

Decision Report

Application for Works Approval

Part V Division 3 of the Environmental Protection Act 1986

Works Approval Number W6696/2022/1

Applicant	Inghams Enterprises Pty Ltd
ACN	008 447 345
File number	DER2022/000279
Premises	Inghams Enterprises Pty Ltd
	9 Baden Street
	Legal description
	Lot 68 on Diagram 98482
	Osborne Park WA 6017
	Certificate of Title Volume 2172 Folio 927
	As defined by the premises maps attached to the issued works approval
Date of report	16/01/2023
Proposed Decision	Works approval granted

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 operation of a new Wastewater Treatment and Recycling Plant (WTRP) at the Inghams Chickens abattoir in Osborne Park. The assessment does not include an assessment of potential emissions and discharges from the decommissioning of the existing Wastewater Treatment Plant (WWTP) at the facility and does not allow operation of both the WTRP and the WWTP at the same time.

As a result of this assessment, works approval W6696/2022/1 has been assessed as suitable to grant subject to Planning Approval being obtained by the City of Stirling. Time Limited Operations will be authorised under the Works Approval to allow for operation of the new WRTP to occur, following commissioning of the facility, and to allow validation testing of noise and odour emissions to occur.

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 and overview of premises

The Inghams Chickens Abattoir in Osborne Park has been in its current location since 1991 and during the 2021 annual reporting period approximately 20 million birds were reported to have been processed at the facility. Under *Environmental Protection Act 1986* Licence L7477The premises is authorised to slaughter up to 50,000 tonnes per annum of birds (live weight). On average this amounts to production of approximately 37,500 tonnes of chicken meat per year with approximately 12,500 tonnes of animal bi-products generated.

Bi-products include heads, feet, feathers, blood and intestines which are transported offsite to a rendering plant for treatment where they are turned into saleable products such as tallow, meat meal for the pet food industry and blood and bone. In addition to these wastes, large amounts of wastewater are generated at the site. Abattoir effluent high in Biological Oxygen Demand (BOD) due to the presence colloidal suspended solids such as blood, fats, proteins, grease; Total Suspended Solids (TSS), Total Nitrogen (TN) nitrogen and Total Phosphorus (TP).

Untreated abattoir effluent can cause blockages in municipal sewers, widespread odours and harmful gas build up in mains pipework and contribute to processing upsets for the biological wastewater treatment plants that service the community as a whole. Discharge is required to be treated to approved water quality criteria, to prevent shocks to the system.

The new WTRP will process approximately 1700kL per day of incoming effluent derived from the abattoir operations at the premises. Following treatment, up to 900kL per day is allowed to be discharged into the water corporation sewer meaning that up to 800kL needs to be either stored or reused on site.

The wastewater generated from the abattoir operations is subject to an industrial Trade Waste Permit and Regulated by the Water Corporation. Inghams are required to meet prescribed water quality and volumetric limits from Water Corporation prior to discharge into it's sewers.

On 22 June 2022, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act) to construct a new WTRP

to allow for more efficient and effective wastewater treatment, that also reduces the incidence of odour emissions from the treatment of wastewater.

Prior to discharge the water must not have a Biological Oxygen Demand of greater then 3,000mg/L and the concentration of oil and grease must not exceed 500 mg/L.

The premises adjoins a number of landholdings that contain multiple residential dwellings, the closest of which adjoin the premises boundary to the east of the premises as shown in Figure 1 below.



Figure 1: Premises boundary (shown in red) in relation to Wastewater treatment and recycling plant foot print area (shown in yellow).

Odour complaints have been associated with the existing wastewater treatment plant, the live birds holding shed and the offal storage areas. This works approval is made to partially address odour complaints at the facility associated with odours generated from the existing WWTP.

The current application is to construct a new enclosed WTRP at the premises that enables these wastewater processing and discharge demands to be met. The WTRP is shown in Schedule 1 Figures 2 and 3 of the Works Approval and has four main constituent parts:

- an odour control system
- a Wastewater Treatment System

- a Brackish Water Reverse Osmosis (BWRO) system; and
- a recycled water reuse system.

No change is proposed for the effluent from staff amenities. This is managed separately from abattoir waste and will continue to be discharged directly to the Water Corporation sewage system, without any on-site treatment.

2.3 Operation of the Wastewater Treatment and Recycling Plant

2.3.1 Wastewater Treatment System

The wastewater is passed through an internally fed rotary screen filter to remove gross physical solids from the wastewater stream prior to treatment. The wastewater is then gravity fed into a fully enclosed balance treatment tank where the water undergoes mechanical jet aeration and where it is mixed and stored awaiting treatment. pH is also adjusted at this stage. The water is then transferred to the Dissolved Air Floatation (DAF) plant where the water is dosed with a coagulant, dosed with a polymer and subject to further aeration. In the DAF plant, the polymer binds with suspended solids and the aeration causes the formation of a scum on the surface where it is then mechanically removed. The scum is dewatered to form a sludge in a screw press which is then transferred to a skip bin for storage pending off-site disposal. The water from the sludge dewatering is transferred back into the balance tank where it is subject to retreatment. From the DAF plant approximately 750kL/day water is then pumped to the trade water discharge point into water corporation sewer. The remaining approximate 680kL/day is sent to the Membrane Bioreactor(MBR) tanks for further treatment.

The Wastewater Treatment system is situated within an enclosed shed within the WTRP footprint area (see Figures 2 and 3 contained in Schedule 1 of the Works Approval).

2.3.2 Brackish Water Reverse Osmosis (BWRO) system

Following treatment in the DAF plant, the partially treated water is passed into one of two preanoxic mixing tanks where the water is dosed with caustic, aluminium coagulant and it is then passed through 4 aeration tanks (A-D). After aeration the water is then dosed with a biocide in one of two post anoxic mixing tanks. The wastewater is then conveyed through the Membrane Bioreactor which consists of 8 modular units, where the effluent is subject to a micro filtration under pressure and where the water is filtered under pressure through 5- and 1-micron filters to remove fine particles within the water. The filtrate is then subject to UV sterilisation.

The filtrate is considered to be of suitable quality for recycling at this stage however it is subject to further treatment to minimise the risk of pathogens from wastewater going back into the wastewater reuse areas within the abattoir.

Following the UV sterilisation, up to 476 kL/day is pumped through a series of Reverse Osmosis membranes which results in descaling to produce potable quality water. The resultant treated wastewater is suitable for reuse and it is stored in one of 2 500kL recycled water treatment tanks.

The Reverse Osmosis Plant is located within an enclosed shed within the WTRP footprint area (see Figures 2 and 3 contained in Schedule 1 of the Works Approval).

Approximately 204kL/day of brine wastewater is removed from the BWRO plant and sent to sewer.

2.3.3 Recycled water reuse system

Recycled water is recirculated and dosed prior to re-use into the abattoir to maintain water quality. There are three pumps that transfer water into dedicated reuse areas using dedicated reuse conveyance infrastructure, within the processing plant. Although the recycled water is of

potable water quality standards, it will not be used in areas where high hygiene standards area required, such as in areas where meat intended for human consumption is processed or packaged. Therefore, recycled water use will be limited to cleaning, scalding, crate wash, evisceration, cooling towers/condensers and the live bird holding area.

2.3.4 Odour control system

'Unlike the old WWTP, the new WTRP allows for tertiary treatment of wastewater and uses a completely enclosed treatment system which allows for odorous air to be captured and treated through a dedicated odour control system prior to discharge to ambient air. Odorous air will be extracted from the point sources that generate odorous air including: primary solids screen and static bow screen; central balance tank, sludge storage tanks and sludge transfer screw, DAF unit, balance tank, screening area, anoxic and aeration tanks, membrane bioreactor tank and various pumps and fans throughout the process.

The odour control system consists of four biofiltration tanks which allow for treatment of 750m3/hr each (3,000m3/hr cumulatively in total); in 4 enclosed biofilter tanks. The odorous air will be treated at a volumetric loading rate of approximately 86m3/m3/hour and will be is forced through the biofilter tanks under positive pressure using two odour extraction fans with a residence time of approximately 42 seconds. The treated air is polished through an activated carbon filter to remove hydrogen sulphide from the treated air. All four biofilters discharge air though a common filter. The treated air is to be discharged to ambient air via a common 14m stack.

The Odour Control System is located on the hardstand area between the commercial shed and the Balance Tank (see Figures 2 and 3 contained in Schedule 1 of the Works Approval).

3. Noise impact assessment

The Applicant submitted an assessment of environmental noise as part of the Works Approval application. The new WRTP footprint area is proposed to be built 50-100m closer to the nearest sensitive receptors than the existing wastewater treatment plant footprint area. The new WRTP will operate 24 hours a day 7 days a week subject to processing demands.

The Acoustic Report for WRTP Inghams (19 August 2022 Acoustic Engineering Solutions) included a predictive noise assessment and noise measurement indicating high noise levels from existing activities and operations. There are a number of proposed noise generating infrastructure (pumps and air compressors etc) included within the current works approval application. Figure 2 and 3 of the works approval provide detailed layout of these. Infrastructure is to be positioned both inside and outside the shed.

The Acoustic Report includes a calculation of influencing factors based on proximity to the Mitchell Freeway to the west of the premises, and that the residential receptors are within land that is zoned "development' and the percentages of commercial, residential and industrial land uses near them (Inghams being the sole industrial land use within close proximity to these receptors). This is illustrated in Figure 2 below which shows industrial land use as Type A, commercial land use as Type B and the residential premises within 100m and 450m of the premises boundary The prediction of noise (noise modelling) implies that the residential dwellings within proximity of the prescribed premises should be afforded a lower level of protection from impacts from noise on account of the calculation of the influencing factor.



Figure 2: Distance to noise sensitive receptors within 100m and 450m of the premises boundary (as shown by yellow circles)

The Acoustic Report concludes that the WRTP will comply with the Noise Regulations as there is already so much ambient noise in the area, that the contribution from the new shed and its infrastructure at sensitive receptors is effectively "inaudible and masked" and therefore

cancelled out at the nearest sensitive receptors. The information provided does not include a cumulative noise modelling assessment, yet cumulative ambient noise appears to have been part of the calculation method for determining the influencing factor and that predicted impacts will be negligible on nearby sensitive receptors.

4. Odour Assessment

Between January 2020 and October 2022 DWER received more than 193 complaints of odour impacting the amenity of members of the community neighbouring the premises. As a result, DWER contracted an odour consultant to investigate odour emissions from the Premises. The consultant's report determined that fugitive odorous air emissions from the open structure of the existing Wastewater Treatment Plant (WWTP) was one of the key causes of offsite odour emissions.

The Applicant submitted an Operational Odour Analysis Report (OOAR) as part of the current application for the WTRP for both normal and non-standard operating conditions because of the proximity of nearby sensitive residential receptors. The OOAR notes that as the design is to fully capture, contain and treat odour emissions through the Odour control system and during normal operations that odour emissions will be negligible with the operational control "SCADA system" continuously monitoring performance for humidity of inlet air, and water flow into the biofilter bed media and the hydrogen sulphide (H₂S) concentration post the carbon filter scrubber.

During non-standard operations the OOAR notes that monitoring critical process points against the manufacturer's specifications will determine if corrective actions need to be taken. H₂S concentration at the odour control system discharge stack, the absence of negative pressure (positive pressure) within the WTRP units, monitoring of water flow within the biofilter bed media and relative humidity of the inlet air to the biofilters and air inflow rates will serve as trigger points for maintenance and corrective actions.

5. 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.

5.1 Source-pathways and receptors

5.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction, commissioning and time limited operations which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Emission	Sources	Potential pathways	Proposed controls
Construction			

Emission	Sources	Potential pathways	Proposed controls
Dust	Construction of Wastewater Recycling and Treatment Plant	Air/windborne pathway causing	Site preparation works will be of short duration
Noise	(WRTP)	impacts to health and	Construction works of limited duration
		amenity	On site machinery compliant with vehicle noise emission requirements
			Works to occur between 0700 hrs and 1700hrs Monday-
Commissioning a	nd Operation		
Noise	 enclosed biofilters, sludge storage 	Air/windborne pathway	Noise bund of 1.8m L-shaped located next to the two treated water distribution pumps
	tanks,	causing impacts to	Some processing Operations within shed
Odour	 dewatering screw press, solids inlet screens, Dissolved air 	health and amenity	Waste water processing vessels are either fully self-contained or fitted with an air extraction fans and ductwork to extract and convey process air through the Odour Control system.
	flotation plantreverse osmosis		Vessels fitted with air extraction hoods includes:
	plant and • bioreactor		Open vessels fitted with air extraction fans mechanisms and contained within a commercial shed includes
			Odour control system consist of 4 x biofilter units which contain microorganisms on biofilter media such as bark or woodchips, and consume the odorous air as a food source.
			After the biofilters, all air is passed through an activated carbon H2S scrubber before being discharged to the environment via a 14m stack
			Higher level of water treatment means waste water is less odorous
			Biofilter will be monitored continuously for humidity, Temperature and air flow rate
			The activated carbon filter will be monitoring for Ppm h2S
Wastewater/effluent discharge to the	Accidental discharge of partially treated	Overland flow and infiltration causing groundwater contamination and odour	Tanks to be fitted with level control devises to continuously monitor levels.
environment	environment effluent Effluent high in Biological Oxygen Demand, Suspended solids, Total Nitrogen and Total Phosphorus		These include ultrasonic level sensor, hydrostatic pressure transmitters level switches are to be fitted The main untreated waste water containment tank is the balance tank and this is fitted with a 110% bund, fill sensors to raise an alarm when a high fill level is reached.
			Should the tank over flow this triggers an alarm which is to be used to signal a shut-down of operations.
			The alarm has a back level switch in case of failure of the primary alarm mechanism.
			The bund can be treatment plant
			The commercial shed that contains the DAF

Emission	Sources	Potential pathways	Proposed controls
			plant, Rotary Screen, Bow screen. WRTP chemicals and Brackish Water Reverse Osmosis Treatment plant
			Has a 200mm hob wall creating its own bund with concrete ramps and the volume of this bund is 110% of the largest tank in the shed.
Dewatered Solid abattoir waste Solids removed from wastewater	Odour from solids removed from WWTP	Air extraction for treatment through OCS	Solids removed from the internally fed drum screen are separated and dewatered and sent to a spirotainer for off-site disposal (this includes screenings from the wastewater and also solids
via internally fed drum screen			generated from the clerning of the drum Suspended solids removed from the wastewater via the polymerization and air suspension through the DAF plant are scrapped off the top of the water, dewaters and sent to a spirotainer
from wastewater via polymerization and aeration in DAF plant			for off site disposal Sludge waste is dewatered and stored within self-contained spirotainers
Untreated or partially treated wastewater	Accidental discharge of partially treated effluent	Overland flow and infiltration causing	Discharge to Water Corporation Sewer Water Corporation regulates discharge criteria to sewer.
discharge Very High in TDS,	Leaks, spills and ruptures of liquid waste delivery lines	groundwater contamination and odour	
BOD and nutrients	Overtopping of tanks Failure of pumps		

5.1.2 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 2 and Figure 2 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 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential Premises	 There are a number of residential properties immediately adjacent to the east premises: 12 residential dwellings, closest ~105m north-east from WTRP shed, located at 9 Powell Street Osborne Park (Lot 10 on Plan 51925); 10 residential dwellings, closest ~50m north-east from WRTP shed, located at 10 Powell Street

	 Osborne Park (Lot 227 on Plan 302946); 18 residential units, closest ~ 55m east from WTRP shed, located at 35 Main Street;(Lot 1 on Plan 48220); 10 residential Units, closest ~ 95m east from WTRP shed , located at 27 Main Street (Lot 64 on Plan 34644); Single residential dwelling located ~ 119m south- east from WRTP shed at 23 Main Street Osborne Park, Lot 3 on Plan 5901; and 10 residential units, closest ~ 135m south-east from WTRP shed at 21 Main Street Osborne Park, (Lot 65 on Plan 34643).
Environmental receptors	Distance from prescribed activity
Specified Ecosystems	Herdsman Lake Regional Park 950m SW
	Environmentally Sensitive Area and a Bush Forever Site Threatened Fauna – Blue Billed Duck; Glossy Ibis; Carnaby Cockatoo Herdsman lake 1.3km south

5.2 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 5.1. 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 5.1), 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 3.

Works approval W6696/2022/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the WRTP. 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 3: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk events					Risk rating ¹	Annlinent		Justification for
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	additional regulatory controls
Construction	construction							
Orreturtion	Dust	Air / windborne pathway causing impacts to health and amenity	Air / windborne pathway causing impacts to health and amenity 60 residences within 50- 120m east south east and norther eat of Refer	Refer to Section 6.1	C = Minor L = Rare Low Risk	Y	Standard construction works approval conditions will apply	N/A
Construction	Noise			Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Y	Standard construction works approval conditions will apply	N/A
-	Operation and Commsioning (including time-limited-operations operations)							
Commissioning and Time Limited Operation of wastewater treatment and recycling plant	Odour	Air / windborne pathway causing impacts to health and amenity	Approximately 60 residences within 50- 120m east, south-east and north- east of the premises	Refer to Section 6.1	C = Minor L = Unlikely Medium Risk	Ν	Standard construction, compliance and reporting works approval conditions will apply In addition, odour monitoring will be required during time limited operations in accordance with Condition 12.	The Applicant is required to demonstrate construction meets the required specifications prior to commence commissioning Following commissioning, Time Limited Operations are permitted until such a time as an amended Licence is granted To ensure odour control system works as intended and does not result in unreasonable impact to nearby residential receptors the Applicant is required to undertake continuous monitoring for biofilter humidity, air velocity and volumetric flow rate

Risk events					Risk rating ¹	Applicant	ls works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = controls	Applicant controls sufficient?		
								at the main biofilter inlet during Time Limited Operations. Odour is required to be monitoring prior to discharge to the stack. Odour concentration shall be monitored at least once during Time Limited Operations to validate performance of the Odour Control System.
	Noise	Air / windborne pathway causing impacts to health and amenity	Approximately 60 residences within 50- 120m east, south-east and north- east of the premises	Refer to Section 6.1	C = Moderate P = Possible Medium Risk	Ν	Standard construction, compliance and reporting works approval conditions will apply Conditions 9, 10 and 11 are included to allow validation noise emissions at the nearest sensitive receptors	Noise verification monitoring is required to verify that the proposed operations comply with the EP Noise Regulations at the nearest sensitive receptors during time limited operations.
	Untreated or partially treated wastewater discharge; brine from reverse osmosis plant and Membrane Bioreactor Very High in TDS, BOD and nutrients	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality Infiltration to groundwater impacting on beneficial use of groundwater by nearby residential receptors	Herdsman Lake Regional Park 950m SW City of Stirling groundwater area (superficial) aquifer	Refer to Section 6.1	C = Slight L = Rare Low Risk	Y	Standard construction works approval conditions will apply and are sufficient to manage risk of discharge during operations	N/A

Risk events	Risk rating ¹	Annlisont		luctification for				
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
	Solid waste	No Pathway	Direct discharge to land	Refer to Section 6.1	C = Slight L = Rare Low Risk	Y	Standard construction works approval conditions will apply and are sufficient to manage risk of discharge during operations	

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. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 26 September 2022.	None received	N/A
Local Government Authority advised of proposal on 19 September 2022.	The City of Stirling replied on 11/10/2022 advising that the proposal had been referred to the Joint Development Assessment Panel as the City was not the decision maker in relation to this application. DWER was provided a copy of the Metro Inner-North Joint Development Assessment Panel and Western Australian Planning Commission Development Application (DA22/0911) determination (dated14 December 2022) on 21 December 2022.	The Planning Development approval is for a period of two years from the date of grant. The Delegated Officer considers that construction works must be completed by 13 December 2024.
47 other direct interest stakeholders were emailed on 20 September 2022.	None	N/A
Applicant was provided with draft documents on 13 December 2022	ТВА	The Applicant provided notification on 11 January 2023 accepting the draft works approval and decision report with the exception of the specification that the approved throughput capacity of 50, 000 tonnes per year should be changed from liveweight to dressed carcass weight.
		The Delegated Officer does not agree with the requested change as the original licence was assessed as liveweight. Should the works approval holder wish to increase the assessed throughput of the abattoir, this will need to be applied for through an amendment application so the increased emissions can be assessed and authorised.

7. 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.