs). The proposed works have the potential to reduce the efficacy of these programs.</p>	Noted. A rigorous sampling program has been included within the works approval to monitor discharges to the Harvey Dam and to ensure there is no adverse impact to aquatic species and the environment.

Direct interest stakeholder comment	Comments received	Department response
Gnaala Karla Booja Aboriginal Corporation advised of proposal on 5 June 2024	Gnaala Karla Booja Aboriginal Corporation responded on 5 July 2024 stating that they have resolved their questions directly with Harvey Water and have no comment to make in relation to this works approval application.	Noted
South West Aboriginal Land Sea Council Aboriginal Corporation advised of proposal on 5 June 2024	South West Aboriginal Land Sea Council Aboriginal Corporation responded on 5 July 2024 stating that they have resolved their questions directly with Harvey Water and have no comment to make in relation to this works approval application.	Noted

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

Condition	Summary of applicant's comment	Department's response
Condition 1, Table 1	Some of the pipeline infrastructure requires higher pressure rating pipe. Amend the wording of the pipe requirement to be a minimum requirement to allow for higher rating pipe where required.	Amended as requested. The use of higher pressure rated pipe does not alter the risk assessment.
Condition 9, Table 4	Update the TDS and Conductivity (EC) values to align with the Harvey Fresh licence.	<p>The Delegated Officer notes that there are no discharge limits within the Harvey Fresh licence. The licence amendment granted on 18 December 2023 for the Harvey Fresh premises assessed only the construction of the wastewater treatment infrastructure located on the Harvey Fresh premises and did not assess or authorise the discharge into the Harvey Water pipeline and Harvey Dam.</p> <p>As part of reviewing the TDS and EC values, a clerical error was identified in the conversion of EC to TDS. Both TDS and EC values have been updated to the correct values (2000 mg/L and 2500 μS/cm respectively)</p>
Condition 9, Table 4	Residual Chlorine requirement is too low for accurate reading with minimum readings from available analysers being 0.005 mg/L. Amend residual chlorine limit to 0.005 mg/L at the inflow pipe sampling location as chlorine will degrade in the pipeline to meet the 0.003 mg/L limit.	Amended as requested. Chlorine degradation calculations confirm that a limit of 0.005 mg/L at the inflow pipe monitoring pipe would then meet the required 0.003 mg/L concentration at the diffuser.
Condition 9, Table 4	A number of discharge limits appear to be based upon the trigger values and not the wastewater input quality. The discharge limits should align with the Harvey Fresh licence.	The Delegated Officer has reviewed and updated the discharge limits for BOD, FRP and NH_4^+ to the correct values. The Delegated Officer notes that discharge limits are set based upon the quality of the treated wastewater (sampling data) that has been used as the input value for dilution modelling calculations and not the quality of the water within Harvey Dam.
Condition 9, Table 4	E.coli is naturally occurring in the dam and fluctuates throughout the year.	Noted. The discharge limit during time limited operation for E.coli is based on the Guidelines for the Non-Potable Uses of Recycled Water in Western Australia requirements. The Delegated Officer notes that there is no limit for sampling locations within the dam given the presence of natural

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Condition	Summary of applicant's comment	Department's response
		occurring E.coli.
Schedule 1, Figure 2	Update Figure 2 and Figure 3, Schedule 1 due to minor alterations to the anchoring plan.	Figures updated
Schedule 2, Table 6	Confirm that note 1 (In-field non-NATA accredited analysis permitted) applies to pH, temperature and residual chlorine.	The Delegated Officer confirm that in field non-NATA accredited analysis is permitted for Volumetric Flow Rate, pH, Temperature, Electrical Conductivity, Dissolved Oxygen and Residual Chlorine.