Government of Western Australia
Department of Water and Environmental Regulation

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	120 175 635
File Number	DER2023/000550~2
Premises	Banksia Road Putrescible Landfill Banksia Road CROOKED BROOK WA 6236 Legal description – Part of Lot 2 on Deposited Plan 65861 As defined by the coordinates in Schedule 2 As defined by the coordinates in Schedule 1 of the revised licence
Date of Report	27/03/2025
Decision	Revised licence granted

Grace Heydon

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MANAGER WASTE INDUSTRIES
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 on Banksia Road, Crooked Brook.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during required capping works and the ongoing management of the closed Tronox 1 cell (TDS Cell 1). As a result of this assessment, revised llicence 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 29 October 2024, the licence holder applied to the department to amend works approval W6855/2023/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought:

- Inclusion of capping activities for Tronox 1 cell into approved construction and installation requirements.

Tronox Cell 1 is the contemporary name for the titanium dioxide slurry disposal cell labelled as the TDS Cell 1 and MIC Titanium Dioxide Slurry in previous iterations of the premises licence. For consistency with current terminology in use at the premises, the cell will therein be referred to throughout this document as ‘TDS Cell 1’.

On 18 November 2024, the department sought confirmation from the licence holder that the proposed works were required to be authorised under an amended licence L8904/2015/1 rather than an amended work approval W6855/2023/1.

On 18 November 2024 the licence holder resubmitted their application documentation confirming the application was to amend licence L8904/2015/1 to facilitate capping activities for TDS Cell 1.

On 17 February 2025, the Delegated Officer issued a second request for information in support of the application, and to address matters raised during stakeholder consultations. In response, the licence holder provided a *TDS Cell 1 Capping Design Response to DWER Comments Summary Report* to the department on 10 March 2025.

This amendment is limited only to changes to Category 5 activities from the existing licence. No changes to the aspects of the existing licence relating to Category 61 or 64 have been requested by the licence holder.

Table 1 below outlines the proposed changes to the existing licence.

Table 1: Proposed design or throughput capacity changes.

Category	Current design/ throughput capacity	Proposed design/throughput capacity	Description of proposed amendment
Category 5: Processing or beneficiation of metallic or non-metallic ore: premises on which: (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; (b) tailings from metallic or non-metallic ore are reprocessed; or (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	350,000 tonnes per annual period	350,000 tonnes per annual period	The premises shall continue to receive titanium dioxide tailings for disposal to TDS Cell 2, however TDS Cell 1 will be capped and rehabilitated.

2.2.1 TDS Cell 1

The geometry of TDS cell 1 is approximately 210 m (west to east) by 360 m (north to south), with a cell footprint area of approximately 75, 600 m2 or 7.6 hectares. The cell basal composite lining system comprises a geosynthetic clay liner (GCL) and a 1.5 mm smooth/textured HDPE geomembrane anchored at perimeter anchor trenches. Based on a February 2022 survey, the tailings material surface levels within the cell vary from approximate relative level (RL) of 76.5 at the northern central discharge location to approximately RL 74 at the interface with perimeter embankments.

The depth of the cell varies from approximately 4 m at the southeast corner to approximately 12.5 m at the northwest corner of the cell (not inclusive of freeboard). The current thickness of deposited tailings material is estimated to range from approximately 9 m at the central part of the cell to approximately 10 m.

The objectives of the *WSP Golder Cleanaway TDS Cells Rehabilitation and Closure Plan* submitted in support of the licence amendment application lists its objectives as follows:

- To provide a rehabilitation and closure plan which satisfies Condition 21 of the premises licence, and
- To provide an engineered capping system which:
    - Provides a physical barrier between the placed tailings and the environment,
    - Minimises infiltration to the tailings waste mass and associated leachate generation,
    - Is designed to manage the potential for differential settlement associated with the physical characteristics of the tailings; and
    - Provides effective protection against the radiation levels associated with tailings.

It has been identified that in accordance with the premises radiation management plan, a 2 m minimum cap thickness is required for radiation management.

The volume of water removed from TDS Cell 1 during its operational life has frequently been lower than designed. This is likely to result in low density and strength of the deposited waste due to limited drying of the solid waste.

Leachate management during TDS cell operations involved a perimeter decant, leachate drainage system, and an under-drainage system above the cell's composite basal lining. This system effectively managed leachate and decant water, ensuring that surface water was gravity-drained through geotextile wrapped drains along the cell's side slopes. The collected water was directed to the Tronox Leachate Ponds (TLPs) and subsequently pumped to a loading bay for collection by trucks for removal offsite. Any leachate accumulated during construction of the cap will be pumped to the established leachate ponds. The collection of tailings leachate from the cell following capping will ultimately cease, although continued collection is required during consolidation of waste, and is expected to last many years post closure.

2.2.2 Proposed capping works

ATC Williams Pty Ltd (ATCW) has been commissioned by the licence holder to design the capping of TDS Cell 1.

The licence holder and ATCW selected a capping system that includes geomembrane, as it is considered the system that meets the regulatory requirements and design objectives adopted by the department, specifically the *'Victoria EPA, Siting, design, operation and rehabilitation of landfills – publication 788.3, 2015'*.

The chosen design incorporates a liner system which meets best practice specifications for Class 3 landfills, with an estimated leakage rate of 1000 L/ha/day. This means an allowable seepage rate through the cap is 750 l/ha/day.

The capping design for TDS Cell 1 includes a pre-settlement landform profile with a side slope of 5%, grading to 8.5%, transitioning to an intermediate slope of 1.5%, and ultimately levelling to 0% at the top, the desired final profile.

The proposed capping works will involve the following activities:

1. Site preparation.
    a. Removal of existing star pickets around perimeter embankments.
    b. Removal of existing pipework.
    c. Installation of high strength geotextile for foundation support on potentially soft tailings.
2. Earthworks (Stage 1 and 1B)
    a. Bulk/general fill placement to achieve required design levels.
    b. Installation of cushion geotextile.
    c. Select fill placement.
3. Capping system installation.
    a. Construction of anchor trenches in select fill for securing geomembrane.
    b. Installation of 1.5 mm low-density polyethylene (LDPE) geomembrane.
    c. Geocomposite drainage net placement.
4. Drainage system
    a. Installation of perimeter subsurface drainage pipes.
    b. Construction of stormwater management systems to tie into existing infrastructure.

5. Final landform and vegetation
    a. Placement of a revegetation layer on the final landform.
    b. Application of hydro mulch/spray seed for vegetation establishment.

The proposed capping system, consisting of a LDPE liner and a geocomposite drainage layer is a recognised landfill caping solution designed to limit infiltration through the cap liner to less than 75% of that through the landfills base liner (GCL/HDPE system).

The design of the capping system includes the following components (from bottom up):

- General bulk fill of varying depths over tailings,
- Selected fill layer around embankment perimeter of minimum nominal depth 0.5 m,
- 1.5 mm low-density polyethylene (LDPE),
- Geocomposite drainage net,
- Revegetation layer of minimum nominal depth 1.3 m,
- Rehabilitation with grasses and shallow-rooted shrubs,
- Stormwater system.

A detailed overview of the capping profile is included in Table 2 and Figure 1 below.

Table 2: Proposed capping profile.

Layer	Description
Placement of interim capping layer	Higher PI clay materials (lower permeability) which also reduces rainwater infiltration and leachate generation to 1-2% which formed part of the Basis of Design. A dust suppressant or hydromulch will also be placed on the interim cap (applied when?)
Installation of high strength geotextile for foundational support (cushion geotextile)	Non-woven needle punched continuous filament polyester, polyethylene or a polypropylene fabric that complies with the following properties (MARV[1]): • Tensile strength (MD/CD) ≥ 100 kN/m • Weight ≥ 500 g/m^2 • CBR burst strength ≥ 15 kN • Mass per unit area ≥ 1,900 g/m² • Wide Strip Tensile Strength (MD/CMD) ≥ 52 kN/m • Trapezoidal Tear ≥ 1,200 N • CBR Burst Strength ≥ 10,000 N • Grab Tensile Strength ≥ 4,000 N
Stage 1: Placement of general fill layer (layer depth varies) with material sourced from the proposed Cell 9 excavation on site	Select Fill Material shall be a soil material comprising the following: a. Materials which produce a competent fill when compacted. b. Generally, be free of discrete organic and carbonaceous materials.

Layer	Description
	c. Well graded d. Exhibit the following properties: • % fines (<0.075 mm) ≥40% • Plasticity index ≥20% • Maximum particle size 2.36 mm • Emerson Class ≥4 • Coefficient of Permeability at OMC and • SMCC of 95% ≤ 5x10-8m/s
Stage 1B: Placement of select fill layer around the perimeter embankment (nominal depth approximately 500 mm).	Fill shall be placed in uniform horizontal layers of 300 mm thickness. Each layer shall be compacted to 95% Maximum dry density (standard compaction) (SMDD) placed within +/- 2% of Optimum moisture content (OMC).
Stage 2: – Placement of 1.5 mm linear low-density polyethylene (LLDPE) geomembrane. – Placement of geocomposite drainage net.	• Thickness 1.5 mm • Lowest individual roll thickness (any of the 10 values) 1.35 mm • Lowest individual roll thickness (8 of the 10 values) 1.4 mm • Density (min) 0.92 g/cm3 • Density (max) 0.939 g/cm3 • 2% modulus (max) <840% • Axi-symmetric Break Resistance Strain ≥30% • Carbon Black Content (range) 2 – 3% • Carbon Black Dispersion (rating) 90 % Cat. 1 or 2, 10% Cat 3 • Tensile Properties (each direction): -Strength at Break ≥21 kN/m -Break Elongation ≥250% • Tear Resistance ≥200 N • Puncture Resistance ≥400 N • Oxidative Induction Time (OIT): - Standard OIT ≥100 min, and - High Pressure OIT ≥400 min • Oven Aging at 85°C – High Pressure Oxidative Induction Time 60% retained after 90 days
Stage 3: Placement of revegetation layer (nominal depth approximately 1,300 mm).	• Nominal depth approximately 1300 mm • Rehabilitation with grasses and shallow rooted shrubs

Layer	Description
Spreading of hydromulch/sprayseed	Polymer spray containing jute fibre to bind soil surface, potentially containing pre-treated seed of appropriate shallow-rooted revegetation species (e.g. colonising native pea and *Acacia* species).
Stormwater management and drainage system	Positive gradient (1% or more) after settlement to form a self-shedding profile which achieves drainage away from capped area towards existing stormwater drainage network.

MARV = Minimum Average Roll Value representing a confidence level of 97.5% of test results meeting the required value.

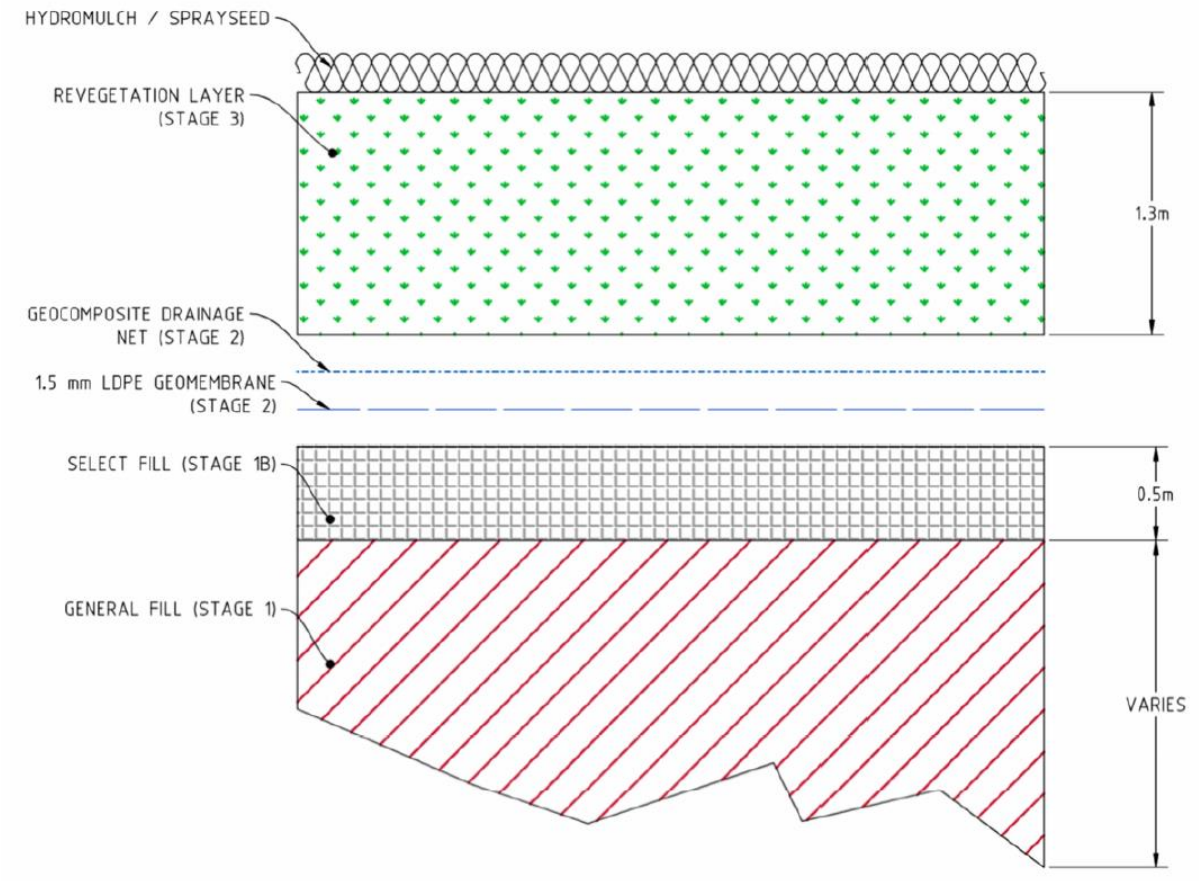

Figure 1: Proposed capping system profile.

ATCW developed the proposed capping system with the intention on achieving the following design objectives, as set out in

Table 3 below:

Table 3: Basis of capping design summary.

Design item	Design assumption/goal	Justification and comment
Cap type	Seepage through cap less than seepage through inert waste landfill liner.	Sourced from the 'Siting, design, operation, and rehabilitation of landfills' report (Publication 788.3) Section 8. Reduce risk of water accumulating in cell. Requires the use of a geosynthetic capping system.
Leachate collection	To eventually cease, although required during consolidation of waste which is expected to last many years.	Capping system will eliminate leachate generation through cell.
Final cap gradient	Positive gradient (1% or more) after settlement to form a self-shedding profile.	Achieve drainage away from capped area. Assumption to reduce amount of fill required to achieve landform. BPEM requires a minimum of 5% for landfills at time of construction to account for expected settlement of degradable municipal solid waste. This does not apply here. Rather, waste consolidation and settlement calculations are carried out to demonstrate that a positive gradient can be achieved post settlement.
Minimum cap thickness	2 m (or equivalent).	As required by premises Radiation Management Plan.
Waste classification	Class I waste (inert).	As determined by testing against the department's *Landfill Waste Classification and Waste Definitions* document.
Tailings and embankment material properties	Geotechnical parameters derived from ATCW investigations and Golder investigations. Chemical and radiological properties	Nature of deposited tailings and existing embankments not subject to modification as part of capping works. Tailings will continue to settle with ongoing leachate collection.
Gas generation	Assumes no landfill gas generation and no landfill gas venting system required.	Inert waste will not putrefy and generate methane gas.

Design item	Design assumption/goal	Justification and comment
Current cell design	Compacted earth embankments with slopes of 1V:3H (upstream/internal) and 1V:2H (downstream/external). The cell is lined with geosynthetic liner, comprising a 1.5 mm thick high-density polyethylene (HDPE) geomembrane overlying a geosynthetic clay liner (GCL). Cell has Central discharge towers. The cell has a leachate drainage systems gravity draining to a leachate pond (no flow data available).	Sourced from the design and the 'Capping Design Considerations' Report by Golder.
Radiation control	Minimum 2 m soil cover. Control radon emissions.	Geosynthetic capping system to assist in controlling radon emissions.
Stormwater drainage	Cap runoff to be diverted towards existing onsite stormwater drainage network.	Cleanaway site water management plan. Runoff from the facility is designed to sheet flow from the cap towards the perimeter of the facility and be captured in the existing stormwater management system.
Slope stability	Embankment and tailings material properties: established based on investigation results. Acceptable Factor of Safety: as per ANCOLD tailings guidelines: □ Long-term drained 1.5 □ Short term undrained: 1.3 - 1.5 □ Post-seismic: 1.0-1.2	A consequence category of SIGNIFICANT was assigned based as outlined.

2.2.3 Staging of works

This proposed capping of TDS Cell 1 is planned to occur in three stages over the period of several years. The details of each stage, and associated timings, are set out in Table 4 below. Due to the duration of timing for each stage of works, the amended licence will differentiate each stage.

Table 4: Capping construction staging

Stage	Works	Approximate area (hectares)	Indicative duration and timing of works	Estimated volume of capping material required (m^3)
1	Capping (Bulk Earthworks)	6.1	2 years (2024-2026)	195,000
1B				

Stage	Works	Approximate area (hectares)	Indicative duration and timing of works	Estimated volume of capping material required (m^3)
2	Capping (Geomembrane)	6.1	2 years (2026-2028)	-
3	Capping (Growing medium)	6.1	2 years (2026-2028)	85,000

The staged construction proposed is intended to facilitate dissipation of pore pressures and consolidation and strengthening of the underlying tailings material during and in between capping stages. The timing of works has been determined based on the regions prevailing seasonal climatic conditions, with capping construction scheduled for the dry summer period.

The tailings waste stored in TDS Cell 1 is expected to settle and consolidate over time due to removal of water from the pore space and the weight of the overburden material placed on the tailings. ATCW carried out a consolidation and settlement estimate to develop a landform with a positive gradient of no less than 1% after settlement has occurred.

The seepage estimate prepared for the proposed capping system, assuming average liner installation quality and quality control, estimates an approximate leakage rate of 432 L/ha/d, which is less than the required amount of 750 L/ha/d. This amounts to a total seepage rate of 2500 L/d for the 6-ha cap footprint and 950 m^3 of leachate per year. Sensitivity analysis of the seepage estimate indicates that the seepage rate is highly dependent on the number of holes in wrinkles and that therefore good quality control on the installation is recommended. Further sensitivity analysis indicates that the without a continuous geocomposite drainage net, seepage rates may increase by 50% due to an increased hydraulic head on the liner.

2.2.4 Radiation management

The premises received titanium dioxide tailings into TDS Cell 1 from its commissioning in 2013 through to 2021, when tailings were diverted to a new cell (TDS Cell 2). Tailing material was received via tanker as a slurry, which was deposited via three deposition points located in the centre of TDS Cell 1. The slurry comprises unreacted ore and coke, metal hydroxides, gypsum and lime inert, and titanium dioxide. The residue was disposed of as a slurry containing 15-20 percent solids. The slurry water is moderately alkaline (pH 7 to 9) and has a salinity level (as TDS) of about 3500 mg/L. The dried residue is an inert, insoluble, non-toxic, clay-like material. Previous chemical testing of the in-situ tailings material has resulted in classification of the tailings material as a Class 1 waste in accordance with the departments *Landfill Waste Classification and Waste Definitions 2019*. Previous radiation testing undertaken to characterise radiation levels of the tailings in TDS Cell 1 yielded results that were assessed as 'low and indistinguishable from background, indicating that radiological impact of the operation was minimal and that employees were not exposed to levels of radiation above background (*Radiation Professional Australia, 2017*). The tailings disposed of at the premises are relatively inert and risks to the receiving environment associated with emissions from the tailings are considered low.

The licence holder has previously engaged and independent consultant, Radiation Professionals Australia, to prepare a Radiation Management Plan (RMP) for the premises. The RMP outlines the systems and processes that ensure compliance with the *Radiation Safety Act 1975* (RSA1975) [1] and the *Radiation Safety (General) Regulations 1983*, governing radiation protection in Western Australia. It describes the application and optimisation of protection measures at the premises that will ensure that radiation exposure doses to workers and the public, as well as any impacts on the environment, are kept As Low as Reasonably Achievable (ALARA), social and economic factors being considered.

Monthly composite samples have previously been provided to Radiation Professionals by Tronox. The samples were sent for radiometric analysis by an independent accredited laboratory to determine the 'head of chain' and isotropic activity to calculate the dis-equilibrium factor. The radiometric analysis of the composite samples returned an average activity concentration for uranium and thorium of 1.65 ± 0.18 Bq/g and 1.89 ± 0.19 Bq/g respectively. Using the results for the isotropic analysis for Ra-226, Pb-210 and Po-210 isotopes in the uranium decay chain and Ra-228 and Th-228 in the thorium decay chain, there is an approximate 86% equilibrium between the parent uranium and thorium in the samples and their respective decay progeny. These results have been considered in determining the depth of the capping layer required for post-closure of TDS Cell 1.

TDS Cell 1 is lined with a geosynthetic clay liner and with an HDPE liner to ensure that the contents can be retained and to prevent the loss of residue to the surrounding environment or contact between the waste residue and/or leachate, and the environment. Leachate drainage has been engineered into the cell liner to enable recovery of the liquid and to assist with natural compaction of the deposited slurry material. The was designed and constructed to specific engineering specifications ensuring that the cell will maintain its integrity and contain the compacted tailings waste residue. The specifications allow for safety margins against a range of natural events. Radionuclides are unlikely to enter groundwater due to both the nature of the residue and the design of the disposal cell Leachate recovery system to return radioactive fluids to the Tronox Australind plant.

2.2.5 TDS Cell 1 Stability under capping

ATC Williams assessed the proposed design of the overall TDS Cell 1 capping system to confirm the stability of the proposed construction. The eastern and western embankments of TDS Cell 1 were considered for the stability assessment using a capping design including a pre-settlement landform profile with a side slope of 5%, grading to 8.5%, transitioning to an intermediate slope of 1.5%. The landform was designed to achieve a final landform with a minimum gradient of no less than 1% after settlement. The stability assessment was completed for the following scenarios:

- Existing conditions
    - Static loads
    - Post liquefaction loads
    - Post seismic loads
- During construction conditions
    - Static loads
    - Post liquefication loads
    - Post seismic loads
- End of construction
    - Static loads
    - Post liquefication loads
    - Post seismic loads

The outcome of the ATC Williams stability assessment was that the proposed cap liner configuration was suitably stable. Realistically however, the actual slope of the cap to be lined will be at a lesser grade than the scenario considered during the stability assessment, which is a conservative position. Additionally, over time, as the waste mass continues to settle, further lessening of the slope angle will make the capped surface more stable.

Additional new vane shear investigations were conducted to assess the in-situ shear strength of the tailings. The test results validated the proposed design by confirming that the tailings' shear properties align with the design assumptions and criteria for the capping system. Vane Shear Testing (VST) was conducted at eighteen (18) locations spread across the surface of TDS Cell 1 from 12 February 2025 to 15 February 2025. The Vane Shear Tests were performed using an Inspection Vane Tester H-60 Borer equipped with standard four-blade vanes and 0.50 m extension rods. The vane shear test results are generally in excess of those assumed in the design, indicating that tailings are not soft and significant drying of the tailings has occurred to date.

Additionally, the licence holder excavated two test pits, TP-CWY101 and TP-CWY102, located in the south of the facility to assess the condition of tailings. The test pits were excavated to 1.6 m and 2.1 m below the existing surface. Both test pits stayed open without collapse, indicating that tailings are not soft and that a dried crustal layer has formed in the area tested.

2.2.6 Maintenance of capping system

The deposited tailings material within the cell has a high moisture content, high fines content, and low strength; resembling a sludge material prior to drying and consolidation. The high moisture content and fines content of the tailings leads to low structural strength. The tailings are poorly draining and slow drying with a ‘clay like’ constancy.

The characteristics of the tailings, particularly moisture content create the potential for significant differential settlement of the waste mass during and after construction. Accordingly, the capping system needs to be designed to handle potential settlement and consolidation. The bridging capacity of the system and the ability to span minor to moderate voids created by differential settlement is key.

A phytocap trial was initiated on site by Tonkin Consulting in spring 2018, with earthworks finished in October 2019. The purpose of the trial was to investigate the potential for a phytocap to be used at the premises to manage rainwater infiltration through the waste profile, as opposed to a synthetic cap, that provides a physical barrier to reduce the movement of moisture through the cap and into the waste.

The trial was terminated by the licence holder, as it was determined that a phytocap did not meet their requirements for capping. The key lessons derived from the trial were:

- Local native plants are slow to establish, and require intensive maintenance to ensure their successful establishment, and
- The site-won soil is highly erodible; hence an alternative solution of re-vegetation would be required, with an addition of a higher-level of preparatory works, management and maintenance.

In view of the high level of maintenance required to establish the phytocap vegetation, combined with the high erodibility of the on-site soil, the licence holder has determined that a phytocap is not a suitable option for the TDS Cell 1, and has opted to utilise a more conventional synthetically lined capping system which incorporates a vegetation layer intended to support low-growing native shrubs, herbs, and grasses to enhance the visual amenity of the closed cell. The proposed species to be used in revegetation are small-growing and inherently shallow-rooted and will not pose a risk to the integrity of the engineered capping system.

The quarterly inspection for of the cap surface defects and the management (removal) of naturally recruited native or exotic tree and large shrub species will be included as a condition of the amended licence. This is intended to ensure that the licence holder maintains the surface of the cap such that it does not deteriorate and is not damaged by undesirable plant species.

3. Part IV of the EP Act

Ministerial Statement 1213 was made in relation to the premises on 21 November 2023. The statement appertains the construction and operation of landfill cells 9, 10, and 12A and associated infrastructure at the premises. This statement is not applicable to the capping activities proposed under the current amendment application.

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 capping activities which have been considered in this Amendment Report are detailed in Table 5 below. Table 5 also details the proposed control measures the licence holder has proposed to assist in controlling these emissions, where necessary.

Table 5: Licence holder controls.

Emission	Sources	Potential pathways	Proposed controls
Tailings leachate	Damage to cell liner system during capping works	Seepage to soils and groundwater	Existing premises groundwater monitoring network and contingency measures: A network of monitoring wells have been installed down hydraulic gradient from the cell to identify impacts to groundwater. The designer intended these wells to also function as extraction points to intercept contaminants, forming a critical part of the environmental contingency plan.
Tailings dust and gas (Radioactive emissions)	Trafficking of dried/compacted tailings during preliminary capping phase	Air/windborne pathway	Placement of interim capping layer across cell surface. Minimum 2 m capping profile as per Radiation Management Plan
Sediment laden stormwater	Runoff from unfinished and finished cap surface during heavy rainfall events	Overland flow and sediment deposition	Intermediate capping layer placement. Existing drainage infrastructure (contour drains, drainage chutes) Earthen swales directing runoff to Stormwater Pond 1 and Stormwater Pond 2.

Emission	Sources	Potential pathways	Proposed controls
Leachate leakage and spillage	Accidental damage or disturbance of existing leachate management infrastructure during preparatory works.	Overland flow, seepage to soils and groundwater	Existing drainage infrastructure (contour drains, drainage chutes) Earthen swales directing runoff to Stormwater Pond 1 and Stormwater Pond 2.
Dust	Potential sources of dust emissions include: · Wind erosion and dust lift-off from dry surfaces · Construction: Excavation: Minor trimming of the tailings beach surface may be required. Generally, this is pushing around the surface soil with a dozer to reshape the landfill to achieve a smooth surface on which to place the synthetic liner Excavation of soil from stockpile for use in the capping construction. Due to the depth of the excavation into the stockpiled soil, the soil is relatively moist and hence does not generate significant dust – Haulage – Medium consideration as the haulage distance is short and roads are wet down by water cart as necessary, but dust can accumulate on heavy trafficked roads Vehicle wheels tracking mud and liberating dust.	Air/windborne pathway	Existing premises dust management plan. • Monitoring weather forecasts to minimise dust-generating activities during adverse meteorological conditions • Vehicles kept to designated access roads • Slow vehicle speeds; Changing haulage routes • Wetting down of haul roads and stockpile areas • Restricted activities during certain weather conditions (strong winds) • Application of dust suppressant chemicals if necessary (e.g. Dustex or similar). Visual dust monitoring. If unacceptable dust emissions are identified offsite, the following contingency plans are available to improve dust management on site: • Slow haulage vehicles down • Apply additional quantities of water via water cart • Restrict dust-generating activities to the appropriate time of day to reduce dust generation (weather dependent) • Utilisation of chemical dust suppressants (last resort).

Emission	Sources	Potential pathways	Proposed controls
Noise	Transportation and placement of fill and cover materials.	Air/windborne pathway	Environmental noise assessment of the site, including the contribution of construction activities specifically related to Cell 12A, 9, and 10 construction [Environmental Acoustic Assessment March 2022 - Herring Storer Acoustics Revision 1 - This noise assessment remains valid for the proposed capping works for TDS Cell 1, as the works would occur in the same vicinity] "*noise modelling and assessment of the noise emissions from the various operating conditions has been undertaken. The results of that assessment shows that noise emissions from the facility will comply with the requirements of the Environmental Protection (Noise) Regulations 1997 at all times*" *Cleanaway and Tonkin Consulting (March 2021) Environmental Management Plan Banksia Road Landfill Crooked Brook, WA 6236 Licence Number: L8904/2015/1 version 4* The noise control strategy includes the following control measures: • Regular maintenance of equipment • Installation of broadband reversing alarms on vehicles regularly used on site • Direction of heavy vehicles, where practicable, away from the southern portion of Banksia Road where residences are located • Creation and maintenance of buffer zones around the site boundary • Use of noise barriers where possible • Restricting operating hours • Maintenance of a noise complaint register.

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 from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 6 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 6: 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.
Dardanup Aeromodellers Society, 270 Panizza Rd, Crooked Brook	Approximately 1.3 km north of northern premises boundary.
Environmental receptors	**Distance from prescribed activity**
Dardanup Conservation Park	Adjacent to southern and eastern boundaries of the premises
Boyanup State Forest	Approximately 0.7 km south, and 1 km east of the premises.
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 m 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 to the west of the premises on the opposite site of Banksia Road.
Geomorphic wetland: Multiple use Palusplain and Dampland (flat, seasonally waterlogged)	Approximately 400 m southwest through to the northwest of the premises boundary.
Crooked Brook (significant stream)	Located approximately 1100 m south/southwest of the premises boundary flowing in a generally east/west direction. Crooked Brook flows into Preston River approximately 5km downstream.

Preston River	Approximately 5 km west of the premises. Groundwater from the superficial aquifer discharges into the Preston River.
Groundwater	It is understood that the superficial aquifer is present within the Yoganup geological formation between 20 m to 30 m below ground level. It is also possible that further isolated perched aquifers occur under the premises 15 – 20 m below ground level. The permanent, confined Leederville aquifer has been encountered at the site between 35 mbgl and 40 mbgl Groundwater flows in a northwest direction.
Beneficial users of groundwater	Approximately 41 bores are located within 3 km of the premises. Water abstracted from these bores are used for such purposes as: • Stock watering. • Dairy purposes. • Irrigation of pasture. • Domestic use.
Dardanup Water Reserve	The Priority 1 groundwater protection zone for Dardanup Water Reserve is located approximately 2.5 km northwest of the premises.
Priority Flora	• Priority 3 flora species – adjacent to the southeast corner of the premises and approximately 180 m south of the premises. • Priority 4 flora species - approximately 160 m east of the premises.
Fauna - Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*) and the forest red-tailed black-cockatoo (*Calyptorhynchus banksii naso*)	The remaining vegetation on the eastern side of the premises contains areas of potential black cockatoo breeding habitat as well as foraging and roosting habitat

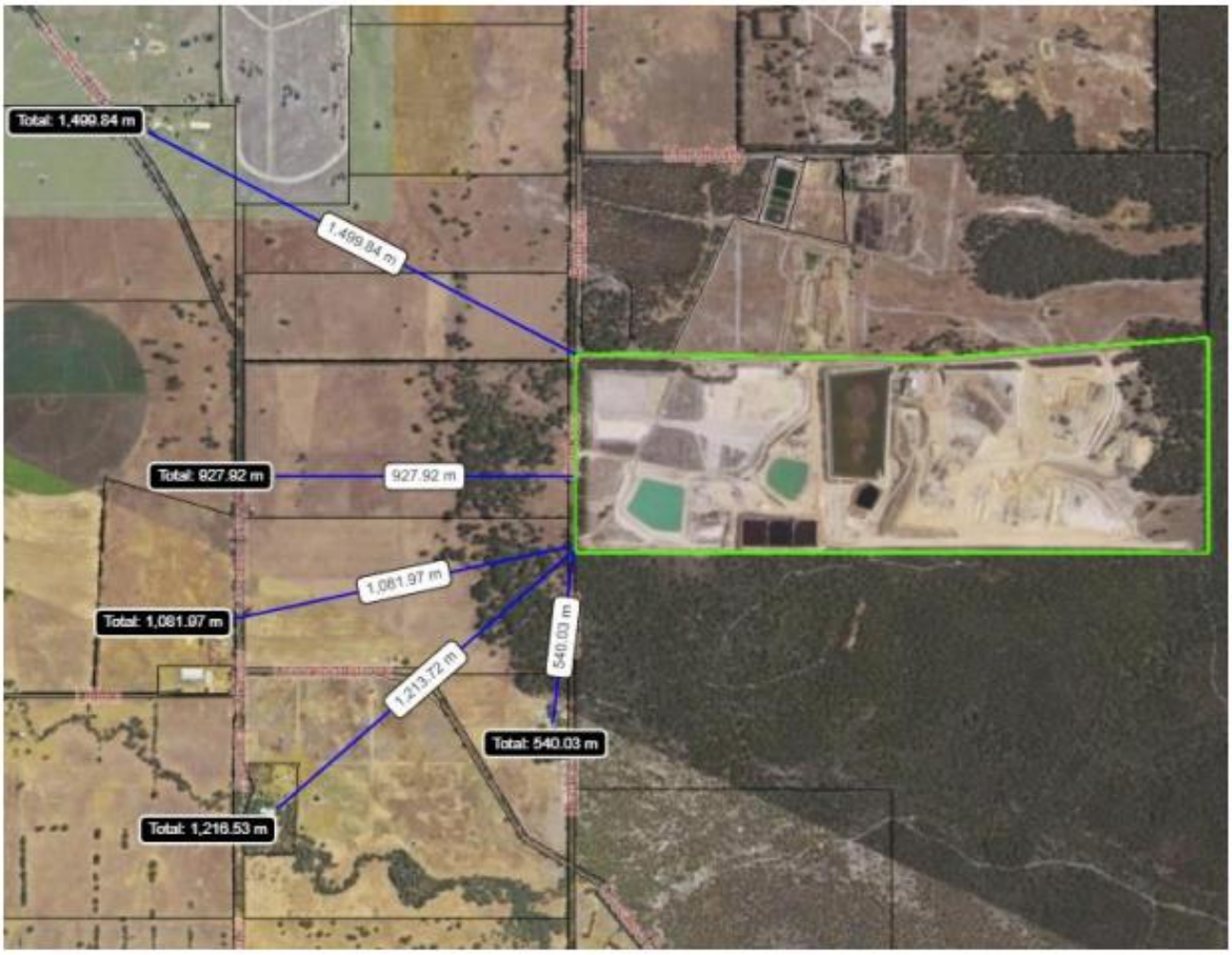

Figure 2: Relative proximity of premises (green polygon) to closest sensitive human (residential) receptors.

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 considers potential source-pathway and receptor linkages as identified in Section 4.1. Where linkages are in-complete 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 7.

The revised licence L8904/2015/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Licence have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required following the time-limited operational phase authorised under the licence to authorise emissions associated with the ongoing capping management. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 7. Risk assessment of potential emissions and discharges from the premises during capping construction.

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**				
Capping works	Dust (fill materials)	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	Rural residences	Refer to Section 5.1	C = Minor L = Unlikely **Medium Risk**	Yes	83 and 84	Existing licence conditions appertaining to dust management are not specific to tailings cell capping activities.
	Noise			Refer to Section 5.1	C = Slight L = Unlikely **Low Risk**	Yes	31	N/A
	Leachate leakage and spillage	**Pathway:** Overland flow and infiltration to groundwater, groundwater migration and abstraction - irrigation **Impact:** Contamination of surface waters, soil profile and groundwaters	Underlying groundwater Beneficial groundwater users Geomorphic wetland: Multiple use Palusplain and Dampland (flat, seasonally waterlogged) Crooked Brook (significant stream)	Refer to Section 5.1	C = Minor L = Unlikely **Medium Risk**	Yes	11, 85, 56, and **87**	N/A
	Silt contaminated stormwater	**Pathway:** Air/windborne pathway **Impact:** Health and amenity		Refer to Section 5.1	C = Slight L = Unlikely **Low Risk**	Yes	16	N/A

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**				
	Radioactive emissions (tailings dust)	**Pathway:** Air/windborne pathway **Impact:** Human health	Rural residences	Refer to Section 5.1	C = Unlikely L = Slight **Low Risk**	Yes	82 and 83	N/A
	Cell damage/failure and tailings release	**Pathway:** Overland flow and infiltration to groundwater, groundwater migration and abstraction - irrigation Air/windborne pathway **Impact:** Contamination of surface waters, soil profile and groundwaters Health and amenity Rural residences	Underlying groundwater Beneficial groundwater users Geomorphic wetland: Multiple use Palusplain and Dampland (flat, seasonally waterlogged) Crooked Brook (significant stream)	Refer to Section 5.1	C = Major L = Unlikely **Medium Risk**	No	83, **86,87, 88, and 89**	Requirement for quarterly inspection of vegetation post capping works completion shall be required to mitigate the recruitment of unsuitably large tree and shrub species, which ostensibly may ultimately present a risk to liner integrity.

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 8 provides a summary of the consultation undertaken by the department.

Table 8: Consultation

Consultation method	Comments received	Department response
Shire of Dardanup advised of proposal on 16 December 2024	The Shire of Dardanup engaged MBS Environmental to undertake peer review of Cleanaway's application to the regional Joint Development Assessment Panel (JDAP) for the capping works. A formal response was received from the Shire of Dardanup on 7 February 2025. The response sets out numerous questions which were posed to the Delegated Officer at a stakeholder meeting held in Bunbury on 6 February 2025.	The questions posed by the Shire of Dardanup were taken on notice at the 6 February meeting. The Delegated Officer provided responses to these matters in the formal meetings provided to the Shire of Dardanup on 12 February 2025. Much of the commentary relates to ongoing planning considerations for the premises post facility closure (not only TDS Cell 1).
Dardanup environmental Advisory Group (DEAG) advised of proposal on 16 December 2024	Two formal submissions from DEAG members were received on 7 January 2014. A further submission on behalf of DEAG as received on 6 February 2025.	Overview of comments and Delegated Officer responses is set out in Appendix 1.
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 14 January 2024	DEMIRS replied on 22 January 2025 providing the following advice in relation to its responsibilities under the *Mining Act 1978* (Mining Act). *With respect to the adequacy of the capping design to manage naturally occurring radioactive elements of the waste material/residue deposited in the Banksia Road cell, it is noted that the radiation management requirements stipulated in the Work Health and Safety (Mines) Regulations 2022 are not applicable in this context. It is important to note that the WA Radiological Council is the appropriate authority to provide advice for this matter. Similar advice was provided via email to Stephen Checker, Manager Waste Industries on 10 October 2023. On the basis that previous advice provided by DEMIRS Inspector of Mines - Geotechnical Engineers to DWER has been adopted then no further comment is provided.*	Noted. Application referred to the WA Radiological Council for review and comment.

Consultation method	Comments received	Department response
WA Radiological Council advised of proposal on 23 January 2025	Radiological Council provided the below response on 5 February 2025. *Please be advised that we have reviewed the documentation with respect to radiation for this proposed amendment which is for the capping of TDS Cell 1. We do not have objections or comments that need to be addressed.* *The Radiation Management Plan (RMP) referenced within the documentation was since updated and replaced with a version dated 4 July 2024. However, this does not affect the outcomes of the documentation provided. Both versions of the RMP recommend a capping thickness of 2 m for site rehabilitation and decommissioning, and this is mentioned within the documentation.*	Noted.
Licence Holder was provided with the draft amendment on 17 March 2025	The licence holder responded on 19 March 2025 with comments on: **Amendment Report** Corrections to Table 4 including the approximate area, indicative duration / timing of works and estimated volume of capping material required. **Licence** Confirmation of the expected timeframe for the completion of the staged capping works.	The Amendment Report has been updated accordingly. The expected completion date deadlines have been added to Table 27 as per the licence holder's comments.

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.

The technical drawings prepared by ATCW for the proposed TDS Cell 1 capping have been inserted into the amended licence and referred to in the Design and construction/installation requirements table.

ATCW has prepared a CQA plan for the TDS Cell 1 capping works. The particulars of this plan have been inserted as a reporting requirement in the amended licence.

6.1 Summary of amendments

Table 9 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.

Table 9: Summary of licence amendments

Condition no.	Proposed amendments
42, i)	Typo corrected – administrative error identified.
82	Condition setting out Tronox Cell 1 capping design and construction / installation requirements, including specifications table, inserted.
83	Condition setting out dust mitigation requirements during Tronox Cell 1 capping activities inserted.
84	Condition prohibiting the use of any tailings or landfill leachate for use in dust suppression as part of Tronox Cell 1 capping works.
85	Condition requiring that final cap depth must be a minimum of 2m.
86	Condition inserted requiring licence holder to undertake construction quality assurance, including visual inspection and materials testing for the high strength geotextile (cushion geotextile), low-density polyethylene geomembrane, and geocomposite drainage net, for the for each item of specified infrastructure.
87	Condition requiring Licence Holder undertake an audit of their compliance with the capping construction requirements and prepare and submit to the CEO an Environmental Compliance Report on that compliance within 60 calendar days of all items of infrastructure or equipment required by condition 82 being constructed inserted.
88	Condition outlining construction quality assurance reporting requirements inserted.
89	Condition requiring licence holder to undertake quarterly monitoring of final capped cell for unsuitable vegetation (tree) species inserted.
90	Condition requiring licence holder to actively manage unsuitable vegetation (tree) species on an ongoing basis inserted.
Definitions, Table 28	Relevant testing standards for capping components inserted.
Appendix 1	Capping Construction and Installation Requirements.
Appendix 2	Construction Quality Assurance Testing Requirements
Appendix 3	Capping plans

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.
4. *Environmental Protection Authority (EPA) 2018, Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual, Environmental Protection Authority, Perth, WA.*
5. *ATC WILLIAMS REPORT Cleanaway Solid Waste Pty Ltd. ABN: 79 000 164 938 Tronox 1 Capping Design Dardanup, Western Australia 123169.01R02 Rev A, October 2024*
6. *ATC WILLIAMS REPORT CLEANAWAY SOLID WASTE PTY LTD ABN: 79 000 164 938 Tronox 1 Capping Design Licence Amendment Application Supporting Documentation 123169.01 R03 Rev 0 SEPTEMBER 2024*
7. *ATC Williams Tronox 1 Capping Design Response to DWER Comments Summary Report 123169.01 R04 Rev 0 MARCH 2025.*
8. *WSP Golder Report Cleanaway TDS Cells Rehabilitation and Closure Plan PS12963-001-R-Rev0 – Final 29 June 2022*
9. *Tonkin Consulting. 22 January 2022. PHYTOCAP PERFORMANCE TRIAL FINAL REPORT.*

Appendix 1: Summary of stakeholder comments on amendment application package.

Submission	Summary of stakeholder comment	Department's response
DEAG formal submission and DEAG members submission.	Concerns raised with limited information on the integrity, analysis and composition of the material within TDS Cell 1.	Tailings deposition in TDS Cell 1 began in 2013 and ceased in mid-2019. The cell has been undergoing consolidation and drying since this time. The tailings composition has been well documented over the time it has been accepted to the premises and is known to have a uniform consistency. Chemical characterisation of the tailings material was undertaken by WML consultants in 2011. Golder undertook additional tailings testing in 2017. Additionally, a geotechnical investigation of TDS Cell 1 was undertaken to obtain preliminary data on the in-situ properties of the tailings material. Findings from these studies have been used to inform and guide the capping design. The Delegated Officer considers that sufficient information on tailings characterisation has been provided by the Licence Holder to inform the capping risk assessment.
	Concerns raised with the quality of the documents submitted in support of the application and difficulties interpreting documentation.	Multiple reports and differing recommendations within the application package are noted as a source of confusion to stakeholders by the Delegated Officer.
	Concerns raised that DWER has not reviewed supporting documentation submitted with the application.	As the regulatory authority, DWER is responsible for reviewing the submitted application, determining that the capping system proposed is appropriate, and setting appropriate licence conditions to ensure that construction and management is undertaken in an appropriate manner. The Delegated Officer considers that an appropriate review of all submitted documentation has been undertaken to inform DWER's risk assessment relating to capping works.
	Concerns raised that the material will not consolidate within TDS Cell 1, leading to cap failure and the loss of equipment moving across the surface of the Cell.	The staged construction of the cap is intended to facilitate consolidation and strengthening of the underlying tailings material during and in between capping stages. The tailings are expected to settle and consolidate over time due to the removal of water from the pore space and the weight of the overburden material placed on the tailings. These outcomes are supported by stability modelling. A high-strength geotextile is to be placed on potentially soft tailings and is designed to create a stable working surface for equipment after placing 1 m of soil. The purpose of the high-strength geotextile in this configuration is to allow construction equipment to operate on the surface safely. Ongoing maintenance of the cap will be the responsibility of the licence holder and will be enforced through licence conditions and later, through a closure management plan issued to the licence holder under the EP Act.

Submission	Summary of stakeholder comment	Department's response
	Concerns raised that Cleanaway do not have experience with the closure of TSF's and do not understand their own documentation.	The Delegated Officer notes that TDS Cell 1 is not a traditional TSF, as the cell is constructed using a HPDE liner system and incorporates leachate collection. The disposal of tailings to a lined facility is atypical. The Delegated Officer considers that the capping system proposed by the licence holder for TDS Cell 1 is appropriate for a TSF of this design. There is no evidence to substantiate that Cleanaway do not understand their own submitted supporting documentation.
	Seeking an additional investigation be undertaken by Cleanaway to ensure the correct capping approach has been adopted.	The Delegated Officer does not consider this appropriate. Sufficient information has been provided by the Licence Holder to undertake a detailed risk assessment on the proposed capping works. It is noted that DWER sought additional information from the Licence Holder on 17 February 2025 to address comments raised in the stakeholder engagement period. A response was received on 10 March 2025, which informed decision making into the setting of conditions within the revised Licence.
	Concerns raised that the *Victoria Best practice environmental management: Siting, design, operation and rehabilitation of landfills* (Vic BEPM) guidelines are not appropriate when considering a TSF.	The Delegated Officer notes that TDS Cell 1 is not a traditional TSF, as the cell is constructed using a HPDE liner system and incorporates leachate collection. The design of TDS Cell 1 is consistent with that of a single composite lined landfill cell as outlined in the Vic BEPM. Therefore, the Delegated Officer considers Vic BEPM is the most appropriate guideline to refer to when considering TDS Cell 1. It should be noted that DWER have consulted with DEMIRS as the regulatory agency for TSFs to inform this assessment. As a regulatory authority, DEMIRS consider the capping of TDS Cell 1 in line with relevant TSF guidance, including the ANCOLD guidelines. DEMIRS have flagged no concerns with the capping design.
	Concerns that the capping of TDS Cell 1 will not result in a facility which has no requirement for ongoing maintenance.	As discussed above, TDS Cell 1 is not a traditional TSF, and as such cannot be considered solely under TSF guidance as the Cell aligns more with the specifications of a lined landfill cell. The Delegated Officer considers that the requirement for no ongoing maintenance to be needed on closure of TDS Cell 1 is impractical and not applicable due to the Cells design. Ongoing maintenance of the cap will be the responsibility of the licence holder and will be enforced through licence conditions and later, through a closure management plan issued to the licence holder under the EP Act.
	Concerns that Cleanaway are not aware of developments in tailings dam designs.	As discussed above, TDS Cell 1 is not a traditional TSF. There is no expectation from DWER that Cleanaway should be aware ongoing tailings dam designs. The information relating to TDS Cell 1 and capping design for this application has been assessed, with the Delegated Officer determining that the design appears suitable.

Submission	Summary of stakeholder comment	Department's response
	Concerns that the best option for capping has not been chosen.	DWER can only assess applications that are submitted. The Delegated Officer considers that the proposed capping design and works are suitable for TDS Cell 1. This is supported by risk assessment outcomes.
	Seeking that the total removal of the material should be evaluated.	As above.
	Seeking that Cleanaway should be made to do a formal assessment of alternative options including a 2m clay cap and total removal and relocation of the material.	As above.
	Concerns with leachate recovery and disposal, and that the life of the leachate collection system has not been addressed.	The leachate recovery system has been designed to include a HDPE liner system in the leachate pond. HPDE liners are known to have an operational life span of at least 200 years. Leachate generation is anticipated to decline over time as the cell is capped and the tailings consolidate. As such, the Delegated Officer considers that the leachate recovery system is suitable for the collection of leachates generated during the capping of TDS Cell 1.
	Concerns that the total depth of the capping layers will be less than 2m, which is what was recommended for radiation control.	A 2m cap depth was incorporated in capping design specifications and has been included within revised Licence conditions.
	Seeking Cleanaway provide an overview document setting out in a table design criteria used to develop the capping and rehabilitation program to remove uncertainty.	Multiple reports and differing recommendations within the application package are noted as a source of confusion to stakeholders by the Delegated Officer. DWER has conducted a review of the supporting information and has determined that sufficient information has been provided to inform the risk assessment. At this stage of the application, a summary document is not required.
	Concerns that a risk assessment has not been undertaken by Cleanaway.	The Delegated Officer considers that Cleanaway have addressed risks throughout their supporting information. Irrigardless, DWER have conducted their own risk assessment on the proposed capping works, and have determined that risks can be adequately managed through the licence holders proposed controls.

Submission	Summary of stakeholder comment	Department's response
	Concerns with the potential success of hydroseed / mulch application.	The application of hydroseed to the cap is conditioned within the works approval. Ongoing maintenance of the cap (including maintenance of vegetation) will be the responsibility of the licence holder and will be enforced through licence conditions and later, through a closure management plan issued to the licence holder under the EP Act. It should be noted that the proposed revegetation does not form part of the containment system; instead, it is intended to improve amenity values and facilitate the intended future land use (grazing lands).Visual amenity falls outside DWER's regulatory scope.
	Concerns raised that the risk to groundwater has not been assessed.	Risk to groundwater from leachate recovery and tailings dam failure has been considered in DWER's risk assessment detailed in Section 4.2 of this Decision Report.
	Concerns with the radioactivity within the material and potential release of radionuclides to the environment in the event of liner failure.	Radioactivity is managed by the Radiological Council of WA under the sites Radiation Management Plan. The Radiological Council of WA were referred this application for comment and recommended a capping thickness of 2 m for site rehabilitation and decommissioning. Impacts to groundwater from tailings release have been considered in DWER's risk assessment detailed in Section 4.2 of this Decision Report.
	Concerns that samples used to inform the capping design are not representative of the material within the cell.	Chemical characterisation of the tailings material was undertaken by WML consultants in 2011. Golder undertook additional tailings testing in 2017. Additionally, a geotechnical investigation of TDS Cell 1 was undertaken to obtain preliminary data on the in-situ properties of the tailings material. Findings from these studies have been used to inform and guide the capping design. As TDS Cell 1 has not received tailings since 2019, and the characterisation of the tailings is well known, the Delegated Officer considers that sampling used to inform the capping design is sufficiently accurate.
	Concerns that Cleanaway are not undertaken sufficient stakeholder engagement.	This is outside of DWER's regulatory scope.
	Concerns raised with responsibility of the maintenance of the cap on an ongoing basis.	Ongoing maintenance of the cap will be the responsibility of the licence holder and will be enforced through licence conditions and later, through a closure management plan issued to the licence holder under the EP Act.

Submission	Summary of stakeholder comment	Department's response
Comments received within Engeochem Consulting's Review of Tronox Cell 1 Capping Design and Rehabilitation and Closure Plan undertaken on behalf of DEAG	Concerns that studies undertaken are limited and not rigorous enough to inform the capping design.	The Delegated Officer has reviewed the supporting documentation and considers that adequate information has been provided to inform the assessment on capping works. Additionally, a request for information was issued to the licence holder on 17 February 2025. In the response received 10 March 2025, ATCW advised the department that additional shear vane testing and test pit excavations indicate that the tailings are potentially of a higher strength than assumed in the settlement and bearing capacity assessments, which mainly relied on previous testing carried out when the tailings were softer.
	Concerns that supporting documentation demonstrates that the cell is not ready for capping and / or the site is not amendable to a capping campaign.	Supporting documentation details the staged construction of the cap, which is intended to facilitate dissipation of pore pressures and consolidation and strengthening of the underlying tailings material. The Delegated Officer considers that the staged works will ensure the cell is adequately prepared for the application of cover material.