



Application for Works Approval

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

Works Approval Number W6679/2022/1

Applicant FBROS Pty Ltd

ACN 634 416 078

File number DER2022/000183

Premises

Funk Cider

38 Swan St, Henley Brook, WA

Legal description - Lot 123 on Plan 3820

Certificate of Title Volume 2761 Folio 567

As defined by the coordinates in Schedule 1

Date of report 01/11/2022

Proposed Decision Works approval granted

Table of Contents

1. Scope of assessment	1
1.1 Application summary and overview of premises	1
1.2 Regulatory framework	1
2. Proposed activities	1
2.1 Construction works	1
2.2 Operational aspects	2
2.2.1 Beverage manufacturing	2
2.2.2 Wastewater treatment	2
2.2.3 Wastewater irrigation	3
2.2.4 Pasture Management Plan	4
2.2.5 Solid waste management	4
3. Legislative context and other approvals	4
3.1 Planning approval	4
3.2 Department of Health	4
4. Risk assessment	5
4.1 Source-pathways and receptors	5
4.1.1 Emissions and controls	5
4.1.2 Receptors	8
4.2 Risk ratings	9
5. Decision	13
6. Consultation	13
7. Conclusion	14
References	14
Appendix 1: Summary of applicant’s comments on risk assessment and draft conditions	16
Table 1 Expected raw and treated wastewater quality	3
Table 2: Proposed applicant controls	5
Table 3: Sensitive human and environmental receptors and distance from prescribed activity	8
Table 4: Risk assessment of potential emissions and discharges from the premises during construction and operation	10
Table 5: Consultation	13

1. Scope of assessment

1.1 Application summary and overview of premises

On 18 July 2022, FBROS Pty Ltd (the applicant) submitted a works approval application to the department under section 54 of the *Environmental Protection Act 1986* (EP Act). The application is to undertake works relating to the construction of a cidery at 38 Swan St, Henley Brook (the premises), about 1 km southeast of the Perth suburb of Averly, WA.

The premises relates to the categories and assessed production capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6679/2022/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6679/2022/1.

1.2 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. Proposed activities

2.1 Construction works

A detailed list of the beverage production facility infrastructure, as it relates to category 24 and 25 activities, is detailed in Condition 1, of works approval W6679/2022/1. In addition to the cidery and fruit juice production shed, the applicant proposes to install a wastewater treatment plant (WWTP) and an irrigation system to enable the on-site treatment and disposal of wastewater generated by the cidery operations.

The cidery shed will be enclosed and house fermentation tanks (total capacity of 25,700 L), carbonation tanks, beer storage tanks, fruit (apple and orange) processing equipment, bottling and canning areas, a cool room, freezer, tank farm and general storage sheds. Floor drains will direct all liquid waste (including wash-down water) to the WWTP. Lined waste bins (10 x 500 kg) for solid waste storage prior to off-site disposal will be situated alongside the external perimeter of the shed.

The WWTP will be built on gravel hardstand adjacent to the proposed irrigation area south of the production shed. It will have capacity to treat up to 7 kL of wastewater per day and comprises a 7 kL holding tank, a 23 kL sequential batch reactor (SBR) with a submersible vortex pump and a 4.5 kL irrigation holding tank for treated wastewater (see Figure 3, Schedule 1 of W6679/2022/1). Level sensors and alarms will be fitted to monitor overtopping and pump/aerator malfunction. Two 23 kL water storage tanks will be installed to provide contingency wastewater holding capacity during winter months.

The irrigation area will be divided into four zones with a total area of 1.193 ha (see Figure 1, Schedule 1 of W6679/2022/1). A mainline will disperse treated wastewater to submain lines installed at each irrigation zone, with integral drip lines along vines (surface) and inter-row voids (subsurface).

2.2 Operational aspects

Beverage production, wastewater treatment and on-site disposal via irrigation are discussed in this Section. The applicant has proposed to undertake time limited operations, during which period the WWTP will be tested (commissioned) to determine the treatment outcomes that can be achieved. Irrigation will also occur to enable the disposal of treated wastewater to land, with wastewater, groundwater and soil monitoring proposed to validate compliance with environmental objectives.

2.2.1 Beverage manufacturing

Production at the site will include the manufacture of alcoholic apple cider (approximately 75% of the production capacity), beer (15%) and cold pressed juice (10%), with a maximum total alcoholic beverage production of 350 kL/year and non-alcoholic beverage production of < 50 kL/year. The premises will operate across all months of the year, with busier periods and higher production anticipated in the summer months.

Fruit processing includes the following production lines:

- Apple belt press line, including bin tipper, washer, elevator, crusher and belt press
- Process apples and other pomace fruits;
- Citrus line, including bin tipper and citrus pressing machine to process oranges, lemons, limes, grapefruit; and
- Mango destoner line, which only process mangos.

Beer production steps include:

- Malt is mashed in the mash lauter tank;
- Wort is drawn and moved to the kettle whirlpool tank where it is boiled;
- It is then cooled and directed to the fermenting tanks where fermentation takes place;
- Beer then packaged.
- Spent grain and hops are stored in plastic mega bins before being transported off-site by a contractor on a weekly basis.

2.2.2 Wastewater treatment

Wastewater will primarily be generated from apple crushing, keg washing, tank cleaning, filtering and floor wash-down activities within the production shed. Working areas will be dry swept, where possible, to limit the need for hosing down at the end of each shift.

Wastewater volumes are expected to peak during summer with about 1,500 L wastewater generated per day in December. The applicant estimates that about 1,000 kL of wastewater will be generated per year from 350 kL of alcoholic beverage manufactured, which is a ratio of about 3 litres of wastewater generated for every litre of beer/cider produced and consistent with typical industry ratios. Including the additional 50 kL of non-alcoholic juice produced per year, it is expected that total wastewater generated within the production shed will be closer to 1,150 kL per year.

The maximum authorised wastewater treatment rate is 4,631 kL per day, as specified in the applicant's Department of Health WWTP apparatus approval.

Raw wastewater quality is expected to be comparable to other breweries, with elevated levels of nutrients, BOD, organic content and salts. Estimated raw wastewater quality and treated effluent quality is provided in Table 1 (Kasa Consulting 2022).

As outlined in the application, Total nitrogen (TN), total phosphorus (TP) and total suspended

solids (TSS) concentrations in treated wastewater quality once the proposed WWTP is operational are expected to meet the ANZECC 2000 guidelines as outlined in Table 1 below.

Table 1 Expected raw and treated wastewater quality

Parameter	Total nitrogen (mg/L)	Total phosphorus (mg/L)	Biological oxygen demand (BOD) (mg/L)	Total suspended solids (mg/L)
Expected influent quality	54.6	10.6	3,120	1,090
Typical range of raw cidery wastewater ¹	25 – 80	10 – 50	1,200 – 3,600	200 – 1,000
Expected treated effluent quality ²	30	2.0	1.56 kg/d ⁴ <500	30
ANZECC 2000 trigger levels for primary industries ³	25 – 125	0.8 – 12	<15	<40

¹ Kebede, 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 Following installation and operation of the proposed WWTP

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 BOD concentration provided in kg/d in WWTP product specifications

Expected treatment quality (from application NIMP)

Parameter	Concentration/Value
pH	6.5-8.5
TDS	<350 mg/L
TN	<30 mg/L
TP	<10mg/L
BOD	<500 mg/L

Sludge from the WWTP is anticipated to be generated at a rate of 3 kL to 5 kL per year and will be transported off site by a licenced liquid waste contractor in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004*.

2.2.3 Wastewater irrigation

The applicant proposes to irrigate treated wastewater throughout the year. The irrigation area comprises a former vineyard with rows of vines will be irrigated in summer along with crops planted along the inter-row voids. In winter, different crops will be sewn for irrigation and nutrient uptake, while the vines are dormant. The irrigation zones provide four proportional areas of similar size and irrigation flows to promote the even application of wastewater to land.

As discussed in Section 2.2.2, about 1,150 kL of wastewater is expected to be generated per year and therefore discharged to the irrigation area. per year. The applicant proposes to plant a range of crops between existing vines to maximise nutrient uptake during winter when the vines are dormant and provided a Pasture Management Plan (PMP)

2.2.4 Pasture Management Plan

A Pasture Management Plan entitled “Funk Cider Crop Management Plan”, (KASA Consulting, November 2022) (PMP) was submitted to the Department in November 2022. The objectives of the PMP were to propose summer and winter crops to improve nutrient uptake and management strategies for biomass removal of the proposed crops after each growing season.

The primary summer crop selection is the existing vines on site which are mainly dormant with reduced nutrient uptake potential. However, the vines are subject to local government authority restrictions that prevent their removal. Therefore, sunflowers and sorghum were selected to supplement the vines as summer crops.

Sunflowers and sorghum will be planted between inter-row voids of the vines in November prior to summer irrigation period commencing and harvested in February each year. The vines will be pruned at the same time.

Winter crop selection of Canola Brassica and oats will be planted between inter-row voids in the last week of April prior to winter irrigation period commencing and harvested in September and October each year.

In terms of plant biomass removal from the irrigation area, Summer crops will be cut to around 5cm in February (season depending), left to cure on the ground for 5-10 days then baled and removed. The winter crop will be cut in September/ October (season depending), left to cure on the ground for 5-10 days then baled and removed from the premises.

Crops will be harvested using a line trimmer with biomass subsequently raked into rows and baled and an estimate of dry weight biomass yield will be recorded, prior to removal off site off-site to landfill or nearby farms with approval of the landowner.

2.2.5 Solid waste management

Fruit processing for cider production will generate approximately 175 tonnes of solid fruit waste annually. It is estimated that 1 kg of apple fruit produces approximately 65% juice and 35% fruit pulp. For oranges, it is estimated that 1 kg of fruit produces 350 ml juice and 650 grams of fruit waste.

The solid waste produced during fruit processing as well as spent grains and hops from the brewing process, will be stored in the 500 kg plastic mega bins with plastic bin liners before being transported off-site by a contractor on a weekly basis. At peak times, additional bins may be required for waste storage prior to off-site disposal.

3. Legislative context and other approvals

3.1 Planning approval

The licence holder gained City of Swan Development Approval (DA967-20) on 7 July 2021 for a proposed partial change of use to food and beverage production and for additions to an existing winery and restaurant.

Development Approval (DA967-20) included conditions for noise and an ablutions onsite effluent disposal system but did not consider beverage production effluent treatment or on-site disposal.

3.2 Department of Health

On 10 August 2022 the Department of Health (DOH) issued the applicant Martin Michael *Health Act (Miscellaneous Provisions) 1911* Approval to Construct or Install an Apparatus for the Treatment of Sewage for the proposed beverage manufacturing effluent wastewater treatment and disposal system.

The DoH approval included the following key conditions that were incorporated into the works approval:

- A Coerco SEP-7000 Holding Tank to Coerco 23, 000L Corrugated Industrial Tank – SBR (Aeration Tank) to Coerco 4,500L Corrugated Industrial Tank to 11,938m2 above ground Drip Irrigation
- the system is approved to receive a **maximum wastewater volume of 4,631 L/day** from beverage production and achieve the following treatment quality targets : BOD – 1.5kg/d, COD – 2.35 kg/d, TN – 2.9mg/l, TSS – 30mg/l, pH – 6.5 – 8.5.
- The wastewater system to be maintained and serviced adequately to ensure the water quality targets as per the approved designer’s/manufacturer’s designed specifications are achieved and maintained in the final treated effluent.
- A sampling point to be provided post treatment system prior to discharge.
- High level audio-visual warning alarms to be provided to indicate a malfunction in the pumps in the surge control and effluent discharge tanks. The audio alarm shall have a muting device and shall be fitted to the control panel.
- Cumulative flow meter/Water flow meter to be installed post-treatment or prior to discharge disposal to monitor the volume of effluent applied to the irrigation area

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.

4.1 Source-pathways and receptors

4.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 2 below. Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 2: Proposed applicant controls (from application)

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of production shed and WWTP, including installation of tanks and equipment, vehicle movements.	Air / windborne pathway	No controls proposed.
Noise			
Operation			
Odour	High BOD and	Air /	<ul style="list-style-type: none"> • All tanks in the WWTP are enclosed.

Emission	Sources	Potential pathways	Proposed controls
	nutrient wastewater contained within the WWTP	windborne pathway	
Noise	Operation of cidery processing facility including refrigeration units.	Air / windborne pathway	<ul style="list-style-type: none"> The construction of wall around externally located refrigeration units to mitigate noise risk. Refrigeration unit compressors to operate as per specifications to minimise noise generation A tree line will be maintained and enhanced to further mitigate noise emissions. Beverage production hours will be limited to: <ul style="list-style-type: none"> Monday-Saturday (7am to 7pm). Sunday 9am to 5pm. A complaints register has been established to log and investigate and action noise complaints.
Wastewater with elevated nutrient, salts (TDS) and BOD concentrations	Fruit and grain processing, equipment and floor cleaning	Infiltration through soil to groundwater	<ul style="list-style-type: none"> Shed is enclosed to prevent rain entering operational areas with all tanks and equipment for processing installed inside the shed Direct all wash-down and cleaning wastewater to the WWTP via floor drains
	WWTP leaks and overtopping of tanks		<ul style="list-style-type: none"> WWTP installed on gravel hardstand SBR tank has been sized to accommodate the requisite volume required to treat the incoming organic and nutrient load (TN, TP, BOD) WWTP is designed to achieve the following treatment quality: BOD – 1.5kg/d, COD – 2.35 kg/d, TN – 2.9mg/l, TSS – 30mg/l, pH – 6.5 – 8.5. Tanks inspected daily to check for rupture or leaks and if detected immediately repaired
	Irrigation	Direct discharge to land, infiltration to groundwater, runoff to surface water	<p>Controls to manage nutrient and hydraulic loading to irrigation area:</p> <ul style="list-style-type: none"> Drains upstream to WWTP holding tank fitted with strainers for large solids removal to decrease nutrient levels in wastewater Submersible aerators within the Sequence Batch Reactor to be maintained to enable the aeration of wastewater within the unit

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> • Monitoring of raw and treated wastewater quality during WWTP commissioning • Driplines installed to enable even distribution of wastewater to 1 ha irrigation area divided into 4 zones • Intelligent control system which allows control and monitoring of the system, including data collection sensors • 46 kL of additional water storage capacity for wet periods. • Visual inspection to be undertaken daily to ensure the irrigation system is working effectively with no leaks or blockages • Irrigation area to be bunded to prevent surface water runoff • No irrigation during heavy rainfall events • Summer crops, sunflowers and sorghum to be planted between the vines in November prior to summer irrigation period commencing. • Summer crops to be harvested in February each year for nutrient removal. Vines to be pruned at the same time. • Winter crops, canola and oats to be planted between the vines in the last week of April prior to winter irrigation period commencing. • Winter crops to be harvested in September and October each year for nutrient removal. • Crops will be harvested using a line trimmer with biomass subsequently raked into rows and baled. • Post summer and winter harvest, crop offtake/biomass removal to be documented by date, an estimate of dry weight biomass yield to be recorded and evidence of removal offsite to landfill or another premises and presented in a report. <p>Monitoring controls:</p> <ul style="list-style-type: none"> • Installation of groundwater monitoring bores up and down-hydraulic gradient to the irrigation area • Six-monthly monitoring of groundwater for nutrients, conductivity, pH, BOD and standing water levels • Annual monitoring of soil across each irrigation zone for nutrients, pH, conductivity, phosphorus buffering index

Emission	Sources	Potential pathways	Proposed controls
			(PBI), sodium, calcium and magnesium
Sludge / leachate	Leaks in vessels storing sludge generated in WWTP	Direct discharge to land, infiltration to groundwater	<ul style="list-style-type: none"> Pipework and pump to be installed to allow for sludge to be pumped out of each tank once operational Sludge to be disposed off-site by a licenced liquid waste contractor
Nutrient-rich leachate	Solid waste bins	Runoff and infiltration	<ul style="list-style-type: none"> Bins are enclosed, lined with plastic liner and placed on hardstand Waste bins to be emptied weekly for off-site disposal by a licenced contractor

4.1.2 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 3 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 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Rural dwellings	130 southeast of proposed WWTP and production shed 100 m west of proposed WWTP and production shed 300 m east of proposed WWTP and production shed
Environmental receptors	Distance from prescribed activity
Swan River (also an environmentally sensitive area) Premises also within the Swan River System surface water area proclaimed under the <i>Rights in Water and Irrigation</i> (RIWI) Act 1914	About 250 m east of the proposed irrigation area
Underlying groundwater (non-potable purposes), which likely flows east toward the Swan River and is within the Swan Groundwater Area proclaimed under the RIWI Act 1914	Depth to groundwater estimated to be 8 – 16 m bgl (Perth Groundwater Atlas 2022)
Soils (sampling indicates low buffering capacity,	Underlying irrigation area

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and considers potential source-pathway and receptor linkages as identified in Table 4. 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 4.1), 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 4.

Works approval W6679/2022/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. discharge to treated wastewater to land. 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 4: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk Event				Risk Rating ¹ C = consequence L = likelihood	Reasoning / justification	Regulatory controls in addition to proposed Applicant controls (refer to conditions of the granted instrument)
Source/ Activities	Potential emissions	Potential receptors, pathway, and impact	Applicant controls- Table 2			
Construction / Installation						
Construction of production shed and WWTP, including installation of tanks and equipment, vehicle movements	Fugitive dust	Air / windborne pathway causing unreasonable impacts to health, comfort, convenience or amenity of nearby residents	No controls proposed	C – Slight: Minimal on-site impact. L – Unlikely: the risk event will probably not occur in most circumstances. Low Risk Acceptable, generally not subject to regulatory controls.	The delegated officer considers that the separation distance from the proposed location of the WWTP to the closest receptor is sufficiently large for there to be no adverse impact from noise or dust emissions from the installation of the production shed and WWTP.	N/A
	Noise	Closest residential receptor located approximately 100 m west of the proposed production shed and WWTP				
Operation						
Operation of production shed and WWTP.	Noise	Closest residential receptor located approximately 100 m west of the proposed production shed and WWTP	See Table 2	C - Moderate Mid-level on-site impacts. L – Unlikely: the risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	The delegated officer considers that the applicant's proposed design and operational controls to mitigate noise risk are necessary and sufficient to lower the risk to an acceptable level and will be specified in the works approval. Controls proposed by the applicant include: The construction of a noise attenuating wall, 100 mm thick, 1.2m in height and 8m in length abutting externally located refrigeration units. The operation of the refrigeration units as per noise mitigating specifications. The maintenance of a noise mitigating tree line. The establishment of a noise complaints register. Limiting production hours to Monday-Saturday (7am to 7pm) and Sunday 9am to 5pm.	Condition 1 – A noise attenuating wall composed of Colorbond steel paneling, 100 mm thick, 1.2m in height and 8m in length to be constructed abutting external refrigeration units.
Beverage manufacturing in the production shed: • Fruit and grain processing • Cleaning activities	Wastewater with elevated nutrient, salts (TDS) and BOD concentrations	Overland runoff from shed, causing infiltration and contamination of shallow groundwater	See Table 2	C – Minor: Low-level on-site impact. L – Unlikely: the risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	The delegated officer considers that the applicant's proposed design and operational controls, including the enclosed nature of the shed, hardstand and floor drains capturing all wastewater and directing it to the WWTP, and the undertaking of all processing activities inside shed, are necessary and sufficient to lower the risk to acceptable level and will be specified in the works approval.	N/A
Storage of cidery solid waste prior to off-site disposal	Nutrient-rich leachate leaking from storage of solids (spent fruit, grain and hops)		See Table 2	C – Slight: Minimal on-site impact. L – Unlikely: the risk event will probably not occur in most circumstances. Low Risk Acceptable, generally not subject to regulatory controls.		
Treatment and storage of wastewater in the WWTP	Odour from wastewater high in nutrients and BOD	Air / windborne pathway causing unreasonable impacts to health, comfort, convenience or amenity of nearby residents	See Table 2	C – Slight: Minimal on-site impact. L – Unlikely: the risk event will probably not occur in most circumstances. Low Risk Acceptable, generally not	Due to the nature of cidery and fruit processing wastewater, there is an inherent risk of odour causing impacts to offsite receptors. Given the enclosed nature of the wastewater system, the delegated officer does not reasonably foresee off-site receptors being impacted by odour from the treatment process.	N/A

Risk Event				Risk Rating ¹ C = consequence L = likelihood	Reasoning / justification	Regulatory controls in addition to proposed Applicant controls (refer to conditions of the granted instrument)
Source/ Activities	Potential emissions	Potential receptors, pathway, and impact	Applicant controls- Table 2			
		Closest residential receptor located approximately 100 m west of the proposed production shed and WWTP		subject to regulatory controls.		
	Wastewater with elevated nutrient, salts (TDS) and BOD concentrations discharged to ground from leaks, spills and overtopping events	Overland runoff and direct infiltration causing contamination of shallow groundwater	See Table 2	C – Minor: Low-level on-site impact. L – Unlikely: the risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	The delegated officer considers that the applicant's proposed design and operational controls, including installing the WWTP on hardstand and ensuring the WWTP has sufficient capacity to treat the expected hydraulic loading, are necessary to lower the risk to acceptable level and will be specified in the works approval. The proposed monitoring of raw and treated wastewater quality during time limited operations will also verify the performance of the WWTP and confirm whether it is adequately sized and designed. In addition to the applicant's controls, the delegated officer has specified that level sensors and warning alarms are to be installed to ensure the applicant can prevent or respond to any high tank levels or potential spills.	Condition 1 – installation of level sensors, warning alarms
	Nutrient-rich leachate leaking from storage of sludge generated in the WWTP		See Table 2	C – Slight: Minimal on-site impact. L – Rare: Likely to only occur under exceptional circumstances. Low Risk Acceptable, generally not subject to regulatory controls.	The delegated officer considers that the applicant's proposed design and operational controls, including disposal of sludge waste off-site and placement of the WWTP on hardstand are necessary and sufficient to lower the risk to acceptable level and will be specified in the works approval.	N/A
On-site disposal of wastewater to designated irrigation area via dripline system	Excessive nutrient loading applied to land (wastewater with elevated nutrients, salts and BOD)	Excessive nutrient or hydraulic loading causing contamination of underlying soils and groundwater via nutrient and BOD infiltration beyond the root zone, or adverse impacts to Swan River ecosystem health and water quality from overland runoff and contaminant migration in groundwater Depth to groundwater about 8 m bgl (yet to be confirmed by site investigation) Swan River about 250 m east of irrigation area	See Table 2	C = Moderate: Mid-level on-site impacts. L = Possible: Could occur at some time. Medium Risk Acceptable, generally subject to regulatory controls.	The discharge of wastewater with high levels of nutrients and oxygen demand to land has potential to cause local soil degradation and groundwater contamination which may migrate off-site and adversely affect ecosystem health at the down-hydraulic gradient Swan River. The potential for soil and groundwater impacts in the proposed irrigation area is dependent on the long-term capacity for vegetation and the upper soil profile to accommodate the nutrient loading applied to the areas. A simple nutrient balance model provided by the applicant states that the proposed crops will uptake almost all irrigated nutrients in each annual period. A preliminary nutrient balance assessment using New South Wales irrigation effluent guidelines (NSW EPA, 1998) also indicates that the proposed crops, using a conservative nutrient uptake scenario, will be adequate to prevent the infiltration of excessive nutrients beneath the root zone. However, the delegated officer notes that this is only a preliminary assessment and genuine nutrient balance will only be achieved via the implementation of a rigorous biomass removal program. The lower the risk of excessive nutrient loading during time limited operations, the delegated officer has specified applicant controls including the installation of physical gross solids screens, even spread of wastewater across the irrigation field, regular harvesting of crops and vines and soil and groundwater monitoring. In addition, the delegated officer determined has specified a limit on fermentation tank (production) capacity, nitrogen, phosphorus and BOD loading limits based on conservative crop nutrient uptake values and predicted nutrient loadings, a daily limit on the WWTP treatment rate (and therefore discharge rate) and recording of biomass volumes removed. These additional regulatory controls are considered necessary to ensure the risk event is monitored and prevented.	Condition 7 – limit on WWTP treatment rate and record biomass removed from irrigation area Condition 10 – loading limits for total nitrogen, total phosphorus and BOD
	Excessive hydraulic loading applied to land (wastewater with elevated nutrients, salts and BOD)		See Table 2	C = Moderate: Mid-level on-site impacts. L = Possible: Could occur at some time. Medium Risk Acceptable, generally subject to regulatory controls.	The discharge of wastewater to land at a rate that exceeds the water needs of the vegetation may pose a risk of seepage of water and nutrients below the root zone to groundwater, pooling and surface water runoff. The risk of waterlogging and seepage is increased during the wetter months when soils are saturated and the water table peaks. The applicant will have about 10 - 20 days of water storage based on the capacity (46 kL) of the proposed water holding tanks. A preliminary hydraulic loading assessment undertaken by the applicant and verified by the department using the maximum permitted discharged rate (daily average of 4,631 L/day) indicates that the proposed irrigation area is sufficient in size to accommodate the maximum hydraulic loading. Depth to groundwater is yet to be measured at the premises however the applicant proposes to install bores up and down-gradient to the irrigation area which may identify the water table depth during time limited operations. The delegated officer has determined that applicant proposed controls are sufficient to lower the risk of surface water runoff and will be specified in the works approval. These controls include an	Condition 9 (a) - Where treated wastewater cannot be irrigated or stored on-site, it must be removed from tanks by a licensed controlled waste carrier and transported off-site. Condition 9 (b) - record the daily volume (in kilolitres) of excess wastewater removed from the premises via a licensed controlled waste contractor

Risk Event				Risk Rating ¹ C = consequence L = likelihood	Reasoning / justification	Regulatory controls in addition to proposed Applicant controls (refer to conditions of the granted instrument)
Source/ Activities	Potential emissions	Potential receptors, pathway, and impact	Applicant controls- Table 2			
					<p>irrigation system designed to evenly apply wastewater across the irrigation area, daily inspections for blockages and leaks in the system, installing a bund to prevent surface water runoff from the irrigation area and not irrigating during heavy rainfall events.</p> <p>However, given the lack of information regarding groundwater depth and quality at the premises, in addition to the lack of detail provided on pasture management to ensure nutrient balance, the delegated officer has specified a ban on irrigation during the wettest months of May, June, July and August during time limited operations to lower the risk of seepage of nutrients beneath the root zone. The applicant may choose to increase treated waste storage capacity, otherwise must dispose excess treated wastewater off-site during this period. This is a key operational control considered necessary to lower the risk of seepage and will be reviewed following the provision of new monitoring data collected during time limited operations.</p>	

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

5. Decision

The delegated officer has determined, subject to regulatory controls and justification outlined in Table 4, that the construction and operation of the beverage manufacturing facility, including the wastewater treatment plant and disposal of treated wastewater to land through irrigation of crops does not present an unacceptable risk to human health, amenity or the environment.

6. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised for public comment on the department's website on 15 August 2022.	No submissions received	N/A
One stakeholder (nearby resident) was invited on 1/08/2022 to provide comment on the application.	Two submissions on 25/8/2022 and 27/8/2022 were received raising the following concerns: <ol style="list-style-type: none"> 1. Unreasonable noise being generated from the 3 externally- located refrigeration units 2. Concerns regarding sodium and calcium ions contained in the wastewater which could affect soil stability and infiltration. 3. Land-use planning related concerns 	<ol style="list-style-type: none"> 1. The works approval requires the construction of a noise attenuation wall around the externally located refrigeration units. 2. Operational controls for monitoring of sodium, calcium as well as nutrients, pH, conductivity, phosphorus buffering index in soil across each irrigation zone are included as conditions of the works approval. 3. Land use is a matter for the Local Government and granted development approval and not a consideration for a works approval under Part V, Division 3 of the <i>Environmental Protection Act 1986</i>
City of Swan advised of application on 1 August 2022. (Request for comment)	City of Swan responded on 15/08/2022 that they had no comments.	NA
Department of Health (DoH) advised of application on 10 August 2022. (Request for comment)	Comment received on 11/8/2022 - DoH provided copy of the approval for the construction or installation for apparatus for the treatment of sewerage at the premises.	N/A

<p>Comment was sought from Department of Primary Industries and Regional Development (DPIRD) on the Crop Management Plan (CMP) entitled “Funk Cider Crop Management Plan”, (KASA Consulting, November 2022 on the 10 November 2022</p>	<p>Comments received on 24/11/2022:</p> <ul style="list-style-type: none"> • The wastewater production volumes and treated effluent quality are optimistic, but possible. • The proposal is conceptually feasible but light on detail therefore it is recommended that the proponent is held accountable for the ‘off take’ i.e. as part of their environmental reporting that they provide evidence of dry matter removed. The process is fairly standard for estimating crop/pasture yields. 	<p>DWER has incorporated the reporting of the crop/pasture nutrient offtake into the proposed licence.</p>
<p>The applicant was provided with the draft works approval and decision report for comment on 11 October 2022 and 30 November 2022</p>	<p>The applicant responded on 10 November 2022 and 1 December 2022.</p>	<p>A summary of the submissions is outlined in Appendix 1.</p>

7. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that works approval W6679/2022/1 will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

On completion of the works and at least 3 months prior to the end of time limited operations, as authorized under works approval W6679/2022/1, the works approval holder will need to apply for an operating licence.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Industry Regulation Guideline to Licencing*.
3. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2022, *Perth Groundwater Atlas*, available at: <https://maps.water.wa.gov.au/Groundwater>.
6. KASA Consulting 2022, *Funk Cider Works Approval Supporting Document*, prepared for Fbros Pty Ltd works approval application submitted to DWER on 6 July 2022).
7. Funk Cider Nutrient Irrigation Management Plan, (KASA Consulting, July 2022).(NIMP)

8. NSW DEC 2003, *Use of Effluent for Irrigation*. Technical Guidelines.
9. Works Approval IR-F09 Application Form – submitted by FBROS Pty Ltd (Martin Michael on 18 July 2022)
10. Approval to construct or install an apparatus for the treatment of sewerage (Department of Health, 10 August 2022)
11. Funk Cider Crop Management Plan, (KASA Consulting, November 2022).(CMP/PMP)
12. Email response to DWER request for information letter dated 20 June 2022. Peter Jansen – KASA consulting (DWERDT620519)
13. Email response to DWER request for information letter dated 8 July 2022. Peter Jansen – KASA consulting (A2112231)
14. Email response to DWER request for information letter dated 21 July 2022. Peter Jansen – KASA consulting (DWERDT620519)
15. Email response to DWER-comment on Crop Management Plan dated 24 November 2022. DPIRD. (A2141801)

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Condition 2a	<p>The WWTP is an SBR unit comprising of a series of tanks each with specific functions as described in the Supporting Document. One of the tanks is below ground. The other tanks will be placed on compacted earth at the designated location shown in relevant site plans provided. No specific bunding is proposed on the basis that the system includes audible overflow alarms and automatic shut off systems/float switches in the event of malfunction to prevent overtopping.</p>	Drafts updated
Condition 9 Table 2, Item 3: (b) <i>Irrigation is not permitted between the period 1 May to 31 August;</i>	<p>Funk Cider maintains its opposition to this proposed limitation, and categorically states that it will render the Project commercially unfeasible. As stated in the Supporting Document, whilst capacity in the form of a 23,000 L holding tank is available as a contingency measure, the production data presented in Table 6-2 demonstrates that holding all wastewater between 1 May to 31 August will require in excess of 205,000L of wastewater.</p> <p>The Decision Report notes that this limitation is based on DWER's consideration of the lack of information regarding groundwater depth and quality at the premises, in addition the lack of detail provided on pasture management. To address this concern, a Crop Management Plan has been prepared specifically for the proposed operations at Funk Cidery.</p> <p>Since submission of the Works Approval application, monitoring bores have been installed and are currently being surveyed. Groundwater was intercepted at over 15m depth thereby providing even greater buffer between ground surface and the water table.</p>	Drafts updated to incorporate the key commitments of the PMP.