Government of Western Australia
Department of Water and Environmental Regulation

Licence

Licence number	L9413/2023/1
Licence holder	FBROS Pty Ltd
ACN	634 416 078
Registered business address	Valencia Complex 55 Benara road, CAVERSHAM, WA 6055
DWER file number	DER2023/000675
Duration	15/04/2024 to 14/04/2044
Date of amendment	25/11/2024
Premises details	Funk Cider 2.0 38 Swan Street, HENLEY BROOK, WA 6055 Legal description Lot 123 on Plan 3820 As defined by the premises map in Schedule 1

Prescribed premises category description (Schedule 1, ***Environmental Protection Regulations 1987***)	**Assessed production capacity**
Category 24: Non-alcoholic beverage manufacturing	No more than 50 kL of non-alcoholic fruit juice produced per annual period
Category 25: Alcoholic beverage manufacturing	No more than 350 kL of beer and cider produced per annual period

This licence is granted to the licence holder, subject to the attached conditions, on 25 November 2024, by:

Caron Goodbourn

Digitally signed by Caron Goodbourn
Date: 2024.11.25 10:51:30 +08'00'

Manager, Process Industries

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

Licence history

Date	Reference number	Summary of changes
01/12/2022	W6679/2022/1	Works approval granted.
24/07/2023	W6679/2022/1	Works approval amendment to extend timeframe for time limited operations and allow commissioning of the wastewater treatment plant.
15/04/2024	L9413/2023/1	Licence granted
25/11/2024	L9413/2023/1	Licence holder-initiated amendment to replace wastewater irrigation limitations with the addition of soil saturation monitoring and other controls and authorisation of additional production vessels. Includes department-initiated amendments to correct unintentional errors and remove redundant conditions.

Interpretation

In this licence:

(a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this licence:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

Works

1. The licence holder must ensure that the site infrastructure and equipment listed in Table 1 and located at the corresponding infrastructure location is constructed and/or installed in accordance with the corresponding design and construction requirement / installation requirement set out in Table 1.

Table 1 Design and construction requirements

	Infrastructure and / or equipment	Design and construction requirement / installation requirement	Infrastructure location- Figure 1 in Schedule 1	Completion timeframe
Proposed works				
1	Carbonation / brite tanks: 3 x 950 L Beer production consisting of: 2 x 3,750 L Uni-tanks 2 x 1,875 L Uni-tanks	Must be located inside the process building	Shown as: Process	31 March 2025

Works – Notification requirement

2. The licence holder must, within 30 calendar days of the infrastructure required by condition 1 being constructed or installed, notify the CEO in writing. The notification must include evidence that the infrastructure described in condition 1 has been constructed or installed inside the process building.

Infrastructure and equipment

3. The licence holder must ensure that the site infrastructure and equipment listed in Table and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 2.

Table 2: Infrastructure and equipment requirements

	Site infrastructure and equipment	Operational requirement	Infrastructure location- Schedule 1
Cidery, beer and juice production and storage			
1	Beverage production building consisting of the following: Externally located refrigeration units with noise attenuation wall; Concrete floor with floor	(a) All beverage production must occur inside the process building. (b) Western doors of the beverage production building must be kept closed when undertaking canning operations and beer manufacturing other than opening	Shown as: “Outdoor”, “Process”, “Storage” and “WWTP” in Figure 1

	Site infrastructure and equipment	Operational requirement	Infrastructure location- Schedule 1
	drains capable of draining all wastewater to the wastewater treatment plant (WWTP); Apple belt press, including bin tipper, washer / elevator / crusher and belt press; Citrus Line, including bin tipper and citrus pressing machine; Mango destoner; 10, 000 L juice settling tank; Canning line Cool room and freezer; Fermentation tanks: 2 x 600 L 1 x 850 L 1 x 1,700 L 5 x 2,000 L 1 x 2,500 L 1 x 3,000 L 3 x 3,500 L Carbonation / brite tanks: 2 x 1,000 L 1 x 1,200 2 x 2,000 L 2 x 4,000 L 1 x 500 L 3 X 950 L (once installed) Beer production consisting of: 3 X 3,750 L Uni-tanks (once installed) 2 X 1,875 L Uni-tanks (once installed) 3 x 1,200 L tanks 2 x 2,400 L Uni-tank (fermentation/carbonation) 1 x 2,000L Lauter Slash/Mash Tank 1 X 2,000L Kettle (Whirlpool)	for forklift entry and exit. (c) No more than one batch of beer to be brewed per week. (d) All wastewater generated from beverage production activities must be directed to the WWTP. (e) Noise attenuation wall must be maintained around the external refrigeration units.	

	Site infrastructure and equipment	Operational requirement	Infrastructure location- Schedule 1
	tank 1 x 4,000 hot liquor tank Storage building consisting of a concrete hardstand.		
Wastewater treatment			
2	Wastewater drainage infrastructure Wastewater drainage pipelines from process building to the WWTP (7kL below ground tank).	(a) Drains conveying wastewater from the process building to the WWTP must be fitted with solids strainers that are maintained to allow free flowing wastewater.	Shown as: "Process" and "WWTP" in Figure 1
3	Beverage production Wastewater treatment plant (WWTP) 7 kL raw wastewater polyethylene holding tank (below ground) pH closed-loop dosing system 23 kL Sequence Batch Reactor unit with submersible aerator 2 x 23 kL balance tanks with lift pumps Multicyclone with back flush drain to holding tank 5 kL irrigation tank Pumps, pipes and associated infrastructure. Sampling point (M2) Telemetered flow meter (M1) Sludge storage IBCs	(a) No more than 4,631L per day of beverage production wastewater may be directed into the SBR tank of the WWTP; (b) All WWTP tanks must be enclosed. (c) Sludge from the WWTP to be disposed off-site to a licensed liquid waste facility. (d) Sampling point at the exit (M2) of the WWTP to be maintained to allow for periodic sampling of treated wastewater. (e) High level sensors within each tank must be maintained in working condition. (f) Submersible aerators within the Sequence Batch Reactor to be maintained to enable the aeration of wastewater within the unit. (g) Alarms, connected to visible flashing lights on top of the tanks, must be operational and maintained to alert of any pump, aeration, or electrical failure. (h) Must undertake daily inspections of the WWTP to detect for wastewater and foam leaks and overtopping. (i) Flow meter (M1) must be maintained to enable accurate recording of the WWTP outflow meter readings to the irrigation area. (j) Wastewater excess to WWTP capacity must be removed off-site for disposal at a licensed liquid waste facility. (k) All IBCs containing sludge must be stored on a hardstand with all spills directed to the WWTP.	Shown as: "WWTP", "M1", "M2", "Storage" and "Outdoor" in Figure 1
Wastewater disposal via irrigation			
4	Irrigation area (1 ha) L1 including irrigation system comprising: Irrigation zones 1, 2, 3, 4, irrigation pipe, pump, and	(a) Irrigation pump, pipelines, and other fittings must be maintained and inspected daily for ruptures or leaks when irrigating. (b) Irrigation is not undertaken during, or 24 hours immediately after a rainfall event	Shown as: "Irrigation area L1" in Figure 1 and "Irrigation zone 1",

	Site infrastructure and equipment	Operational requirement	Infrastructure location- Schedule 1
	drippers/sprinklers. 4 Observation Wells: OW1, OW2, OW3, OW4	over 2 mm. (c) Irrigation must cease in the irrigation zone(s) when free water is detected at or within 1 mBGL, in the respective Observation Wells (OW) (d) No irrigation generated run-off occurs beyond the boundary of the irrigation areas. (c) A summer crop must be planted by November of each year and harvested by April the following year. (d) A winter crop must be planted by May of each year and be harvested by October of the same year. (e) The type of crop and estimated tonnage removed for each crop must be recorded. (f) Healthy vegetation is maintained over the irrigation areas.	"Irrigation zone 2", "Irrigation zone 3", "Irrigation zone 4", "OW1", "OW2", "OW3", "OW4" in Figure 2.
5	Observation Wells (OW): OW1, OW2, OW3, OW4 (once installed) Irrigation control comprising of: Leak detection tape sensor installed at 1000mm Internet of Things control system (IoT) Web interface	Well design and construction: a) Designed and constructed in accordance with Figures 2 and 3 in Schedule 1; b) Wells must be designed to detect saturated soil conditions; c) Be installed by either a Soil Scientist, Hydrogeologist or a DWER Licensed Driller; d) Be installed to a depth of at least 1 mBGL and Irrigation control: e) A leak detection tape must be installed and maintained to 1 mBGL in each observation well (OW) f) The leak detection tape must be connected to the IoT and must take at least one water detection test per 24-hour period; g) The IoT system must be capable of sending email alerts to the web interface when free water is detected in the observation well; and h) Application of wastewater must cease in the related irrigation zone, when free water is detected in the related observation well.	Shown as: "OW1", "OW2", "OW3", "OW4" in Figure 2 and "Observation Well Design" in Figure 3.
Solid waste storage			
6	Bitumen hardstand where waste pulp bins containing solids are stored.	(a) All waste pulp bins must be lined with plastic to prevent leakage and kept closed when containing waste.	Shown as: "Outdoor" in Figure 1

	Site infrastructure and equipment	Operational requirement	Infrastructure location- Schedule 1
		(b) All waste pulp bins containing waste must be stored on a bitumen hardstand. (c) All waste pulp bins must have lids or be emptied at a minimum every 48 hours from November to April (inclusive) and once a week May to October (inclusive).	

Emissions and discharges

4. The licence holder must ensure that emissions from the discharge point listed in Table 3 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with condition 5.

Table 3: Emission and discharge limits

Discharge point	Parameter	Limit
Irrigation zones 1,2,3 & 4 as shown Schedule 1, Figure 2.	pH	≥5.5 and ≤9
	Electrical conductivity	2.9 dS/m
	[2]Sodium absorption ratio (SAR)	<6
	Total nitrogen	<30 mg/L
	Total phosphorus	<10 mg/L
	[1]Total nitrogen	Not more than 100 kg/ha/annual period
	[1]Total phosphorus	Not more than 17 kg/ha/annual period
	[1]Biochemical oxygen demand	Not more than 1500kg/ha/month

Note 1: See Schedule 2 loading calculation spreadsheet.

Note 2: NSW Department of Primary Industries 2016, *Primefact1344: Interpreting water quality test results*, Sydney, New South Wales

Monitoring

Monitoring of emissions to land

5. The licence holder must monitor emissions in accordance with the requirements specified in 4 and record the results of all such monitoring.

Table 4: Emissions and discharges monitoring

Discharge point	Monitoring location	Parameter	Units	Frequency	Averaging period	Method
Irrigation zones 1, 2, 3 & 4, as shown in Schedule 1 Figure 2.	Wastewater sampling point M2 as shown in Schedule 1 Figure 1	Volumetric flow rate (cumulative)	L/day	Continuous when discharging	Daily	N/A
		pH[1]	-	Monthly when irrigating	Spot sample -	AS/NZS 5667.1 and AS/NZS 5667.10
		Electrical conductivity[1]	dS/m			
		Total nitrogen	mg/L			
		Total phosphorus				

Discharge point	Monitoring location	Parameter	Units	Frequency	Averaging period	Method
		Total dissolved solids				
		Total suspended solids				
		BOD				
		Sodium ion (Na^+)				
		Calcium ion (Ca^{2+})				
		Magnesium ion (Mg^{2+})				
		Sodium adsorption ratio	-			

[1] In field non-NATA accredited analysis permitted for pH and electrical conductivity.

Monitoring of ambient soil

6. The licence holder must monitor soil during for concentrations of the identified parameters in accordance with Table 5: and record the result of all such monitoring.

Table 5: Monitoring of ambient soil concentrations during time limited operations

Monitoring location as shown in Schedule 1 Figure 2	Parameter	Unit	Frequency
S1, S2, S3 and S4 within Irrigation zones: 1, 2, 3 and 4 comprising: At least 1 topsoil and 1 subsoil sample must be collected at S1, S2, S3 and S4 with a total of 8 samples for the irrigation zone. Sampling of each major soil horizon must occur to 1 metre depth.	Field measurement of texture using the hand bolus method	-	
	pH	-	Once every two years starting in March 2025.
	Electrical Conductivity (EC (1:5)), converted to saturated extract EC_{-e}, using standard field texture conversion actors	dS/cm	
	Total Nitrogen	mg P/kg	
	Total Available Nitrogen	kg N/ha	
	Total Phosphorus	mg/kg	
	Total Available Phosphorus (Colwell method)	kg P/ha	
	Phosphorus Buffer Index measured using the Phosphorus Buffering Index (PBI) soil test	mg P/kg	
	Cation Exchange Capacity (CEC) converted to Exchangeable Sodium Percentage (ESP%)	-	
		-	
	Heavy Metals, Organochlorine (OC) and Organophosphate (OP) contaminants by a NATA accredited laboratory.	-	Once every four years starting in March 2025.

Monitoring of ambient groundwater and soil saturation

7. The licence holder must monitor groundwater for the identified parameters in accordance with Table6 and record the results of all such monitoring.

Table 6: Monitoring of groundwater and soil saturation

Monitoring well location	Parameter or measurement	Units	Frequency	Averaging period	Sampling method
MW1, MW2, as shown in Schedule 1 Figure 1	Standing water level	m AHD; and mBGL	Quarterly (March, June, September, and December)	Spot sample	In-field measurement
	pH[1]	-			AS5667.1 AS5667.11
	Electrical conductivity[1]	dS/m			
	Total nitrogen	mg/L			
	Total phosphorus				
OW1, OW2, OW3 and OW4 as shown in Schedule 1, Figure 2.	Detection of standing water 1 mBGL	At or within 1 mBGL	At least once per 24 hours	In-field measurement	Leak detection tape

[1] In field non-NATA accredited analysis permitted for pH and electrical conductivity.

8. The licence holder must ensure that all non-continuous analysis undertaken pursuant to conditions 4, 5 and 6 is undertaken by a holder of a current accreditation from the National Association of Testing Authorities (NATA) for the methods of analysis relevant to the corresponding relevant parameter.

9. The licence holder must ensure that for the monitoring required by condition 7, Table 6, row 1 (MW1, MW2):

(a) monitoring is undertaken in each monthly period such that there are at least 15 days in between the days on which samples are taken in successive months; and

(b) monitoring is undertaken in each quarterly period such that there are at least 45 days in between the days on which samples are taken in successive quarters.

Records and reporting

10. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

11. The licence holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and

(b) prepare and submit to the CEO by no later than **28 February** after the end of that annual period an Annual Audit Compliance Report in the approved form.

12. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence;

(b) any maintenance of infrastructure that is performed in the course of complying with condition 2 of this licence;

(c) monitoring programmes undertaken in accordance with conditions 4, 5 and 6 of this licence; and

(d) complaints received under condition 11 of this licence.

13. The licence holder must submit to the CEO by no later than **28 February** after the end of each annual period, an Annual Environmental Report for that annual period for the conditions listed in

14. Table 7, and which provides information in accordance with the corresponding requirements set out in

15. Table 7.

Table 7: Annual environmental report

Condition or table	Requirement
2	Volume of cider, beer and juice produced each annual period. Tonnages of fruit accepted for processing each annual period. Tonnages biomass (vegetation) harvested from the irrigation area each annual period.
3, 4	Volume (m^3 or kL) of wastewater applied to irrigation area (L1). Monthly photographic evidence illustrating the date, the flow meter serial number and flow meter reading (M1) (ensuring the numbers are readable). Wastewater monitoring data in tabulated and graphical form including the sampling date. Present monthly and annual loadings of nitrogen, phosphorus and BOD applied to the irrigation area (L1) using the Nutrient Loading Spreadsheet in Schedule 2 An assessment and interpretation of the data including comparison to historical trends, water quality limits and loading limits. Copies of laboratory sample analysis reports.
5	Soil monitoring data in tabulated and graphical formats including the sampling date. An assessment and interpretation of the data including comparison to historic trends. Copies of laboratory sample analysis reports
6	Groundwater monitoring data in tabulated and graphical formats including the sampling date. As assessment and interpretation of the data including comparison to historical trends. A summary of the number of days that soil saturation is detected in each observation well. Copies of laboratory sample analysis reports.
10	A summary of complaints recorded for the annual period.
-	Summary of recommendations based on the review of all monitoring data collected.

Condition or table	Requirement
-	Monthly photographic evidence of the irrigation flow meter, illustrating the date, the flow meter serial number and flow meter reading (M1) (ensuring the numbers are readable).

Definitions

In this licence, the terms in Table 88 have the meanings defined.

Table 8: Definitions

Term	Definition
ACN	Australian Company Number
AHD	Australian height datum
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12-month period commencing from 1 January until 31 December.
AS 1726	means the current version of Australian Standards AS 1726: *Geotechnical site investigations*
AS/NZS 4482.1	means the current version of Australia / New Zealand Standard AS/NZS 4482.1 *Guide to the investigation and sampling of sites with potentially contaminated soil*
AS/NZS 5667.1	means the current version of Australian / New Zealand Standard AS/NZS 5667.1 *Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.10	means the current version of Australian / New Zealand Standard AS/NZS 5667.10 *Water Quality – Sampling, Part 10: Guidance on sampling of waste waters*
AS/NZS 5667.11	means the current version of Australian / New Zealand Standards AS/NZS 5667.11 *Water Quality – Sampling, Part 11: Guidance on sampling of groundwaters*
ASTM D5092/D5092M-16	means the ASTM international standard for *Standard practice for design and installation of groundwater monitoring bores (Designation ASTM D5092/D5092M-16)*
averaging period	means the time over which a limit is measured or a monitoring result is obtained
beverage production facility	means all equipment listed in Table 2 including canning, bottling, fruit processing, beverage production, refrigeration units and the WWTP
BOD	biochemical oxygen demand
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer of the Department. "submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
Department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
DWER Licensed Driller	A person who has a 26D Licence to construct and/or alter a well, under the *Rights in Water and Irrigation Act 1914* (RiWI Act).
dS/m	decisiemens per metre

Term	Definition
emission	has the same meaning given to that term under the EP Act.
harvest	means the quantity of a natural product gathered in a single season.
kg/ha	kilograms per hectare
kL	kilolitres
L/day	litres per day
licence holder	means the occupier of the premises, being the person to whom this licence has been granted, as identified on the front of this licence
licensed liquid waste facility	means a liquid waste facility that holds a licence under Part V, Division 3 of the EP Act
m	metres
mBGL	metres below ground level
mg/L	milligrams per litre
monthly	means a one-month period from the first day of a month until the last day of that same month
NATA	means the (Australian) National Association of Testing Authorities
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis
OC	Organochlorines
OPs	Organophosphates
premises	means the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map (Figure 1) in Schedule 1 to this licence
quarterly	means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December in the same year
rainfall event	means greater than or equal to 2 mm of precipitation within a 24-hour period
SBR	Sequencing Batch Reactor
spot sample	means a discrete sample representative at the time and place at which the sample is taken
waste	has the same meaning given to that term under the EP Act
WWTP	The WWTP consists of a number of components, the SBR being the most NB one
Treated wastewater	means water that has passed through the wastewater treatment plant

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in pink in the map below

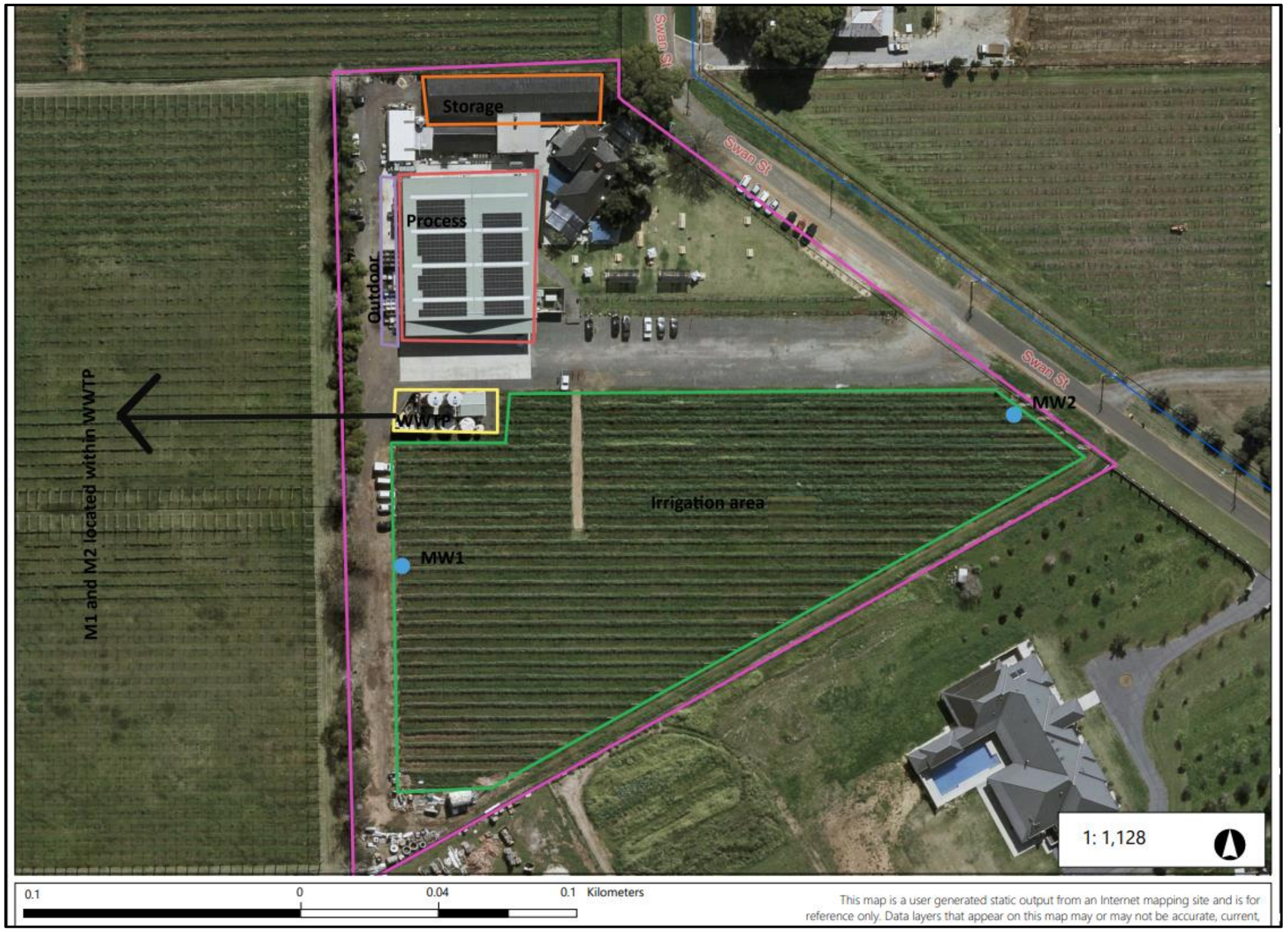

Figure 1: Site layout of the premises

Observation Wells (OW), Irrigation Zones and soil sampling locations

The boundary of the four irrigation zones and related observation wells is shown on the map below

Figure 2: Observation Wells (OW) used for soil saturation monitoring within each irrigation zone

Observation Well design

The required design of observation wells is depicted below

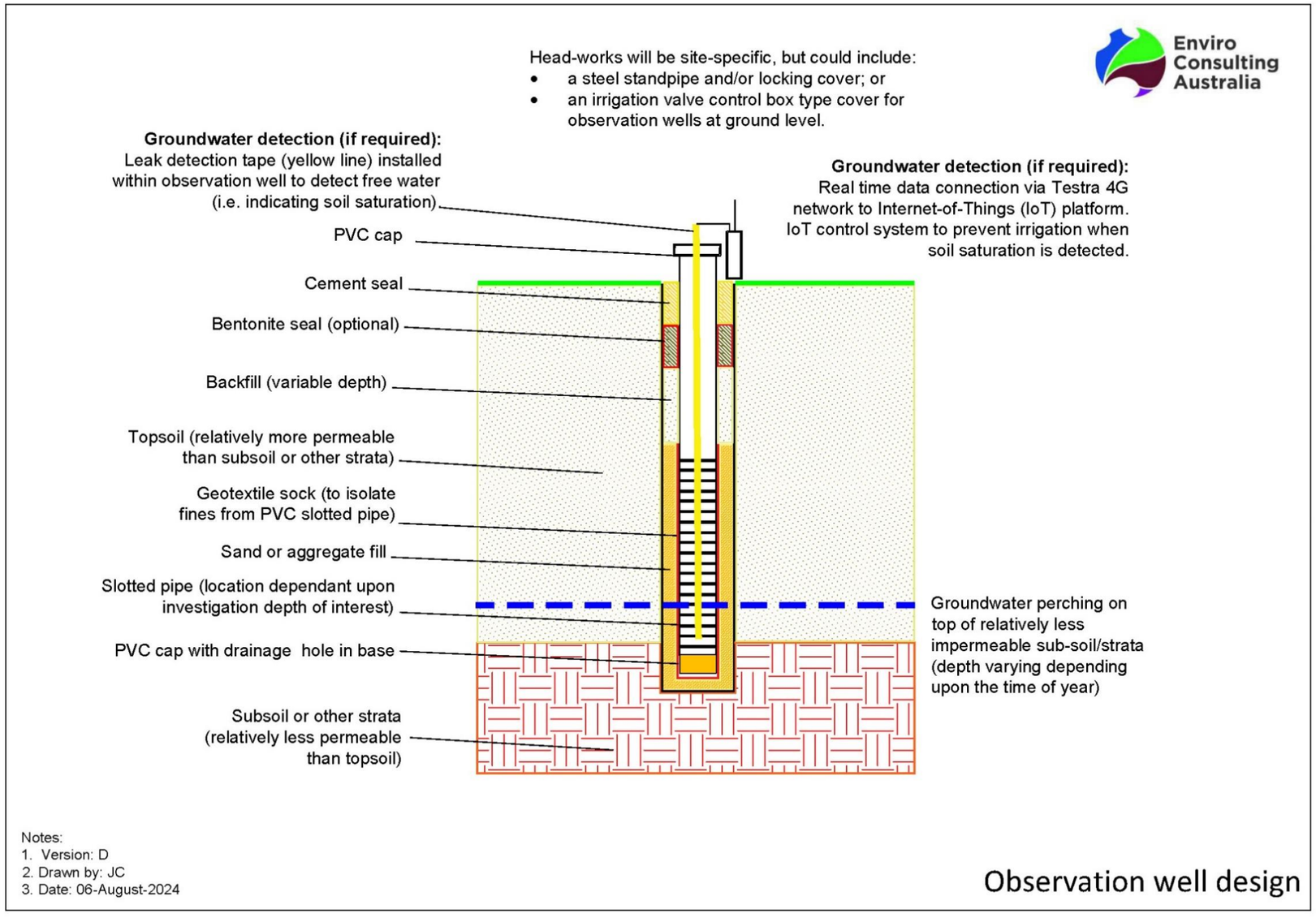

Figure 3: Observation Well design

Schedule 2: Nutrient loading calculator

Irrigation areas[1]: size, volume irrigated, irrigation days				Annual period (as defined by your licence)[2]												Volume irrigated during annual period (kL)[3]
	Size (ha)			January	February	March	April	May	June	July	August	September	October	November	December	
EXAMPLE irrigation area:	*25*	*volume irrigated*	*kL*	*20,000*	*20,000*	*18,000*	*15,000*	*0*	*0*	*0*	*0*	*15,000*	*18,000*	*20,000*	*25,000*	*151,000*
		days of irrigation	*days/month*	*29*	*28*	*30*	*25*	*0*	*0*	*0*	*0*	*20*	*25*	*30*	*27*	
Irrigation Area 1:		volume irrigated	kL													
		days of irrigation	days/month													
Irrigation Area 2:		volume irrigated	kL													
		days of irrigation	days/month													
Irrigation Area 3:		volume irrigated	kL													
		days of irrigation	days/month													
Wastewater quality[4]	*EXAMPLE sampling date:*			*20/01/2022*	*15/02/2022*	*17/03/2022*	*19/04/2022*	*12/05/2022*	*12/06/2022*	*9/07/2022*	*15/08/2022*	*12/09/2022*	*15/10/2022*	*13/11/2022*	*7/12/2022*	
	EXAMPLE total nitrogen	*mg/L*		*13.2*	*21.3*	*17.6*	*19.2*	*42.4*	*25.1*	*30.4*	*40.3*	*34.8*	*38.7*	*44.6*	*47.3*	
	EXAMPLE BOD	*mg/L*		*4.8*	*12.1*	*6.1*	*4.9*	*4.8*	*4.1*	*3.3*	*5.2*	*4.4*	*5.2*	*5.1*	*7.5*	
	Sampling date:															
	For wineries to indicate sampling period:[5]															
	Total nitrogen	mg/L														
	Total phosphorus	mg/L														
	Biochemical oxygen demand	mg/L														

Nutrient and BOD loadings[6]			January	February	March	April	May	June	July	August	September	October	November	December	kg/ha/annual period[7]
EXAMPLE total nitrogen loadings			*10.6*	*17.0*	*12.7*	*11.5*					*20.9*	*27.9*	*35.7*	*47.3*	*183.5*
EXAMPLE BOD loadings		*kg/ha/month*	*3.8*	*9.7*	*4.4*	*2.9*					*2.6*	*3.7*	*4.1*	*7.5*	*38.8*
		kg/ha/day	*0.13*	*0.35*	*0.15*	*0.12*					*0.13*	*0.15*	*0.14*	*0.28*	
Irrigation Area 1	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													
Irrigation Area 2	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													
Irrigation Area 3	Total nitrogen	kg/ha/month													
	Total phosphorus	kg/ha/month													
	Biochemical oxygen demand	kg/ha/month													
		kg/ha/day													

Licence limits[8]				
		kg/ha/annual period	kg/ha/month	kg/ha/day
Irrigation area 1	TN			
	TP			
	BOD			
Irrigation area 2	TN			
	TP			
	BOD			
Irrigation area 3	TN			
	TP			
	BOD			

Explanatory notes and calculations:

White cells should be filled in where applicable. Pale yellow cells will calculate automatically.

NOTE 1 - Where there is irrigation to more than 3 areas, additional copies of this sheet should be completed.

NOTE 2 - This sheet should be completed for your annual period as defined by your licence. *E.g. If your annual period is from 1 October to the 30 September in the following year, for the 2022-2023 annual period, you should include data from January - September 2023, and October - December 2022.*
NOTE 3 - Volume irrigated during the annual period (kL), for each irrigation area is the sum of the monthly volumes irrigated to that area. *E.g. For the example shown: Volume irrigated during annual period = 20,000 (Jan) + 20,000 (Feb) + 18,000 (Mar) + 15,000 (Apr) + 15,000 (Sep) + 18,000 (Oct) + 20,000 (Nov) + 25,000 (Dec) = 151,000 kL. Noting that for the example there was no irrigation during the months of May, June, July or August.*
NOTE 4 - The sampling and analysis of your wastewater quality should be undertaken in accordance with your licence conditions. For sampling less often than monthly, i.e. quarterly, 6-monthly, or annually: for months where no sampling is required, wastewater quality should be taken to be equivalent to the most recent sample taken. *E.g. Quarterly sampling during Feb, May, Aug and Nov - total nitrogen concentrations were analysed to be 7, 11, 8 and 13 mg/L respectively in the wastewater. For March and April, as February was the most recent sample taken, total nitrogen concentration is estimated to be 7 mg/L. Similarly, for June and July, as May was the most recent sample, total nitrogen concentration is estimated to be 11 mg/L. There will be no sampling date associated with non-sampling months.* If your licence requires you to monitor loading rates for additional parameters (e.g. inorganic nitrogen, reactive phosphorus etc.) additional copies of this sheet should be completed for the additional parameters.
NOTE 5 - For wineries to indicate sampling period - this row is only required to be completed if your licence condition specifies a sampling period e.g. pre-vinatge, peak vintage, late vintage, post vintage, non-vintage. Indicate which sampling date corresponds with which period.
NOTE 6 - Parameter loading (TN, TP or BOD) each month per hectare for each irrigation area (kg/ha/month): monthly concentration of parameter (TN, TP or BOD) in mg/L * monthly volume of wastewater irrigated to irrigation area (kL) ÷ 1000 size of irrigation area *E.g. Using the example shown, for total nitrogen for January: 13.2 mg/L * 20,000 kL / 1,000 = 264 kg/month. 264 / 25 ha = 10.6 kg/ha/month (for January).* Loading of parameter (BOD) each day per hectare for each irrigation area (kg/ha/day): BOD loading (kg/ha/month) ÷ number of days of irrigation during that month. *E.g. Using the example shown, for BOD for October: 3.7 kg/ha/month / 25 days of irrigation during October = 0.15 kg/ha/day (for October)*
NOTE 7 - To calculate annual loading of parameter (TN, TP or BOD) per hectare (kg/ha/annual period): sum of monthly loadings (kg/ha/month). You should calculate an annual loading (kg/ha/annual period) for each relevant parameter for each irrigation area. *E.g. Using the example shown, for total nitrogen: 10.6 (Jan) + 17 (Feb) + 12.7 (Mar) + 11.5 (Apr) + 20.9 (Sep) + 27.9 (Oct) + 35.7 (Nov) + 47.3 (Dec) kg/ha/month = 183.5 kg/ha/annual period*
NOTE 8 - Relevant licence limits to be entered. Where TN = total nitrogen, TP = total phosphorus, and BOD = biochemical oxygen demand. Once applicable licence limits have been entered, the calculated loadings will become red text if they exceed the relevant limit.

Note: Licence holders can request a digital Excel spreadsheet (with in-built formulas) on request.

Send all requests to info@dwer.wa.gov.au

Attention: Process Industries and quote the licence number.