



Licence number	L7749/1999/9	
Licence holder	Stella Bella Wines Pty Ltd	
ACN	079 217 164	
Registered business address	205 Rosa Brook Road MARGARET RIVER WA 6285	
DWER file number	DEC6515/1	
Duration	19/01/2014	18/01/2045
Date of amendment	18/03/2025	
Premises details	Stella Bella Wines 365 Brockman Highway, KARRIDALE WA 6288	
	Legal description – Lot 101 on diagram 64801 As defined by the premises map in Schedule 1	

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed production capacity
Category 25: Alcoholic beverage manufacturing: premises on which alcoholic beverage is manufactured and from which is or is to be discharged onto land or waters.	Not more than 750 kiloliters of wine produced per annual period

This licence is granted to the licence holder, subject to the attached conditions, on 18 March 2025, by:

MANAGER, PROCESS INDUSTRIES

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

Licence history

Date	Reference number	Summary of changes
28/04/1999	W2731/1999/1	Works approval
16/12/2005	W4127/1999/1	Works approval
4/04/2007	W4127/1999/1	Works approval amendment
16/01/2014	L7749/1999/9	Licence reissued, including updating the format of the conditions.
29/04/2016	L7749/1999/9	Amendment by Notice to extend expiry date from 18/01/2019 to 18/01/2031
16/05/2022	L7749/1999/9	Amendment by Notice to allow biennial reporting of annual environmental Report.
18/03/2025	L7749/1999/9	Amendment application to remove Category 24 (non-alcoholic beverage manufacturing) and approve works to establish new 0.93 ha effluent disposal (irrigation) area. Includes department-initiated amendments to the format of the licence, reinstate the requirement for annual environmental reporting, additional monitoring requirements and extend the expiry date of the licence to 2045.

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

Infrastructure and equipment

- The licence holder must ensure that the site infrastructure and equipment listed in Table 1 is maintained and operated in accordance with the corresponding operational requirements set out in Table 1.

Table 1: Infrastructure and equipment requirements

	Site infrastructure and equipment	Operational requirement	Infrastructure location-schedule 1
Winery			
1	Consisting of an enclosed winery building, Crush pad area, Concrete hardstand area, Drains, Collection sump 1 (10kL), Collection sump 2 (10kL)	<ol style="list-style-type: none"> All plant and equipment used for the production and bottling of wine (excluding water tanks) must be operated within the winery or within the outside concrete hardstand. The winery outside concrete hardstand must be graded to ensure all wastewater is directed to collection sump 1. Drains within the winery building and in the outside hardstand must direct wastewater to collection sump 1. Drains must have filter baskets installed to screen solids. Drain filter baskets must have a maximum aperture of 5mm. Drain filter baskets must be routinely inspected and emptied when full, when winery operations are occurring. The valve in collection sump 1 must be maintained to be capable of diverting wastewater to collection sump 2 or clean stormwater to the 40 ML onstream dam. 	As shown in Figure 2 as Process building Outside hardstand Collection Sump 1 Collection Sump 2
Wastewater treatment and storage			
2	Wastewater treatment plant (WWTP) consisting of: A 135 kL concrete wastewater storage tank. A 150 kL concrete process tank with aspirator (aerated and operated as a sequence batch reactor with return activated sludge). A 20 kL overflow sump 75 kL HDPE lined emergency overflow sump	<ol style="list-style-type: none"> No more than 30 kL/day of wastewater must be directed for treatment through the WWTP. 150 kL concrete process tank must contain aspirators in working order. If any wastewater overflows to the 75 kL sump or the 20 kL overflow sump it must re-directed back to the WWTP for treatment. All clean stormwater surface flow when operations are not occurring or flow from areas outside winery and WWTP infrastructure must be diverted from 	As shown in Figure 2 as: WWTP 20 kL overflow sump 75 kL emergency overflow sump 1 ML Holding Pond FM1 Flow meter

	Site infrastructure and equipment	Operational requirement	Infrastructure location-schedule 1
	A 1ML clay lined holding pond A 13 kL treated wastewater storage tank Valves, tank sensors, and floats Flow meter (FM1) Treated wastewater sample point (S1)	entering the WWTP, 75kL HDPE lined overflow sump, collection sumps and 1 ML holding pond. (e) All tanks, and interconnecting pipes must be kept in good working order and routinely visually inspected for any seepage or leakage of wastewater. (f) Level sensors and floats must be maintained and in working order. (g) A minimum freeboard of 10cm must be maintained in the 1ML holding pond. (h) All wastewater ponds and sumps must be maintained free of vegetation, algal mats, and debris. (i) A flow meter (FM1) must be maintained to enable the cumulative volume of wastewater discharged to Land application area (L1). (j) A photograph at the end of each month must be taken of the flow meter read (FM1).	S1 sampling point
Solids management			
3	25m x 30m marc pad - Clay lined graded to drain to the marc bay sump 1, which then directs wastewater to 1ML holding pond.	(a) All marc and screen solids must be stored on the marc pad prior to off-site disposal or spreading over vines. (b) All leachate and contaminated stormwater arising on the marc pad must be directed to the marc pad sump, within the marc pad before being directed to the 1ML holding pond. (c) Drainage around the marc pad must be maintained to prevent clean stormwater entering the pad area. (d) Marc and other organic solids that are not to be composted must be removed from the site for off-site disposal.	As shown in Figure 2 as Marc pad Mac pad sump
Irrigation of wastewater to land			
4	Land application area L1 (5.29 Ha) planted to vines	(a) Irrigation does not occur on land when groundwater is within 1 meter of the surface. (b) No wastewater spray drift or run off occurs beyond the property boundary. (c) Irrigation pumps, pipelines, and other fittings must be maintained and routinely inspected (when irrigating) for ruptures or leaks. (d) Irrigation is not undertaken 12 hours before forecasted rain, during, or 24 hours immediately after a rainfall event of over 2 mm.	As shown in Figure 1 as: L1

	Site infrastructure and equipment	Operational requirement	Infrastructure location-schedule 1
		(e) Irrigation must not exceed 20 mm per 24-hour period. (f) No soil erosion occurs.	

Emissions and discharges

Authorised emissions limits

- The licence holder must ensure that wastewater discharged to the authorised discharge area in Table 2 for the corresponding parameter does not exceed the corresponding limit when monitored in accordance with condition 3.

Table 2: Emission limit values

Discharge area	Parameter	Limit value
Land application area L1	Sodium adsorption ratio: Electrical conductivity ratio (SAR:EC ratio)	Within the 'Stable soil structure' range depicted in Schedule 3 Figure 1
	Total nitrogen	<250 kg/ha/annual period
	Total phosphorus	<30 kg/ha/annual period
	Biological oxygen demand	<1,500 kg/ha/month
	pH	Between 6 - 9

Monitoring

Monitoring of emissions to land

- The licence holder must monitor emissions in accordance with the requirements specified in Table 3: and record the results of all such monitoring.

Table 3: Emissions and discharges monitoring

Discharge point	Monitoring location	Parameter	Units	Frequency
Irrigation area L1	Flow meter FM1	Volumetric flow rate (cumulative)	L/day	Continuous when discharging
	Wastewater sampling point S1	pH ¹	-	Monthly
		Electrical conductivity ¹	uS/cm	
		Total nitrogen	mg/L	
		Total phosphorus		
		Total dissolved solids		
		Total suspended solids		
		Biological oxygen demand (BOD)		
Sodium ion (Na ⁺) ²				

Discharge point	Monitoring location	Parameter	Units	Frequency
		Calcium ion (Ca ²⁺) ²		
		Magnesium ion (Mg ²⁺) ²		
		Sodium adsorption ratio	-	Quarterly

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

²Non-NATA accredited analysis permitted

4. The licence holder must ensure that:
 - (a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
 - (b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
 - (c) all soil sampling is conducted in accordance with AS 4482.1; and
 - (d) unless otherwise stated, all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured.
5. The licence holder must ensure that monitoring is undertaken in each monthly period such that there are at least 15 days between the days on which samples are taken in successive months
6. The licence holder must ensure that monitoring is undertaken in each quarter period such that there are at least 45 days between the days on which samples are taken in successive months

Optional Works – New wastewater irrigation area (L2)

7. The licence holder, if they choose to proceed with L2 works, must construct and install the infrastructure and equipment listed in Table 4, in accordance with the requirements specified in Table 4 and complete the works before 31 December 2028.

Table 4: Design and construction / installation requirements

	Infrastructure and equipment	Design and construction / installation requirements	Infrastructure location – Schedule 1
1.	Wastewater pipeline between the 1ML holding pond and the wastewater irrigation area (L2) and a flow meter	(a) A leak free poly pipe must be installed to convey treated wastewater from the WWTP or 1ML holding pond to the irrigation area (L2). (b) The pipeline must be positioned and installed in such a way that it does not result in impacts to native vegetation or 'bed and banks' unless a permit is obtained. (c) A flow meter must be installed that is capable of recording the volumes of all wastewaters discharged to the irrigation area. (L2)	Shown in Figure 1 as: 1 ML holding pond L2
2.	Aerator Sensor / float valve with high-level alarm	(a) An aerator and a level sensor with high-level alarm must be installed in the 1 ML holding pond.	Shown in Figure 1 as: 1 ML holding pond L2

	Infrastructure and equipment	Design and construction / installation requirements	Infrastructure location – Schedule 1
3.	0.93Ha irrigation area (L2) consisting of: Irrigation pipes and valves; Rain gauge; and Fixed sprinklers	(a) Piping, pumps, and associated infrastructure capable of transferring and irrigating wastewater must be structurally sound. (b) Sprinklers must be strategically positioned throughout the irrigation area to ensure an even distribution of wastewater over the entire irrigation area can be achieved.	Shown in Figure 1 as: L2

8. The licence holder must, within 30 calendar days of the infrastructure items required by condition 7 being installed and prior to directing treated or untreated wastewater to the irrigation area (L2):
- (a) undertake an audit of their compliance with the requirements of condition 7; and
 - (b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.
9. The Environmental Compliance Report required by condition 7, must include as a minimum the following:
- (a) certification by a person authorised to represent the licence holder that each item of infrastructure or component thereof, as specified in condition 7, have been installed in accordance with the relevant requirements;
 - (b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 7, Table 4; and
 - (c) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person.
10. 60 days before commencement of irrigation to the new area (L2), the licence holder must submit to the CEO an updated Nutrient Irrigation Management Plan (NIMP) relevant to the new irrigation area.
- The NIMP must include but not be limited to:
- (a) Assessment of adequacy of irrigation area based on:
 - (i) hydraulic loading rates
 - (ii) nutrient loading rates
 - (iii) Biochemical Oxygen Demand loading rates; and
 - (iv) soil sampling results.
 - (b) Assessment of the adequacy of current wastewater storage including:
 - (i) monthly water balance showing the wastewater produced compared to when irrigation can and cannot occur.
 - (ii) contingency plan for storage of wastewater during wet weather periods when irrigation cannot occur.
 - (c) Specify what crop is to be planted and include:
 - (i) the water requirements for this crop
 - (ii) the nutrient balance which identifies nutrient uptake rates
 - (iii) a harvest/nutrient export strategy

- (d) Where the NIMP identifies any issues with (a), (b) or (c) above, the NIMP must include recommendation on how to resolve the limitations.

Operations phase

Commencement of new irrigation area operations

11. The licence holder may only discharge wastewater via irrigation to the new irrigation area L2 after the NIMP and Environmental Compliance Report as required by condition 9 and 10 have been submitted.
12. The licence holder must ensure that the new irrigation area L2 infrastructure and equipment listed in Table 5 is operated in accordance with the corresponding operational requirements.

Table 5. Operational Requirements

Site Infrastructure and equipment	Operational Requirement	Infrastructure Location
0.93Ha irrigation area (L2) consisting of: Irrigation pipes and valves; Rain gauge; and Fixed sprinklers	<ul style="list-style-type: none"> (a) Irrigation pumps, pipelines, and other fittings must be maintained and routinely inspected (when irrigating) for ruptures or leaks. (b) No wastewater irrigation occurs between the months 1 June to 31 August (inclusive). (c) Irrigation is not undertaken 12 hours before forecasted rain, during, or 24 hours immediately after a rainfall event of over 2 mm. (d) Irrigation must not exceed 20 mm per 24-hour period. (e) No irrigation-generated run-off occurs beyond the boundary of the irrigation area. (f) Irrigation area L2 is harvested twice a year, and the harvested material removed from the irrigation area. (g) No soil erosion occurs. (h) Wastewater is only irrigated onto healthy vegetation to maximise water and nutrient uptake 	Shown in Figure 1 as: L2

Emissions monitoring during irrigation area L2 operations

13. The licence holder must monitor wastewater in accordance with Condition 3, Table 3, during time limited operations.
14. The licence holder must comply with the discharge limits stated in Table 6 during time limited operations.

Table 6: Emission limit values for L2

Discharge area	Parameter	Limit value
Irrigation area L2	Sodium adsorption ratio: Electrical conductivity ratio (SAR:EC ratio)	Within the 'Stable soil structure' range depicted in Schedule 1 Figure 3
	Total nitrogen	<270 kg/ha/annual period
	Total phosphorus	<40 kg/ha/annual period
	Biological oxygen demand	<1,500 kg/ha/month
	pH	Between 6 - 9

15. The licence holder must monitor soil for concentrations of the identified parameters in accordance with the parameters set out in Table 7 and record the result of all such monitoring.

Table 7: Monitoring of ambient soil concentrations during time limited operations

Soil Sampling Location	Soil sample	Soil profile	Parameter	Units	Sampling frequency
Irrigation Area L2	Surface composite sample, comprising of 20 samples collected from across L2	0-10 cm	pH	-	Before any irrigation occurs, and then every three years in March.
			Electrical conductivity	dS/m	
			Total nitrogen	mg/L	
			Nitrate – Nitrogen		
			Total Phosphorus		
			Phosphorus (Colwell)		
			Exchangeable sodium percentage	%	
			Phosphorus sorption capacity	kg/ha	
			Saturated hydraulic conductivity	mm/hr	
	5 deep soil composite core samples, collected from across L2	Within each major soil horizon to 1 meter	pH	-	
			Electrical conductivity	dS/cm	
			Total nitrogen	mg/L	
			Nitrate – Nitrogen		
			Total Phosphorus		
			Phosphorus		

Soil Sampling Location	Soil sample	Soil profile	Parameter	Units	Sampling frequency
			(Colwell)		
			Exchangeable sodium percentage	%	
			Phosphorus sorption capacity	kg/ha	

Records and reporting

- 16.** 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:
- the name and contact details of the complainant, (if provided);
 - the time and date of the complaint;
 - the complete details of the complaint and any other concerns or other issues raised; and
 - the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.
- 17.** The licence holder must:
- undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
 - prepare and submit to the CEO by no later than the 31 July after the end of that annual period an Annual Audit Compliance Report in the approved form.
- 18.** The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:
- any maintenance of infrastructure that is performed in the course of complying with condition 1 of this licence;
 - monitoring programmes undertaken in accordance with conditions 3 and 15 of this licence; and
 - complaints received under condition 16 of this licence.
- 19.** The licence holder must, within 24 hours of becoming aware of an exceedance of the 10cm freeboard and/or any overflow of the 1ML holding pond, or any discharge of wastewater (leak or spills) from a wastewater tank, sump or pipe, notify the CEO in writing and include in that notification the following information:
- the time and date when the discharge occurred;
 - if any environmental impact occurred because of the discharge and if so, what that impact is and where the impact occurred, and
 - the details and result of any investigation undertaken into the cause of the discharge.
- 20.** The licence holder must submit to the CEO by no later than 31 July after the end of

each annual period, an Annual Environmental Report for that annual period for the conditions listed in Table 6, and which provides information in accordance with the corresponding requirement set out in Table 8:.

Table 8: Annual environmental report

Condition or table	Requirement
-	<p>The tonnage grapes processed each annual period.</p> <p>The volume of wine produced each annual period.</p>
Condition 1, Table 1	<p>Amount (tonnes) of sludge removed from the WWTP tanks</p> <p>The amount in tonnes/m³ of compost spread to land on the premises and the amount of non-composted organic material removed off-site</p>
Condition 2, Table 2	<p>Wastewater monitoring data in tabulated and graphical form that includes the sample date compared to the discharge limits. If limits have been exceeded an explanation of why and what actions will be taken to ensure limits are met in the future.</p> <p>Present monthly and annual tabulated loadings of nitrogen, phosphorus and BOD applied to the irrigation area (L1) using the Nutrient Loading Spreadsheet in Schedule 2.</p>
Condition 3, Table 3	<p>Monthly volume (m³ or kL) of wastewater applied to irrigation area (L1)</p> <p>Wastewater monitoring data in tabulated and graphical form including the sampling date.</p> <p>An assessment and interpretation of the data including comparison to historical trends and loading limits (minimum of 5 years).</p> <p>Copies of all laboratory sample analysis reports.</p> <p>Copies of the end of month meter photographs</p>
Condition 15, Table 7 (If required)	<p>Soil monitoring data in tabulated and graphical form including the sampling date.</p> <p>An assessment and interpretation of the data including comparison to historical trends (minimum of 5 years).</p> <p>Copies of all laboratory sample analysis reports.</p>
16	<p>A summary of complaints recorded for the annual period.</p>
	<p>Summary of any failure or malfunction of infrastructure equipment and any environmental incidents that have occurred during the annual period and any action taken.</p>

Definitions

In this licence, the terms in Table 9 have the meanings defined.

Table 9: Definitions

Term	Definition
ACN	Australian Company Number
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 July until 30 June of the immediately following year.
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
averaging period	means the time over which a limit is measured or a monitoring result is obtained
BOD	Biological 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 <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
dS/m	decisemens per metre
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)

Term	Definition
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
harvest	means the quantity of a natural product gathered in a single season
malfunction	means a piece of equipment or machinery which fails to function normally. This can include but is not limited to flow meters failing to record, over topping of tanks, blocked sprinklers or pipes bursting.
monthly period	means a one-month period commencing from first day of a month until the last day of the month.
mg/L	milligrams per litre
mgP/kg	milligrams Phosphorus per kilogram
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
premises	refers to 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.
prescribed premises	has the same meaning given to that term under the EP Act.
rainfall event	means greater than or equal to 2 mm of precipitation within a 24-hour period
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	means wastewater treatment plant

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises (orange) and the irrigation areas (yellow) are shown in the map below (Figure 1).



Figure 1: Map of the boundary of the prescribed premises and irrigation area

Site layout map

The site layout of the winery and WWTP of the prescribed premises is shown in the map below (Figure 2).



Figure 2: Map of the site layout of the winery and WWTP

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			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			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
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															
Explanatory notes and calculations:																	

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			

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. <i>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.</i>
NOTE 3 - Volume irrigated during the annual period (kL), for each irrigation area is the sum of the monthly volumes irrigated to that area. <i>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.</i>
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. <i>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.</i> 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-vintage, 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): $\frac{\text{monthly concentration of parameter (TN, TP or BOD) in mg/L} \times \text{monthly volume of wastewater irrigated to irrigation area (kL)}}{1000}$ $\frac{\text{monthly concentration of parameter (TN, TP or BOD) in mg/L} \times \text{monthly volume of wastewater irrigated to irrigation area (kL)}}{1000}$ size of irrigation area <i>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).</i> 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. <i>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)</i>
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. <i>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</i>
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.

Schedule 3: SAR:EC soil structure

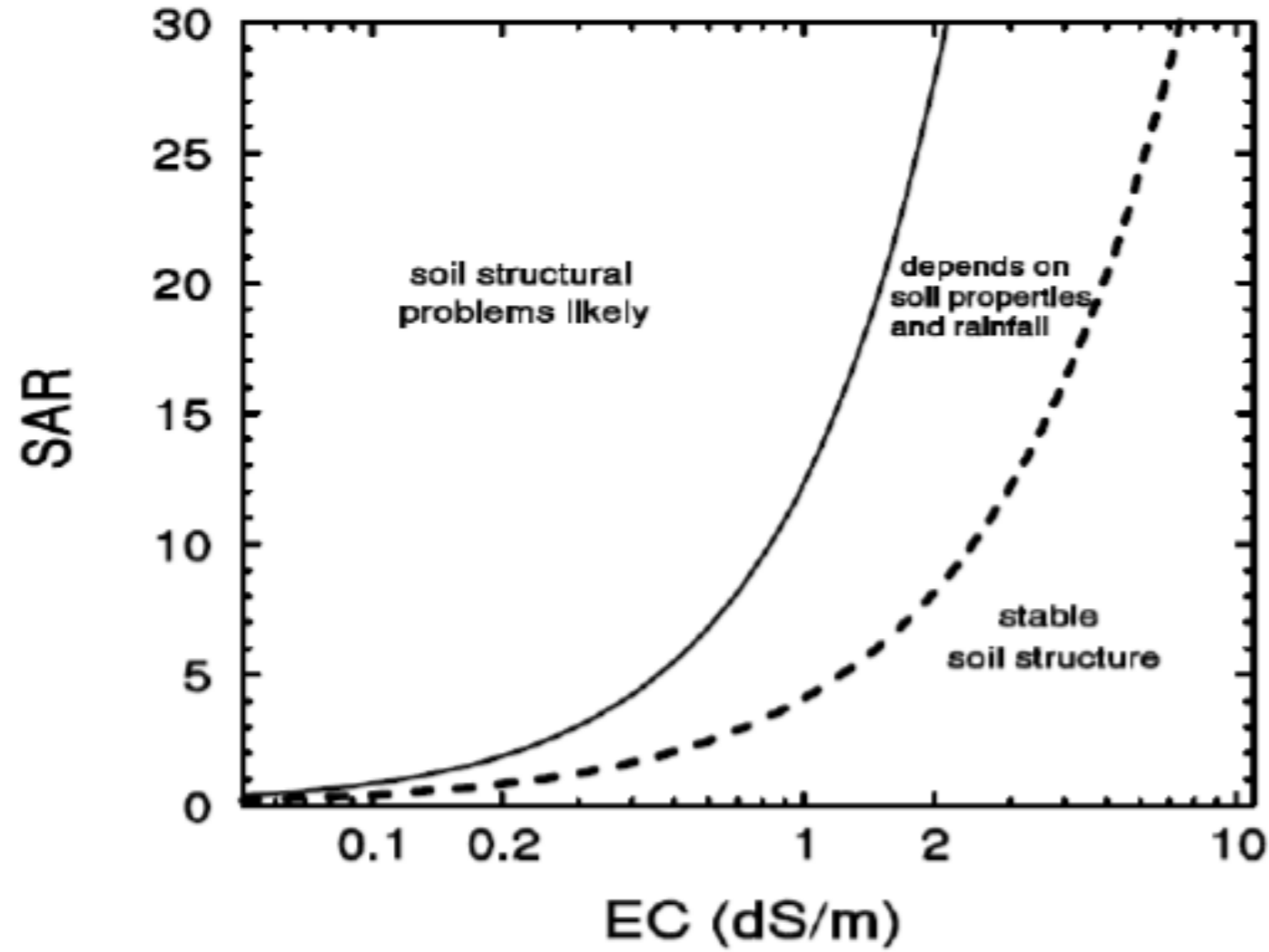


Figure 1. SAR:EC soil structure stability graph