



Application for Licence Amendment

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

Licence Number	L9132/2018/1
Licence Holder	The Beer Farm Pty Ltd
ACN	606 046 306
File Number	DER2018/000586-1~4
Premises	<p>The Beer Farm</p> <p>133 Gale Road, METRICUP WA 6280</p> <p>Legal description –</p> <p>Lot 131 on Deposited Plan 32067</p> <p>Certificate of Title Volume 2223 Folio 345</p> <p>As defined by the Premises maps attached to the Revised Licence</p>
Date of Report	04 August 2022
Proposed Decision	Revised licence granted

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1. Decision summary

Licence L9132/2018/1 is held by The Beer Farm Pty Ltd (licence holder) for The Beer Farm (the Premises), located at 133 Gale Road, Metricup WA 6280.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the Premises. The Delegated Officer has determined to grant some amendments to Licence L9132/2018/1, to authorise the application of brewery treated wastewater to land, subject to conditions commensurate with the determined controls and reporting requirements necessary for administration of the licence, as presented in this Amendment Report. The Delegated Officer has determined not to make a decision on some aspects of the proposed amendments summarised in section 2.3 and has refused some amendments.

This Amendment Report documents the amendments made pursuant to section 59 and 59(B) of the *Environmental Protection Act 1986* (EP Act).

The Decision Report for the existing licence will remain on the department's website for future reference and will act as a record of the department's decision making.

2. Scope of assessment

2.1 Regulatory framework

In amending the licence, the department 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 Background

The Premises is a brewery which manufactures beer and cider. It is located 8km southwest of Metricup. The Premises is currently licensed to manufacture up to 1,040 kilolitres of alcoholic beverages per year but does not allow the discharge of liquid waste to land or waters.

The Premises received approval in 2014 from the City of Busselton to operate a brewery under the threshold for a Prescribed Premises. Operation of the brewery, commenced in 2015 following installation of a wastewater system (WWS). Production of beverages expanded and increased the generated volume of wastewater beyond the capacity of the WWS. After the installation of infrastructure that differed from an approved WWS design, wastewater from the brewing process was disposed to land.

The Beer Farm EP Act Part V licence was first issued in November 2018 for a newly proposed WWS but did not include approval for disposal of wastewater to land, as was sought in the application. Brewery wastewater was required to be removed off-site to a licenced waste facility for disposal.

In 2019 an amendment was granted that included approval of modification to the existing WWS and allowed for irrigation of wastewater pending the completion of a soil survey and soil investigations. Land loading limits were set for irrigation, based on the uncertainty of the receiving environment and whether alterations to the WWS would be able to achieve the expected nutrient concentrations. The soil survey and investigations were not completed, and the planned wastewater treatment system was not constructed, however discharge of wastewater to land continued.

This amendment application seeks to allow brewery wastewater to be discharged to land on the Premises along with the construction of a newly proposed WWS and irrigation infrastructure.

Table 1: Classification of premises

Classification of Premises	Description	Approved Premises production throughput
Category 25	Alcoholic beverage manufacturing: premises on which an alcoholic beverage is manufactured and from which liquid waste is or is to be discharged onto land or into waters.	1,040 kilolitres of beer and cider produced per year

2.3 Amendment

On 27 August 2021, the licence holder submitted an application to the department to amend Licence L9132/2018/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments sought are summarised as being to:

- increase production throughput of alcoholic beverages from 1,040kL/year to 1,470kL/year;
- construct and operate new wastewater treatment system and disposal infrastructure;
- establish and operate a new wastewater disposal (irrigation) area;
- remove existing conditions relating to a soil survey and detailed soil investigations;
- allow for the irrigation of wastewater to land;
- amendment of irrigation nutrient loading limits; and
- amendment of monitoring and reporting requirements.

Table 2 below details the requested changes to the licence.

Table 2: Requested amendments

	Existing licence condition	Description of proposed amendment
1	3	Increase production throughput from 1,040kL to 1,470kL of beverage per annual period.
2	4	Removal of conditions requiring a soil survey and detailed soil investigations to be undertaken by a qualified soil scientist. The licence holder considers these conditions have been met.
	5	
	6	
	14	Removal of condition as it prohibits the irrigation of wastewater to land due to the requirement to carry out a soil survey and detailed soil investigations (as per conditions 4, 5 and 6) which the licence holder considers having satisfied.
3	7- Schedule 2, Table 14	As none of the licence holder proposed works or CEO imposed works have been installed or completed, the licence holder is requesting that these infrastructure/equipment construction requirements are removed and authorisation to construct the following be granted: <ul style="list-style-type: none"> • Changes to wastewater treatment and storage area • 6 kL combined clarifier and lime/waste caustic dosing tank • pH controllers • Irrigation pump

		<ul style="list-style-type: none"> • Rain sensor/gauge • Four 5 kL tanks for trial of BioFilmTech PASND and associated pump/s and controllers • Agricultural-style contour intercept/diversion swale down-gradient of wastewater treatment and storage areas • 2 x 50 kL winter storage tanks • Portable irrigation pump • Volumetric flow meter • Irrigation system and land application areas (LAA) • Groundwater monitoring bores
4	13 - Schedule 2, Table 15	Changes to operational requirements of wastewater treatment, irrigation, and groundwater monitoring infrastructure due to the amendments requested to condition 7. Changes include the removal of operational requirements for the previously specified infrastructure and amended to outline maintenance and inspection of newly proposed infrastructure as listed in proposed amendment 3.
5	15 - Table 4	Amendment to authorised discharge points and irrigation requirements as new irrigation areas have been proposed. Changes to irrigation include fixed sprinklers instead of a transportable pod sprinkler, and removal of the restriction to only allow irrigation through January, February, March, April, May, November, and December.
6	16	<p>Changes to currently imposed restrictions and operation of irrigation areas due to a change in management controls. Requested changes include:</p> <ul style="list-style-type: none"> • Removal of reference to balance/settling tanks that are no longer proposed to be constructed • Irrigation only restricted within 24 hours of a rainfall event greater than 6mm • Restrictions to total wastewater volume allowed to be irrigated over June and July • Removal of redundant conditions regarding plantation trees • Removal of requirement to perform weekly checks • Proposed fixed irrigation system over the entire area for even distribution rather than a transportable pod sprinkler <p>In addition, the following conditions have been proposed:</p> <ul style="list-style-type: none"> • Pasture management • Nitrogen and phosphorus management
7	17 - Table 5	<p>Changes to wastewater monitoring requirements, including:</p> <ul style="list-style-type: none"> • Amended discharge points • Removal of parameters: <ul style="list-style-type: none"> ○ Volume of treated wastewater discharged • Addition of parameters: <ul style="list-style-type: none"> ○ Electrical Conductivity (EC) • Change in averaging period
8	18 - Table 6	Amendment of condition limiting land loading of Total N, Total P and BOD ₅ . Addition of more parameters and increase to all existing limits.
9	19 - Table 7	Amendment of condition 19 outlining waste containment and disposal requirements in relation to onsite storage.
10	20 – Table 8	<p>Changes to ambient soil monitoring requirements, including:</p> <ul style="list-style-type: none"> • Amended monitoring locations • Removal of parameters:

		<ul style="list-style-type: none"> ○ Metals and pesticides • Addition of parameters: <ul style="list-style-type: none"> ○ Electromagnetic induction (EMI) survey • Change in frequency • Change in soil profile depths
11	21 – Table 9	<p>Changes to ambient groundwater monitoring requirements, including:</p> <ul style="list-style-type: none"> • 3 bore locations to be sampled instead of 4 as specified in the existing licence • Addition of Sodium Adsorption Ratio (SAR) parameter
12	22 - Table 10	Minor proposed changes to ambient surface water monitoring requirements.
13	28 - Table 11	Removal of condition requiring the monthly reporting of monitoring data pertaining to land loading limits. The licence holder proposes that monthly monitoring will occur however reporting is changed to annual.
14	Schedule 1	<p>Amended maps provided to reflect changes in infrastructure and irrigation areas. Current maps 1 to 6 proposed to be replaced with the following figures from the WMP:</p> <ul style="list-style-type: none"> • Figure 4.1 Site Location • Figure 5.1 Wastewater infrastructure overview (flowchart) • Figure 6.2 Available Land Application Areas • Figure 9.1 Environmental Monitoring Locations

2.4 Compliance

Table 3: Compliance Inspections and compliance history

Instrument	Event	Findings
NA – the application for the licence was under assessment and not issued at the time	Site visit and issue of EFR	<p>The Department's records show that the licence holder was issued an Environmental Field Report (EFR #06755) on 19 March 2018, requesting:</p> <ul style="list-style-type: none"> • the immediate cessation of the discharge of brewery effluent; • removal of brewery effluent in accordance with the <i>Environmental Protection (Controlled Waste) Regulations 2004</i>; and • weekly updates be provided to DWER detailing the volume of brewery effluent removed and controlled waste tracking information. <p>Following the issue of the EFR, the licence holder did not provide weekly updates to DWER with details of the volume of brewery effluent removed or controlled waste tracking information.</p>
L9132/2018/1	Inspection on 13 August 2019	<p>The following non-compliances were identified:</p> <ul style="list-style-type: none"> • Disposal of treated water without compliance with conditions 14,15,16,17 and 18. • The licensee expressed that they do not intend to meet the requirements of condition 9 regarding WWS and bore construction reporting. • Groundwater monitoring bores required by the Licence were not installed (bore log reporting)

		<ul style="list-style-type: none"> Wastewater is currently irrigating without compliance with conditions 4 and 5 Wastewater irrigation is taking place through the restricted period Only treated wastewater from the final two balance tanks is to be irrigated however the WWS is yet to be operational. Wastewater monitoring not conducted. Calculations to determine compliance with condition 18 cannot be made as wastewater data is not available. WWS is yet to be completed therefore no hardstand is in place or level indicators on current tanks used for storage The first annual period for licence L9132/2018/1 finishes on the 31 December 2019 therefore the requirement to undertake annual sampling is yet to apply however the licensee advised that the Beer Farm do not intend to undertake the required soil testing. The licence is currently in the first annual period and monitoring of ambient groundwater is not due for completion until October however the licence holder advised that the Beer Farm do not intend to undertake the required groundwater testing. The licence is currently in the first annual period and monitoring of surface water is not due for completion until October however the licensee advised that the Beer Farm do not intend to undertake the required surface water testing. Monthly reporting of emission loading is not taking place <p>The following had not yet been completed:</p> <ul style="list-style-type: none"> Soil survey¹ has not been completed as required (Due 08/07/2019) Detailed Soil Investigations¹ has not been completed as required (Due 08/07/2019) Soil Scientist report has not been completed as required (Due 08/07/2019) Schedule 2 table 14 infrastructure has not been constructed as required (WWS and bores - Due 08/08/2019)
L9132/2018/1	Annual Audit Compliance Report (AACR) and Annual Environmental Report (AER) Review 1 November 2018 – 31 October 2019	<p>The 2018/19 AACR and AER review was undertaken 6 October 2020 and identified the following non-compliances:</p> <ul style="list-style-type: none"> monitoring and soil survey¹ has not been undertaken and submitted infrastructure equipment not installed four monitoring bores have not been installed. irrigation occurring irrigation was reported as having occurred throughout the non-permitted months irrigation occurring on waterlogged land volumetric flow rate has not been sampled from the outflow from the final storage tank. TN and all of TP loading limits were exceeded
L9132/2018/1	AACR 2020	The licence holder advised of non-compliance with several conditions

		<p>regarding irrigation, wastewater flow metering, nutrient loading limits, monitoring and reporting.</p> <p>Conditions requiring additional monitoring equipment and reporting remained outstanding in the reporting period,</p>
L9132/2018/1	AACR 2021	<p>The following non-compliances were identified by the licence holder:</p> <ul style="list-style-type: none"> • Condition 3 relating to the production limit which was exceeded by 40kL. • Conditions 4(a) & 5(a) relating to the soil survey and investigations which were not completed in the timeframe due to a lack of available soil scientists in WA. • Conditions 4(d) & 5(d) relating to the soil survey and investigations which were not achieved as the licence holder deemed that they are not reasonable or practical. • Condition 14 which prohibited irrigation prior to the completion of the soil survey and investigations. The licence holder deemed this condition to be not reasonable and practical. • Condition 7, 8 & 9 relating to infrastructure that has not been installed as the licence holder deems them to be not reasonable and practical. • Condition 10 relating to groundwater monitoring bores that have not been installed and is deemed by the licence holder as not achievable to do so. • Condition 15 relating to irrigation which occurred over the winter months when it is not approved to do so, or at all. The condition is deemed unreasonable by the licence holder. • Condition 17 relating to wastewater discharge volumes which have not been metered as volumetric flow metre has not yet been installed. • Condition 16(g) & 16(h) relating to vegetation harvesting which has not been completed as vegetation is unable to grow in the area • Condition 18 relating to nutrient loading limits which have been exceeded. The licence holder considers these limits to be not reasonable and practical. • Condition 20 relating to soil sampling which has not been conducted as the licence holder considers it to be ambiguous.

¹Soil survey and soil investigation reports were submitted with this application. These reports are further discussed in section 4.3.1

3. Legislative context and other approvals

3.1 Planning approval

The licence granted on 1 November 2018 excluded the irrigation of wastewater to land, as the licence holder was unable to provide evidence of planning approval for irrigation of wastewater. The licence holder gained City of Busselton Development Approval (DA18/0793) in 2019 for Existing Tavern (Irrigation of Treated Wastewater on Lot) for the previously proposed wastewater treatment system and irrigation areas.

The DA and DoH approved wastewater treatment infrastructure was not installed, and irrigation has been carried out regardless of non-compliance with DA18/0793. New LAAs and wastewater treatment infrastructure have since been proposed. The licence holder has stated in the amendment application that the development application 'is to be updated to reflect the revised proposal'.

The licence amendment application was referred to the City of Busselton for comment and the City responded that it is yet to receive a revised DA application and they would need to seek comment from the Department of Biodiversity, Conservation and Attractions (DBCA) on the proposed changes if they were to receive an application for the changes. As described in Table 7 of this report, the LAA is within the buffer distance to a threatened ecological community (TEC). As the proposed LAA through is closer to the TEC, the DBCA would need to be requested to provide comment on any potential impact from the changed proposal.

The City of Busselton provided DWER with correspondence received from the applicant on 21 March 2022 regarding DA22/0091 (Tavern Carpark and Additions). This included some additional information in relation to DA18/0793 however a revised development application has not been submitted for all the proposed changes.

3.2 Department of Health

On 20 August 2020 the Department of Health (DOH) issued a refusal to grant approval for the application to construct or install apparatus for the treatment of sewage for the proposed brewery wastewater treatment and disposal system due to the system having already been installed. *The Health (Treatment of Sewage Disposal of Effluent and Liquid Waste) Regulations 1974* does not have provision for retrospective approvals. Under this *Regulation*, the Local Government will not be able to provide a 'Permit to Use' and may wish to prosecute, request decommissioning the system or request the system to be upgraded or modified to comply with the Regulations.

The DoH also expressed its concern of the lack of information provided and lack of engineering certification of the brewery treatment system installed to confirm the integrity of the system in the following aspects:

- Structural design of all the tanks
- Serviceable life years of the system
- Peak hydraulic loading capacity of the system
- Storage capability of the system during winter months when irrigation is not permitted
- The systems treatment capability producing expected effluent quality in the following parameter: BOD, COD, TSS, pH, TN and TP

The licence holder has not yet submitted an application to the DOH or LGA to construct or install a revised apparatus for the treatment and disposal (irrigation) of brewery wastewater. For this reason (in part) DWER is not in a position to approve the proposed wastewater treatment plant 'trial' or an increase in wastewater production until the DOH or LGA has approved the proposal

3.3 Rights in Water and Irrigation Act 1914 (RIWI Act)

The landowner Ms Julia Atkins currently holds surface water licence (SWL176131) which relates to the gully wall dam on Lot 131 Gale Road. This licence authorises the take of 32,600kL/annum from the Carunup River for horticulture, irrigation of pasture and storage of surface water. The allocation volume reflects the storage capacity of the dam. There are numerous unlicensed on-stream and off-stream soaks/excavation dams on the property which are exempt from licensing where used for domestic or stock watering purposes only.

The available water quality is currently unfit for brewing operations and a licence amendment

would need to be sought to update authorised water use activities, subject to any appropriate approvals from other decision-making authorities. There are no existing licences to take water from any soak on the property for the purpose of brewing activities. It is unclear from where washdown water for the brewery operations is sourced. The licence holder would also need to resolve any water licensing issues prior to the department considering an increase in brewery production.

4. 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.

An environmental risk assessment was undertaken in 2019 and is outlined in the Decision Report issued 1 November 2019. This Amendment Report considers the proposed amendments against the original risk assessment and current standards and guidelines.

4.1 Existing wastewater quality

The previous risk assessment identified nitrogen and phosphorus concentrations in the brewery wastewater were highly variable and both greatly exceeded their respective ANZECC short-term irrigation values (STVs), posing a risk to plant health and soil structure. The licence holder has provided more recent water quality results of samples taken from the balancing/storage tanks, which is taken to be indicative of the quality of wastewater that has been treated.

Table 4 presents a comparison of the current effluent quality at the point of discharge against standards and guidelines. These results remain highly variable, and most parameters exceed the recommended water quality guidelines as per the ANZECC Guidelines for Fresh and Marine Water quality (2000). Most notably biological oxygen demand (BOD) far exceeds the STVs for irrigation. The quality of discharged effluent is similar to that of raw brewery wastewater.

Table 4 also demonstrates that the salt content of wastewater sampled at the Premises occasionally exceeds ANZECC Guidelines.

The Delegated Officer notes that this effluent is currently being discharged to land via irrigation. Irrigation with wastewater at this level of quality presents a risk of contaminants entering nearby surface water as well as a risk to soil structure and groundwater. The previous risk assessment remains valid and further treatment of nutrients and BOD is necessary should the licence holder wish to irrigate wastewater at the rates proposed in the application.

Table 4: Wastewater quality

	Total Waste Produced (kl)	Daily flow average (kL)	EC (mS/m)	pH	BOD (mg/L)	TDS (mg/L)	TN (mg/L)	TP (mg/L)	TSS (mg/L)
Typical range of raw brewery wastewater ¹	-	-	-	-	1,200 – 3,600	-	25 - 80	10 – 50	200 – 1,000

Typical effluent quality following nutrient removal treatment ²	-	-	-	-	5 - 20	-	10 - 20	<2	5 - 20
ANZECC 2000 – Primary Industries ³	-	-	130 - 290 ⁵	Above 5.5	<15	3,000	25 – 125 ⁴	0.8 - 12 ⁴	<40
2021	2,261	6.8	176 - 272	4.5 – 5.3	3,600 – 7,460	2,000 – 3,600	48 - 150	17 - 39	290 - 560

¹Kebede, T. B. 2018. *Wastewater treatment in brewery industry*, review. International Journal of Engineering Development and Research. Available at: <https://www.ijedr.org/papers/IJEDR1801124.pdf>

² Treatment process category D from Appendix 6 of ARMCANZ and ANZECC 1997. *National Water Quality Management Strategy – Australian Guidelines for Sewerage Systems – Effluent Management*. Commonwealth of Australia.

³ National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3 Primary Industries, 2000, ANZECC and ARMCANZ (ANZECC 2000).

⁴ ANZECC 2000, requires site specific assessment to determine actual value.

⁵ ANZECC 2000, Suitable for moderately tolerant crops, where 81 is considered extreme and too saline.

Red figures note data above ANZECC 2000 criteria.

4.2 Proposed licence holder controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this Decision Report are detailed in Table 5 below. Table 5 also details the control measures the licence holder has proposed to assist in controlling these emissions.

Table 5: Proposed controls

Sources	Emission	Potential pathways	Proposed controls
Direct discharge to land (Disposal of treated brewery wastewater to 2.8 ha of Lot 131 via irrigation)	Nutrient and salt rich wastewater	<ul style="list-style-type: none"> Seepage of wastewater through the soil profile into groundwater aquifers Overland flow 	<ul style="list-style-type: none"> Adjustment of the pH and SAR of wastewater using hydrated lime and waste caustic pH adjustment of soil via application of lime Reduction of BOD and TN via trial of BioFilmTech Pty Ltd technology known as 'Passive Aeration Simultaneous Nitrification and Denitrification' (PASND) Treatment of phosphorous contamination in surface waters via a trial of Phoslock™ Limiting quantity of treated wastewater discharged to calculated nutrient and BOD loading capacity of LAA Establishment of a mixture of pasture species that have been selected to optimise uptake of nutrients* Harvesting of pasture mechanically for nutrient removal The use of intensive grazing for a 1-week period per year Harvested pasture to be removed from LAAs on the same day as harvest Installation of a rain sensor to manage irrigation scheduling Restricting irrigation over winter months to ensure hydraulic balance Irrigation via fixed sprinkler system that covers entire LAA Surface diversion bunds upgradient of hillside located LAA
Storage and movement of brewery wastewater	Odour	<ul style="list-style-type: none"> Air/wind dispersion 	<ul style="list-style-type: none"> Limiting quantity of treated wastewater discharged to calculated nutrient and BOD loading capacity of the LAA size Irrigation management - resting periods between wastewater applications

4.2.1 Wastewater treatment, and disposal

Wastewater treatment infrastructure

The licence holder has proposed significant changes to wastewater treatment infrastructure and operation. The existing licence set out the requirements for construction of all infrastructure and equipment, including tanks designed for settling, blending, aerobic treatment and clarification of effluent. The proposed wastewater treatment infrastructure differs from the licence requirements in that pH is controlled with lime and waste caustic in a combined dosing and clarification tank (Refer to Figure 1). Sludge is proposed to be removed via a licenced contractor and negates the need for geo-bags or sludge processing

infrastructure. The applicant proposes to reduce BOD, TN and possibly TDS via a trial of 'Passive Aeration Simultaneous Nitrification and Denitrification' (PASND) which involves the use of clay coated biofilm. The licence holder proposes this method of treatment to complement the management of nutrients and BOD by limiting application of wastewater to the loading capacity of each LAA.

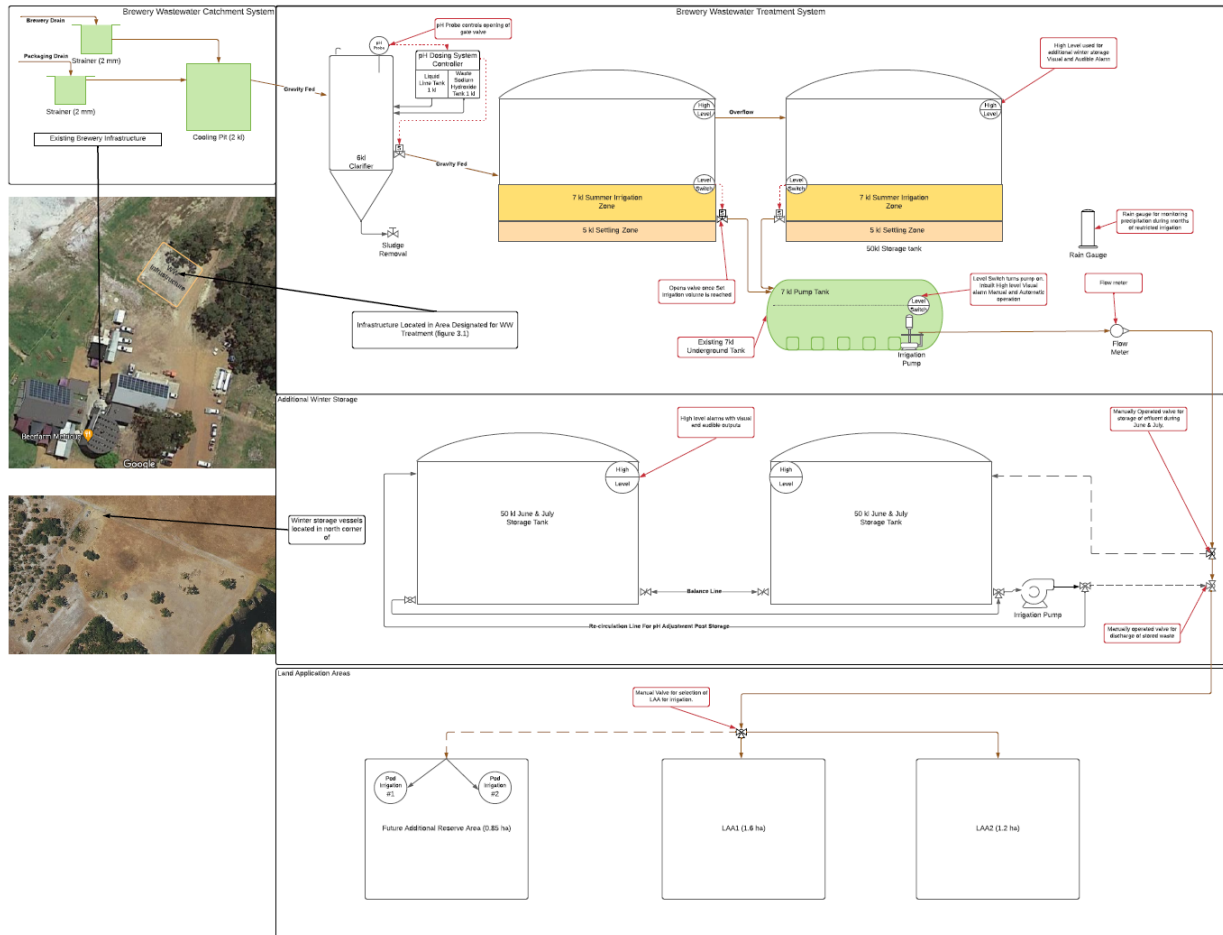


Figure 1: Wastewater schematic

Application to land

The risk of impacts to surface waters via overland run-off and shallow groundwater flow was assessed as high in the previous Decision Report. The Delegated Officer determined that controls are necessary to ensure irrigation generated runoff and contaminated stormwater flows are prevented from exiting the LAAs. The licence holder has proposed agricultural-style contour intercept/diversion swales, down-gradient of wastewater treatment and storage areas however this does not address runoff from the LAAs. Run-off water is to be controlled by ensuring irrigation does not occur after high rainfall and a bund is proposed to be built up-gradient of LAA2 to ensure diversion of up-gradient surface water from rain events.

The 2019 Decision Report identified the requirement for restriction of the scheduling of wastewater irrigation over each year to protect the fresh groundwater beneath the site and surface water downgradient of the LAAs. It was determined that no irrigation from June to October is to occur. The proposed amendments intend for these restrictions to be removed and controlled by way of a rain sensor. The licence holder proposes to avoid irrigation after a rain event of greater than 6mm and limit wastewater application during the months of June and July to 211.4kL and 228.2kL, respectively, as deemed suitable by the calculation of hydraulic loading. Wet-weather storage is to take place during these months.

The licence holder is seeking to manage nutrient infiltration to groundwater via establishment

of a mixed pasture designed to maximise nutrient uptake of the wastewater. The crop will be harvested regularly resulting in exportation of nutrients however there was no detailed Nutrient and Irrigation Management Plan (NIMP) or a detailed Pasture Management Plan provided by the licence holder to support this proposal, considering the management of nutrients is resting strongly on this. The licence holder also seeks to remove land loading limits as required by the existing licence, considering the wastewater management plan submitted is sufficient.

Based on advice from the Department of Primary Industries and Regional Development (DPIRD) the planned pasture management may not be sufficient, but soils have a reasonably good phosphorous retentive capacity (Refer to Table 8).

The previous Decision Report outlined the need for regulatory controls including nutrient loading limits. Monitoring parameters and annual reporting were defined so loading and concentration limits were able to be observed. These have continued to be exceeded due to the failure of the WWS to treat wastewater to the expected quality. The Delegated Officer considers that although there is uncertainty around whether the newly proposed WWS design may be able to improve wastewater quality to the expected standard, the loading limits on the licence have been increased as per the Pasture Management Plan and appropriate pasture management conditions have been applied. The licence holder proposed additional parameters as limits:

- pH, derived from the DEC (2004) guidelines.
- SAR, derived from the ANZECC (2000) guidelines.
- EC, based on the maximum salinity tolerance of the proposed pasture, kikuyu.

The Delegated Officer has considered these and adopted them into the licence as they are appropriate and address some of the key concerns outlined in section 4.1.

4.3 Pathway

4.3.1 Soil survey and investigations

Soil sampling is required by the existing licence at wastewater irrigation sites to determine the physical and chemical characteristics of soil materials to assess their suitability for the long-term application of wastewater application. The results provided did not directly address some key soil characteristics required to inform the risk assessment.

The properties of soils on the site have the potential to constrain the extent to which wastewater application to ground could take place at the site to limit the risks of impacts on sensitive receptors.

The licence holder has not provided all the information required by the existing licence which is considered to be critical to defining the likely pathways and receptors. Therefore, the information is insufficient to form an assessment on the risks to groundwater and soil.

4.4 Receptors

The distances to sensitive receptors are detailed in Table 6 and the distances to environmental receptors are detailed in Table 7.

Table 6: Sensitive receptors and distance from activity boundary

Sensitive receptors	Distance from Prescribed Premises
Surface water users	<p>A private water supply dam is located along the Premises boundary on the topmost eastern portion (downstream of the watercourse on site).</p> <p>Three properties located downstream of the site (NE) have surface water licences for Carburnup River. They are approximately 1 km, 2 km, and 3.4</p>

	km from the premises boundary.
Groundwater users	10 privately owned bores are located within 1 km of the premises boundary (DWER GIS – WIN groundwater sites). Closest located 145 m south and 160 m northeast of the site.

Table 7: Environmental receptors and distance from activity boundary

Environmental receptors	Distance from Prescribed Premises
Groundwater Resource	<p>The site is underlain by sediments of the Vasse Shelf in the western part of the Perth Basin. At shallow depth near the site, these sediments are likely to consist of a thin cover of sandy materials of probable Eocene age (Marnham et al., 2000) which is underlain by highly weather (lateritised) silty and sandy sediments of the Leederville Formation which is Cretaceous in age.</p> <p>The Leederville Formation in the area is a multilayered aquifer that consists of interbedded siltstones, sandstones and coal units which contains fresh groundwater that is a regionally important water source.</p> <p>The licence holder indicated that the groundwater level in two monitoring bores* on site was 2.71m and 2.3m below ground level in October 2018.</p> <p><i>Note: * The licence holder has not demonstrated how the two bores meet the requirements of Minimum Construction Requirements for Water Bores in Australia (AIH 2012) and are sited with regard to the Department of Water Quality Protection Note 30 Groundwater Monitoring Bores (DoW 2009).</i></p>
Non-perennial watercourse (tributary of Caribunup River)	<p>Within the premises boundary.</p> <p>Irrigation area LAA 2 and LAA 3 are 100 m W and LAA 1 is 230 m W of the watercourse.</p>
Caribunup River, major perennial river	The premises is located within the Caribunup River catchment. The Caribunup River is 3 km downstream of the tributary running through the premises or approximately 2 km east of the premises boundary overland.
EPBC Act Threatened Ecological Community – Banksia Woodlands of the Swan Coastal Plain (also listed as a Priority 1 West Whicher Scarp Banksia attenuata woodland)	<p>The premises is within the buffer zone for an adjacent Federally listed TEC.</p> <p>The premises is within the buffer zone for a priority 1 ecological community.</p> <p>Other threatened and priority ecological community buffer zones are located 500 – 1,000 m to the NE of the premises boundary.</p>

5. Consultation

Table 9 below provides a summary of the consultation undertaken by the department.

Table 9: Consultation

Consultation	Comments received
Local Government Authority (City of Busselton) advised of proposal (1 October 2021)	A response was received on 12 November 2021 advising that a revised development application is required to facilitate amendments to the irrigation area and for an increase in production (wastewater volume) and that no application had been received.

Consultation	Comments received
	<p>A further response was received on 22/03/2022 advising that the Beer Farm had submitted additional information to an existing DA on the 21/03/2022 <i>given that this has been lodged as an amendment to an existing development application, and that officers will need to sort through the information and refer to external agencies, it will likely be many months before this reaches a decision stage DWER will be notified when the application goes to referral.</i></p> <p>As of 12/05/2022 DWER has not received a DA application referral relevant to this licence amendment application.</p>
<p>Department of Health (DOH) advised of the licence amendment application (1 October 2021)</p>	<p>No comment received.</p>
<p>Department of Primary Industries and Regional Development (DPIRD) advised of proposal (1 October 2021)</p>	<p>Responses received on 18 November 2021 outlined the following concerns:</p> <ul style="list-style-type: none"> • Wastewater production appears to be significantly underestimated • Year-round irrigation would reduce salt accumulation however wastewater irrigated would require dilution with fresh water • Winter storage proposed is significantly too low • Salinity needs to be addressed before the nutrients • Limiting irrigation slightly over June-July would be acceptable as this would reduce Phosphorous export • Year-round irrigation is possible however pasture management is not detailed enough to support this • Kikuyu would grow at the proposed salinity but would out-compete other selected grass species over summer, resulting in a reduced phosphorous uptake in winter • Rye grasses would need to be reseeded every two years and kikuyu would need to be suppressed during this time using a grass selective glyphosate • The pasture combination is not recommended without further detail about proposed harvesting • There would be an emission of salt down the creek line, likely a brackish plume in late autumn
<p>Department of Primary Industries and Regional Development (DPIRD) comments sought by applicant and provided to DWER (25 March 2022)</p>	<p>Pasture management and nutrient uptake</p> <ul style="list-style-type: none"> • The intensive grazing for a 1-week period per year to remove kikuyu biomass may not be enough to permit the successful establishment of perennial ryegrass in Autumn • Mechanical removal of excess kikuyu biomass will be required • Soils on the property have a reasonably good phosphorous retentive capacity

Consultation	Comments received
	<ul style="list-style-type: none"> • The expected 15t/ha/year harvest of dry matter should remove around 35 kg/ha of P <p>Salinity management and monitoring</p> <ul style="list-style-type: none"> • Measure EC values in groundwater and surface water samples are very low and ample fresh dam water is available to dilute wastewater if required • Even with dam water quality deterioration, TDS will still be low • The monitoring regime appears to be adequate based on limited information provided to DPIRD • Salinity risk is minimal and should be adequately managed by the proposed strategy
The licence holder was provided with the draft amended licence and draft decision report on the 10 January 2022 and again on the 13 May 2022.	Comments were received on 1 February 2022, 9 February 2022 and 22 July 2022. Refer to appendix 1

6. Decision

Based on the assessment in this Amendment Report, the Delegated Officer has determined to grant some amendments to Licence L9132/2018/1 to allow for the construction of proposed wastewater system infrastructure in lieu of the previously proposed infrastructure.

Amendments have also been granted to allow for the irrigation of brewery wastewater to land. The continued requirement for loading limits, as well as additional limits imposed, restrict wastewater application to ensure the prevention of contamination to soil as well as ground and surface waters.

Applicant controls for pasture and irrigation management outlined in (Environmental Consulting Australia 2022) have been applied to the amended licence as proposed.

The Delegated Officer has determined not to make a decision on the proposed increase in annual throughput due to the failure of the licence holder to obtain the following appropriate approvals:

- Development approval from the City of Busselton has not been granted for changes to the wastewater treatment system and irrigation areas or for an increase in brewery production wastewater volumes.
- Approval to construct or install an apparatus for the treatment of sewage has not been granted under the *Health (Treatment of Sewage Disposal of Effluent and Liquid Waste) Regulations 1974*.

Requested amendment to the nutrient loading limits, newly proposed LAAs, waste containment and monitoring requirements have been refused as the Delegated Officer has the following concerns:

- There is uncertainty around the alterations to the WWS and whether it will be able to achieve the expected nutrient concentrations. Currently the wastewater output closely resembles raw brewery wastewater being discharged to the environment. Treated wastewater sampling indicates that TN and TP exceed ANZECC guidelines and far exceed expected treated effluent quality compared with that produced by appropriate wastewater treatment systems.
- Newly proposed LAAs have not yet been assessed and approved through a Development approval from the City of Busselton.

The proposed amendments (as outlined in Table 2) have been considered and the Delegated Officer has made the following determinations:

1. As per section 59B(8) of the *Environmental Protection Act 1986*, the Delegated Officer has determined **not to make a decision** to authorise a throughput increase on the grounds that the licence holder has not obtained the appropriate approvals from decision-making authorities, DOH and City of Busselton.
2. The removal of soil survey and detailed soil investigations requirements as well as conditions prohibiting irrigation **has been granted** on the provision that limits to nutrient loading are retained and limits to salt content have been added, in conjunction with continued monitoring. The purpose of these limits is to mitigate impacts in the absence of detailed information on the receiving environment.
3. *Wastewater treatment system*

The Delegated Officer has determined that amendment of the design and construction requirements **has been granted**. The design and construction requirements table has been amended with the inclusion of infrastructure and equipment proposed by the licence holder. Further changes requested since the assessment of the application have been considered but a subsequent application will be required for significant additions. Where this infrastructure has not been built in the timeframe specified by the licence amendment, risk will need to be reassessed.

Groundwater monitoring bores

To monitor changes in groundwater level and quality across the site, the licence holder has proposed the construction of two groundwater monitoring bores down-gradient of the newly proposed LAAs as well as a single observation well up-gradient of both areas. The Delegated Officer has accepted the location of the new monitoring bores and amendment of the design and construction requirements **has been granted**. Construction requirements of each bore are to be retained as per the original licence.

4. The Delegated Officer has determined that amendment of the infrastructure and equipment controls **has been granted** in accordance with changes made to the design and construction requirements, with the addition of controls commensurate to the existing licence.
5. The Delegated Officer has determined that amendment of the authorised discharge points and irrigation requirements **has not been granted** on the grounds that the licence holder has not obtained development approval from the City of Busselton. Irrigation is only permitted in the area already approved.
6. The Delegated Officer has determined that amendment of conditions outlining irrigation requirements **have been granted in part** on the provision that additional limits to irrigation loading will be applied. Pasture management conditions have been considered and redundant conditions, previously addressed by the licence holder have been removed.
7. The Delegated Officer has determined that the proposed changes to wastewater monitoring **have been granted in part**, with the addition of controls commensurate to the existing licence.
8. The Delegated Officer has considered changes to land loading rates based on the additional Pasture Management Plan that was submitted in July 2022. Amendment of irrigation emission limits therefore **has been granted**. In addition, limits for pH, EC and SAR have been included in the licence as they have been proposed by the licence holder.
9. The Delegated Officer has determined that amendment to waste containment and disposal specifications **has been granted**.

10. The Delegated Officer has determined that the proposed changes to ambient soil monitoring **have been granted in part**, with the addition of controls commensurate to the existing licence.
11. The Delegated Officer has determined that amendment to ambient groundwater monitoring **has been granted**
12. The Delegated Officer has determined that amendment to ambient surface water monitoring **has been granted**
13. The Delegated Officer has determined that amendment of monthly reporting **has been granted** noting that nutrient loading limits have been retained.
14. The amendment of Schedule 1 maps, to be updated to show infrastructure locations, monitoring and emission points **has been granted**.

References

1. ANZECC & ARMCANZ 1997, *National Water Quality Management Strategy Australian Guidelines for Sewerage Systems – Effluent Management*.
2. ANZECC 2000, *National Water Quality Management Strategy Paper No. 4 – Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3 Primary Industries*.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental (DWER) 2019, *Amended Licence L9132/2018/1 and Decision Report for The Beer Farm Pty Ltd*, revised 13/05/2019
5. DWER 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Environmental Consulting Australia Pty Ltd 2022, *The Beer Farm Annual Environmental Report 2021*, submitted to DWER on 28 January 2022 (DWER reference: DWERDT555600)
8. Environmental Consulting Australia Pty Ltd 2022, *The Beer Farm Pasture Management Plan 2022*, submitted to DWER on 22 July 2022 (DWER reference: DWERDT636933)
9. Kebede, T. B. 2018. *Wastewater treatment in brewery industry, review*. International Journal of Engineering Development and Research.
10. Memo 12 April 2022
11. NSW Department of Environment and Conservation (DEC) 2004, *Environmental Guideline: Use of Effluent by Irrigation*
12. Strategen JBS&G 2021, *The Beer Farm Application and Wastewater Management Plan*, submitted to DWER on 27 August 2021. (DWER reference: DWERDT496913)
13. Strategen JBS&G 2021, *The Beer Farm Response to Request for Further Information*, submitted to DWER on 26 November 2021. (DWER reference: DWERDT531912)

Appendix 1: Summary of licence holder's comments on assessment and draft conditions

Condition	Summary of licence holder's comment	Department's response
Draft licence		
General	The licence holder disagrees with the decision to refuse to grant the increase in production capacity on the basis that approval cannot be sought from other authorities until after DWER approval of reporting operating requirement and infrastructure design. The licence holder comments that the previous approved wastewater treatment solution failed. The licence holder will not be able to install the new wastewater treatment infrastructure without the increase in production capacity and will move production to another site interstate.	The Delegated Officer has determined that an increase in production will not be granted for this application for reasons outlined in section 6.
Condition 2, Table 1	The licence holder provided comment that the wastewater treatment system in this application is no longer deemed appropriate and has proposed changes outlined in an updated schematic (refer to Figure 1).	The Delegated Officer has updated the licence to reflect changes that are considered pertinent to pollution control. The licence conditions are outcome based and compliance will be demonstrated by adherence to limits. Therefore, the Delegated Officer is satisfied with the proposed treatment of the wastewater infrastructure and equipment as it is expected that the licence holder is prepared to install what is required to achieve licence compliance. Already constructed infrastructure has been omitted from Table 1 as it relates to works.
Condition 5, Table 2	The licence holder has requested authorisation to construct additional infrastructure that would allow for a throughput increase.	Increased throughput is not authorised for reasons outlined in section 6.
Condition 7	The licence holder has provided additional information on the proposed location of irrigation and controls to include weekly visual checks.	Noted.
Condition 9, Table 4	The licence holder has provided comment that alarms have been included in the latest infrastructure design. Hardstand, bunding and a collection sump is deemed unnecessary.	The Delegated Officer has noted the additional controls of alarms have been proposed however the proposed changes to the containment of wastewater are insufficient in the event of overtopping.
Condition 12, Table 5	The licence holder has made some comments on the changes to	Noted.

Condition	Summary of licence holder's comment	Department's response
	wastewater monitoring, such as the replacement of TDS monitoring with EC, and requests to discuss the matter further with DWER.	
Condition 20, Table 9	The licence holder disagrees with the loading limits outlined in the draft licence and request that they are amended in line with agronomic requirements and the ANZECC (2000) guidelines.	<p>The Delegated Officer has determined that there is not a sufficient nutrient and irrigation management plan (NIMP) or a clear standalone Pasture or cropping management Plan in place to be satisfied that the risk of environmental harm is mitigated by the controls proposed in this application. Therefore, changes will not be made to current nutrient loading limits.</p> <p>Only with the submission of a sufficient NIMP and Pasture Management Plan to support the requested increase in nutrient limits, can the Department support the increased limits. This will need to be applied for through a new licence amendment application to allow the proposal to be assessed and appropriate management controls to be added to the licence as regulatory controls.</p>
	An additional Pature Management Plan was submitted 22 July 2022 to address the concerns of the Delegated Officer.	The Delegated Officer has determined that a Pasture Management Plan has been provided and considered this sufficient to amend the loading limits.
Licence amendment review		
<p>9 February 2022</p> <p>EnviroConsulting provided a report reviewing the draft licence and proposing the following significant amendments to be incorporated into the licence:</p> <ul style="list-style-type: none"> • The replacement of a 1kL lime dosing with a combined lime dosing tank and 6kL clarifier to assist in the reduction of TP in treated wastewater • A trial of BioFilmTech Passive Aeration Simultaneous Nitrification and Denitrification (PASND) wastewater treatment technology for the purpose of reduction of BOD and TN reduction • A trial of Phoslock™ for phosphorus reduction in the existing dam waters • Proposed revisions to secondary containment conditions • Addition of pasture management conditions based on DPIRD advice to improve the management of pasture within the irrigation areas 	<p>The Delegated Officer notes the information provided and has taken it into consideration in the finalisation of approved infrastructure. The WWS is significantly different to what was originally proposed in the application. Although some changes have been made to the licence that Delegated Officer deems pertinent to pollution control, significant changes will need to be assessed and authorised through a standalone works approval.</p> <p>The Delegated Officer advises that a trial of Phoslock™ in surface waters may need to be managed by a licence to take water under the <i>Rights in Water and Irrigation Act 1914</i> and will not be authorised by this licence.</p> <p>Pasture management conditions have been considered and the Delegated Officer has made some changes to the licence.</p>	

Condition	Summary of licence holder's comment	Department's response
<p>12 April 2022</p> <p>EnviroConsulting provided a Memo to DWER containing additional comments including:</p> <ul style="list-style-type: none"> • Annual Phosphorus and Nitrogen uptake values based on the nutrient needs of the proposed crop in the irrigation areas • Ongoing salinity monitoring should be included in the licence • Request that DWER makes its decision on the licence amendment ahead of City of Busselton Planning approval being granted and prior to DoH approval for the wastewater treatment and disposal system being granted. • Revision to the wastewater treatment plant, the addition of a 4000L capacity septic tank for the treatment and storage of sludge removed from the wastewater treatment plant 		<p>The Delegated Office has outlined the decision regarding nutrient loading in Section 6(8) and has adopted the addition of salinity monitoring into the amended licence.</p> <p>The Delegated Officer will not make a decision on throughput increase prior to appropriate approvals from decision-making authorities, DOH and City of Busselton as per section 3 of the decision report.</p> <p>Amendments made to the revision of the WWS have been noted however changes will need to be assessed and authorised through a separate application.</p>