



Application for Works Approval Amendment

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

Works Approval Number	W6452/2020/1
Works Approval Holder	Ausvision Rural Services Pty Ltd
ACN	106 075 763
File Number	DER2020/000477
Premises	Beaufort River Meats Abattoir 46 Macri Road BEAUFORT RIVER WA 6394 Legal description – Part of Lot 508 on Plan 418913 As defined by the Premises maps attached to the Revised Works Approval
Date of Report	14 December 2023
Proposed Decision	Revised works approval granted

Amendment description

Works Approval W6452/2020/ is held by Ausvision Rural Services Pty Ltd (Works Approval Holder) for the Beaufort River Meats Abattoir (the Premises), located at 46 Macri Road, in Beaufort River.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, an amended Works Approval W6452/2020/1 has been granted.

Purpose and scope of assessment

On 19 October 2023, the Works Approval Holder submitted an application to the department to amend Works Approval W6452/2020/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Construction of a HDPE lined sludge dewatering pad area completed with 500mm bund wall and a 1m x 1m x 1m HDPE lined leachate collection sump;
- Installation of 3 x GF36-20 Geoflow Geotextile dewatering containers (geobags) on the sludge dewatering pad;
- Dewatering of the sludge removed from the existing anaerobic pond (primary anaerobic pond); and
- Use of a mobile floating dredging unit within the ponds to remove sludge.

The Delegated Officer also incorporates Department initiated changes to the Works Approval. These relate to the testing and relining of the primary anaerobic pond post desludging to ensure that the pond is in good working order following the desludging activities.

Following the emptying of the primary anaerobic pond the Works Approval Holder can choose to replace a liner based on a visual inspection for damage such as tears, punctures, bubbling, and obvious signs of wear and tear such as leaks. The occupier can also choose to repair or replace the liner without formally undertaking a seepage test of the pond (relined in accordance with the HDPE liner construction and specifications as specified in Schedule 2 of the Works Approval)

If the Works Approval holder wishes to reinstate the pond for use without relining it following desludging, or undertake patch or repair works to the pond liner (i.e.: does not replace the full liner); the following must be undertaken **prior** to reinstating that pond for ongoing use at the premises:

- the in-situ liner must be subject to a liner integrity assessment and seepage test rate to determine its ongoing suitability for the containment of contaminated wastewater. An overnight 4-7 day water balance test and an estimation of the total mass of nitrogen and phosphorus emitted via seepage is required to be reported at this time. Ham and Baum 2009 and Parker et al. 2009 are considered appropriate in field testing methodologies;
- following the assessment, if the results indicate the liner of the primary anaerobic pond is damaged and discharging to the environment, then it is required to be decommissioned from use or relined according to industry standards prior to being re-commissioned for use (in accordance with the HDPE liner and construction specifications as specified in Schedule 2 of the Works Approval).
- The findings from this identification, repair, replacement and testing process; as well as seepage rates of nitrogen and phosphorus are required to be submitted to the CEO as

part of the Liner Integrity Assessment and Seepage Report to support the ongoing regulation and reliable use of the wastewater treatment ponds over the long to medium term.

An additional change the Works Approval includes correction to a typographical error. On 6 November 2023, the Works Approval holder sent an email to the Department noting an error within the existing works approval and requested this be changed (DWER document reference number: A2215361). In the original Works Approval, Table 1, sections a) and b), specify that the pond should be constructed with a minimum volume of 4,819 m³, with dimensions of 42m x 42m x 5m deep and walls featuring a 3:1 gradient. However, the Works Approval Holder has indicated that a pond of these dimensions would result in a volume of 4,050 m³, not 4,819 m³ as stated. It appears the volume presented in the initial application was wrongly calculated. The proposed pond has a volume of approximately 4,050 m³, as indicated in the desludging survey attached in the current application.

As a consequence, the secondary anaerobic pond volume will be amended from 4,819 m³ to 4,050 m³

Background

Staff from the Department of Water and Environmental Regulation (DWER) undertook a compliance inspection of the premises on the 21 July 2020. Through this audit process, it was identified that the premises was found to be non-compliant with the total nitrogen and total phosphorus irrigation limits on Licence L6826/1994/13 over the annual reporting period (then Licence Condition 2.5.2) at the time (Condition 11 in the current Licence as amended 30 April 2021). This was believed to be caused by the ponds not functioning optimally due their age and reduced water treatment capacity.

As a means to rectify this non-compliance, the Works Approval holder proposes to improve wastewater quality by way of construction of additional water treatment capacity through the addition of a secondary anaerobic pond. This new pond is to be commissioned when the primary anaerobic pond is desludged (Works Approved under this works approval). Although the desludging as proposed allows for the ponds to remain on-line during the removal of sludge, the primary anaerobic pond liner will need to be permeability tested following removal of sludge and relined if the pond does not meet permeability requirements (based on seepage test rates). It is noted that the desludging activity itself also has the capacity to damage the aged liner.

Should the pond liner not be deemed suitable for continued use, the primary anaerobic pond would need to remain off-line for an extended period of time to allow relining activities to occur or be decommissioned from use if the occupier doesn't select to reline the pond. This was originally identified by the Works Approval holder when making application for the new anaerobic pond, however was not included into the current Works Approval.

The Delegate Officer considers it suitable to allow for the construction and time limited operation of the desludging of the wastewater treatment ponds to incorporate additional conditions providing for testing for the primary anaerobic liner and construction requirements of a new replacement liner for the primary anaerobic pond, should it be required.

Consultation

The Department referred the application to the local government authority on 14 November 2023 seeking comment and to determine if a planning approval is required for the proposed desludging works. No comments have been received back from the Shire of Woodanilling.

The Department sent a copy of the draft on 21 November 2023 to the Works Approval Holder. Correspondence was received on 23 November 2023 and several phone calls ensued. A second draft version of the Amended Works Approval and Amendment Report were sent to the Applicant on 11 December 2023.

3. Risk assessment

The table below describes the risk events associated with the amendments consistent with the *Guidance Statement: Risk Assessments* (DER 2017). The table identifies whether the risk events are acceptable and tolerated, or unacceptable and not tolerated, and the appropriate treatment and degree of regulatory control, where required.

Source/ Activities	Risk Event			Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
	Potential emissions	Potential receptors, pathway and impact	Licence holder controls					
PROPOSED AMENDMENT								
Civil construction earthworks, vehicle movements, HDPE liner and geo bag placement, pipework pumps and associated infrastructure	Dust	Receptor: Residence 1000 m south southeast of premises boundary	Short duration of works Sufficient distance to sensitive receptors Works to occur during daylight hours	Slight: Onsite impacts minimal, no offsite impacts	Rare: Risk event may only occur in exceptional circumstances	Low risk: event is acceptable	The Delegated Officer considers that the separation distance of nearest residential dwellings from the proposed location of the new sludge dewatering pad to be sufficiently large for there to be no adverse impacts from noise or dust through the construction phase of works. Additionally, construction is expected to occur during daylight hours and is expected to be of a short duration only.	No additional regulatory controls will be applied. The Environmental Protection (Noise) Regulations 1997 (EP Noise Regulations) will apply.
	Noise	Pathway: Air/windborne pathway Impact: impacts to health and amenity						
Operation of desludging pad, wastewater collection sump and geotextile dewatering containers	Leachate	Receptor: Soil contamination and overtime localised groundwater quality Pathway: Seepage through liner, compacted soils; infiltration through soil to groundwater Impact: Soil contamination, decline in groundwater quality	Conducted on hard stand area lined with HDPE Collection of leachate in designated sump Recovery of leachate and pumped back to effluent ponds	Minor: onsite impacts low level, off site impacts minimal	Unlikely: the risk event will probably not occur	Medium risk: event is acceptable subject to Regulatory Controls	The Delegated Officer considers that the groundwater in the regional area is generally brackish to saline and the inferred groundwater level is greater than 10mbgl. The soil in the region is used for agricultural purposes, and activities from the premises should be managed to not cause a loss or decline of beneficial use of the soil or groundwater. The initial dewatering event is likely to occur over approximately 17 days period, which is considered a short duration and the dewatering will occur of a lined pad area designed to capture all run off and redirect it back into the lined wastewater treatment ponds. On this basis the Delegated Officer considers that the discharge of leachate to ground is unlikely to occur during operation should the construction conditions be met. As such the construction of the sludge dewatering pad and leachate sump is required to meet a minimum permeability coefficient of 1 x 10-9m/s.	Time limited operations will apply In accordance with Condition 1 the sludge dewatering pad and leachate sump is required to meet a minimum permeability coefficient of 1 x 10-9m/s. Condition 2 and 3 require the Works Approval Holder to provide evidence that the desludging pad complies with construction requirements.
	Very high in TDS, BOD and nutrients		Compacted soil overlain by HDPE Liner or Compacted soil with an engineered soils clay liner or Continued use of existing liner				Possible: the risk event could occur at some time	The Delegated Officer considers that the discharge of leachate from the primary anaerobic pond is at risk of occurring following the removal of sludge, due to the age of the existing pond liner and due to the potential further disturbance to the existing liner following desludging activity. The Delegated Officer considers the liner of the primary anaerobic pond should be subject to an liner integrity assessment and seepage rate assessment to determine the ongoing suitability of the pond for ongoing wastewater treatment and containment. If the liner has reached its end of life and is not considered functional, the pond is required to be relined prior to the ponds being recommissioned for use as a water treatment pond, or alternatively it can be decommissioned for use. The construction requirements for new liners are provided for within the current works approval and mirror the construction requirements of the new anaerobic treatment pond. Should the pond liner not meet permeability test requirements, and the Works Approval Holder opt not to reline this pond, it shall not be recommissioned for use and will be removed from the Licence as an authorised wastewater treatment pond.
Operation of pond liner for primary anaerobic pond								

Wastewater and sludge delivery lines Leaks spills and ruptures	Leaks, spills and ruptures of liquid/solids waste. Very High in TDS, BOD, nutrients and potentially pathogenic organisms	Receptor: Soil contamination with potential to impact of groundwater quality Pathway: Direct discharge to land Potential to infiltrate soil and groundwater quality Impact: Soil contamination with potential to impact of groundwater quality over the long term Decline in water quality of nearby ephemeral surface water tributary (Beaufort River tributary 3.4km east of premises) May pose a human health risk if discharges not cleaned up (bacteriological and vermin)	Short duration of operations Ongoing visual inspection and monitoring during filling of the geotextile container bags Desludging operations undertaken by specialist contractors Clean up and recovery procedure if needed	Slight: Onsite impacts minimal, no offsite impacts	Possible: The risk event could occur at some time	Low risk: event is acceptable subject to Works Approval Holder controls and standard conditions	The dewatering is to occur for a short duration of approximately 17 days. The Delegated Officer Considers that the dewatering and sludge lines associated with dewatering activities should be inspected at least 3 x times daily for leaks, ruptures and spills. In accordance with the Environmental Protection (Unauthorised Discharges) Regulations 2004 it is an offence to discharge animal waste, including animal oil, fat or grease to the environment. The Delegated Officer considers that all spills that occur during dewatering of sludge are required to be recovered.	Existing Licence Condition 1 Table 1 requires all sumps, drains and pipes to be maintained to prevent leakage (L6826/1994/13). Condition 6 Table 2 is amended to require all material discharged to the environment as a result of spills, leaks and ruptures is required to be contained, recovered and disposed of back into the wastewater treatment system.
Overflow of desludging pad and wastewater collection sump	Contaminated stormwater run-off Elevated levels of TDS, BOD, nutrients and potentially pathogenic organisms	Receptor: Soil and nearby vegetation Pathway: Overland flow and inundation of soil and vegetation towards surface water body 3.4km east of the premises (Beaufort River) Impact: Decline in water quality of nearby ephemeral surface water tributary	Short duration of operations Ongoing visual inspection and monitoring during filling of the geotextile container bags Desludging operations undertaken by specialist contractors Clean up and recovery procedure if needed	Slight: Onsite impacts minimal, no offsite impacts	Possible: The risk event could occur at some time	Low risk: event is acceptable subject to Works Approval Holder controls and standard conditions	The dewatering pad is constructed to have a bund wall and a gradient which directs run off towards a collection sump for recovery and conveyance of run-off water (or filtrate) back to the secondary anaerobic treatment pond. The dewatering is to occur for a short duration (17 days) and The Delegated Office considers it is suitable for inspection at least 3 x daily to ensure no over flows or overtopping of the bund containment area, or the sump occurs. In accordance with the Environmental Protection (Unauthorized Discharges) Regulations 2004 it is an offence to discharge animal waste, including animal oil, fat or grease to the environment. The Delegated Officer considers that all overflows that occur during dewatering of sludge are required to be recovered.	Existing Licence Condition 1 Table 1 requires all sumps, drains and pipes to be maintained to prevent leakage. (L6826/1994/13). Condition 6 Table 2 is amended to require all overflow materials to be contained, recovered and disposed of back into the wastewater treatment system.
Desludging activities	Odour	Receptor: Residence 1000 m south south east of premises boundary Pathway: Air/windborne pathway Impact: impacts to health and amenity	Short duration of works Geotextile containment bags minimize sludge surface area and exposure to ambient air	Slight: Onsite impacts minimal, no offsite impacts	Rare: Risk event may only occur in exceptional circumstances	Low risk: event is acceptable subject to Works Approval Holder controls	The Delegated Officer considers that the separation distance of nearest residential dwellings from the proposed location of the new sludge dewatering pad to be sufficiently large for there to be no adverse impacts from odour.	Standard works approval construction conditions will apply. No additional regulatory controls will be applied to the regulation of odour.
Discharge of dried sludge derived biosolids to land	Organic matter high in nutrients, oil, grease, and chemicals harmful to human and environmental health such as heavy metals and pesticides	Receptor: Direct discharge to land Pathway: Direct discharge to land Potential for contaminated	Not assessed Licence Holder has not applied for this activity and it shall not be permitted under current approval	Not assessed	Not assessed:	Not assessed	Should the Works Approval Holder wish to apply sludge to land, an approval to do so must be applied for first through application to amend the Works Approval or Licence L6826/1994/13.	Condition 12 is included and prevents sludge being applied to land at the premises

		<p>stormwater run-off and seepage to remobilize contaminants. Infiltration from soil to groundwater quality; overland flow to nearby vegetation and surface water tributary.</p> <p>Impact: Contamination of soil and decline in soil structure and function Decline in water quality of nearby ephemeral surface water tributary and groundwater May pose odour impacts to residents 1000m away; Pathogenic microorganisms and vermin affecting nearby human and nearby livestock health</p>						
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Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guidance Statement: Risk Assessments (DER 2017).

Decision

The Delegated Officer has determined that the application to construct a new sludge dewatering pad at the premises is suitable for approval subject to appropriate regulatory controls. The changes are unlikely to result in a material change to overall premises risk profile and are expected to improve the function of the wastewater treatment system and ponds at the premises.

The improved function of the wastewater treatment system will increase the amount of organic matter stripped from the wastewater prior to irrigation by restoring the available volumetric capacity in the pond which allows the hydraulic retention time to be optimised. It also allows for greater mixing in the pond between organic matter and microbes, maximising microbial digestion and reduce the nutrient loading of treated effluent, which goes on to be irrigated to land.

Testing of wastewater treatment pond liners

The Delegated Officer considers the inclusion of additional regulator controls to be crucial after desludging to ensure the liner remains reliable and that there are no leaks or tears in the liners which could compromise the effective treatment of the wastewater and cause environmental impacts to soil, surface water and groundwater. Leak detection surveys using the ASTM D6747 – 15 international standard Selection of techniques for electrical leak location of leaks in geomembranes was not considered suitable for the primary anaerobic pond liner as the current liner does not contain a geo membrane. On this basis the seepage rate water balance in field methods proposed by Ham and Baum (2009) and Parker et al. (2009) are considered a suitable de-facto integrity assessment methodology in this instance. The tests will provide an estimate of seepage volume, and existing information on untreated water quality sampling allows the seepage rate to be used to calculate an estimation of the seepage rates of nitrogen and phosphorus emissions from the pond. This information will allow for further consideration of the potential risks to receptors posed by the existing pond liner, including the life of the pond, and enables the Works Approval Holder to verify that mass emissions across the premises activities are consistent with water quality objective of nearby surface and ground water resources.

Sludge dewatering pad

The operation of the sludge dewatering pad does not represent a long-term risk to the environment as sludge dewatering may occur as infrequently as once in every one or two decades and as there are no sensitive receptors within 1000 m of the ponds. There is, however, a longer-term risk posed to the environment of the reuse of the anaerobic pond if the liner is faulty, post desludging. To address the potential for impacts to vegetation, soil and groundwater the Delegated officer has determined the following controls are suitable to manage the risks of impacts from operation and time limited operation under the existing Works Approval:

- Amendment of secondary anaerobic pond volumetric capacity from 4,819m³ to 4050m³ as requested by the Works Approval holder;
- Design and construction requirements for the construction of a new sludge dewatering pad;
- Installation and operational requirements for the sludge dewatering geobags;
- Specifications for the permeability/liner integrity assessment and relining of the primary anaerobic wastewater treatment pond as required;

- A requirement to a Liner Integrity Assessment and Seepage Report containing nitrogen and phosphorus seepage rates to the CEO if the desludged ponds are not relined, to demonstrate they are operationally functional;
- Time limited operations requirements of the sludge dewatering pad; geobags, leachate sump and pipes, drains and other wastewater and sludge conveyance infrastructure; and
- A condition preventing the discharge of sludge within the premises boundary to a licensed waste facility.

Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that an amended Works Approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Summary of amendments

The table below provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the amended Works Approval as part of the amendment process.

Summary of works approval amendments

Condition no.	Proposed amendments
1 Table 1	Amendment of the secondary anaerobic pond volumetric capacity from 4,819m ³ to 4,050m ³ Inclusion of design and construction requirements for <ul style="list-style-type: none"> ○ Sludge dewatering pad and leachate sump ○ Ponds subject to relining
2	Requires the Licence Holder to submit a report of Pond Liner integrity assessment and seepage assessment for the primary anaerobic pond following desludging if it is not relined
6 Table 2	Provides operational requirements for: sludge dewatering bed, geo-bags and sludge management, the leachate sump, sludge and wastewater conveyance infrastructure, desludged ponds found to be leaking
12	Prevents onsite disposal of sludge generated from dewatering activities within the premises boundary

References

1. Alanoix, D (2023) Email received 6/11/2203: Subject title: *RE: FW: Works Approval Application: L6826/1994/13 Beaufort River Meats| Desludging Ponds*. (DWER reference document: A2215361).
2. ASTM D6747 (2015) the ASTM international standard Selection of techniques for electrical leak location of leaks in geomembranes.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
5. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
6. Ham, J.M. and Baum, K.A., 2009. Measuring seepage from waste lagoons and earthen basins with an overnight water balance test. *Transactions of the American Society of Agricultural and Biological Engineers*, 52(3), 835-844.
7. Parker, D.B.; Eisenhauer, D.E.; Schulte, D.D.; and Nienaber, J.A., 1999. Seepage Characteristics and Hydraulic Properties of a Feedlot Runoff Storage Pond. *Biological Systems Engineering: Papers and Publications*, 179

Appendix 1: Summary of Works Approval Holder's comments on risk assessment and draft conditions

Condition	Summary of Works Approval Holder's comment	Department's response
1	<ol style="list-style-type: none"> 1. Request the integrity test be amended from an electrical test more suited to geo membrane: ASTM D6747 (2015) the ASTM international standard Selection of techniques for electrical leak location of leaks in geomembranes. 2. The requirement to integrity test and reline the aerobic ponds not be conducted at this time as it would prevent the site from operating as they required all the aerobic ponds to operate. 	<ol style="list-style-type: none"> 1. The Delegated Officer agreed to change the testing methodology and an infield seepage assessment methodology is now required: <ol style="list-style-type: none"> a. A visual assessment conducted by third- party independent engineer; b. A seepage assessment using either: Measuring seepage from waste lagoons and earthen basins with an overnight water balance test (Ham and Baum, 2009); or Seepage Characteristics and Hydraulic Properties of a Feedlot Runoff Storage Pond (Parker et al., 2009) <p>The Delegated Officer requires this is to be supported by submission of a Liner Integrity Assessment Report and Seepage Report in Condition 2 to affirm liner integrity and to verify the amount of nitrogen and phosphorus seeping into the ground via the liner.</p> <p>As a result of the changes to Liner Integrity Test methods, the infield methods and reports as required by condition 2; condition 3 requires these findings to be verified by a third party qualified engineer.</p> 2. Agreement to exclude the aerobic ponds has been agreed upon at the current time, however may be requested at a time in the future post construction of the additional anaerobic pond, which provides greater wastewater retention capacity across the premises