Amendment Report

Application for Licence Amendment

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

Licence Number	L8904/2015/1
Licence Holder	Cleanaway Solid Waste Pty Ltd
ACN	120 175 63
File Number	DER2015/001648
Premises	Banksia Road Putrescible Landfill Banksia Road CROOKED BROOK WA 6236 Lot 2 on Deposited Plan 65861 Certificate of Title Volume 1670 Folio 568 As depicted in Schedule 1 of L8904/2015/1
Date of Report	27 February 2023
Decision	Revised licence granted

Steve Checker

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Steve Checker
MANAGER WASTE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Licence L8904/2015/1 is held by Cleanaway Solid Waste Pty Ltd (Licence Holder) for the Banksia Road Putrescible Landfill (the Premises), located at 2 Banksia Rd, Crooked Brook WA (Lot 2 on Deposited Plan 65861).

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the capping at the Premises. As a result of this assessment, Revised Licence L8904/2015/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 16 June 2022, the Licence Holder submitted an application to the department to amend Licence L8904/2015/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The application relates to capping of three portions of the landfill (Stage 1, 2 & 5) as depicted in Appendix 2, including installation of a leachate recirculation system. No changes to the operational aspects or throughputs of the existing Licence have been requested by the Licence Holder as part of this amendment.

2.3 Part IV of the EP Act

On 1 April 2021, Cleanaway referred a proposal to the EPA under Part IV of the EP Act for consideration. The proposal was for the continuation of existing landfill activities and the establishment of additional landfill cells within the existing premises boundary. The Proposal was limited in extent to the existing Premises boundary with no proposed increase to the existing approved throughput or removal of any remnant native vegetation. A public consultation period was undertaken between 12 and 18 July 2021 with 17 submissions received. On 5 August 2021, EPA made a determination to assess the proposal stating that the proposal has the potential to impact on:

- Inland Waters from stormwater runoff and leachate seepage into groundwater;
- Social Surroundings from interference with amenity values;
- Generation of Greenhouse Gas emissions from flaring; and
- Air Quality from dust and odour.

DWER understand that the EPA is reviewing additional information from Cleanaway required to undertake their assessment.

2.4 Exclusions from the scope

Due to the active assessment under Part IV of the EP Act for new portions of the landfill, this application relates only to Stages 1, 2 & 5 which are areas that have already reached their final height. This application does not assess capping for areas under assessment by the EPA, and future capping works will be subject to a separate assessment.

No vegetation clearing is required for this proposal.

3. Proposed Works

3.1 Capping Design

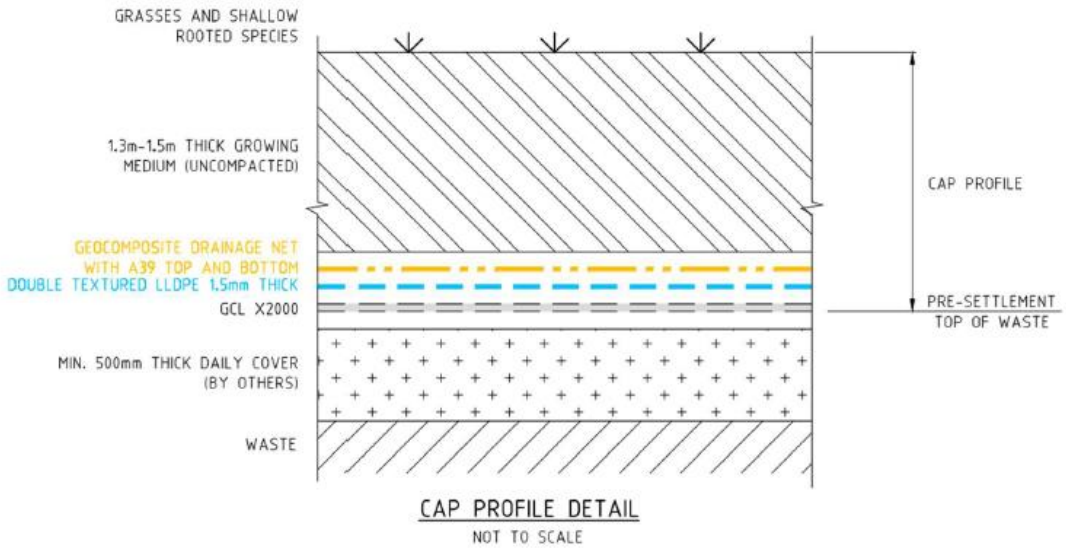
In the absence of any specific WA guidance on landfill capping design, the licence holder has proposed a capping system which consists of a composite liner. This design meets the requirements of a Class III landfill base liner in accordance with the Landfill Waste Classification Waste Definitions and is considered a highly effective liner configuration for landfill capping works.

In accordance with DWER's Regulatory Framework, applicants are not typically required to address guidance produced by other jurisdictions. In this instance, the applicant has referred to some sections of the *Best Practice Environmental Management Guidelines: Siting, design, operation and rehabilitation of landfills*, EPA Victoria, August 2015 (Vic BPEM) in informing the design, which DWER has accepted as suitable for this premises on this occasion. The Vic BPEM specifies that a capping layer should not exceed 75% of the design seepage rate of the liner in order to prevent pooling of water in the waste mass. As the cells to be capped are historic class I and II waste masses with a single liner the double liner capping configuration exceeds the Vic BPEM minimum requirements and is closer to 150% of the base seepage rate.

The specific capping design includes the following components as depicted in Figure 1:

- Minimum 500 mm cover material over waste
- Geosynthetic Clay Liner (GCL)
- 1.5mm double textured LLDPE liner
- Geocomposite Drainage Material with A34 geotextile heat bonded to the top and bottom surface
- 1.3 m to 1.5 m of uncompacted soil growing medium
- Rehabilitation with grasses and shallow rooted shrubs
- Stormwater control drains (contour, primary and stormwater control bunds)
- Access roads over the capped surface

The proposed capping will have no impacts on the ongoing landfill operations.



CAP PROFILE DETAIL
NOT TO SCALE

Figure 1: Synthetic Cap Profile

HELP modelling has determined that the designed leakage rate through the capping will be less than 0.001 mm/year, effectively preventing stormwater infiltration to the waste mass.

A final waste profile that consists of a maximum side slope of 1V:3.5H and a top slope of 1V:20H is being developed. Due to differential waste settlement the final slope is anticipated to be gradual and less uniform in the top of the waste design profile. In the unlikely event that areas of the final waste profile are steeper than 1V:3.5H these areas will be re-profiled to achieve the maximum slope. These slopes are supported by a stability assessment discussed in section 3.2

3.2 Stability assessment

The applicant has provided a stability assessment of the proposed capping system. The sloping side portions of the cap have the potential to fail if there is insufficient interface friction between the layers of synthetic materials. In assessing the stability of the capped side slope, shear box testing of the various interfaces between the soil and synthetic liner materials has been undertaken.

Project specific testing of the material has been undertaken for the stability assessment, however a different geocomposite was used. The report recommends that specific direct shear testing in accordance with ASTM D5341 is undertaken on each of the material interfaces used in the final cap to validate the parameters used for the stability assessment and re-evaluated using updated parameters. A condition will be placed on the licence to require this testing to be undertaken before construction commences.

A section of the proposed capping system has been modelled to represent a worst-case scenario 'longest and steepest slope' of the proposed system. Three scenarios were considered as part of the stability assessment, representing different conditions throughout the operational stages of the landform (static, pseudo-static and static conditions with an elevated phreatic surface). Target factors of safety were established from AS/NZS 1170.0:2002. The model results are shown in Figure 2.

Loading conditions	Interface		Target FOS	Achieved FOS
	Top	Bottom		
Static LE Analysis	Growing medium (clay)	Geo-composite	1.3	1.78
	Geo-composite	Textured LLDPE		1.78
	Textured LLDPE	GCL		1.78
	GCL internal			1.63
	GCL	Clay		1.78
Seismic LE analysis	Growing medium (clay)	Geo-composite	1.1	1.57
	Geo-composite	Textured LLDPE		1.18
	Textured LLDPE	GCL		1.57
	GCL	Clay		1.57
Worst case ground water conditions (flooded cap) FE analysis	Growing medium (clay)	Geo-composite	1.3	1.78
	Geo-composite	Textured LLDPE		1.78
	Geo-composite	Textured LLDPE		1.78

Figure 2: Modelled Factors of Safety

The results demonstrate that the minimum factors of safety are able to be met for the worst-case slope, 255m long at an angle of 1V:3.5H. If the slope profile is steepened beyond 1V:35H or lengthens beyond 255m or the proposed lining system is altered, the stability analysis must be reassessed. These parameters will be conditioned in the licence, and any

changes will require a licence amendment and re-assessment including reviewing an updated stability analysis.

3.3 Leachate reticulation design

Leachate is currently used for dust suppression on the landfill roads within the lined landfill area and the landfill active face surface. The licence holder proposes to construct several leachate reticulation systems to support the management of leachate volumes at the Premises.

The licence holder is proposing to construct up to 4 systems, distributed within the lined footprint of existing cells 1, 2, 3, 4, 4B, 5 & 12. These cells contain older and drier waste and are therefore expected to benefit the most from accelerated waste decomposition from leachate addition. If the licence holder intents to construct additional systems over newer cells 6, 7 and 8 as well as any future cells this will be subject to a separate application and assessment.

Each system consists of a 22,500 litre storage tank feeding into approximately 5 to 6 ‘spider legs’ consisting of 63mm to 90mm HDPE piping up to 24 meters long, with 8-10mm holes drilled. The spider legs will be placed in aggregate or brick rubble (or similar) in approximately 1 meter of waste at a 2 degree slope or greater. Figure 3 depicts the design detail for each system.

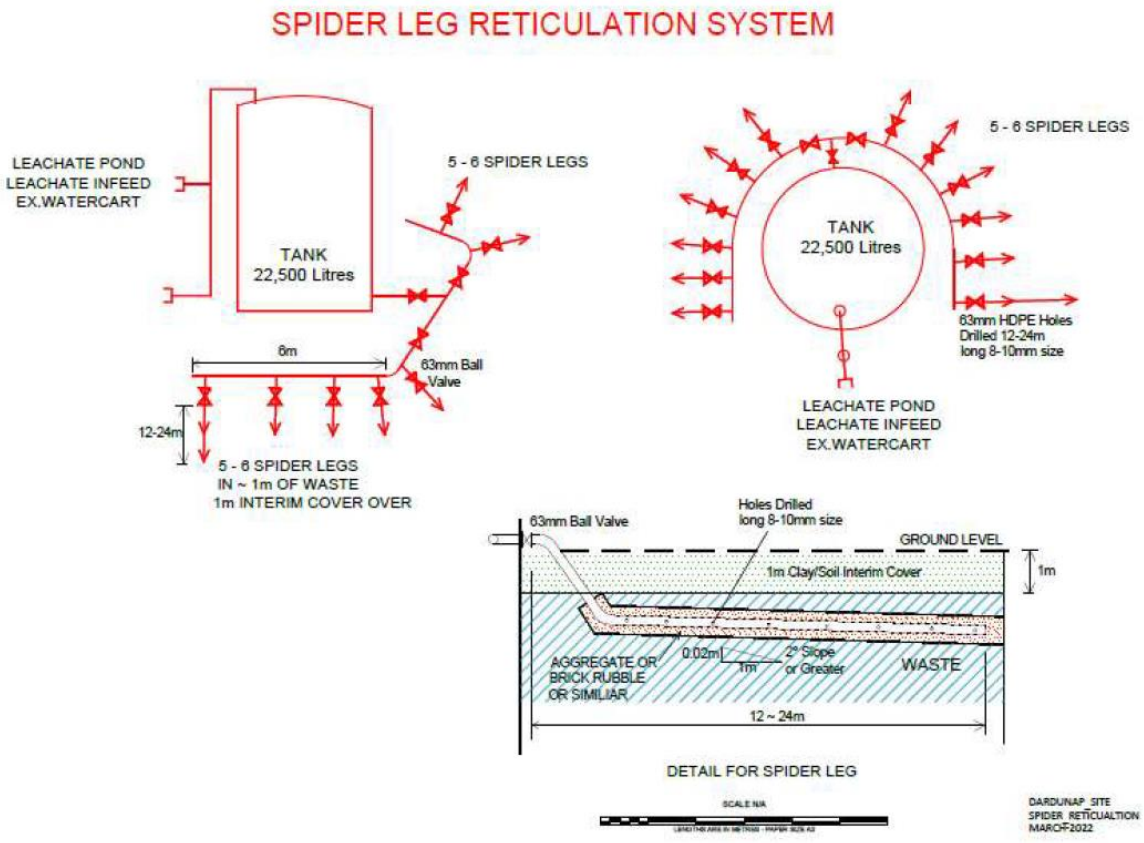


Figure 3: Leachate reticulation design

Leachate will be transported from the existing leachate ponds in a water cart to the tanks though a camlock connection. It is anticipated that each system will recirculate approximately 30-50 m^3 per week (approximately 1.5-2.5 water carts per week).

3.4 Timeframe

The estimated capping construction timeframes are as follows, subject to achievement of final waste profiles and winter non-construction periods:

- Stage 1 – Summer 2023/2024
- Stage 2 – Summer 2024/2025
- Stage 5 – Summer 2028/2029

The installation of the leachate reticulation system will be staged, with one stage to be installed initially and future stages installed in future months.

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 Amendment Report are detailed in

Table 1 below.

Table 1 also details the proposed control measures the Licence Holder has proposed to assist in controlling these emissions, where necessary.

Table 1: Licence Holder controls

Emission	Sources	Potential pathways	Proposed controls
Noise	Vehicle movements, earthworks and placement of infrastructure and equipment	Air/windborne pathway causing impacts to health and amenity	Noise modelling and assessment of noise emissions from construction activities at the current facility have demonstrated that noise emissions from the facility will comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times. The capping activities will be carried out in the same area with less machinery and so they are similarly expected to comply with the *Environmental Protection (Noise) Regulations 1997* at all times. No further controls are proposed.
Dust	Vehicle movements, earthworks and placement of infrastructure and equipment Exposed final capping profile	Air/windborne pathway causing impacts to health and amenity	All construction activities will be carried out in order to minimise dust generation Roads will be wetted down to limit dust generation In the event that dust is unable to be adequately controlled, dust generating activities will cease until adequate dust management can occur or ambient weather conditions improve. Vehicles will be kept to designated roads as far as practicable
Leachate	Decomposition of wastes in the capped landfill cell Infiltration of surface water through the landfill cap into the waste mass	Seepage to land impacting groundwater quality	Leachate management system as per current licence conditions, consisting of an engineered liner, leachate sump, leachate extraction system, four synthetically lined leachate ponds. The proposed landfill capping design incorporates a thick growing medium on top of a synthetic lining system to ensure there is minimal moisture ingress to the waste mass below. Stormwater is directed away from the landfill area through a series of culverts, swales and drains, sedimentation basins and stormwater ponds.
Landfill gas	Decomposition of wastes in the capped landfill cell	Air/windborne pathway causing impacts to health and amenity	The proposed synthetic cap lining system will prevent fugitive emissions of landfill gas and will enable gas to be captured and extracted in accordance with the premises landfill gas management plan. The depth of the soil growing medium on top of the synthetic cap provides an ability to oxidise landfill gas that may escape. A landfill gas extraction system was installed under works approval W5301/2012/1, and the current licence contains landfill gas monitoring requirements which will be maintained following capping completion.
Potentially	Vehicle movements,	Overland flow	An engineered stormwater collection and

Emission	Sources	Potential pathways	Proposed controls
contaminated stormwater Sediment laden stormwater	earthworks and placement of infrastructure and equipment Exposed final capping profile	due to overtopping of stormwater storage dams or the failure of stormwater conveyance infrastructure Stormwater overflow causing erosion and deposition of sediment Infiltration through soil profile to groundwater Movement through groundwater	management system including perimeter drains to intercept flows and prevent stormwater leaving the premises. Stormwater ponds for the retention of stormwater generated at the premises Sedimentation basins to promote settlement of suspended solids Monitoring of groundwater to validate stormwater management infrastructure is working effectively.

4.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Licence Holder's from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 2 below 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 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential Premises	• 0.54 km south of the southwest corner of the Premises, separated by the Dardanup Conservation Park. • 0.92 km due west of the Premises. • 1 km west southwest of the southwest corner of the Premises • 1.2 km southwest of the southwest corner of the Premises • 1.5 km due south of the Premises, separated by the Dardanup Conservation Park and Boyanup State Forest • 1.5 km northwest of the northwest corner of the Premises. • 1.5 km northeast of the northeast corner of the Premises separated by the Dardanup Conservation Park and Boyanup State Forest. • 1.75 km east northeast from the eastern boundary of the Premises separated by the Dardanup Conservation Park and Boyanup State Forest.
Environmental receptors	**Distance from prescribed activity**
Dardanup Conservation Park	Adjacent to southern and eastern boundaries of the Premises

Boyanup State Forest	Approximately 0.7km south of the Premises and 1km east
Priority Ecological Community (PEC) – Dardanup Jarrah and Mountain Marri woodland on laterite (P1)	Three occurrences of this PEC occur within the Dardanup Conservation Park. The closest occurrence is mapped within 15 metres of the Premises eastern boundary.
Priority Ecological Community/Threatened Ecological Community (TEC) – Banksia Dominated Woodlands of the Swan Coastal Plain	An occurrence of this PEC/TEC is mapped adjacent to the southern boundary of the Premises and also to the west of the Premises on the opposite site of Banksia Road.

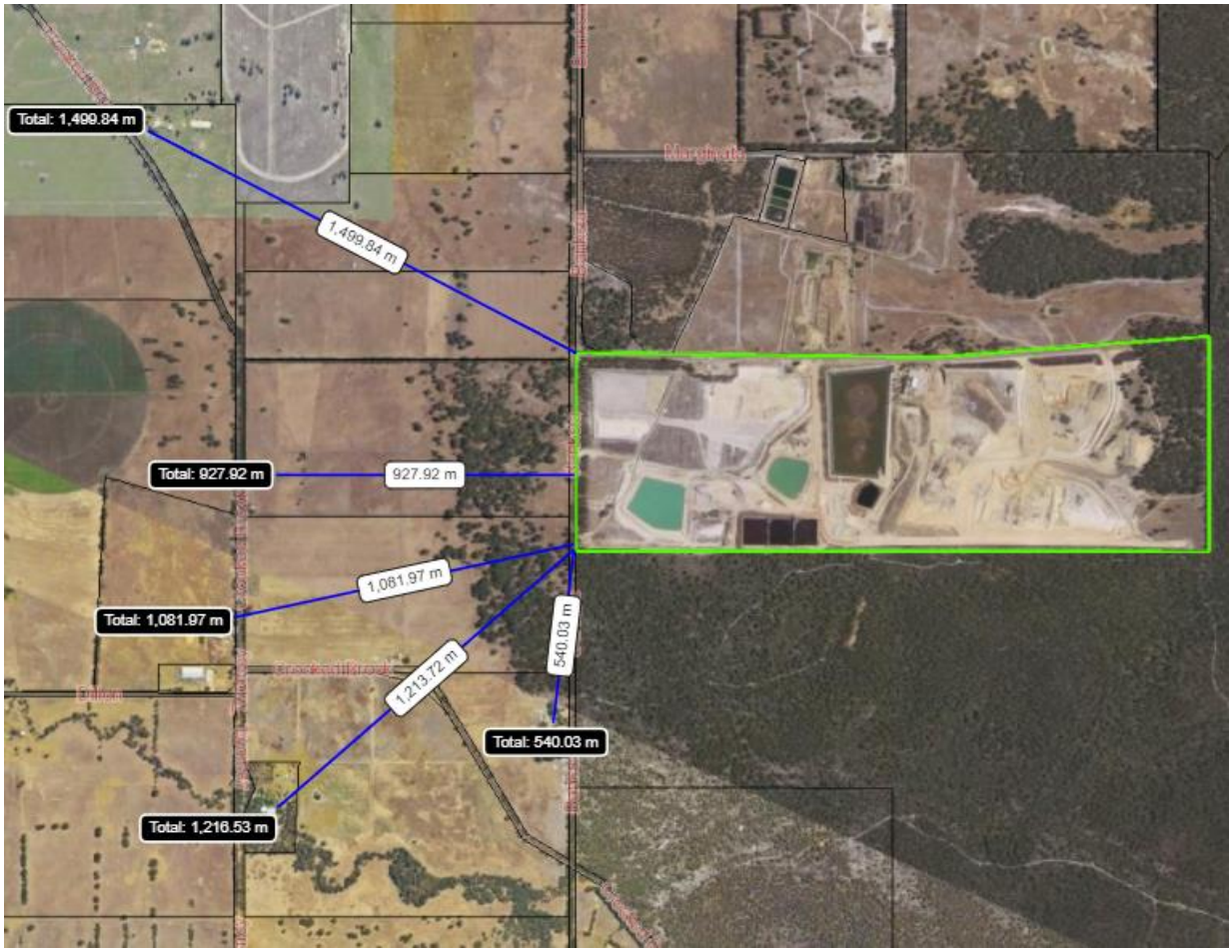


Figure 1: Distance to closest residential receptors

4.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and takes into account potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are incomplete they have not been considered further in the risk assessment.

Where the Licence Holder 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 Licence Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the Licence Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

The Revised Licence L8904/2015/1 that accompanies this Amendment Report authorises emissions associated with the operation of the Premises.

The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 3. Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
Construction								
Vehicle movements, earthworks and placement of infrastructure and equipment	Dust	Air/windborne pathway causing impacts to health and amenity	Human and Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Major* *L = Unlikely* ***Medium Risk***	*Y*	Existing conditions 19, 22 to 28.	*N/A*
	Noise			Refer to Table 3	*C = Moderate* *L = Possible* ***Medium Risk***	*Y*	Existing condition 31	*N/A*
	Contaminated stormwater/sediment laden stormwater	Overland flow	Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Major* *L = Possible* ***High Risk***	*Y*	Existing conditions 16, 35 and 36	*N/A*
Operation								
Exposed final capping profile	Dust	Air/windborne pathway causing impacts to health and amenity	Human and Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Major* *L = Unlikely* ***Medium Risk***	*Y*	Existing conditions 19, 22 to 28. **New condition 69**	*N/A – the proposed cell capping will ultimately reduce dust generation and associated risk over time.*
	Contaminated stormwater/sediment laden stormwater	Overland flow	Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Major* *L = Possible* ***High Risk***	*Y*	Existing conditions 16, 35 and 36 **New condition 69**	*N/A – the proposed cell capping will ultimately reduce potential for contaminated stormwater emissions and associated risk*

Risk Event					Risk rating[1] C = consequence L = likelihood	Licence Holder's controls sufficient?	Conditions[2] of licence	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Licence Holder's controls**				
								over time.
Decomposition of wastes in the capped landfill cell Infiltration of surface water through the landfill cap into the waste mass	Leachate	Seepage to land impacting groundwater quality	Underlying Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Moderate* *L = Possible* ***Medium Risk***	*Y*	Existing conditions 10, 12, 13. **New condition 69**	*N/A – the proposed cell capping will ultimately reduce leachate generation and associated risk over time.*
Decomposition of wastes in the capped landfill cell Infiltration of surface water through the landfill cap into the waste mass	Landfill gas	Air/windborne pathway causing impacts to health and amenity	Human and Environmental receptors – Refer to Table 4	Refer to Table 3	*C = Slight* *L = Unlikely* ***Low Risk***	*Y*	Existing conditions 14 and 15	*N/A*

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

Note 2: Proposed Licence Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

5. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website (7/11/2022)	Refer to Appendix 1	
Local Government Authority advised of proposal (9/11/2022)	The Shire advised they have no comment, aside from noting that the tanks associated with the leachate reticulation may require development approval from the Shire.	Noted. Nothing in the amended licence removes the requirement to obtain other relevant approvals.
Application referred to Department of Biodiversity, Conservation and Attractions (9/11/2022)	No comments received.	Noted.
Application referred to all stakeholders on DWER's register of stakeholders for this premises (9/11/2022)	Refer to Appendix 1	
Works Approval/Licence Holder was provided with draft amendment on (15/02/2023)	No comments, updated as built gas infrastructure plan provided.	Noted. Plan 3 updated with provided as built diagram. Previous Plan 4 removed as all items are now included in Plan 3. Previous Plans 5 to 7 renamed 4 to 6 and relevant conditions amended.

6. Conclusion

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

6.1 Summary of amendments

Table 5 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Licence as part of the amendment process.

Due to the ongoing appeal, amendments to the licence have been limited to only those necessary to implement the proposal. Therefore, conditions requiring an action by a due date will remain on the licence as-is. Compliance with these conditions will be assessed separately and may be amended in subsequent amendments or renewal of the licence.

Table 5: Summary of licence amendments

Condition no.	Proposed amendments
65	A requirement has been added to report on any alterations to cell rehabilitation sequencing and timing within the annual environmental report
68	A notification requirement has been added to notify the CEO no later than 60 days after the final landform of each stage has been achieved.
69	Condition 69 has been added to specify the design and construction/installation requirements of the capping stages 1, 2 and 5 and the leachate reticulation system.
70	Condition 70 has been added to require an audit against the requirements of condition 69 and preparation and submission of an environmental compliance report.
71	Condition 71 has been added to specify the minimum requirements of the environmental compliance report.
Plan numbering and conditions referencing plans	Plan 3 updated with provided as built diagram. Previous Plan 4 removed as all items are now included in Plan 3. Previous Plans 5 to 7 renamed 4 to 6 and relevant conditions amended.
Plan 6	Plan 6 has been added to demonstrate the rehabilitation stages.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

Appendix 1: Summary of Stakeholder comments

Summary of Stakeholder's comment	Department's response
The application documentation is overwhelming, confusing, and highly technical in nature. Questions regarding the relevance of some information provided, including why landfill base construction works are included when that is not part of the application.	DWER acknowledges that there is a large amount of documentation including reports of a technical nature, however this is not unusual applications relating to large landfills. During the advertising period DWER provided advice to several stakeholders to assist in interpreting the application documents. DWER publishes all application documents as provided by an applicant for each application. There may be information provided with an application that is superfluous to the needs of DWER to carry out its risk assessment. Additionally, information may be lacking which DWER seeks out during the assessment process. Please note that DWER public comment period commences once the application is validated and before DWER has commenced any assessment on the information. The public comments are used to inform DWER's assessment process and this is why no summary or assessment is included during the public comment period. Once the assessment is completed the full decision and assessment is published. This application does not request any changes to other activities occurring at the facility.
Query regarding whether a risk assessment has been carried out on the Capping and Rehabilitation Plan, as the stakeholder does not recall having ever seen a risk assessment on any aspects of the Banksia Road operations. Request for risk assessment to be carried out on this application.	DWER has undertaken multiple risk assessments of the Banksia Road operations, with these assessments published on the DWER website available here https://www.der.wa.gov.au/component/k2/itemlist/filter?fitem_all=8904&moduleId=94&Itemid=175 The Department's risk assessment framework was developed in accordance with the following Australian/New Zealand Standards: • • AS/NZS ISO 31000:2009 Risk management – principles and guidelines • • AS/NZS 4360:2004 Risk management • • HB 203:2012 Managing environment-related risk.

Summary of Stakeholder's comment	Department's response
	The most recent risk assessment for the premises is captured in the Licence Review amendment report. This report identify possible risks and assess the likelihood and consequence in line with DWER's regulatory framework within the scope of DWER's legislative remit. This application has carried out a risk assessment of the Capping and Rehabilitation Plan as it relates to the licence amendment to authorise capping of the stages 1, 2 and 5. The assessment has considered all of the stakeholder requests and concerns as outlined in this table. As future cells are ready for capping and closure the applicant will need to apply for a licence amendment, at which time the individual stages will be risk assessed. DWER has reviewed the Closure and Rehabilitation Plan to ensure it is compliant with the requirements of the licence conditions.
Request for an independent third party to review the Rehabilitation and Closure Plan documentation as it is of a low quality/not comprehensive enough.	DWER has assessed this application in line with DWER's Regulatory Framework, including undertaking a risk assessment which has determined the suitability of the proposal and amended the licence to include appropriate conditions commensurate to the risk. As noted above, DWER acknowledges the provided documentation may be lengthy and technical however it considers that all relevant detail to inform the risk assessment has been provided. For the purposes of this capping application the relevant information has been provided and the entire capping and closure plan is not required to be finalised for DWER to risk assess the proposal.
Query regarding whether this application is for interim capping or final capping	This application relates to the final capping of the landfill stages 1, 2 and 5.
Concerns regarding the suitability of the proposed synthetic liner	As discussed in this decision report, the double liner configuration is considered one of the best available configurations for landfill capping and exceeds the requirements of relevant guidance. The modelled seepage rate is practically zero (0.001 mm/year). DWER has assessed the suitability of the proposed capping structure throughout this decision report and has specifically assessed the risk of Infiltration of surface water through the landfill cap into the waste mass within Table 5. The risk of leachate infiltration has been assessed as

Summary of Stakeholder's comment	Department's response
	medium risk, with the proposed capping as proposed considered appropriate. Installation of the capping will work to reduce infiltration and therefore further reduce the leachate risk. In regard to the final cell slope, a stability assessment has determined that the proposal meets the relevant factors of safety, and this maximum slope is conditioned in the licence.
Concerns regarding the selection of vegetation, and whether the plant species selected will damage the liner. Specific reference is made to Acacia species.	For the purposes of DWER's risk assessment the permeability of the synthetic layers is the most relevant factor, with the final determination of the vegetation species not influencing the performance of these layers, aside from ensuring their root structures do not penetrate these layers. The vegetation to be planted has been selected to be shallow rooted. Specifically, the Acacia species identified are the *Acacia flagelliformis* and *Acacia lasiocarpa* which are prostrate small shrubs. The licence conditions specify that rehabilitation is to be done with grasses and shallow rooted shrubs.
Concerns regarding the erosion risk as this was shown to be an issue in the phytocap trial.	The premises has stormwater management infrastructure in place which is conditioned on the current licence. The capping layer will contain stormwater drains as the primary mechanism for controlling erosion. Vegetation establishment on the capping layer is a secondary measure. Water tanks and a reticulation system will be used for the first few years to ensure the seed and tube stock vegetation can establish. As part of maintenance of the capped surface, any erosion gullies will be immediately repaired. Additionally, there will be infill planting in areas of the capped surface where there is minimal vegetation establishment.
Query regarding the final height of the cells, and compliance with heights set by the Shire of Dardanup. Query regarding proposed throughput changes mentioned in the application documentation.	This proposal does not request any changes to the height of the landfill, and the amendment does not authorise any increase to the landfill height. Additionally, the proposal does not request or authorise any changes to throughput. References to different heights or throughputs within the application documentation are due to the large number of documents provided, some of which may reference unapproved heights or throughputs as part of the applicant's proposed future plans. None of these references are considered as part of this amendment.
Concerns regarding the visual impacts of	The seismic safety and drainage of the final landforms are considerations for DWER's risk assessment, while the visual amenity of the height is not a consideration within the legislative

Summary of Stakeholder's comment	Department's response
the landfill	remit of Part V of the EP Act. The Shire of Dardanup's planning approval and the current referral for new cells to the EPA takes into consideration visual amenity. DWER would seek to ensure that the licence conditions are congruent with the planning approval conditions, including consideration of any height limitations which are limited by planning or other approvals due to visual amenity concerns.
Questions regarding what this application means for the Category 5 tailings cell capping.	The capping of the tailings cells or any aspect of the management of the tailings at the facility is not part of this licence amendment application and has not been considered. While the application documentation contained reference to the tailings cell this was superfluous information and no infrastructure related to the tailings cell has been reviewed or endorsed as part of this application. Any future changes to the tailings cell will be subject to a separate licence amendment.
Concerns about radioactive material in the leachate	This application relates only to the capping of landfill cells which do not contain any radioactive materials.
Questions relating to the Application of the BPEM guidelines or relevant criteria, in particular in relation to the siting of the landfill.	This licence amendment is only in relation to the capping of a number of cells and does not assess the siting of the premises. WA has no specific landfill guidelines that must be met and allows an applicant to use guidance from other jurisdictions as relevant to the facility. The Victoria BPEM is one of many guidance documents that is typically considered to be relevant for a number of design aspects. The Vic BPEM was developed for a different environmental region and legislative system and is therefore not always entirely relevant to WA. DWER assesses each proposal on a case-by-case basis. DWER does not require any applicant to demonstrate they meet all requirements of the VIC BPEM.
Question regarding whether a performance review of closed landfills has been undertaken and used in the planning and design.	DWER's regulatory framework outlines how applications are assessed through a risk framework. Information gathered from other similar activities may provide context for the application and assessment however it is not a requirement for DWER to be able to undertake an assessment. Each landfill is assessed on a case-by-case basis taking into account unique siting and design aspects.
The licence holders' representations	This information is provided as reference to provide context to the application. DWER undertakes its own stakeholder consultation on each application, and also maintains its own database of

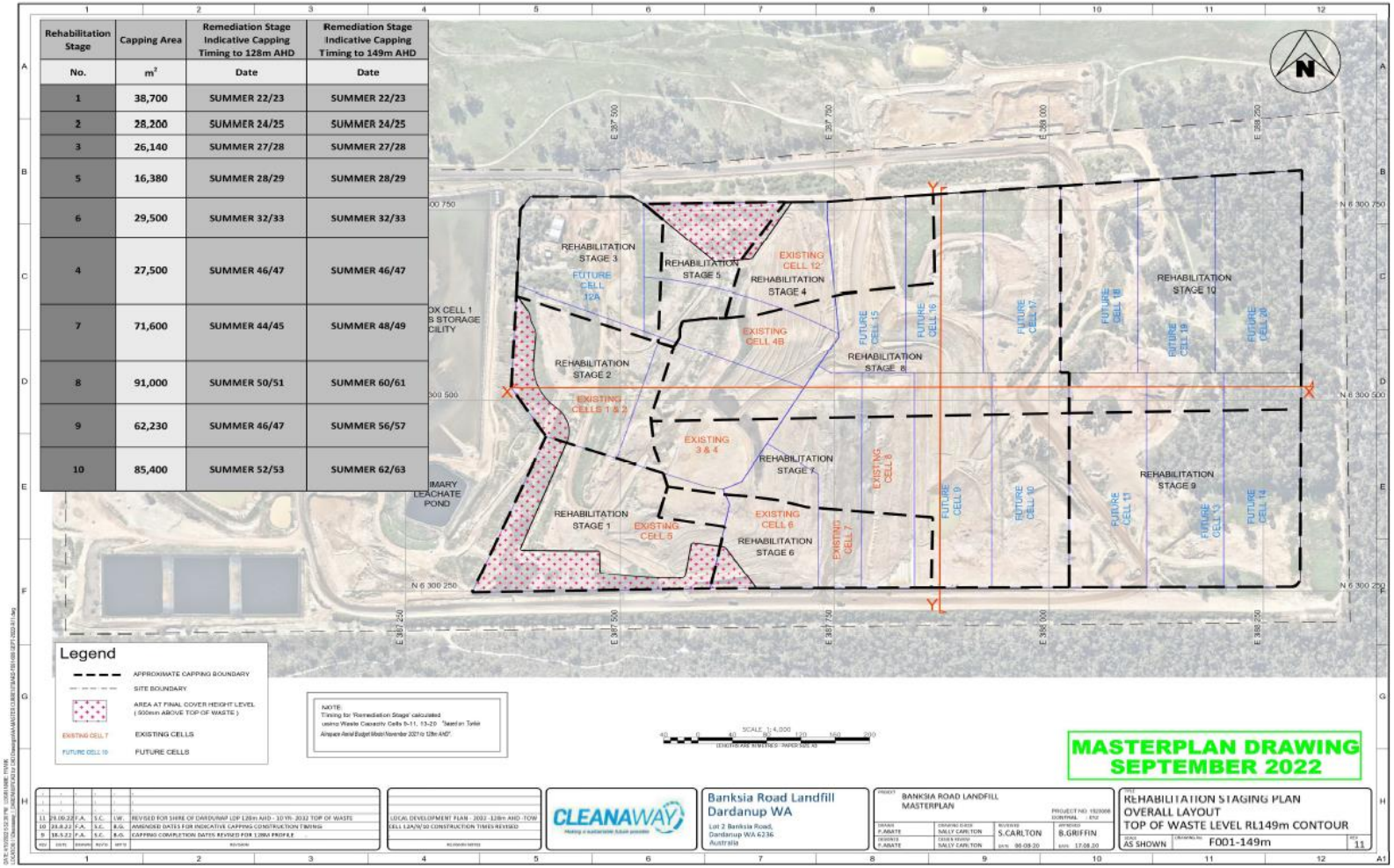
Summary of Stakeholder's comment	Department's response
about stakeholder consultation are misleading, and the complaints register is incorrect.	complaints against premises. Stakeholders are encouraged to report any emissions or incidents to the Pollution Watch Hotline https://www.der.wa.gov.au/your-environment/reporting-pollution
Questions related to the longevity or effective life of the capping and leachate systems, and who is responsible for ongoing maintenance and monitoring? Questions related to who holds responsibility for remediation if the capping fails?	While landfilling is occurring at the premises the premises will be required to be licenced under the *Environmental Protection Act 1986*. The premise licence will contain monitoring and maintenance conditions and a requirement to operate and maintain infrastructure which includes repairs/remediation in the event any infrastructure fails. In practice, many historic landfill facilities become transfer stations following closure, and so they remain regulated under the EP Act. The licence may contain monitoring and management measures in relation to the historic cells as needed in addition to conditioning for new activities. It has not been determined what the final land use will be. In the event that a premises is no longer a prescribed activity and does not require a licence, a closure notice is able to be issued in accordance with 68A(2). A closure notice can require actions such as ongoing monitoring and maintenance. The cap has been designed to last practically permanently and is expected to be self-sustaining with the vegetation naturally seeding and propagating. The leachate system is designed to manage leachate for the duration that the cell generates leachate. It is expected that a putrescible landfill may generate leachate for up to 30 years post closure which will be monitored, and should the landfill continue to generate leachate for longer than expected this will continue to be managed under notice with the critical leachate management system/infrastructure having an expected lifespan of greater than 100 years. Some of the above ground components have lifespans of 5 to 20 years however these are easily replaced and maintained to facilitate the ongoing management of leachate over the period during which leachate generation occurs.
Questions related to how the leakage (infiltration) rate changes over time, concerns the application did not include a seepage rate and query regarding whether a target will be set for leachate	The proposed synthetic lining system of a GCL/LLDPE/Geocomposite drainage layer or sand drainage layer is an accepted landfill capping system for limiting the possible infiltration rate through the cap liner to less than 75% the landfill base liner (GCL/HDPE lining system). This infiltration rate is not expected to reduce over time.

Summary of Stakeholder's comment	Department's response
generation.	The seepage rate has been modelled as effectively zero seepage for the life of the capping layer. This was included within the application documentation. There is no target set for leachate generation as the expected outcome of the capping is to reduce the leachate generated in the waste mass to effectively zero over time. Leachate management is a condition of the licence, and the installation of a leachate reticulation system further ensures that leachate will not overflow as it is being redirected into the landfill cell.
Query regarding how the seepage rate of the capping has been set due to the variety of liners, and whether the proposed seepage rate is appropriate.	The proposed design for the capping liner is consistent across the proposal and is considered one of the highest standards available for landfill liner configuration. The capping infiltration rate has been designed to be at least 75% of that of the base liner, but in many areas of the landfill it will exceed this due to the variety of the basal liners, effectively achieving 150% of the liner in some instances.
Request for a design criterion for all key design factors	The relevant design criterion and design factors commensurate to the risk assessment has been set by DWER and is included in the licence conditions.
Will the premises be referred to the Contaminated Sites Register?	As previously outlined in the decision report for the licence review 'The Premises was reported to the department under Section 11 of the Contaminated Sites Act 2003 (CS Act), which commenced on 1 December 2006. The Premises was reported under the CS Act due to landfilling activities undertaken at the premises since 1999. This activity has the potential to cause contamination as specified in the guideline 'Potentially Contaminating Activities, Industries and Landuses (Department of Environment, 2004 & DER 2014). The site is located in area of moderate to low risk of acid sulfate soils which may have been disturbed by construction of the landfill and previous extractive industry activity prior to 1999. Land at Lot 2 on Diagram 65861, as shown on certificate of title 1670/568, was classified under Section 13 of the CS Act as possibly contaminated - investigation required on 28 May 2014 and a memorial (M675551) was placed on the certificate of title. The classification was based on groundwater monitoring results submitted to the former Department of Environment and Conservation (DEC) by May 2014. The investigations found at that time that the pH of groundwater and copper concentrations were outside the accepted range or exceeding assessment levels for fresh waters, drinking water and long-term irrigation as published in the guideline 'Assessment Levels for Soil, Sediment and Water' (DEC, 2010 & Department of Environment Regulation [DER], 2014). Hydrocarbons were also found to be present in groundwater at concentrations below the relevant screening criteria.

Summary of Stakeholder's comment	Department's response
	As a requirement of the Licence, groundwater monitoring is conducted at the premises. The groundwater results are being monitored by the department against the current, relevant environmental and health guidelines.'
Concerns regarding truck movement and truck noise	Truck movements outside of the premises are not a consideration for DWER's licensing risk assessment and are managed by the Shire of Dardanup. Noise from truck movements on site during construction has been assessed as part of this decision report. Once the capping is completed there is no truck movement associated with the closed cells.
Odour concerns from general activities at the premises.	The activity of capping cells is not odorous, and it is expected that once cells are capped this may reduce odour risk, therefore odour risk for capping is not considered to be a potential emission from this activity. General odour concerns from the facility are not part of the scope of this application.
Leachate management concerns (general)	This application is only assessing leachate management in relation to the capping of a number of cells and has not re-assessed leachate management for the entire site. The risk assessment undertaken for this application as shown in table 5 indicates that the activity is acceptable with the appropriate controls in place.
Concerns regarding the time frame not being specified.	Timeframes have been outlined in the application documentation and are included in the licence amendment.
Concerns regarding movement of waste from cell to cell	No movement of waste is proposed in this application. The application document makes mention of a potential future sand extraction activity that is not part of this application.
Cleanaway's ability to comply with licence requirements.	DWER undertakes a risk assessment based on consequence and likelihood. An applicant's ability to comply with licence requirements may be considered in informing the likelihood of a risk event occurring. The risk assessment undertaken for this application as shown in table 5 indicates that the activity is acceptable with the appropriate controls in place.
Concerns regarding significant subsidence	Putrescible landfills are expected to have approximately 20% settlement, 15% of which will occur within the first 5 years after waste placement and the remaining 5% continuing at a slow rate thereafter. Therefore, the majority of subsidence will have occurred by the time the cells are capped as they have already been active for many years.

Summary of Stakeholder's comment	Department's response
	Subsidence has been considered in the stability and design of the capping. Settlement is relatively uniform, as waste has been placed and compacted in thin layers which creates a uniform waste mass further reducing the likelihood of significant subsidence. The capping liner incorporates high flexibility and elongation (stretch) characteristics to accommodate differential settlement after the cap has been constructed should this occur.
Concerns regarding proposed post-closure use	The specific post-closure use of the premises is outside the scope of the licence amendment.
Concerns over the risk of contamination of monitoring bores	The current risk of leachate emissions to groundwater has been assessed in table 5 as Medium Risk, and it is noted that the proposed capping cell will reduce leachate generation and risk over time.

Appendix 2: Rehabilitation Staging Plan



Appendix 3: Application validation summary

SECTION 1: APPLICATION SUMMARY					
Application type					
Works approval	☐				
Licence	☐	Relevant works approval number:		None	☐
		Has the works approval been complied with?		Yes ☐ No ☐	
		Has time limited operations under the works approval demonstrated acceptable operations?		Yes ☐ No ☐ N/A ☐	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?		Yes ☐ No ☐	
		Date Report received:			
Renewal	☐	Current licence number:			
Amendment to works approval	☐	Current works approval number:			
Amendment to licence	☒	Current licence number:	L8904/2015/1		
		Relevant works approval number:		N/A	☐
Registration	☐	Current works approval number:		None	☐
Date application received					
Applicant and Premises details					
Applicant name/s (full legal name/s)		Cleanaway Solid Waste Pty Ltd			
Premises name		Banksia Road Putrescible Landfill			
Premises location		Lot 2 on Deposited Plan 65861 Banksia Road CROOKED BROOK WA 6236			
Local Government Authority		Shire of Dardanup			
Application documents					
HPCM file reference number:		DER2015/001648-1			
Key application documents (additional to application form):		*Application Form for Capping and Leachate Retic. Rev 2 Banksia Road Landfill Stage 1, 2 & 5 Capping Leachate Reticulation System – Inc Appendix 1-3*			
Scope of application/assessment					

Summary of proposed activities or changes to existing operations.	This proposal is for the capping of Stage 1, 2 & 5, which together form the western portion of the landfill.

Category number/s (activities that cause the premises to become prescribed premises)

As defined in licence L8904/2015/1.

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes ☐ No ☒	The Construction and Operation of Landfill Cells 9, 10, 12A have been referred to EPA. The capping of these cells does not form part of this referral.
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes ☐ No ☒	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes ☐ No ☒	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes ☒ No ☐	Certificate of title ☐ General lease ☒ Expiry: Mining lease / tenement ☐ Expiry: Other evidence ☐ Expiry:
Has the applicant obtained all relevant planning approvals?	Yes ☒ No ☐ N/A ☐	Approval: Expiry date: If N/A explain why?
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes ☐ No ☒	CPS No: N/A
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes ☐ No ☒	No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes ☐ No ☒	Licence / permit not required.

Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ☐ No ☒	N/A
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes ☐ No ☒	N/A
Is the Premises subject to any other Acts or subsidiary regulations (e.g. *Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx*)	Yes ☒ No ☐	*Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004*
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ☐ No ☒	
Is the Premises subject to any EPP requirements?	Yes ☐ No ☒	
Is the Premises a known or suspected contaminated site under the *Contaminated Sites Act 2003*?	Yes ☒ No ☐	possibly contaminated - investigation required on 28 May 2014 and a memorial (M675551) was placed on the certificate of title