



Waste Facility Decommissioning and Closure Plan Sandy Ridge



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Version 5

Company Proprietary Information

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ABBREVIATIONS

Term	Definition
AHD	Australian Height Datum
BGL	Below ground level
BoM	Bureau of Meteorology
Cth	Commonwealth
CAD	Cell Air Dome
CAR	MS1234 Compliance Assessment Report
CPI	Consumer Price Index
CSM	Conceptual Site Model
DAWE	Department of Agriculture, Water and the Environment (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DAWE)
DGMMP	Deep Groundwater Monitoring and Management Plan
DoH	Department of Health
DoL	Department of Lands
dS/cm	deciSiemens per centimetre
DMPE	Department of Mines, Petroleum and Exploration
DWER	Department of Water and Environmental Regulation
EP Act	Environmental Protection Act 1986 (WA)
EPA	Environmental Protection Authority
EPBC Act	Environmental Protection and Biodiversity and Conservation Act 1999 (Cth)
FAD	Financial Assurance Deed
FMP	Fauna Management Plan
FVMP	Flora and Vegetation Management Plan
GNSS	Global Navigation Satellite System
ha	Hectare
HIL-D	Human Health Investigation Level D (commercial/industrial land use)
IAEA	International Atomic Energy Agency
ICP	Institutional Control Period
IWDF	Intractable Waste Disposal Facility
LiDAR	Light Detection and Ranging
LMMP	Leachate Monitoring and Management Plan
LLW	Low level radioactive wastes
MCP	Mine Closure Plan
meq/100g	milliequivalent of hydrogen per 100g of dry soil
mg/kg	milligrams per kilogram
mm/day	millimetres per day

Term	Definition
NEPM HILs	National Environment Protection (Assessment of Site Contamination) Measure 2011 (as amended 2020) – Health Investigation Levels for assessing potential human health risks from soil contamination under different land-use scenarios.
NORM	Naturally Occurring Radioactive Material
PAEC	Potential Alpha Energy Concentration
PCBs	Polychlorinated biphenyls
PCRSA	Post-Closure Radiological Safety Assessment
PFAS	Per- and poly-fluoroalkyl substances
RHU	Radiation Health Unit
RMP	Radiation Management Plan
SIBERIA	Simulation of Interacting Processes Between Erosion and Relief in Arid Areas
SWL	Standing Water Level
WFDGP	Waste Facility Decommissioning and Closure Plan

RELEVANT MANAGEMENT PLANS

Document No.	Management Plan	Aspect / Impact Related to Decommissioning and Closure
SR-11-MPL-003	Deep Groundwater Monitoring & Management Plan – Sandy Ridge	Groundwater
SR-11-MPL-007	Leachate Monitoring & Management Plan – Sandy Ridge	Leachate
SR-09-MPL-009	Sandy Ridge Radiation Management Plan	Radiation
SR-11-MPL-004	Sandy Ridge Air Quality Management Plan	Air quality
SR-11-MPL-006	Flora and Vegetation Management Plan	Flora and Vegetation

DOCUMENT STRUCTURE

The structure of this Waste Facility Decommissioning and Closure Plan (WFDCP) is based on the template requirements detailed in the 'Instructions on how to prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans' (EPA, 2024).

The table below lists the requirements as set out by the WA EPA (2024) and shows where these requirements are addressed within this WFDCP.

Reference (as per WA EPA Oct 2024)	Template Requirement (as per WA EPA Oct 2024)	Location in WFDCP
1.	Executive Summary	Start of document
2	Context, scope and rationale	Section 1
2.1	Proposal	Section 1.1
2.2	Key environmental factors	Section 1.2
2.3	Condition requirements	Section 1.3
2.4	Rationale and approach	Section 1.4
3.	EMP components	Section 2
4.	Adaptive management and review of the WFDCP	Section 3
5.	Stakeholder consultation	Section 4
6.	Changes to WFDCP	Section 5

EXECUTIVE SUMMARY

Aspect	Summary
Facility name	Sandy Ridge Facility
Proponent name	Tellus Holdings Ltd
Ministerial Statement number	MS 1234 (superseding MS 1078 and MS 1152)
Purpose of the WFDCP	Provide an outline of decommissioning, rehabilitation, closure, and post-closure monitoring and management activities in accordance with the conditions of MS 1234
Key environmental factors	• Terrestrial fauna • Terrestrial environmental quality • Inland waters • Human health • Air quality
Key environmental outcomes	• Site will be rehabilitated, remediated, and decommissioned to be physically safe to members of the public and non-human biota for the long term, • Site remains geotechnically and geomorphically stable, and • Site is chemically and radiologically non-polluting
Condition clauses (if applicable)	B5-1, B5-2, C2-6, C4-2
Construction date	Construction: Completed October 2020 Operations: Commenced October 2020

1 CONTEXT, SCOPE, AND RATIONALE

1.1. Proposal

Tellus Holdings Ltd (Tellus) owns and operates the Sandy Ridge Facility (the *Facility*, *Project* or *Site*), Australia's only commercial-scale near-surface geological repository for Class IV and V wastes. At the Site, kaolin is mined for later use (e.g. as cell capping material or potential export to Asia or the domestic ceramics market), and Class IV and V intractable and low-level radioactive wastes are permanently isolated within the void spaces created by the mining operations. The Facility is located approximately 75 kilometres north-east of Koolyanobbing, within the Shire of Coolgardie (Figure 1-1).

The Sandy Ridge Facility was approved under Ministerial Statement 1078 on 26 June 2018, authorising the development and operation of a near-surface geological repository for the permanent isolation of Class IV and V intractable and low-level radioactive waste. Commonwealth approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC 2015/7478) was granted on 7 January 2019.

On 9 July 2021, Tellus referred a Revised Proposal under Section 38 of the Environmental Protection Act 1986 to align the tonnage of waste received at the gate with the quantity approved for disposal (up to 280,000 tpa). The proposal was assessed by the EPA at the Public Environmental Review (PER) level, with the Environmental Review Document published in October 2023 and EPA Report 1767 released in June 2024.

Following completion of the assessment, Ministerial Statement 1234 was issued on 13 December 2024, superseding MS 1078 and MS 1152 (the latter relating to financial assurance requirements). The Facility continues to operate in accordance with the conditions of MS 1234 and other relevant statutory instruments, including Licence L9240/2020/1. The authorised extent of the physical and operational elements of the Facility under MS 1234 is summarised in Table 1-1.

Table 1-1 Authorised Extent of Physical and Operational Elements

Element	Maximum Extent
Physical elements	
Mine pits/waste cells	Clearing up to 202.3 ha of native vegetation within a 1,061 ha development envelope
Associated infrastructure	Clearing up to 73.75 ha of native vegetation within a 1,061 ha development envelope
Waste cap design	2.0 metres (m) capillary break (screened and gap-graded material) 3.0 m thick seal layer beneath the capillary break layer Unless otherwise approved by the CEO as part of licencing decision under Part V of the EP Act
Operational elements	
Wastes permitted	Acceptance of only Class IV & V waste
Class IV and V wastes accepted at gate	Up to 280,000 tonnes tpa
No acceptance of nuclear waste as outlined in the <i>Nuclear Waste Storage and Transportation (Prohibition) Act 1999</i>	None

Temporary waste storage on surface	Up to 15,000 t
Waste (including treated waste) disposed to waste cells	Up to 280,000 tpa
Waste origin	Only wastes generated within WA, other Australian States and Territories, and the Australian Exclusive Economic Zone
Water use	Up to 0.18 GL/a
Timing elements	
Maximum temporary surface storage time	Up to 12 months, or as agreed by the CEO
Project life	25 years

1.1.1. Purpose of this document

The purpose of this Waste Facility Decommissioning and Closure Plan (WFDCP) is to define the approach to decommissioning, rehabilitation, and long-term environmental management of the Sandy Ridge Facility, in accordance with Conditions B5-1, B5-2, C2-6 and C4-2 of Ministerial Statement (MS) 1234. The plan provides for safe closure and management leading up to, and during, the Institutional Control Period (ICP).

To meet the closure outcomes required under MS1234, the Facility must remain:

- Physically safe to members of the public and non-human biota.
- Geotechnically and geomorphically stable over the long term.
- Chemically and radiologically non-polluting, with no unacceptable impacts to land, water, air, or ecological receptors.

This WFDCP supersedes the *Sandy Ridge Facility – Waste Facility Decommissioning and Closure Plan* (Version 4, 14 November 2022).

The WFDCP complements the separate *Mine Closure Plan (MCP, SR-09-MPL-002)*, which addresses mine voids, stockpiles, and supporting infrastructure. By contrast, the WFDCP focuses on the closure of engineered waste cells and associated environmental safeguards. A detailed delineation of responsibilities between the MCP and WFDCP is provided in Section 1.4.1.

1.1.2. Scope of this document

This WFDCP applies to the engineered waste disposal infrastructure and associated environmental management systems at the Sandy Ridge Facility. The scope of this document includes:

- Waste facility infrastructure – engineered cells, capping systems, leachate management features, and ancillary containment structures.
- Closure and rehabilitation measures – surface preparation, topsoil replacement, revegetation, and long-term stability works.
- Post-closure monitoring and maintenance – subsidence, vegetation, radiological performance, and surface water management, consistent with MS1234 Condition C4-2.
- Institutional Control Period (ICP) definition – the regulatory period following closure during which Tellus, and subsequently the WA Government, will remain responsible for ongoing monitoring, maintenance, and reporting, supported by financial assurance arrangements to ensure adequate funding of these obligations.
- Roles and responsibilities – delineation of Tellus and contractor responsibilities in closure implementation and compliance reporting.

The WFDCP does not address broader mine closure obligations relating to kaolin extraction and processing at the Sandy Ridge site. Those are described in the *Mine Closure Plan (MCP, SR-09-MPL-002)*. Cross-linkages between the MCP and WFDCP are provided in Section 1.4.1.

1.2. Key environmental factors

The Sandy Ridge Facility is subject to long-term closure obligations under MS 1234. In developing this WFDCP, the key environmental factors were identified in line with the EPA's Environmental Factor Framework (EPA, 2024) and through site-specific risk assessment. These factors represent the pathways by which closure activities could materially impact the environment or human health if not managed.

The selected factors—terrestrial environmental quality, human health, flora and vegetation, terrestrial fauna, inland waters, and air quality—reflect the Facility's waste profile, its arid climatic setting, and the outcomes mandated by MS 1234. Table 1-2 demonstrates how the EPA objectives for each factor are addressed, the relevant outcomes and conditions from MS 1234, and the potential direct and indirect impacts across operational, closure, and post-closure phases.

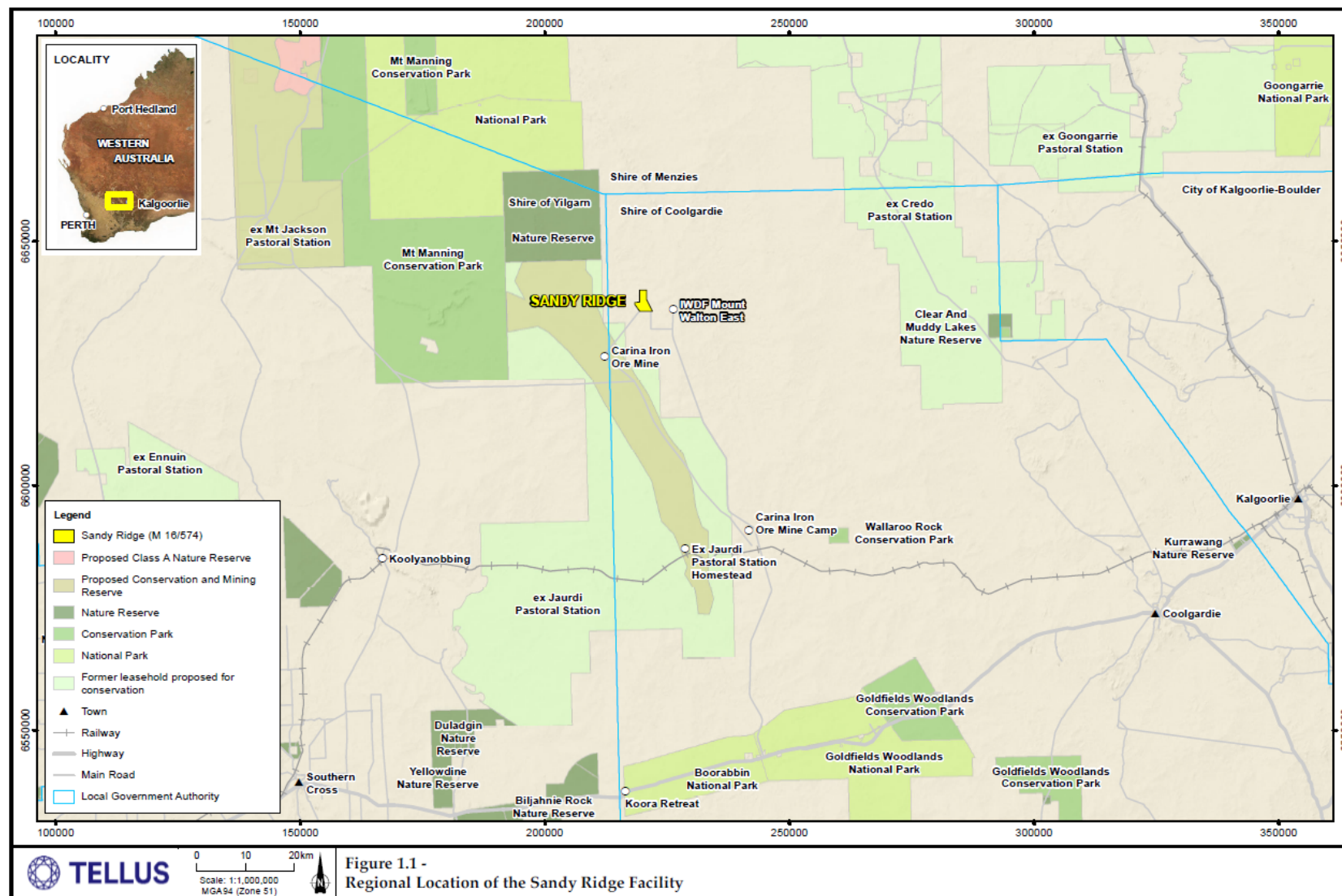


Figure 1.1 - Regional Location of the Sandy Ridge Facility

Figure 1-1 Regional location of the Facility

Table 1-2 Environmental Factors, EPA and MS1234 Objectives and Potential Impacts

Environmental Factor	EPA Objective	MS 1234 Outcome/ Objective	Potential Impacts		
			Operation	Decommissioning and closure	Post-closure
Terrestrial environmental quality	Avoid where practicable, or otherwise minimise, contamination of soil quality and soil pore water.	B1-1: Operate so that site is prepared to achieve B5-1 outcomes before institutional control. B1-2: Avoid where practicable, or otherwise minimise, contamination of soil and pore water.	Characteristics of wastes accepted; soil removal; potential spills/leaks.	Subsidence and instability of the waste cell	Long-term containment failure; potential contamination of soils/pore water.
Human health	Protect human health from significant harm.	Risks managed under MS 1234 Part B and Radiation/Work Health & Safety legislation.	Exposure to hazardous wastes during handling, disposal, or transport; accidental spills.	Risk of injury, death or chemical/radiological exposure through cell instability or collapse	Risk of injury, death or chemical/radiological exposure through cell instability or collapse
Flora and vegetation	Protect flora and vegetation so that biological diversity and ecological integrity are maintained.	B2-1: No adverse impact to <i>Banksia arborea</i> shrubland; limits on disturbance of priority flora (Table 1 MS 1234). B2-2: Minimise weeds, prevent fire, minimise fugitive dust.	Clearing of native vegetation and significant flora; weed introduction; dust emissions; fire risk.	Dust emissions during capping, altered hydrology, clearing of vegetation for capping, bushfires	Altered hydrology, bushfire, transpiration of leachate
Terrestrial fauna	Protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	B3-1: Avoid or minimise fauna injury/mortality; prevent increase in feral animal populations; maintain boundary fence/exclusion.	Vehicle and machinery collisions; fauna exclusion from habitat; attraction of feral animals, drowning in containment ponds, chemical exposure from waste handling activities	Risk of injury or death during decommissioning via vehicle interactions and instability/collapse from capping works	Risk of injury or death through cell instability/collapse
Inland waters	Maintain hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	B1-2 and B5-1(3): Avoid/minimise contamination of groundwater and surface water; ensure site is chemically and radiologically non-polluting in long term.	Leachate generation from direct precipitation, surface inflow, or liquid waste emplacement; runoff from surface storage.	Leachate generation due to cap failure or external recharge	Long-term leachate generation if cap performance degrades.

Waste Facility Decommissioning and Closure Plan

Environmental Factor	EPA Objective	MS 1234 Outcome/ Objective	Potential Impacts		
			Operation	Decommissioning and closure	Post-closure
Air quality	Maintain air quality and minimise emissions so that environmental values are protected.	B2-2(3): Minimise fugitive dust emissions.	Dust emissions generated due to vehicle movement, vegetation clearing, kaolin and topsoil stockpiles, waste handling	Dust emissions from capping material and disturbed surfaces	Dust emissions from exposed surfaces during extreme weather

1.3. Condition requirements

This Waste Facility Decommissioning and Closure Plan (WFDCP) has been prepared to comply with those conditions of Ministerial Statement 1234 (MS 1234), which govern closure, rehabilitation, and long-term environmental outcomes for the Sandy Ridge Facility.

The original WFDCP was developed under MS 1078 (Condition 12). It has now been reviewed and updated in accordance with Conditions B5-1, B5-2, C2-6, and C4-2 of MS 1234. These conditions establish the required outcomes, define the scope and format of the WFDCP, and set expectations for monitoring, modelling, and review.

This Plan also follows the WA EPA Environmental Management Plan (EMP) template (EPA, 2024) and draws on supporting detail from the Leachate Monitoring and Management Plan (LMMP), the Radiation Management Plan (RMP), and the Post-Closure Radiological Safety Assessment (PCRSA). Table 1-3 summarises the relevant MS 1234 conditions and identifies where each is addressed in this Plan.

Table 1-3 Conditions attached to MS 1234

Condition	Requirement	Where addressed
Rehabilitation and Remediation		
B5-1	The proponent must implement the proposal to ensure the following environmental outcomes are achieved: - Site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term, - Site is geotechnically and geomorphically stable in the long term, and - Site is chemically and radiologically non-polluting in the long term.	Section 2
B5-2	The proponent must review and update the <i>Sandy Ridge Facility – Waste Facility Decommissioning and Closure Plan (Version 4, 14 November 2022)</i> that demonstrates how achievement of the environmental outcomes in condition B5-1 will be monitored, substantiated, and satisfies the requirements of C4, and submit it to the CEO.	This document
C2-6	The proponent must revise the Plan required by condition B5-2 every five years unless otherwise advised by the CEO.	Section 5
C4-2	The environmental management plan required under condition B5-2 (This WFDCP) must contain provisions which enable the achievement of the relevant outcomes of those conditions and substantiation of whether the outcomes are reasonably likely to be met, and must include: - Rehabilitation, remediation and decommissioning targets; - specify appropriate completion criteria and performance indicators to ensure outcomes in condition B5-1 are achieved. - detail outcomes based upon completion criteria that would need to be quantitative or semi-quantitative; - provide appropriate mathematical environmental modelling, including landform evolution modelling, or projection techniques that are used to predict that the site would meet the outcomes of condition B5-1 in the long term; - specify monitoring to measure the effectiveness of remediation, rehabilitation and decommissioning actions against completion criteria, including but not limited to, parameters to be measured, baseline data, monitoring locations, and frequency and timing of monitoring; - an estimate of the liability represented by the site should it require closure when the revised environmental management plan is implemented; - actions that would need to be undertaken should the site require closure when the revised environmental management plan is implemented; and - the matters outlined in C4-2(6) and C4-2(7) must be reviewed by an independent person with suitable expertise.	Section 2.5

1.4. Rationale and approach

The WFDCP adopts a risk-based, outcome-focused framework that reflects the operating context of the Sandy Ridge Facility, the engineering controls in place, and the regulatory obligations under MS 1234. The approach is aligned with the WA EPA's 2024 EMP Template and Condition C4-2, providing a clear structure to demonstrate how closure outcomes will be achieved, monitored, and substantiated.

The Plan is designed to show how the EPA's objectives for key environmental factors (Section 2.2) will be met by focusing on three overarching outcomes:

- Physical safety of the public and non-human biota.
- Geotechnical and geomorphic stability of the landform.
- Chemical and radiological non-pollution of soil, air, and water.

To support these outcomes, the WFDCP sets out:

- Completion criteria and performance indicators.
- Quantitative and semi-quantitative closure outcomes.
- Environmental modelling, including landform and radiological assessments.
- A post-closure monitoring program.
- Financial assurance and independent review provisions.
- Baseline data and survey results that inform trigger criteria.

This framework ensures that closure and post-closure outcomes are measurable, achievable, and transparent, from progressive rehabilitation through to handover during the Institutional Control Period.

1.4.1. Interface with the Mine Closure Plan

Responsibility for closure activities is shared between the Mine Closure Plan (SR-09-MPL-002) and this WFDCP. The MCP addresses dismantling of operational infrastructure, while the WFDCP focuses on long-term safety, stability, and non-pollution of waste facilities. Table 1-4 summarises how responsibilities are divided between the MCP and the WFDCP.

Table 1-4 Elements of MCP and WFDCP for the Facility regarding decommissioning and closure

Physical elements	MCP	WFDCP
Class V/Class IV cell closure	×	✓
Mine void	✓	×
Material stockpiles	✓	✓
Water bores and pipeline	✓	×
Roof canopy	×	✓
Radioactive waste warehouse	×	✓
Accommodation camp	✓	✓
Class II Putrescible landfill	✓	✓
Internal roads	✓	✓

Access road	x	✓ ¹
Intractable Waste Disposal Facility (IWDF) access road borrow pits	✓	✓
Main infrastructure area:		
Front gate office and amenity building	x	✓ ¹
Waste inspection area	x	✓
Container hardstand – paved	x	✓
Container hardstand – unpaved	x	✓
Diesel fuel tank, piping reticulation and bowser	✓	✓
Waste laboratory	x	✓
Vehicle washdown pad and washdown treatment and storage system	✓	✓
Water treatment system	✓	✓
Contractors' offices, laydown yard and maintenance workshop	✓	✓
Water storage ponds	✓	✓
Sewage treatment system	✓	✓
Power station	✓	✓
Evaporation ponds (liquid waste)	x	✓
Flood levee	x	✓

¹ An access track, the office building and carpark will be retained for post-closure activities e.g. monitoring, short-term visits.

1.4.2. Survey and study findings

Between 2015 and 2021, a series of baseline investigations were undertaken at Sandy Ridge, including both independent consultant studies and Tellus-led monitoring programs. Baseline findings for hydrogeology, groundwater, soils, and radiation (gamma, dust, radon, thoron) are discussed below.

Baseline flora, vegetation, and fauna surveys are documented in the Flora and Vegetation Management Plan (FVMP) and the Fauna Management Plan (FMP). These datasets guide the management of key environmental factors during operations but are not directly relevant to closure outcomes. Accordingly, they are referenced here but not discussed further in this WFDCP.

1.4.2.1. Conceptual Hydrogeology

Independent hydrogeological investigations (Rockwater 2015; CyMod 2016, 2021, 2022; Geo9 2019) confirm that groundwater at Sandy Ridge is relict, hydraulically isolated, and highly restricted. Recharge is negligible under the prevailing semi-arid climate, and no regional aquifer has been identified.

Groundwater, where present, occurs only in small discontinuous pockets within granite basement lows, with extremely slow movement and residence times measured in hundreds of thousands of years.

These independent investigations are supported by standing water level monitoring conducted by Tellus since 2015, which has consistently shown stable conditions and the absence of recharge trends.

Together, these findings underpin the conceptual site model and provide confidence that the natural geological barrier system will continue to limit leachate migration during closure and post-closure periods. Further details are provided in the LMMP. A summary of key conceptual hydrogeological findings is provided in Table 1-5

Table 1-5 Conceptual hydrogeology baseline summary (2015–2022)

Attribute	Finding	Source / Notes
Aquifer presence	No regional aquifer; groundwater confined to isolated basement lows	CyMod 2016, 2021
Recharge	Negligible (<300 mm rainfall vs >2400 mm evaporation)	CyMod 2016, 2021
Connectivity	No lateral connectivity; isolated sumps only	Seismo-electric survey, Geo9 2019
Residence time	~400,000 years in the unsaturated zone	CyMod 2016
Flow potential	Extremely low; no evidence of mounding or lateral seepage	CyMod 2021, 2022
Kaolin bores	SWL typically 30–42 m bgl; water columns <10 m. Several bores including those adjacent Cell 1 remain permanently dry	Tellus monitoring
Granite bore	One deep granite bore, water column ~62m, chemistry similar to kaolin bores	Tellus monitoring
Silcrete bores	Typically dry; ephemeral water only after heavy rainfall, dissipates rapidly	Tellus monitoring

Closure relevance: The conceptual model confirms negligible recharge, no aquifer pathways, and minimal potential for leachate migration, supporting long-term containment confidence.

1.4.2.2. Groundwater quality

A targeted baseline groundwater quality program was undertaken between April and September 2020, with fortnightly sampling over six months. Six monitoring bores (five kaolin, one granite) were selected on the basis that they contained a sufficient water column (>1 m) and were located within 1 km of Cell 1. This dataset was used to establish site-specific trigger and threshold criteria, which have been applied in subsequent compliance monitoring. Results are summarised in Table 1-6. Further details of results and monitoring are presented in the LMMP.

Table 1-6 Baseline groundwater quality summary (2020–2021)

Analytical suite	Status	Notes
General chemistry	Background	Neutral to slightly acidic (pH ~6.5); brackish to saline similar across kaolin and granite bores.
Metals, nutrients, cyanide	Present / background	Metals consistently detected at levels reflecting natural geology; nutrients within expected background ranges; cyanide occasionally detected at very low levels.
Radionuclides	Present	Ra-226, Ra-228, Th-series, U-238, gross alpha/beta detected at low levels; consistent with NORM background.
Chlorinated/volatile organics	Not detected	PCBs, pesticides, BTEX, all below LOR
Minor organics (PAHs, TRH, PFAS)	Occasional detection	Low level detection, likely artefacts from bore installation and/or sampling

Closure relevance: These results establish closure benchmarks and confirm the absence of groundwater pathways near waste cells, supporting long-term containment confidence. Further details are provided in the LMMP.

1.4.2.3. Soils

Baseline soil investigations were undertaken in 2019 and 2020 to establish pre-operational conditions for the Sandy Ridge Facility and to support the development of trigger and threshold criteria. Approximately 210 samples were collected across the Crown Lease in April 2019 and approximately 50 samples along the Mt Walton Access Road and Facility Access Road in January 2020 (Landloch 2020). Analytical suites included heavy metals, radionuclides, asbestos, PFAS, PCBs, and inorganic parameters.

Results confirmed that soil quality was within guideline values, with no exceedances of NEPM HILs (Table 1-7). Elevated chromium and nickel relative to EIL-1 were attributed to natural geochemical variability of the local geology. All other analytes — including asbestos, PFAS, and PCBs — were below detection limits or well within guideline criteria, and radionuclide concentrations were consistent with background levels.

Soil quality is considered a poor indicator of leachate migration because surface soils are isolated from subsoils by an impermeable silcrete layer. However, soil monitoring provides a valuable check for localised impacts such as spills, dust deposition, or asbestos fragments, and establishes a baseline against which any future disturbance or contamination can be assessed. Further details are provided in Landloch (2020) and consolidated in the LMMP.

Table 1-7 Baseline soil quality summary (2019–2020)

Analytical suite	Status / outcome	Notes
Metals	Background / elevated	Chromium and nickel elevated in some locations vs. EIL-1; consistent with natural geology; no NEPM HIL exceedances.
Radionuclides	Background	Concentrations consistent with natural background.
Asbestos, PFAS, PCBs	Not detected	Below detection limits

Closure relevance: Soil monitoring provides baseline conditions and is useful for detecting potential surface impacts (spills, dust deposition, asbestos fragments), but is not considered a sensitive indicator of leachate migration due to the isolating silcrete layer.

1.4.2.4. Soil Moisture

A set of soil moisture probes were installed in the surficial soil profile in the centre of the mining area for future waste cells to provide reference data on baseline soil moisture behaviour. Five probes collected hourly soil moisture data over 16 months in 2021 and 2022 at depths ranging from 0.25 m to 1.25 m.

Results summarised in Table 1-8 show a clear seasonal cycle typical of the semi-arid climate at Sandy Ridge. Shallow probes (0.25–0.5 m) responded rapidly to winter rainfall, with sharp increases in soil moisture followed by drying during summer. Deeper probes (1.0–1.25 m) remained buffered and comparatively stable, with mean values between ~5–6% and overall variability constrained to 4–7%. Intermediate depths (0.75 m) showed moderate variability, transitional between shallow and deep behaviour.

The dataset confirms that soils in the upper 1–1.5 m exhibit short-term variability at shallow depths but long-term stability at depth, with no evidence of sustained increasing trends. This behaviour provides a reference envelope against which future cell cap moisture monitoring can be assessed (see Section 2.5.5.3).

Table 1-8 Sandy Ridge soil moisture data (2021-2022)

Depth (m)	Min (%)	Max (%)	Mean (%)	Observations
0.25	3.8	11.1	6.2	Moderate seasonal variation; clear winter–summer cycle.
0.5	5.4	16.6	7.4	Strongest seasonal fluctuation with peak values in winter
0.75	4.9	8.6	6.2	Reduced variability compared with shallower depths.
1.0	4.3	5.8	4.9	Stable profile, minimal seasonal variation
1.25	4.0	7.1	5.8	Slight variation, generally stable.

Closure relevance: Baseline data from shallow soils exhibit seasonal variability while deeper soils remain stable within a narrow range (4–7%). This establishes a benchmark envelope against which future cell cap moisture monitoring can be assessed.

1.4.2.5. Baseline radiation data

Tellus commissioned studies to establish radiological baseline conditions for the Facility prior to operations. These conditions were agreed with the WA Department of Water and Environmental Regulation (DWER) and the Radiation Health Unit, and monitoring was undertaken in accordance with Naturally Occurring Radioactive Material (NORM) guidelines published by the DMPE.

Baseline investigations included:

- Environmental gamma surveys over waste cell areas, waste management areas, and site access roads;
- Alpha activity of dust at fixed monitoring locations; and
- Radon and thoron at fixed monitoring locations.

Gamma radiation baseline

A site-wide gamma monitoring grid was established by Radiation Professionals (2019) covering approximately 217 hectares onsite and 140 km of access roads. Measured dose rates were consistent with typical background levels for the Perth Coastal Plain (0.05–0.19 $\mu\text{Sv/hr}$) and average levels for Australia. These levels do not pose a risk to human health or the environment.

A follow-up survey of the first waste cell (Radiation Professionals, 2020) confirmed similar results. Table 1-9 summarises baseline gamma survey results for the Facility.

Table 1-9 Baseline gamma survey results (2019-2020)

Area	Range ($\mu\text{Gy/hr}$)	Mean ($\mu\text{Gy/hr}$)	Notes
Overall mining area for future cells (100x100 m grid, n=272)	0.11 – 0.24	0.14	Consistent with Perth Coastal Plain background (0.05–0.19 $\mu\text{Sv/hr}$)
First cell (25x25 m grid, n=45)	0.13 – 0.30	0.18	Slightly elevated due to local geology; within natural background
Facility (50x50 m grid, n=139)	0.11 – 0.32	0.14	Within Australian average background
Mt Walton access, site and facility roads (1000 m intervals, n=107)	0.11 – 0.63	0.20	Occasional higher values along roads; still consistent with background

Closure relevance: Gamma dose rates were within natural background ranges, establishing a benchmark for assessing long-term radiological stability of the site.

Dust radiological baseline

Baseline dust monitoring was undertaken quarterly in 2019 and 2020 at seven fixed locations across the Facility, including the village, weather station, Facility boundary, and areas adjacent to the waste cells. Monitoring measured gross alpha activity in dust deposition, providing a direct indicator of radiological risk from airborne particulates.

Results confirmed very low alpha activity, generally close to or below detection limits, and consistent with background conditions. These baseline data establish the benchmark for future post-closure comparison. Quarterly operational data continue to be reported through the Facility's Annual Radiation Safety Report to DMPE and are therefore not duplicated in this WFDCP. Table 1-10 summarises baseline dust radionuclide concentrations.

Table 1-10 Baseline dust gross alpha activity (2019–2020)

Parameter	Range (min–max)	Mean	Notes
Alpha activity per dust monitoring station per quarter (Bq)	<0.008 – 0.069 ± 0.013	0.02	Most results close to or below detection; consistent with background
Dust per monitoring station (g/quarter)	0.065 – 0.85	0.35	Typical for semi-arid WA; elevated during construction
Alpha activity per unit dust (Bq/g)	0.025 – 1.06	0.21	Consistent with background; no health risk indicated

Closure relevance: Baseline dust monitoring confirms airborne radionuclide activity is negligible and consistent with natural background, providing a benchmark for long-term closure comparison and demonstrating no radiological health risk.

Radon and Thoron

Baseline radon and thoron monitoring was undertaken quarterly in 2019 and 2020 at the same seven fixed monitoring locations used for dust. Monitoring measured radon and thoron concentrations and exposures, providing a direct indicator of airborne radionuclide levels and potential inhalation dose.

Results confirmed that radon and thoron levels were consistent with natural background conditions for semi-arid Western Australia, with derived doses well below the public exposure limit of 1 mSv/y.

Table 1-11 summarises baseline radon and thoron concentrations and derived dose estimates.

Table 1-11 Baseline dust radionuclide concentrations (2019–2020)

Parameter	Range (min–max)	Mean	Notes
Radon concentration (Bq/m ³)	30 - 103	45	Consistent with background for semi-arid WA
Thoron concentration (Bq/m ³)	10 - 49	23	Within typical natural variability; influenced by soil thorium
Radon dose (mSv/y)	0.40 – 0.85	0.42	Below 1 mSv/y public dose limit; typical of Australian background
Thoron dose (mSv/y)	0.22 – 0.37	0.29	Below 1 mSv/y public dose limit

Quarterly operational monitoring continues in accordance with the Facility's Radiation Monitoring Plan, with results reported annually to DMPE through the Radiation Safety Report and therefore not duplicated in this WFDCP.

Closure relevance: Baseline radon and thoron monitoring confirms that airborne radionuclide exposures are consistent with natural background levels and well below public dose limits.

1.4.2.6. Baseline studies summary

The baseline studies undertaken between 2015 and 2021 establish a comprehensive understanding of the physical and radiological environment at Sandy Ridge. Hydrogeological investigations confirm negligible recharge and no aquifer pathways; groundwater quality monitoring provides closure benchmarks and demonstrates stability near waste cells; soil investigations confirm background conditions and provide a reference for localised surface impacts; and radiation monitoring confirms gamma, dust, radon, and thoron levels are consistent with natural background and well below health criteria.

1.5. Key assumptions and uncertainties

The key assumptions and uncertainties are:

- The extent to which climatic factors outside of Tellus's control, for example extreme weather events, may impact closure
- The extent to which social opinions outside of Tellus's control may impact closure
- The accuracy of baseline survey results
- The accuracy of ongoing monitoring data

1.6. Objective based EMP – risk-based approach

This WFDMP has been developed using a risk-based approach that outlines management provisions to minimise risks. An environmental risk assessment of the key environmental factors was undertaken for the Proposal, based on AS/NZS ISO 31000:2018. The risk significance is presented on a continuum of 'eliminated', 'low', 'medium', 'high' and 'extreme'. There are no extreme risks. Appendix B presents an assessment of the risks related to decommissioning and closure.

1.6.1. Raw risks

Raw risk levels are assessed as those that would exist without controls or mitigation measures. The risk assessment indicated the following high and medium-level raw risks associated with decommissioning and closure:

High risk:

- Bushfire during Stage 2 of the Institutional Control Period (ICP), where the Facility is maintained by the government

Medium risks:

- Hydrocarbon spill and soil contamination during decommissioning, caused by overturning of a truck or forgetting to drain hydrocarbon lines
- Bushfire during Phase I of the ICP, where the Facility is maintained Tellus
- Major earthquake with surface displacement, causing cracking of cap, water infiltration, and contamination plume
- Unauthorised access into the Facility and damage to cell cap, resulting in individual fauna falling into cell, or the cell becoming unstable and collapsing inwards
- Terrorist attack via plane crash or bombing of the cells, causing expulsion of waste and loss of integrity of the waste cell

- Subsidence of a waste cell allowing infiltration of water and the generation of leachate
- Erosion/gullies/deep rooted vegetation creating cracks in the clay capping, allowing surface water infiltration
- Failure of waste cell revegetation

1.6.2. Residual risks

Residual risk levels are assessed as those that remain once controls or mitigation measures are in place. Actions proposed to mitigate and manage the above risks are detailed in Section 2. The following medium-level risks remain post-mitigation:

Medium risks:

- Bushfire during ICP Stage 1
- Bushfire during ICP Stage 2
- Major earthquake
- Terrorist attack
- Failure of waste cell revegetation

1.6.3. Rationale for choice of indicators and/or management actions

The indicators and management actions for this WFDCP are based on two primary guidelines: the DEMIRS Mine Closure Plan Guidance (2020) and the International Atomic Energy Agency (IAEA) Guidelines for Disposal of Radioactive Waste (2011). In addition, the Institutional Control Period and revegetation framework are defined to reflect the specific requirements of Sandy Ridge.

1.6.3.1. Mine Closure Guidance

"Accordingly, this Plan applies the DMPE Guideline for preparing Mine Closure Plans (2025) as the overarching framework for determining indicators and management actions, noting this guideline now sits within DMPE's Mining Development and Closure Proposal (MDCP) and Approvals Statement Framework, which commenced on 9 September 2025. The guidance requires that:

'Mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geotechnically stable, geochemically non-polluting/non-contaminating and capable of sustaining an agreed post-mining land use (PMLU) with consideration for cultural values and without unacceptable liability to the state'.

This WFDCP provides semi-quantitative completion criteria, consistent with DMPE guidance, and will be revised as new data and technologies become available. The completion criteria have been developed to be:

- Specific – enough to reflect a unique set of environmental, social and economic circumstances.
- Measurable – to demonstrate trending towards analogue indicators; avoid unmeasurable terms like "significant"/"minimises".
- Achievable – attainable; often set to reflect analogue sites.
- Relevant – to outcomes/risks being managed; flexible to adapt without compromising outcomes.
- Time-bound – monitored over an appropriate time frame so results are robust for closure completion.

The completion criteria for this management plan have been developed from baseline data as mine closure planning for the Facility is in its conceptual phase at the time of writing.

1.6.3.2. International Atomic Energy Agency (IAEA) Guidelines

This Plan incorporates the IAEA Guidelines for Disposal of Radioactive Waste (IAEA, 2011). The primary goal of the disposal of radioactive waste is the long-term protection of people and the environment.

Key management controls include:

- Containment and shielding of radioactive waste
- Isolation of radioactive waste
- Preventing and controlling releases from the Facility
- Controlling access to the site
- Reducing the potential for conflicting surrounding use
- Developing the Facility in accordance with the safety case.

The attribute risk rating for each closure objective has been assessed as low, meaning risks are acceptable with standard management procedures and monitoring. This WFDCP and future revisions will:

- Enable transparent reporting and auditing through the Facility life.
- Define semi-quantitative completion criteria.
- Establish clear closure endpoints where the site can be considered “rehabilitated” by stakeholders.

1.6.3.3. Institutional Control Period

In accordance with MS 1234, the Institutional Control Period (ICP) commences only after final closure and decommissioning of the Facility. Operations (expected ~25 years) and decommissioning (~18 months) are therefore distinct from the ICP.

The ICP is defined as a 100-year period of post-closure management, implemented in two stages:

- ICP Stage 1 (20 years) – Tellus remains responsible for funding, implementing, and reporting on all monitoring and maintenance programs necessary to demonstrate that closure outcomes and completion criteria are being achieved.
- ICP Stage 2 (80 years) – Custodial responsibility for the site transfers to the State of Western Australia. The State assumes oversight and implementation of the agreed monitoring and maintenance programs, while Tellus continues to provide funding via the Trust Fund established under the Financial Assurance Deed.

Further detail on the ICP, including associated funding arrangements and monitoring programs, is provided in Section 3.

1.6.3.4. Revegetation

Cell caps will be revegetated as part of the closure phase of works. Each cell cap will be graded to promote surface water runoff to prevent rilling and loss of seedlings and topsoil. Vegetation in the capping layer will facilitate the store-and-release of rainwater and protect against erosion. Criteria for revegetation are included in this Plan.

2 EMP COMPONENTS

2.1. Alignment with Ministerial Conditions

This section describes the outcome-based components of the Waste Facility Decommissioning and Closure Plan (WFDCP), consistent with the EPA's Environmental Management Plan (EMP) template (EPA, 2024) and the requirements of Ministerial Statement 1234 (MS 1234).

Table 2-1 shows how the relevant conditions of MS 1234 are addressed in this Plan.

Table 2-1 Alignment of Environmental Outcomes with Monitoring & Management Measures

Condition	Requirement	Where Addressed
B5-1	Long-term environmental outcomes: (1) Site is physically safe to the public and non-human biota. (2) Site is geotechnically and geomorphologically stable. (3) Site is chemically and radiologically non-polluting.	Sections 2.2 - 2.5
B5-2	Review and update the WFDCP to demonstrate how the outcomes in B5-1 will be achieved, monitored, and substantiated.	This Plan
C2-6	Revise the WFDCP every five years unless otherwise advised by the CEO	Section 0
C4-2(1)	Define rehabilitation, remediation, and decommissioning targets	Section 2.5
C4-2(2)	Specify completion criteria and performance indicators	Section 2.5
C4-2(3)	Detail outcomes based on quantitative/semi-quantitative criteria	Section 2.5
C4-2(4)	Provide appropriate environmental modelling (e.g., landform evolution, radiation)	Section 2.5
C4-2(5)	Specify monitoring to verify achievement of outcomes	Section 2.5
C4-2(6)	Estimate closure liability for the Facility	Section 2.5
C4-2(7)	Define closure actions if the site requires closure during implementation	Section 2.5
C4-2(8)	Independent expert review of C4-2(6) and C4-2(7)	Section 2.5

2.2. Environmental Outcome 1 – Physical Safety of Public and Biota

This outcome addresses Condition B5-1 (1) which requires that the Site remains physically safe to the public and non-human biota in the long term.

Relevant EPA factors include:

- Terrestrial Environmental Quality
- Human Health
- Terrestrial Fauna

Environmental Outcome 1 ensures that the Sandy Ridge Facility remains physically safe for both the public and non-human biota over the long term, including during the Institutional Control Period (ICP). This requires managing risks associated with engineered waste cells, site access, and potential exposure pathways.

Key safety risks include:

- Subsidence or structural failure of capped waste cells.
- Unauthorised access or intrusion (accidental or deliberate) into the repository.
- Exposure to radioactivity and hazardous chemical constituents via air, soil, or groundwater.

Management approach:

- Engineered cell caps designed to provide long-term physical containment, verified through subsidence, erosion and moisture monitoring.
- Restricted access protocols and intrusion detection systems.
- Radiological monitoring of groundwater, soil, ambient radiation and airborne dust, aligned with the Radiation Management Plan and LMMP, as applicable.
- Targeted radiological soil monitoring during progressive cell closure, with a comprehensive radiological soil survey undertaken prior to facility closure and transition to the ICP.
- Ongoing verification through surveys, inspections, and post-closure assessments.
- Groundwater monitoring for chemistry and radionuclides (as detailed in the LMMP).

Verification:

Achievement of this outcome will be demonstrated through effective risk prevention, timely repair of any defects, and compliance with quantitative closure criteria. Monitoring is undertaken during operations to demonstrate compliance and build baseline trends, with a comprehensive soil survey undertaken prior to facility closure and transition to the ICP. Monitoring during ICP Stage 1 will confirm long-term containment, safety performance, and the absence of contaminant migration. Monitoring results will be consolidated and reported annually through the Compliance Assessment Report (CAR), in accordance with MS 1234 requirements.

Table 2-2 Environmental Outcome 1: Condition B5-1 (1)

Condition B5-1 (1) EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Human health; to protect human health from significant harm Terrestrial fauna; to protect terrestrial fauna so that biological diversity and ecological integrity are maintained Outcomes: The site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term Key environmental values: safety, soil quality Key impacts and risks: cell cap subsidence, radiation exposure						
Outcome-based						
Aspect	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
Cell cap stability	Subsidence	Trigger: >5% settlement of cell cap height survey (or as otherwise defined via detailed design of capping systems and associated Works Approval conditions) Threshold: >10% settlement of original cell cap height, confirmed through repeat survey (or as otherwise defined via detailed design of capping systems and associated Works Approval conditions)	Trigger: Undertake internal investigation of cause (e.g. settlement, construction defect, erosion). Implement corrective actions if required. Record in site environmental system and report in Annual CAR. Threshold: Immediate risk mitigated (e.g. cap repairs, local regrading, erosion control) as far as reasonably practicable utilising contingency stockpile of capping/regrading material maintained on site Notify DWER in accordance with MS 1234 Condition D1-2 (within 7 days). Implement corrective works to restore cap to approved profile. Monitor effectiveness of repairs.	Annual survey pickup and fixed photo monitoring for slumping, cracking, deformation, or ponding, consistent with Sections 3.5.5.1. Measurements of erosion of clay domes (surface geometry, location, depth) and any subsidence features (number and depth) will be recorded. Potential use of ground-penetrating radar, LIDAR, or seismic surveys if required.	Annually for first 10 years of capping, then every 4 years until the end of Stage 1 ICP.	During operations: Report potential non-compliance to DWER within seven days Annual Compliance Assessment Report Monthly Environment Report Radiation Safety Report Groundwater Monitoring Report Soil Monitoring Report During ICP Stage 1: Annual Compliance Assessment Report, consolidating post-closure monitoring results
	Erosion	Trigger: Erosion scour depth > 150mm	Trigger: Investigate cause (runoff concentration, surface grading, armouring). Repairs and/or erosion controls. Record in	Visual inspections with recording of number and depth of erosion scours; inspect following significant weather events.	Annually for first 10 years after capping, then every 4 years until the end of Stage 1	

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Condition B5-1 (1) EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Human health; to protect human health from significant harm Terrestrial fauna; to protect terrestrial fauna so that biological diversity and ecological integrity are maintained Outcomes: The site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term Key environmental values: safety, soil quality Key impacts and risks: cell cap subsidence, radiation exposure						
Outcome-based						
Aspect	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
		Threshold: Erosion scour depth > 300mm (or as otherwise defined via detailed design of capping systems and associated Works Approval conditions)	system and Annual CAR. Threshold: Mitigate immediate risk (regrade, repair, install erosion controls) as reasonably practicable. Notify DWER within 7 days. Implement corrective repairs and/or longer-term controls utilising contingency stockpile of capping/regrading material maintained on site. Verify effectiveness via follow-up survey.		ICP; ad hoc following significant weather events.	
	Moisture	Trigger: A sustained increasing trend over ≥6 consecutive months outside expected seasonal/background variability. Threshold: A sustained increasing trend over ≥12 consecutive months outside expected seasonal/background variability.	Trigger: Internal investigation into possible causes (e.g. rainfall anomaly, probe fault, localised cap compaction). Review and validate monitoring data. Report finding in Annual CAR (D2-1). Threshold: Immediate risk (if known) to be mitigated as far as reasonably practicable Notify DWER within 7 days of confirmation. Undertake targeted laboratory analysis of cap material and underlying soils to determine whether elevated	Soil moisture and temperature probes installed in the caps of Cells 1-3. Cell 1: one probe within each of the three engineered cap layers. Cells 2-3: one location per cap; with exact depths informed by Cell 1 results. Data capture: 24/7 electronic logging.	Operations: Quarterly data assessment for 10 years, or until probe failure (whichever is later) ICP Stage 1: Annual data assessment while probes remain functional.	As above

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Condition B5-1 (1) EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Human health; to protect human health from significant harm Terrestrial fauna; to protect terrestrial fauna so that biological diversity and ecological integrity are maintained Outcomes: The site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term Key environmental values: safety, soil quality Key impacts and risks: cell cap subsidence, radiation exposure						
Outcome-based						
Aspect	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
			moisture is associated with a contaminant plume. Implement remedial measures as appropriate based on the investigation findings. Engage relevant technical consultants to mitigation program (if required) with outcomes reported to DWER			As above
Radiological exposure	Groundwater radiation	Trigger: Radiological triggers according to LMMP Threshold: Confirmed exceedance of threshold presented in LMMP	Trigger Investigation cause (hydrogeology, waste history, incident linkage). Validate data. Run Rad 2 Suite as per LMMP. Record in site system and report in Annual CAR. Threshold response: Confirm exceedance and delineate spatial extent using surrounding bores. Mitigate any identified risk as far as reasonably practicable; notify DWER within 7 days of confirmation. Engage relevant technical consultants to develop mitigation program with outcomes reported to DWER	During Operations Per LMMP During ICP Phase 1: Per LMMP with the following modification: monitoring only at cell bores where sufficient water is present. Use a consolidated screening sample (per 3.5.5.4); if not clean, analyse individual bores to isolate the source. Analytical suite aligned to waste types disposed to the cell.	During Operations: 6-monthly. During ICP phase 1: Every 2 years	
	Soil radiation	Progressive cell closure: Trigger: 2 x background/control median Threshold:	Trigger response: Investigate cause. If practicable, remediate soil. Record in system and report in Annual CAR (MS 1234 D2-1).	Progressive cell closure: Targeted radiological soil monitoring of waste cell caps as part of the three-yearly LMMP soil monitoring program	Progressive cell closure: 3-yearly during operations, in accordance with LMMP.	

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Condition B5-1 (1) EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Human health; to protect human health from significant harm Terrestrial fauna; to protect terrestrial fauna so that biological diversity and ecological integrity are maintained Outcomes: The site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term Key environmental values: safety, soil quality Key impacts and risks: cell cap subsidence, radiation exposure						
Outcome-based						
Aspect	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
		Confirmed exceedance of 3 x background/ control median Facility pre-closure: Triggers and thresholds to be refined through future revisions of the WFDCP, taking into account the 2020 baseline and applicable radiological criteria.	Threshold response: Mitigate any immediate risk as far as reasonably practicable. Delineate the extent of the affected soils through additional sampling. Where contamination attributable to Facility operations is confirmed, excavate and dispose of affected soils to an appropriate waste cell where practicable, or implement another approved remediation method. Undertake validation sampling to confirm remediation effectiveness and notify DWER of the exceedance and corrective actions.	Pre-facility closure: Prior to commencement of ICP: Comprehensive radiological soil monitoring program consistent with 2020 baseline survey (Section 2.5.5.6)	Pre-facility closure: Comprehensive pre-closure radiological soil survey to be completed prior to transition to ICP.	As above
	Ambient radiation	Gross alpha (dust): Trigger: measurement beyond control measurement plus uncertainties; Threshold >1 Bq/g. Radon & daughter products: Trigger: PAEC >0.12 $\mu\text{l}/\text{m}^3$ Threshold: PAEC >0.60 $\mu\text{l}/\text{m}^3$.	Trigger: review sources / increase monitoring frequency. Threshold: Review exposure sources and apply respiratory protection as required.	Gross alpha activity (dust deposition); radon and thoron dosimeters at fixed monitoring locations, per RMP.	During operations: Quarterly During ICP Stage 1: Monitoring campaigns once every 4 years	

Waste Facility Decommissioning and Closure Plan

Condition B5-1 (1) EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Human health; to protect human health from significant harm Terrestrial fauna; to protect terrestrial fauna so that biological diversity and ecological integrity are maintained Outcomes: The site will be rehabilitated, remediated, and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term Key environmental values: safety, soil quality Key impacts and risks: cell cap subsidence, radiation exposure						
Outcome-based						
Aspect	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
Human safety	Physical access	Threshold: Intrusion detected	During Operations Immediate response from onsite staff followed by investigation During ICP Stage 1 Site visit to verify and investigate source of alarm/seismic detection. Further actions (e.g. repairs, reinforcement, regulator notification) implemented as required.	During Operations Continuous CCTV monitoring of private Mt Walton access road, site entry points and key infrastructure. During ICP Stage 1 Continuous seismic monitoring via perimeter ground sensors; alarms triggered and categorised through analysis software; supplemented by periodic site visits.	Continuous during both operations and ICP Stage 1.	

2.3. Environmental Outcome 2 – Geotechnical and Geomorphic Stability

This outcome addresses Condition B5-1 (2) of MS 1234, which requires that the Site remains geotechnically and geomorphologically stable in the long term.

Relevant EPA factor:

- Terrestrial Environmental Quality

Outcome:

Landforms constructed during closure—including capped waste cells and associated earthworks—remain stable over the long term, preventing erosion, subsidence, or structural failure that could compromise containment or environmental values.

Key risks include:

- Settlement or subsidence of capped waste cells.
- Erosion of cell caps caused by wind or water
- Failure of capping materials or landform design over time
- Failure of vegetation establishment, reducing erosion protection

Management approach:

These risks are managed through appropriate landform design, erosion monitoring, and revegetation of capped cells. Monitoring parameters, trigger and threshold criteria, and corrective actions relevant to this outcome are presented in Table 1-2 with further detail provided in Section 2.5.5 – Post-Closure Monitoring.

Key management measures supporting this outcome include:

- Verification of capping specifications, including compaction and domed landform profiling (Section 2.5.2).
- Annual erosion inspections, with a focus on identifying scours exceeding 300 mm in depth (refer to Section 2.5.5.2 – Erosion).
- Vegetation monitoring to ensure establishment of shallow-rooted species that stabilise soil and reduce erosion (refer to Section 2.5.5.7 – Vegetation Monitoring).
- Modelling of long-term landform behaviour, used to inform current and future design parameters (refer to Section 2.5.4 – Environmental Modelling and Figure 2-1 SIBERIA model 10,000-year results for long term landscape evolution of cells – Figure 2-2).

Verification:

This outcome will be verified through semi-quantitative closure criteria (e.g. erosion depth limits), site inspections, and modelling outputs, ensuring geotechnical performance remains within acceptable thresholds through to the end of the Institutional Control Period. Monitoring results will be consolidated and reported annually through the Compliance Assessment Report (CAR), in accordance with MS 1234 requirements.

Table 2-3 Condition B5-1 (2)

Condition B5-1 (2)	EPA factor: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Outcomes: Site is geotechnically and geomorphologically stable in the long term Key environmental values: soil quality, vegetation Key impacts and risks: cell cap subsidence, erosion, failure of revegetation					
Outcome-based						
Item	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
Cell cap stability	Subsidence	Refer to Table 3.2 (Environmental Outcome 1 – Physical Safety of Public and Biota) for detailed triggers, thresholds, response actions, monitoring and reporting requirements. These parameters are equally relevant to ensuring the Facility remains chemically and radiologically non-polluting.				During operations: Report potential non-compliance to DWER within seven days Annual Compliance Assessment Report Vegetation Health Report
	Erosion					
Cell cap revegetation	Vegetation establishment	Trigger: Vegetation cover or species composition not trending towards stable, self-sustaining level within an appropriate timeframe Threshold: Confirmed failure of vegetation to establish	Trigger: Investigate and remediate as required through infill seeding/planting, erosion control and/or weed management Threshold: Determine remedial actions with rehabilitation specialist. Report to DWER within 7 days.	Quadrat and/or high-resolution aerial imagery survey of rehabilitated cell caps to determine percentage cover and species composition.	Commencement: Begins 1 year after rehabilitation of each individual cell cap. Frequency: Annual monitoring for the first 3–5 years to assess establishment, then reduced frequency (e.g., 4-yearly) until completion criteria are achieved, in line with Section 3.5.5.7.	During ICP Stage 1: Annual Compliance Assessment Report, consolidating post-closure monitoring results

Note: Specific criteria for vegetation establishment will be provided in future revisions of the WFDCP, to ensure they are risk-based, practical for a semi-arid environment, and aligned with best practice.

2.4. Environmental Outcome 3 – Chemical and Radiological Non-Pollution

This outcome addresses Condition B5-1 (3) of MS 1234, which requires that the Facility remains chemically and radiologically non-polluting in the long term, including throughout the Institutional Control Period (ICP).

Relevant EPA factors:

- Terrestrial Environmental Quality
- Inland Waters
- Air Quality

Outcome:

The Sandy Ridge Facility will not cause unacceptable chemical or radiological pollution of air, soil, or groundwater. This ensures that no exposure pathways arise that could impact human health or ecological receptors.

Key risks:

- Potential for contaminant leaching from the repository to groundwater.
- Potential for airborne emissions of radionuclides or other particulates.
- Residual soil contamination from waste handling or storage activities.

Management Approach:

These risks are managed through an integrated program of monitoring, modelling, and site management, which include:

- Groundwater quality and standing water level (SWL) monitoring, including radionuclide testing, undertaken in accordance with the LMMP. During ICP Stage 1, monitoring incorporates consolidated screening samples, with individual bores analysed if triggers are exceeded.
- Air quality monitoring for radionuclides in dust (gross alpha), radon, and thoron, undertaken in accordance with the Radiation Management Plan (RMP).
- Soil quality sampling: chemical analytes assessed against HIL-D criteria where available (with 50% exceedance as trigger and 100% as threshold), and radiological parameters compared against baseline/control values.
- Radiological modelling and safety assessment, to predict long-term behaviour and validate assumptions.

Monitoring and response framework:

Trigger levels, thresholds, monitoring frequency, and corrective actions for this outcome are summarised in Table 2-4.

Verification:

Achievement of this outcome will be demonstrated by:

- Compliance with the trigger/threshold framework set out in the LMMP and RMP.
- Soil monitoring results remaining within HIL-D (chemical) and baseline (radiological) benchmarks.
- Groundwater monitoring confirming containment, with no sustained exceedance of LMMP thresholds.
- Air quality monitoring confirming radiological parameters remain within RMP limits.

- Long-term environmental modelling confirming pollutant transport remains negligible.

Monitoring results will be consolidated and reported annually through the Compliance Assessment Report (CAR), in accordance with MS 1234 requirements.

Waste Facility Decommissioning and Closure Plan

Table 2-4 Condition B5-1 (3)

Condition B5-1 (3)	EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Inland waters; to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected Air quality; to maintain air quality and minimise emissions so that environmental values are protected Outcomes: The site is chemically and radiologically non-polluting in the long term Key environmental values: air quality, soil quality, groundwater level and quality Key impacts and risks: radiation exposure, soil contamination, groundwater contamination					
Outcome-based						
Item	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
Air quality	Radiation (gross alpha in dust, thoron & radon)	Refer to Table 3.2 (Environmental Outcome 1 – Physical Safety of Public and Biota) for triggers, thresholds, response actions, monitoring and reporting requirements. These apply equally to Outcome 3 to ensure the Facility remains chemically and radiologically non-polluting.				During operations: Report potential non-compliance to DWER within seven days
Soil	Soil quality (chemical)	Trigger: Exceedance of 50% of relevant HIL-D criteria Threshold: Confirmed exceedance of 100% of HIL-D criteria	Trigger response: Investigate cause; validate data, remediation as required. Threshold response: Additional sampling to confirm extent of contamination. Removal and replacement of contaminated soil.	Risk-based targeted soil sampling, including metals and PFAS at a minimum, as required under LMMP Comprehensive pre-closure soil monitoring prior to transition to the ICP (Refer to 2.5.5.6)	3-yearly during operations. Prior to transition to ICP Stage 1.	- Annual Compliance Assessment Report - Radiation Safety Report - Groundwater Monitoring Report - Soil Monitoring Report
	Soil quality (radiation)	Refer to Table 3.2 (Environmental Outcome 1 – Physical Safety of Public and Biota) for triggers, thresholds, response actions, monitoring and reporting requirements. These apply equally to Outcome 3 to ensure the Facility remains chemically and radiologically non-polluting.				During ICP Stage 1: Provision of an Annual Compliance Assessment Report, consolidating monitoring results in accordance with MS 1234 reporting requirements (e.g., D1-2, D2-1).
Groundwater	Standing Water Level	Trigger: Rise in SWL of ≥0.5 m compared to previous reading. Threshold: Rise in SWL of ≥1.0 m compared to previous reading.	Trigger response: Investigate cause (rainfall anomaly, measurement error, bore integrity, localised recharge). Validate data (resample/QA checks). Threshold response:	SWL of kaolin and granite monitoring bores	During operations: 6-monthly (April & October) During ICP Stage 1: Every 2 years	

Waste Facility Decommissioning and Closure Plan

Condition B5-1 (3)	EPA factors and objectives: Terrestrial environmental quality; to maintain the quality of land and soils so that environmental values are protected Inland waters; to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected Air quality; to maintain air quality and minimise emissions so that environmental values are protected Outcomes: The site is chemically and radiologically non-polluting in the long term Key environmental values: air quality, soil quality, groundwater level and quality Key impacts and risks: radiation exposure, soil contamination, groundwater contamination					
Outcome-based						
Item	Parameter	Trigger and threshold criteria	Response actions	Monitoring	Timing/frequency of monitoring	Reporting
			Detailed investigation to confirm extent; engage hydrogeological specialist if required. Implement corrective management measures if a sustained rise is confirmed.			
	Groundwater quality (chemical)	Triggers and thresholds: As defined in LMMP	Response actions: In accordance with LMMP (e.g., investigation, validation sampling, escalation of analysis, corrective management).	During Operations Per LMMP. During ICP Stage 1: Per LMMP with the following modification: use a consolidated screening sample (per Section 3.5.5.4) from cell-adjacent bores with water present. If trigger exceeded, analyse individual bores to isolate the source.	During operations: 6-monthly (April & October) During ICP Stage 1: Every 2 years	
	Groundwater quality (radiological)	Refer to Table 3.2 (Environmental Outcome 1 – Physical Safety of Public and Biota) for triggers, thresholds, response actions, monitoring and reporting requirements. These apply equally to Outcome 3 to ensure the Facility remains chemically and radiologically non-polluting.				

2.5. Condition C4-2

Condition C4-2(1) requires that the WFDCP specifies rehabilitation, remediation and decommissioning targets to demonstrate how long-term closure outcomes will be achieved. These targets set the desired end-state for the Sandy Ridge Facility and provide the framework for developing completion criteria and monitoring provisions.

The targets in Table 2-5 define the key performance objectives for ensuring the site remains physically safe, geotechnically and geomorphically stable, and chemically and radiologically non-polluting in the long term.

Table 2-5 Condition C4-2

EMP Provisions
Condition C4-2 The environmental management plan required under condition B5-2 (this WFDCP) must contain provisions which enable the achievement of the relevant outcomes of those conditions and substantiation of whether the outcomes are reasonably likely to be met, and must include: 1. Rehabilitation, remediation and decommissioning targets; 2. specify appropriate completion criteria and performance indicators to ensure outcomes in condition B5-1 are achieved. 3. detail outcomes based upon completion criteria that would need to be quantitative or semi-quantitative; 4. provide appropriate mathematical environmental modelling, including landform evolution modelling, or projection techniques that are used to predict that the site would meet the outcomes of condition B5-1 in the long term; 5. specify monitoring to measure the effectiveness of remediation, rehabilitation and decommissioning actions against completion criteria, including but not limited to, parameters to be measured, baseline data, monitoring locations, and frequency and timing of monitoring; 6. an estimate of the liability represented by the site should it require closure when the revised environmental management plan is implemented; 7. actions that would need to be undertaken should the site require closure when the revised environmental management plan is implemented; and 8. the matters outlined in C4-2(6) and C4-2(7) must be reviewed by an independent person with suitable expertise.

This section addresses C4-2(1)–(8) in turn.

2.5.1. Rehabilitation, remediation and decommissioning targets

Condition C4-2 (1): Rehabilitation, remediation and decommissioning targets.

The targets in Table 2-6 presents the reporting requirements of Condition C4-2(1).

Table 2-6 Rehabilitation, remediation and decommissioning targets

Outcome	Targets
Site is physically safe to members of the public and non-human biota in the long term	– Radiation levels do not exceed levels approved in the Radiological Safety Case – Cell cap moisture levels demonstrate stabilisation within the range expected for the surrounding regolith, without sustained increases outside seasonal variability – Erosion scours in cell caps do not exceed 300 mm depth
Site is geotechnically and geomorphically stable in the long term	– Construct cell caps per regulatory approvals and licences – Compact barrier seal and key into silcrete layer – Implement compacted capillary break layer with graded top surface

Outcome	Targets
	– Construct domed cap with graded surface – Cell cap subsidence does not exceed 10% of the height measured at the time of cell cap installation (or as otherwise defined via detailed design of capping systems and associated Works Approval conditions). – Vegetation established on cell caps has shallow-rooted species composition, diversity, and foliar cover
Site is chemically and radiologically non-polluting in the long term	– Soil quality characteristics do not exceed the baseline levels summarised in Table 2.7 – Maintain groundwater quality within the criteria specified in the LMMP – Radiation levels do not exceed levels approved in the Radiological Safety Case

2.5.2. Completion criteria and performance indicators

Condition C4-2 (2): Specify appropriate completion criteria and performance indicators to ensure outcomes in Condition B5-1 are achieved.

The criteria and outcomes in Table 2-7 provide the completion criteria and performance indicators to address Condition C4-2 (2).

Tellus is in the early stages of closure planning and hence is not yet in a position to provide quantitative completion criteria. This Plan provides indicative completion criteria that are semi-quantitative where possible. As closure planning progresses, quantitative datasets will be prepared to inform completion criteria and performance indicators.

Table 2-7 Completion criteria and performance indicators

Environmental Outcome	Domain	Risk Pathway	Completion criteria	Monitoring / measurement
Site will be rehabilitated, remediated and decommissioned to ensure it is physically safe to members of the public and non-human biota in the long term.	Waste cells/ Facility	Failure or deterioration of engineered containment resulting in physical or radiological exposure to the public or non-human biota	Cell caps meet the applicable closure criteria and radiological exposure remains within the applicable closure criteria, including the public dose criterion specified in the Radiological Safety Case.	Cell cap survey and inspection and radiological monitoring, as detailed in the post-capping monitoring provisions of Section 2.5.5.
Site is geotechnically and geomorphically stable in the long term.	Waste cell caps	Subsidence, deformation, erosion or inadequate vegetation establishment compromises the integrity and long-term stability of capped waste cells	Cell caps conform to approved design; subsidence and erosion remain within the applicable closure criteria; and vegetation meets defined completion criteria, to be refined in future revisions of the WFDCP.	Survey and fixed-point photography of cap profile, settlement and deformation; inspection and measurement of erosion features; and vegetation monitoring using quadrats and/or high-resolution aerial imagery.
Site is chemically and radiologically non-polluting in the long term.	Soil	Contamination of soil from un-remediated emissions and/or via upward migration.	Soil quality meets the applicable closure criteria in line with baseline monitoring and/or Radiological Safety Case.	Detailed pre-closure soil survey of comparable extent to baseline. (In addition to 3 yearly soil targeted soil surveys during operations)
Site is chemically and radiologically non-polluting in the long term	Groundwater	Leaching or migration of contaminants from waste cells results in deterioration of groundwater quality	Groundwater quality does not exceed the applicable groundwater quality thresholds specified in the LMMP	6-monthly groundwater quality analysis during operations, including at closure.

2.5.3. Outcomes

Condition C4-2(3) requires that outcomes based upon completion criteria be detailed. These outcomes correspond directly to those already required under Condition B5-1 and are demonstrated through the completion criteria and performance indicators in Table 2-6 and Table 2-7. Collectively, they show that:

- The site will remain physically safe to members of the public and non-human biota in the long term;
- The site will remain geotechnically and geomorphically stable in the long term; and
- The site will remain chemically and radiologically non-polluting in the long term.

2.5.4. Modelling

Condition C4-2 (4): Provide appropriate mathematical environmental modelling, including landform evolution modelling, or projection techniques that are used to predict that the site would meet the outcomes of Condition B5-1 in the long term.

To demonstrate the long-term safety and stability of the Sandy Ridge Facility, Tellus commissioned multiple modelling studies. These include landform evolution modelling, development of a conceptual site model, and post-closure radiological safety assessments. Together, these tools provide evidence that the outcomes of Condition B5-1 will be achieved over both the Institutional Control Period (ICP) and the very long term.

2.5.4.1. Landform evolution modelling

Landloch (2016) undertook landform evolution modelling of the waste cell caps using the SIBERIA model to assess erosion risks and potential impacts to engineered caps over a 10,000-year timeframe.

Key findings were:

- The Facility's design of approx. 5-m-high cells (i.e. worst-case landforms) with approx. 3-degree batters, covered with deep layer topsoil, is predicted to remain erosionally stable over the very long term due to the topsoil permeability, arid climate, and gentle slope.
- Minimal changes are expected over 1,000 years, with less than 200 mm erosion from cell batter slopes and up to 500 mm deposition between cells.
- At 10,000 years, modelled landforms evolve from peaked crests and flat slopes to smoother, rounded profiles with no loss of cap integrity.

The original surface and predicted surface after 10,000 years is shown in Figure 2-1 and Figure 2-2.

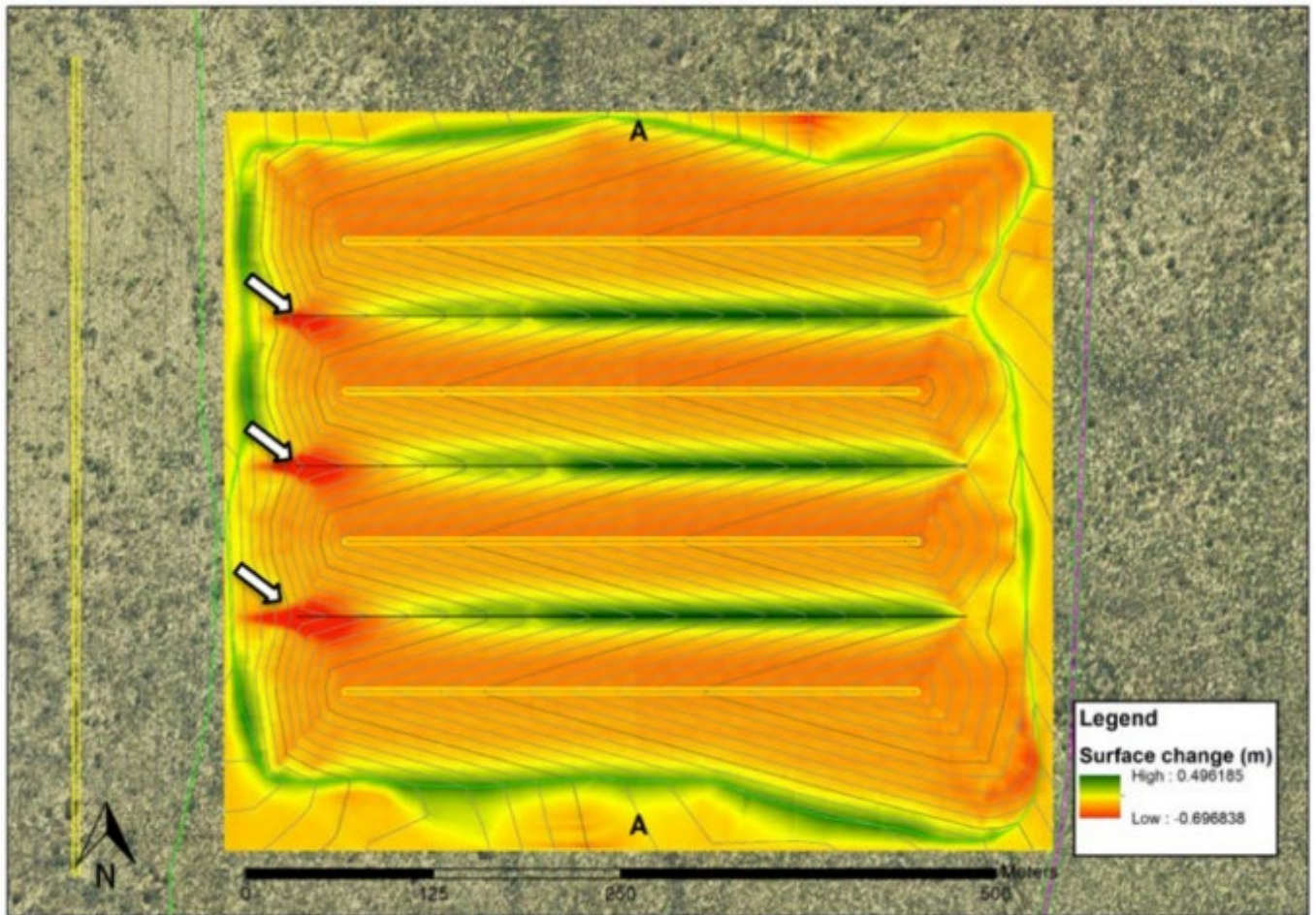


Figure 2-1 SIBERIA model 10,000-year results for long term landscape evolution of cells

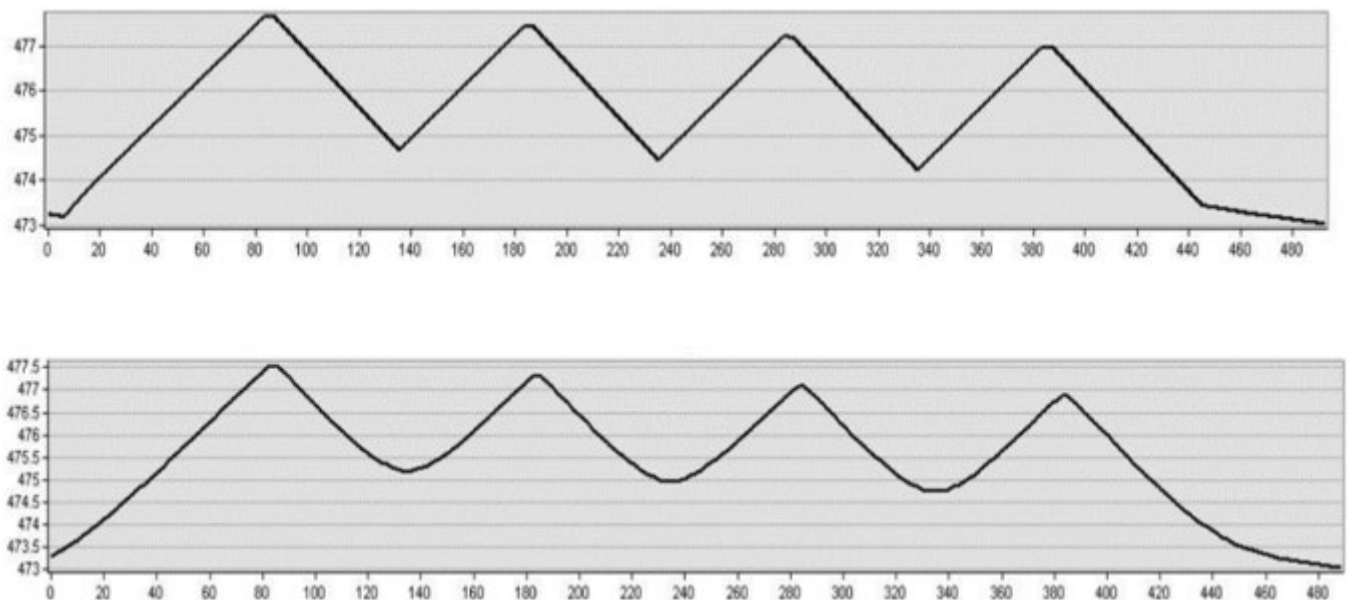


Figure 2-2 SIBERIA model results cross section for the original surface (top) and at 10,000 years (bottom). Axis in metres.

2.5.4.2. Site conceptual model post-closure

The Site Conceptual Model (CSM) (Figure 2-3) illustrates the expected post-closure condition of the Facility. Following successful rehabilitation with native vegetation, the landform will be returned to baseline levels and will incorporate permanent surface markers (monuments) to notify future populations of the prior use as a geological repository. Depending on final registration under the *WA Contaminated Sites Act 2003*, the markers may also reference potential hazards associated with disturbing the land.

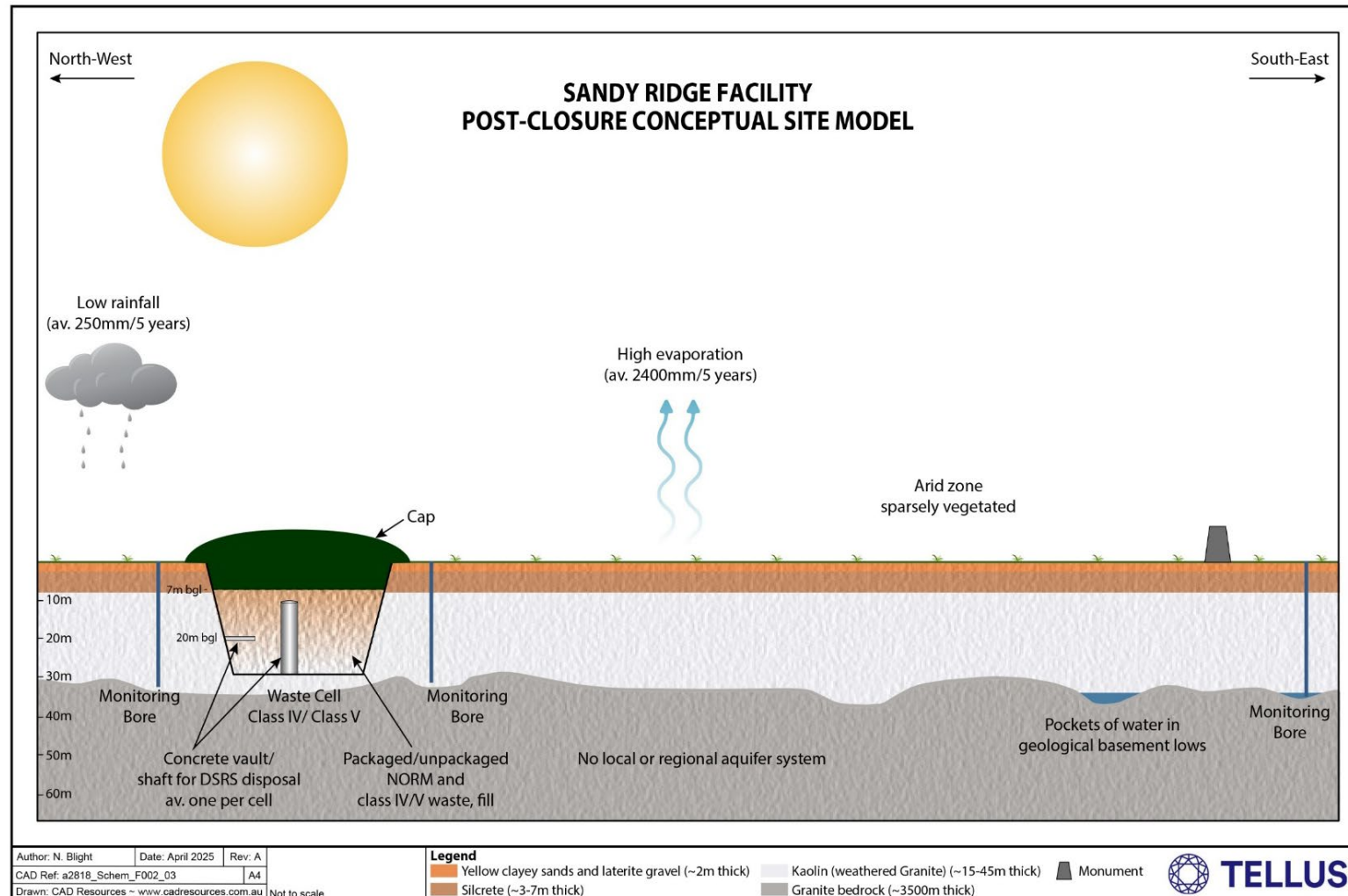


Figure 2-3 Site Conceptual Model during closure and post-closure of the Sandy Ridge Facility

2.5.4.3. *Post-closure radiological modelling*

Post-closure radiological modelling was conducted as part of the Post-Closure Radiological Safety Assessment (Blerk, Avila & Jaeschke, 2022). Scenarios included:

- Design Scenario – repository performs as intended.
- Defect Scenario – localised failure of engineered barriers.
- Facility Disturbance Scenario – deliberate human intrusion (e.g. drilling) post-ICP.

The assessment considered groundwater and gas release pathways, as well as drilling into waste. Modelling demonstrated that radiological safety will be maintained post-closure, with potential exposures remaining below the 0.3 mSv/year public dose criterion specified in the Radiological Safety Case.

Closure relevance: Landform evolution and radiological modelling demonstrate that engineered caps remain stable and exposures remain below regulatory dose limits over a 10,000-year period, providing assurance of long-term containment.

2.5.5. *Post-closure monitoring*

Condition C4-2 (5): Specify monitoring to measure the effectiveness of remediation, rehabilitation and decommissioning actions against completion criteria, including but not limited to, parameters to be measured, baseline data, monitoring locations, and frequency and timing of monitoring.

Monitoring commitments under Condition C4-2 apply at two distinct scales:

- Cell-scale monitoring (progressive closure): Commences once an individual cell is capped (with Cell 1 expected in 2027) and continues for a defined period to verify the early performance of engineered caps. Typical commitments include soil-moisture probes and early post-capping inspections, which provide proof of concept for the cap design.
- Facility-scale monitoring (post-closure/ICP): Commences after final facility closure and continues through the Institutional Control Period (ICP). These programs demonstrate long-term safety, stability and non-pollution across all closed cells, and include subsidence, erosion, groundwater and vegetation monitoring.

The monitoring commitments described in this section build on the operational triggers and thresholds defined in Sections 2.2–2.4. ICP Stage 1 monitoring will be implemented by Tellus during the first 20 years after final facility closure. ICP Stage 2 monitoring, to be undertaken by the WA Government, is not specified here; its scope and frequency will be determined at the transition point in accordance with the Financial Assurance Deed, the Contaminated Sites Act 2003 and the Radiological Safety Case (see Section 2.5.8).

2.5.5.1. *Subsidence monitoring*

Waste cell caps will be monitored to confirm they remain stable and retain the approved design profile. Subsidence monitoring begins at the time of interim capping for each cell and continues through operations and into the post-closure period. For most cells, the initial ten-year monitoring period will conclude before facility closure; however, cells capped late in operations will continue to be monitored into the Institutional Control Period (ICP).

During the first ten years after interim capping and before placement of topsoil and revegetation, monitoring will be undertaken annually. Once rehabilitation is complete, monitoring will continue every four years until the end of ICP Stage 1.

Indicators of potential subsidence include slumping of the cap, cracking or unusual deformation, and ponding or preferential flow paths that could result in rilling or erosion.

Monitoring methods include high-precision survey (using GNSS, total station or equivalent) to compare against the approved design profile, fixed-point photographs, and detailed logging of any subsidence

features. Event-based inspections will also be carried out after significant rainfall or wind events. Advanced diagnostic methods such as ground-penetrating radar, LiDAR or seismic surveys may be applied if more detailed investigation is required.

All survey data, photographs and field notes will be recorded in the site environmental management system. Subsidence will be reported both as percentage and absolute deviation from the approved design profile.

Routine maintenance actions include repairing significant cracks or rills and regrading local areas to restore the approved profile, with effectiveness verified at the next inspection.

Trigger and threshold values are consistent with Table 2-2. A trigger is defined as more than 5% settlement of the cell-cap height relative to the design profile. In this case, an internal investigation will be carried out to confirm the cause, validate the data and implement corrective actions. The issue will be recorded in the site system and reported in the Annual Compliance Assessment Report (CAR). A threshold is defined as more than 10% settlement of the original cell-cap height, confirmed by repeat survey. In this case, immediate risk mitigation will be undertaken (such as repairs, regrading or erosion control) and DWER will be notified. Corrective works will then be implemented to restore the cap to the approved profile and the effectiveness of the repairs will be monitored.

Closure relevance: Subsidence monitoring confirms long-term stability of engineered cell caps and ensures they continue to meet approved design profiles.

2.5.5.2. Erosion

Erosion monitoring will ensure that waste cell caps remain geotechnically stable and continue to perform as designed. Monitoring begins from the date of capping for each cell and continues through operations and into the post-closure period. For the first ten years after capping, annual inspections will be undertaken, after which monitoring will occur every four years until the end of ICP Stage 1.

Monitoring will concentrate on identifying erosion scours that may affect the integrity of the cap surface. The number, location and depth of scours will be recorded, supported by fixed-point photographs and survey data where required. Inspections will also be undertaken following significant weather events to capture any storm-related impacts.

Repair works, such as regrading or installation of erosion controls, will be undertaken where necessary to restore the approved profile. Monitoring results and any corrective actions will be documented in the site environmental management system and reported through the Annual Compliance Assessment Report.

Trigger and threshold values, and the corresponding response actions, are set out in Table 2-2.

Closure relevance: Erosion monitoring ensures that cap surfaces remain intact and protective, preventing rilling or gullyng that could compromise long-term performance.

2.5.5.3. Cell cap moisture

Moisture monitoring will be undertaken at the cell scale to assess the performance of the engineered cap system. Tellus will install soil moisture and temperature probes within the first three capped cells.

In Cell 1, three probes will be installed within the cap, each corresponding to one of the engineered layers defined in this WFDCP. In Cells 2 and 3, probes will be installed at a single location in each cap, with depth and placement informed by the results of monitoring in Cell 1. Probes will be installed within access conduits, enabling individual probes to be replaced in the event of failure without disturbance to the surrounding cap.

Monitoring data will be used to characterise moisture movement through the cap profile and verify that each engineered layer performs its intended function. Specifically, the data will verify that the cap layer promotes drying following rainfall events, the capillary break layer limits upward capillary movement, and

the sealing layer restricts downward infiltration. Together, these data will verify that the engineered barrier system performs as designed, providing proof of concept for the cap design.

Moisture and temperature data will be logged continuously (24 hours a day), downloaded and reviewed regularly. Monitoring will continue for a minimum of ten years from the commencement of monitoring, or until the probes fail, whichever is later. Failed probes will be replaced via the access conduit where practicable. Moisture levels in newly constructed caps are expected to be higher than surrounding in-situ regolith due to water applied during construction and compaction (CyMod, 2016). Over time, the caps are anticipated to dry under high evaporation rates, with moisture levels gradually returning to the natural range of local soils. These data will provide an important benchmark for verifying that the cap behaves as designed in the early post-capping period.

Trigger levels, thresholds and associated response actions for cap moisture are set out in Table 2-2.

Closure relevance: Moisture monitoring verifies that engineered caps limit infiltration and progressively equilibrate with natural background conditions, demonstrating effective long-term isolation.

2.5.5.4. Groundwater

Groundwater monitoring will be undertaken at the facility scale during ICP Stage 1 to verify that waste cells are not impacting underlying groundwater systems. Each capped cell will be surrounded by four monitoring bores, with one bore positioned on each side to ensure upgradient and downgradient coverage. Monitoring will occur every two years during ICP Stage 1. Monitoring commitments cover three elements: groundwater chemistry, radionuclides, and standing water levels (SWL).

Groundwater chemistry

Where cell-adjacent monitoring bores contain sufficient water, samples will be collected and analysed for chemical analytes, including metals, major ions, PFAS and other parameters listed in the LMMP. For efficiency, a portion of each independent sample will be composited into a consolidated sample for initial testing. If the consolidated sample returns results below trigger levels, no further analysis will be undertaken at that time. If results exceed triggers, the retained individual samples will be analysed to isolate the source of potential contamination.

Trigger levels, thresholds and associated response actions are set out in Table 2-2.

Groundwater radionuclides

If groundwater of sufficient volume is present in the cell-adjacent monitoring bores, samples will also be analysed for radionuclides in accordance with the LMMP. As with chemistry, a portion of each independent sample will be composited into a consolidated sample for initial screening. If the consolidated sample returns results below trigger levels, no further analysis will be undertaken at that time. If results exceed trigger levels, the retained individual samples will be analysed to isolate the potential source of contamination.

Trigger levels, thresholds and associated response actions are set out in Table 2-2.

Groundwater standing water levels

Standing water levels (SWL) will be measured in all monitoring bores at the same frequency as post-closure groundwater sampling (every two years). Measurements will be taken using water-level meters and referenced to Australian Height Datum (AHD). Where bores are dry, this observation will be recorded as a valid SWL result and retained to confirm the hydrogeological conceptual model.

Trigger levels, thresholds and associated response actions are set out in Table 2-2.

Closure relevance: Groundwater monitoring provides assurance that waste remains isolated from the environment and that groundwater resources are protected throughout the ICP

2.5.5.5. *Ambient radiological monitoring*

Ambient radiological monitoring will be undertaken during ICP Stage 1 to verify that airborne radionuclide exposures remain negligible. Monitoring campaigns will be conducted once every four (4) years and will include:

- Dust deposition gauges to measure gross alpha activity, providing a direct indicator of radiological risk from airborne particulates.
- Radon and thoron dosimeters deployed at fixed monitoring locations consistent with the Radiation Monitoring Plan (RMP), including Facility boundaries and areas adjacent to closed waste cells.

This program represents a less frequent continuation of the quarterly monitoring undertaken during operations in accordance with the RMP. Response actions, including investigation of elevated results, confirmation monitoring and implementation of corrective measures, are summarised in Table 2-2.

Closure relevance: ambient radiological monitoring provides assurance that airborne radionuclide exposures remain consistent with natural background and well below public dose limits.

2.5.5.6. *Soil quality*

Soil quality monitoring will apply to the closure of individual waste cells. Targeted sampling for chemical analytes and radionuclides will be undertaken every three years during operations at high-risk locations, such as cell caps, to confirm that no residual contamination has occurred. Trigger levels, thresholds and associated response actions for the three-yearly soil sampling campaigns during operations are set out in Table 2-2.

A final comprehensive soil monitoring campaign will be conducted during the transition from operations to ICP Stage 1. Results will be compared against the baseline soil database presented in Table 1-7, and where exceedances are identified, soils will be remediated as required to ensure compliance with the rehabilitation and decommissioning targets set out in Section 1.

Routine facility-wide soil monitoring is not required during ICP Stage 1, as potential contamination sources will have been removed once operations cease and all cells are permanently capped. Ongoing surface inspections for erosion or vegetation performance are addressed under other monitoring commitments in Section 5.

Closure relevance: Soil monitoring provides assurance that surface soils remain chemically and radiologically stable, with no long-term potential to pollute groundwater or impede rehabilitation success.

2.5.5.7. *Vegetation monitoring*

Vegetation monitoring will commence once individual cell caps have completed the ten-year subsidence monitoring period and have been reprofiled, topsoiled and revegetated. Methodologies will follow recognised guidance current at the time; this version of the WFDCP applies the EPA's *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016).

Monitoring of revegetated areas will be undertaken annually for the first three to five years to assess establishment success, then at a reduced frequency until completion criteria are achieved. Rehabilitation performance will be compared against two control sites, with trigger levels, thresholds and associated response actions set out in Table 2-2.

At the facility scale, vegetation monitoring will continue during ICP Stage 1 to confirm that rehabilitated areas remain stable and self-sustaining across all closed cells. Results will be reported in the Facility's Annual Environmental Reports to DWER.

Closure relevance: Vegetation monitoring demonstrates that rehabilitated cell caps establish and persist successfully in the long term, confirming that closure objectives for ecosystem stability are achieved.

2.5.6. Estimated liability of closure

Condition C4-2 (6): An estimate of the liability represented by the site should it require closure when the revised environmental management plan is implemented.

Condition C4-2(7): The matters outlined in (6) must be reviewed by an independent person with suitable expertise.

2.5.6.1. Overview

The Sandy Ridge Facility is underpinned by a State Government–approved Financial Assurance Framework designed to ensure that sufficient resources are available to meet decommissioning, closure, and post-closure obligations. The framework is established through:

- A Financial Assurance Deed (FAD), which requires Tellus to establish, fund, model, and audit a Trust Fund, and
- A Trust Deed, which establishes the Trust Fund, with the State of Western Australia as the beneficiary.

The Trust Fund is managed by an independent trustee. Tellus has provided an initial seed payment and makes annual contributions during operations. The Department of Planning, Lands and Heritage (DPLH) administers compliance with the FAD.

The Trust Fund ensures that the costs of long-term monitoring and management are not borne by taxpayers. Instead, all liabilities for the 100-year Institutional Control Period (ICP) are funded upfront by Tellus and independently verified. In accordance with Clause 8.1 of the FAD, the ICP Works Programme and Budget is reviewed and updated every three years, with costings adjusted for CPI. Each update is independently assessed and submitted to DPLH for approval to confirm adequacy of the Trust Fund.

2.5.6.2. Determining the appropriate costs

Cost estimates are developed for all closure and post-closure obligations relevant to this WFDCP. Activities captured in the separate Mine Closure Plan (MCP) are costed and funded under that plan to ensure no duplication or gaps.

The ICP financial model is updated every three years, independently reviewed, and re-approved by DPLH. This triennial cycle ensures that the Trust Fund remains sufficient in real terms over the Facility’s life cycle. The most recent update (2026) estimated the liabilities summarised in Table 2-8.

Table 2-8 Institutional Control Period (ICP) Estimated Liabilities (2026 values)

ICP Stage	Duration	Responsibility	Estimated Liability (AUD)
Stage 1 – Active Monitoring	20 years	Tellus (funded via Trust Fund)	~\$12.3 million
Stage 2 – Passive Monitoring	80 years	WA Govt. (funded via Trust Fund)	~\$8.4 million
Total ICP liability	100 years	Tellus (funding). WA Govt. custodianship	~\$21.0 million

ICP Stage 1 – active control monitoring period (20 years)

Within Phase I of the ICP, annual activities (also referred to as a Works Program) at the Facility include:

- Agreeing responsibility and resourcing
- Administration, planning, record keeping
- Public information - including up-to-date emergency services
- Monitoring, inspections, and site security
- Compliance and enforcement
- Repairs and maintenance
- Rectification and potential remediation contemplated under the EP Act

- Periodic reporting reviews during Phase I
- Contingency management

Tellus is responsible for carrying out all Stage 1 activities and funding them through the Trust Fund. Costings are updated every three years under the FAD and independently confirmed in accordance with Condition C4-2(7) before approval by DPLH.

ICP Stage 2 – passive control monitoring period (80 years)

Stage 2 covers the subsequent 80 years of the ICP, during which responsibility for the site transfers to the WA Government. Monitoring during this phase is expected to be reduced in scope and frequency, focusing on demonstrating long-term containment and stability. Potential activities include:

- Periodic groundwater surveys
- Radon gas monitoring
- Flora and fauna surveys
- Subsidence surveys
- Reduced-frequency environmental reporting and record-keeping

The 2026 ICP model estimated Stage 2 liabilities at approximately AUD \$8.4 million. These figures are also reviewed every three years and adjusted for CPI and other changes as part of the ICP Works Programme update, ensuring adequacy at the time of transition.

Flexibility of financial assurance structure

The assurance structure provides flexibility to cover issues or changes that may occur during the life of the Project. Should the periodic review of the documentation and analysis determine that additional funding is required, additional funding can be provided by Tellus into the Trust Fund to such that all appropriate costs can be met.

Should alternative financial structures become available or preferred by the State Government during the Project period, the structure provides mechanisms to enable such alternative structures, on the request of the State Government, to be implemented.

Transfer to state management during ICP

On completion of ICP Stage 1, and once closure criteria are achieved, Tellus will transfer responsibility for the Facility to the WA Government together with sufficient financial resources to support Stage 2. This reflects the principle that very long-term custodianship is most appropriately undertaken by Government, with full funding provision secured in advance.

2.5.7. Closure actions

Condition C4-2 (7): Actions that would need to be undertaken should the site require closure when the revised environmental management plan is implemented.

Closure actions are presented at two distinct scales:

- **Facility-scale closure actions** – covering decommissioning of infrastructure, progressive rehabilitation of the broader site, the transition into long-term institutional controls and provision for unplanned closure.
- **Cell-scale closure actions** – covering emplacement, interim and final capping, subsidence monitoring, soil replacement, and rehabilitation of individual waste cells.

Upon confirmation of compliance with applicable Federal and State laws and regulations, and once the certification and approval requirements of the closure objectives are met, the Facility will proceed through defined phases of closure as set out in Sections 2.5.7.1 (facility-scale) and 2.5.7.2 (cell-scale). Provisions for early or unplanned closure are addressed in Section 2.5.7.2.

2.5.7.1. Facility closure actions

Facility-scale closure actions describe the overarching steps required to transition the Sandy Ridge Facility from operations, through decommissioning, and into long-term institutional controls. These actions are structured around the three recognised phases of the Facility lifecycle (Table 2-9) and are designed to ensure that the site is progressively rehabilitated, safely decommissioned, and placed under robust long-term custodianship.

Phase I – Operations (25 years):

Progressive rehabilitation of waste cells occurs in parallel with waste emplacement. The WFDCP is reviewed and resubmitted at five-yearly intervals in accordance with Condition C2-6 of MS 1234, ensuring that closure planning remains aligned with operational performance. Environmental monitoring and routine maintenance of fencing and access controls are undertaken to demonstrate safe operations and inform future closure.

Phase II – Decommissioning (~18 months):

Following the completion of waste emplacement, the Facility will be decontaminated and prepared for permanent closure. This phase includes removal or decommissioning of supporting infrastructure (e.g., administration areas, weighbridge, water pipeline, waste processing infrastructure), management of residual contaminated materials, and backfilling and final capping of the last waste cells.

Phase III – Post-decommissioning (100 years):

Institutional controls are implemented to ensure long-term safety. ICP Stage 1 (20 years) will involve active monitoring by Tellus, including radiological, groundwater, soil, and vegetation programs, alongside inspections of fencing and drainage systems. ICP Stage 2 (80 years) will transition to passive controls, with permanent markers in place to reduce the likelihood of inadvertent human intrusion. Monitoring frequency will be reduced, with a focus on demonstrating the ongoing stability and safety of the closed Facility.

Together, these phases ensure that the Facility progresses from safe operations through systematic decommissioning into secure long-term stewardship

Table 2-9 Phases of decommissioning and closure

Phase	Timeframe	Description
Phase I – Operations	~ 25 years (may extend)	Waste emplacement, progressive rehabilitation, 5-yearly WFDCP reviews
Phase II – Decommissioning	~ 18 months	Decontamination, infrastructure removal, capping of final cells
Phase III - Post-decommissioning	100 years (ICP)	Active monitoring by Tellus during ICP1 (20 years) then passive controls during ICP2 by WA govt (80 years)

Additional activities during Phase I include environmental monitoring (Table 2-2), along with maintenance of fencing and access controls to ensure the Facility continues to operate safely. By the conclusion of Phase I, Tellus will have reviewed and resubmitted the WFDCP at five-yearly intervals in accordance with Condition C2-6 of MS 1234, ensuring closure planning remains current and aligned with operational performance. This ongoing process establishes a robust foundation for the transition into Phase II decommissioning and Phase III long-term institutional controls

Facility closure timeline

To estimate a closure timeline, Tellus has assumed operations will continue until 2049. The indicative milestones are shown in Table 2-10. Exact timing may vary subject to future approvals, but the sequence illustrates the expected transition from operations through progressive rehabilitation, monitoring, decommissioning, and final relinquishment.

Table 2-10 Indicative Closure Timeline and Milestones

Year of project	Year 1-25	Year 26-45	Year 36-45	Year 46
Current estimated year	2024-2049	2050-2059	2060-2069	2070
Progressive waste cell excavation and filling				
Progressive closure of waste cells				
Progressive rehabilitation				
Vegetation monitoring				
Cell cap subsidence monitoring				
Decommissioning of supporting infrastructure				
Mining tenements relinquished				
Completion criteria met				

Radiological closure

Closure of all LLW activities will be completed per licence conditions associated with the Facility's Site Registration under the WA *Radiation Safety Act 1975*. Compliance will be demonstrated against closure objectives to ensure that long-term radiological risks remain negligible and below public dose limits.

Long-term risks associated with radiation exposure are assessed in the Post-Closure Radiological Safety Assessment (PCRSA) for the Facility (Blerk, Avila, & Jaeschke, 2022). The PCRSA forms part of the overall Safety Case for the Facility. The Safety Case was prepared per ARPANSA RPS C-3 *Code for Disposal Facilities for Solid Radioactive Waste* (2018), which superseded the *Code of Practice for the near-surface disposal of radioactive waste in Australia* (NHMRC, 1992).

Waste facility decommissioning program and schedule

Decommissioning will occur during Phase II and focus on the safe removal, decontamination, or isolation of all supporting infrastructure and equipment. These works ensure no residual contamination remains and allow transition to long-term institutional controls.

Table 2-11 outlines the indicative program of decommissioning actions for major infrastructure at Sandy Ridge. Exact timing and scope will be confirmed with regulators at closure, but the processes provide a framework for achieving a safe, stable, and non-polluting site.

Table 2-11 Indicative Facility Decommissioning program

Aspect	Process
Administration building	Approaching the time for Facility handover to the State Government, a decision will be made by the relevant authority concerning whether the administration building, which will include bathroom and kitchen facilities, will be removed or remain for the government-managed portion of the ICP. The weighbridge and gate at the Facility entrance will be dismantled and removed. Internal parking and roads will be broken up, and bitumen disposed of in the Class II landfill within the Facility. Both areas will be spread with topsoil, deep ripped, and revegetated.
Water pipeline and associated infrastructure	Approaching the time for Facility handover to the State Government, a decision will be made by Tellus regarding whether the plastic water pipeline is removed and how it is removed or whether it is to remain in place. A section of the water pipeline traverses the ex-Jaurdi pastoral lease, and if removal of the pipeline is the chosen option, it will be discussed with DBCA to minimise impacts to the surrounding vegetation. The rehabilitation activities for the water pipeline route and footprints of associated equipment will include ripping the soil surface and seeding or planting with tube stock. The area may be fertilised

Waste Facility Decommissioning and Closure Plan

	per the requirements of the planted species. Equipment (pumps, tanks etc.) will be removed from the Facility.
Fences	All fences at the Facility will be taken down and removed at year 45, unless requested to remain by the State.
Radioactive waste warehouse	The radioactive waste warehouse will be decommissioned (all equipment removed) and the concrete pad removed and disposed of in the last waste cell, topsoil ripped, and vegetation established. Contaminated soils will be isolated in the final waste cell ahead of closure.
Removal of radioactive equipment	All equipment will be checked for the presence of radioactive contamination. If detected, the equipment will be assumed to be contaminated with constituents of hazardous waste that the equipment contacted. Contaminated equipment will be permanently isolated in the final waste cell ahead of closure.
Contaminated areas	Any contaminated areas or infrastructure will be placed in the final waste cell ahead of closure.
Equipment removal	All waste infrastructure and equipment will be removed from the Facility, either for offsite recycling and reuse, or disposed of into the final waste cell. Support and mobile equipment such as the ambulance, fire truck, portable offices, etc. will be removed from the Facility.

Decommissioning of any uncontaminated waste infrastructure will commence once the final waste cell is capped. Although the precise timing is subject to operational sequencing and regulatory agreement, an indicative schedule of major decommissioning and closure activities is provided in Table 2-12.

Decommissioning of uncontaminated waste infrastructure will commence once the final waste cell is capped. Although precise timing will depend on operational sequencing and regulatory agreement, an indicative schedule of major decommissioning and closure activities is provided in Table 2-12.

Table 2-12 Schedule of works for research purposes and the development of appropriate completion criteria

Activity No.	Activity	Activity schedule (years)							
		0	1	2	5	10	15	20	25
0	Commence research works program to determine appropriate completion criteria	✓							
1	Begin progressive waste cell closure activities		✓	✓	✓	✓	✓	✓	✓
2	Receive final volume of Class IV and Class V waste								✓
3	Remove, process / dispose of contaminated waste from storage areas								✓
4	Clean, demolish and dispose of container storage units								✓
5	Evaporation of evaporation pond liquids								✓
6	Remove, process and dispose of tank wastes								✓
7	Clean, dismantle and dispose of tanks								✓
8	Close remaining runoff collection ponds								✓
9	Clean and dismantle Waste Immobilisation Plant								✓
10	Clean laboratory building								✓
11	Demolish and dispose of laboratory building								✓
12	Implement surface soil sampling program								✓
13	Additional soil removal, sampling and analysis (if necessary)								✓
14	Remove / dispose of vehicle wash area								✓
15	Complete backfill of waste cell, and cap construction		✓	✓	✓	✓	✓	✓	✓
16	Decontaminate closure equipment								✓
17	Remove decontamination residues for waste cell disposal								✓
18	Begin post-closure care								✓
19	Complete final site survey plan								✓
20	Submit closure certification – demonstrating achievement of completion criteria								✓

Early closure – unplanned closure or suspended operations under care maintenance

The completion criteria in this WFDCA apply in the case of unexpected closure, as well as during temporary suspension of operations. In care and maintenance scenarios, it may not be possible to implement all closure actions to the extent required to meet completion criteria, but measures will be applied to ensure the site remains safe, stable, and non-polluting.

Kaolin mining is undertaken on a campaign basis to develop new cells and will be paused periodically as part of normal operational sequencing. Such pauses do not constitute care and maintenance, provided waste disposal continues.

Care and maintenance of the Facility applies only where waste disposal is suspended for an extended period, as follows:

- Waste disposal stops – Any partially open waste cell will be backfilled and capped, and active mining will cease. Kaolin overburden stockpiles will be placed in the final mine pit before backfilling, and no new pits will be opened.
- Both waste disposal and kaolin mining stop indefinitely – In this scenario, Tellus will implement the unplanned closure tasks outlined in Section 2.5.7.1.

Where kaolin stockpiles remain during care and maintenance, they will be managed to maintain stability and minimise erosion risk by:

- Backfilling into the final mine pit.
- Spreading over a larger area and grading to less than 10°.
- Re-spreading topsoil and establishing vegetation.

In the event that care and maintenance is triggered, Tellus will prepare a Care and Maintenance Plan in consultation with DMPE. The plan will identify high-priority risks, confirm appropriate mitigation measures, and set out any changes to monitoring or site management required to maintain compliance and environmental protection during the suspension period.

Unplanned closure may occur for a variety of reasons, including market, operational, or regulatory drivers. Where the Facility is placed on care and maintenance for a period exceeding three months, the following actions will be undertaken:

- Undertake an environmental audit to identify closure-related risks and outstanding tasks.
- Develop a detailed Care and Maintenance Plan in consultation with DMPE, addressing high-priority risks, confirming mitigation measures, and defining any changes to the monitoring program.
- Comply with safety obligations under Part 15 of the Work Health and Safety Act 2020, including notification of the relevant DMPE District Inspector.

Key actions at the commencement of an extended care and maintenance period will include:

- Removing waste oil and other hydrocarbon wastes from the Facility.
- Closing abandonment bunds around mine pits (if applicable).
- Maintaining essential services: the power station will remain operational with most generators powered down, supported by retained diesel storage for generators and vehicles.
- Notifying local communities, the Shire of Coolgardie, Shire of Yilgarn, City of Kalgoorlie–Boulder, and land managers (DBCA for Jaurdi Station).

The completion criteria defined in Section 2.5.1 will continue to apply in the case of unplanned or early closure, ensuring consistency of closure standards regardless of the timing or cause of closure.

Should unplanned closure become permanent, the approved WFDMP, MCP, and RMP will remain the governing documents for closure implementation and transition into the Institutional Control Period.

2.5.7.2. Cell closure actions

Cell-scale closure actions describe the progressive activities required to safely close individual waste cells throughout the operational life of the Facility. Each cell is managed as a self-contained unit, transitioning from excavation and emplacement through to final capping, monitoring, and rehabilitation. This progressive approach ensures that closure and long-term stability are achieved incrementally across the Facility rather than deferred to the end of operations.

Operational phase for each cell

The operations phase of each cell begins once excavation is complete and waste emplacement commences. Activities during this phase include, in accordance with the approved cap detailed design:

- Placement of Class IV, Class V wastes and (where applicable) radioactive wastes, with segregation and buffering as required by the Radiation Management Plan and Waste Acceptance Criteria.
- Progressive backfilling with kaolin or inert material to encapsulate wastes and eliminate voids.
- Interim capping in accordance with detailed design.
- Validation of construction and compaction against the approved cell design.
- Commencement of subsidence, cell cap moisture monitoring once the interim cap is in place

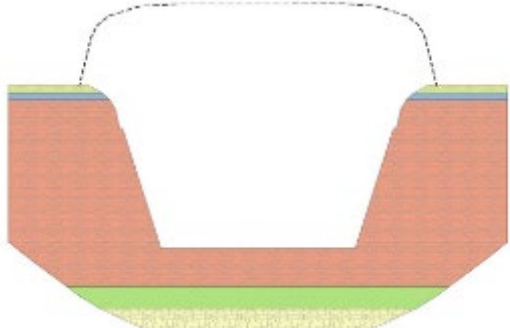
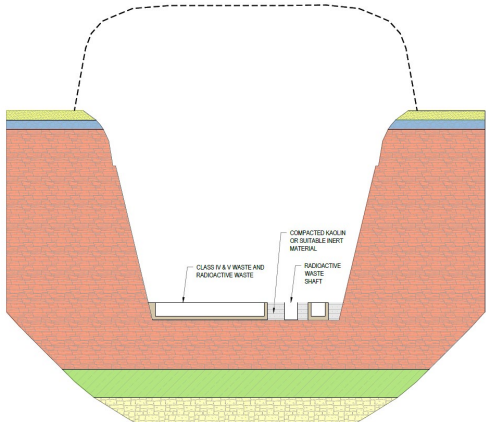
Each cell remains under a cell air dome (CAD) structure throughout this phase. The canopy is only removed once interim capping to ground level is complete.

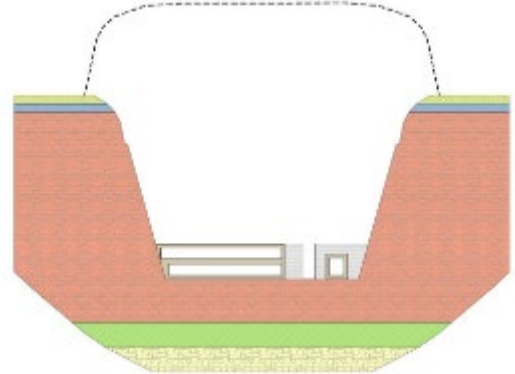
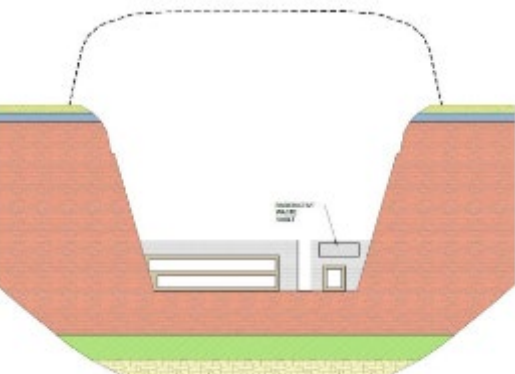
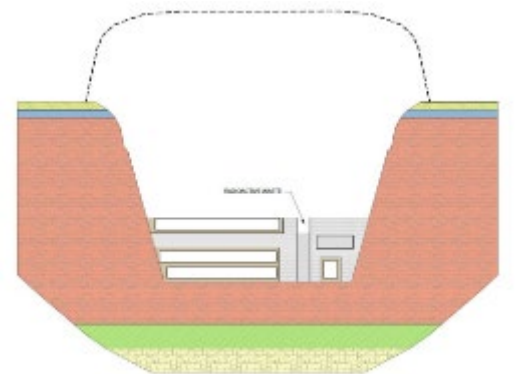
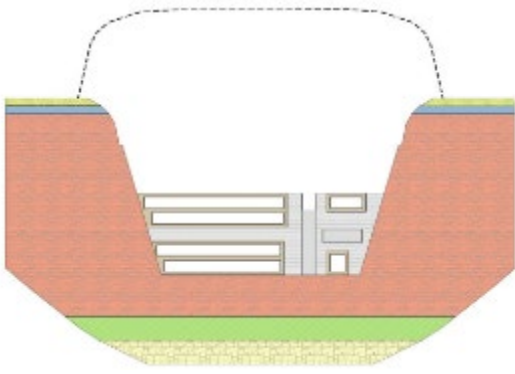
Closure of co-disposed Class IV and V waste and radioactive waste cells

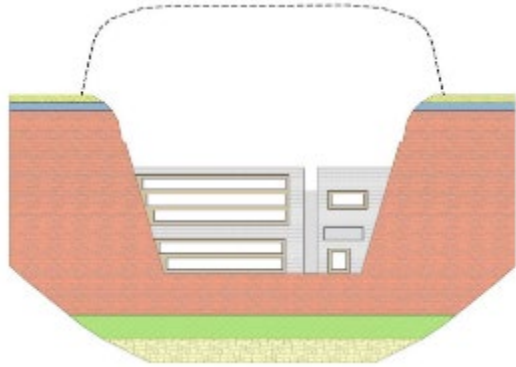
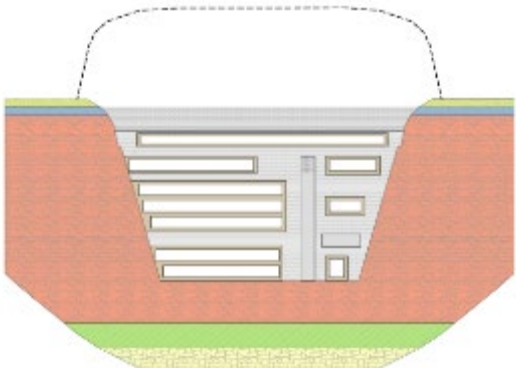
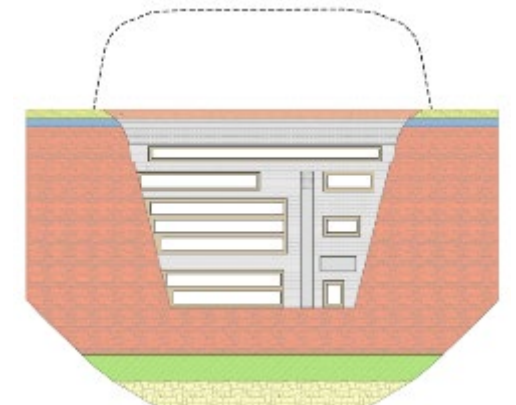
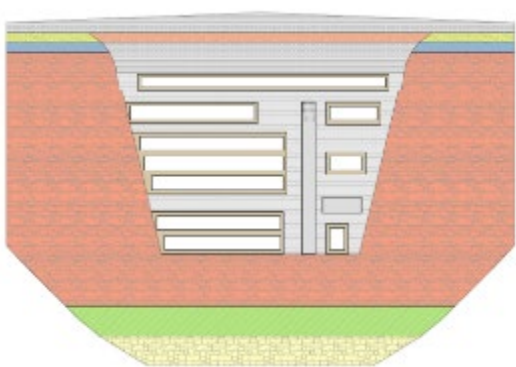
Each waste cell will be covered from excavation to closure via a roof canopy. The CAD will only be removed once a waste cell has been capped to ground level with kaolin clay.

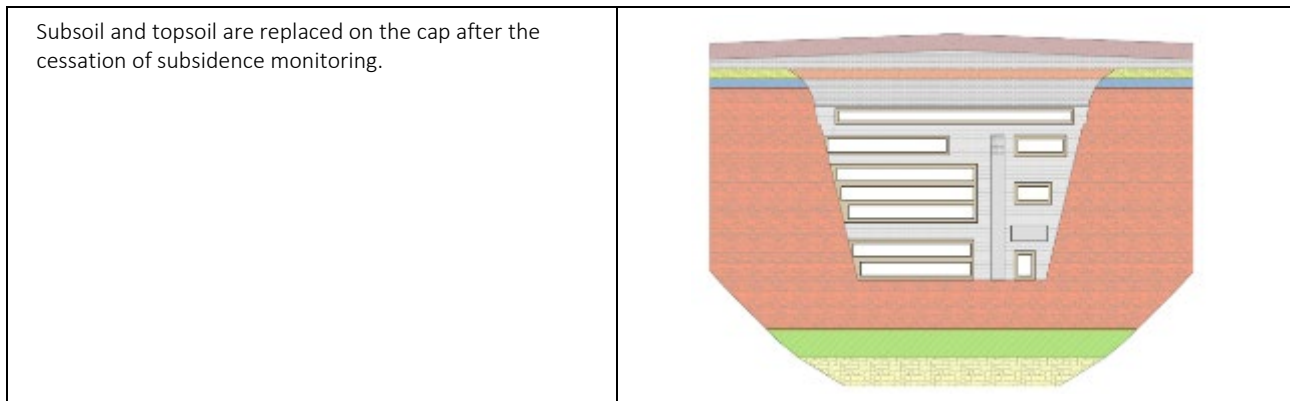
The capped surface of each waste cell will be domed, with an approximate 1 in 20 gradient depending on local topography, and have in place a layer of topsoil and subsoil to a height of approx. 5m above the surrounding land surface. The landform will be integrated with natural contours to the extent possible. Details of the closure process for each cell is outlined in Table 2-13.

Table 2-13 Closure of Class IV and V waste and radioactive waste cells

The bottom of the waste cell is at a minimum safe distance above the unweathered/fresh granite bedrock. This safe distance is determined from the reported drilling logs, hydrogeologic strata and groundwater monitoring data.	
A base layer of Class IV and V waste (including some types of radioactive waste) is placed on the floor of the waste cell. Incompatible wastes are segregated by internal compacted kaolin or other inert material. Granular material is backfilled between and around the waste packages to fill any air spaces. Some types of radioactive wastes are placed in 'shafts' or 'vaults', which are appropriately separated from other wastes in accordance with the Radiation Management Plan (RMP).	

A layer of compacted kaolin or other inert material is placed over the Class IV and V waste layer. Compaction testing would be carried out per appropriate Australian Standards to confirm material is compacted to the density required by the engineering design. The next layer of waste is placed on the compacted layer. The shafts for some types of radioactive waste may continue to be constructed.	
An appropriately thick kaolin or inert material layer is compacted onto the next Class IV and V waste layer, if waste of an incompatible type is to be placed immediately above, or if a radioactive waste vault is to be constructed.	
The next layer of Class IV and V packages are tightly placed on the previous layer and backfilled with granular material to exclude air pockets and voids.	
A layer of compacted kaolin or other inert material is placed over the Class IV and V waste layer. Compaction testing is carried out per appropriate Australian Standards to confirm material is compacted to the density required by the engineering design. The next layer of Class IV and V waste packages is placed on the compacted layer.	

An appropriately thick kaolin or inert material capping layer is compacted onto the next waste layer. Radioactive waste may continue to be lowered into the shaft.	
Further layers of waste are placed in the cell. A concrete lid is fitted onto the radioactive shaft, providing a minimum of 7 m distance between the top of radioactive waste and ground level. A 3 m thick low permeability barrier seal layer is placed on the deposited waste and concrete lids and is keyed into the surrounding geology. In accordance with the detailed design, the final waste and barrier layers will be domed to manage any subsidence.	
A domed capillary break layer consisting of compacted screened and graded silcrete and selected material, is placed on top of the barrier seal.	
The CADS is removed from the waste cell as remaining layers of capping material of the dome cap are placed over the cell. The final capping layer is formed of compacted kaolin material and placed in the form of a dome, to shed stormwater from the structure into perimeter V drains, which flow to a sump. The domal cap would have an approx. 1:20 gradient and be an approximate thickness of 2 m in the middle, thinning as it slopes to integrate into the landscape, in accordance with the approved detailed design. 10-year subsidence monitoring of the cap would commence.	



Progressive rehabilitation schedule

Waste cells will be progressively rehabilitated throughout operations. It is anticipated that nominally one waste cell will be completed and closed each year during the 25-year operational phase. Each cell will be:

- Monitored for subsidence for 10 years.
- Topsoiled and revegetated following confirmation of stability.
- Monitored for a further 10 years to confirm rehabilitation success.

At the end of the monitoring period, it is assumed that the completion criteria will be met. As per the schedule in Table 2-14, the first waste cell will be considered 'closed' in year 21 and the last waste cell will be considered 'closed' in year 45. Those waste cells in Table 2-10 that will continue to be monitored during the Post Closure Management Period are listed in italics. Note that this schedule is approximate only and that cells will be constructed as required.

Table 2-14 Approximate cell rehabilitation schedule

Cell 1	Backfilled and domed cap	Subsidence monitoring (10 years)	Topsoil replacement and vegetation establishment	Revegetation monitoring (10 years)	Predicted year completion criteria met
1	Year 1	Year 1-11	Year 11	Year 11-21	Year 21
2	Year 2	Year 2-12	Year 12	Year 12-22	Year 22
3	Year 3	Year 3-13	Year 13	Year 13-23	Year 23
4	Year 4	Year 4-14	Year 14	Year 14-24	Year 24
5	Year 5	Year 5-15	Year 15	Year 15-25	Year 25
6	Year 6	Year 6-16	Year 16	Year 16-26	<i>Year 26</i>
7	Year 7	Year 7-17	Year 17	Year 17-27	<i>Year 27</i>
8	Year 8	Year 8-18	Year 18	Year 18-28	<i>Year 28</i>
9	Year 9	Year 9-19	Year 19	Year 19-29	<i>Year 29</i>
10	Year 10	Year 10-20	Year 20	Year 20-30	<i>Year 30</i>
11	Year 11	Year 11-21	Year 21	Year 21-31	<i>Year 31</i>
12	Year 12	Year 12-22	Year 22	Year 22-32	<i>Year 32</i>
13	Year 13	Year 13-23	Year 23	Year 23-33	<i>Year 33</i>
14	Year 14	Year 14-24	Year 24	Year 24-34	<i>Year 34</i>
15	Year 15	Year 15-25	Year 25	Year 25-35	<i>Year 35</i>
16	Year 16	Year 16-26	<i>Year 26</i>	<i>Year 26-35</i>	<i>Year 36</i>

17	Year 17	Year 17-27	Year 27	Year 27-37	Year 37
18	Year 18	Year 18-28	Year 28	Year 28-38	Year 38
19	Year 19	Year 19-29	Year 29	Year 29-39	Year 39
20	Year 20	Year 20-30	Year 30	Year 30-40	Year 40
21	Year 21	Year 21-31	Year 31	Year 31-41	Year 41
22	Year 22	Year 22-32	Year 32	Year 32-42	Year 42
23	Year 23	Year 23-33	Year 33	Year 33-43	Year 43
24	Year 24	Year 24-34	Year 34	Year 34-44	Year 44
25	Year 25	Year 25-35	Year 35	Year 35-45	Year 45

Cap monitoring prior to rehabilitation

Each waste cell cap will be monitored for subsidence and erosion for the first ten years after final capping, prior to placement of topsoil and revegetation. The requirements for monitoring methods, frequencies, triggers, thresholds, and response actions are detailed in Section 2.5.5 and **Table 2-2**. This ensures domed caps remain stable, non-eroding, and within approved design parameters before rehabilitation proceeds.

Soil replacement

Following the 10-year cap monitoring period, subsoil and topsoil will be placed if geotechnical assessment confirms the cap is stable. If instability is detected, further monitoring or remedial works will be undertaken before soils are added.

The final revegetation layer soil profile will typically be up to ~1.7 m thickness at the peak of the dome, grading at ~3° to tie into the surrounding landform. Subsoil and topsoil would be used to make up the revegetation layer.

The soils used will be deep yellow sands, as described by Landloch (2015), and will provide nutrients and a medium for revegetation.

Topsoil management and placement:

- During operations, the performance of topsoil stockpiles (e.g., vegetation cover, soil properties) will be measured and annually in accordance with the Topsoil Monitoring Procedure.
- Where possible, fresh topsoil will be directly placed to maximise viability
- Topsoil from the first 10 cells will be stockpiled and managed to maintain a viable seed bank. These stockpiles may later be blended with directly placed soils for rehabilitation of Cells 16–25.

Fencing

Perimeter fencing around waste cells will be maintained from the operational phase through to the end of ICP Stage 1 (years 0–45). At the transition to ICP Stage2, fencing may be removed or left in place if requested by the State.

Fences will be subject to regular inspections, with maintenance undertaken as required. Additional inspections will be triggered following significant weather events to ensure ongoing integrity and effectiveness.

2.5.8. Closure monitoring and maintenance

2.5.8.1. Year 26 to 45 post closure

For the first 20 years of the Institutional Control Period (ICP Stage 1), post-closure management will remain the responsibility of Tellus. Assuming waste disposal is completed by Year 25, the status of project elements will be:

- Subsidence and cap erosion monitoring will be in progress for 10 cells until Year 35 (Section 2.5.7.2)
- Topsoil replacement will be in progress for 10 cells (Section 2.5.7.2)
- Vegetation monitoring until vegetation meets the completion criteria outlined in Table 2-7
- Most Facility infrastructure will have been decommissioned footprints rehabilitated, except for a small office and accommodation building, water tank, small generator set and small carpark/laydown area which will remain onsite until decommissioned (Section 2.5.7.2).

At the end of this period, Facility decommissioning will be handed over to the State Government. The Financial Assurance Deed contains the ICP Works Programme and Budget, which describes the activities that will occur in Phase I and Phase II of the ICP.

2.5.8.2. Handover to State Government

Handover to the State Government at the end of ICP Stage 1 will occur in accordance with the Financial Assurance Deed. The Crown Lease will be surrendered at the end of ICP Stage 1.

Stored electronic records will be transferred to state and federal archives, or a location agreed to by Tellus and the State Government.

2.5.8.3. Year 46 to 125

At Year 46, the Facility will have been handed over to the appropriate authority within the State Government. The State Government will complete the following activities during the remainder of the ICP:

- Continue radiation and groundwater monitoring of the Facility. Groundwater sampling frequency may reduce over time, but only in consultation with stakeholders
- Monitor for human intrusion events at the Facility
- Restrict public access to, or alternative use of, the Facility
- Maintain records of the wastes buried at the Facility
- Assess land use post-ICP to verify its compatibility with stored intractable waste.

2.5.8.4. Length of ICP

Institutional control is defined as the control of a former waste disposal site by the appropriate authority in order to restrict access to and use of the site and to maintain ongoing knowledge that the site has been used for the disposal of radioactive waste (ARPANSA, 2018). Whilst these guidelines specifically apply to radioactive disposal sites, Tellus contends the principles are broadly applicable to sites handling Class V hazardous material as well.

The ICP, as defined by ARPANSA (2018), is the period following the closure of the disposal facility, where public access to, or alternative use of, the site shall be restricted for a predetermined period. The ICP for Sandy Ridge is 100 years, as agreed by the State Government.

At the end of the ICP, the site may be cleared of any remaining fences and infrastructure used for monitoring, as determined by the State Government. Tellus will agree with the government on the appropriate level of site notification (if any) to remain following the end of the ICP.

3 ADAPTIVE MANAGEMENT AND WFDCP REVIEW

Continuous improvement aims to reduce impacts by embedding a cycle of monitoring, reporting, and implementing change (where required). The adaptive management approach involves adjusting management and mitigation measures through what is learned from:

- Evaluation of monitoring data
- Review of assumptions and uncertainties
- Re-evaluation of Project-related risks
- Increased understanding of the ecological regime
- External changes during the life of the Project

Continuous improvement of this WFDCP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets to identify opportunities for improvement. The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause of causes of non-compliance and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets

In accordance with Condition C2-6 of MS1234, the WFDCP will be reviewed and revised at least every five years, unless otherwise advised by the CEO. Revised versions of the WFDCP will be submitted to the CEO in accordance with the applicable requirements of Condition C2.

4 STAKEHOLDER CONSULTATION

A summary of the stakeholder and government authority consultation completed to date, which has informed the WFDCP, is presented in Table 4.1. Consultation will continue with the relevant stakeholders and government agencies as decommissioning and closure planning progresses.

Table 4-1 Stakeholder consultation summary

Stakeholder / Government Authority	Date	Summary
DMP Environmental Branch – Team Leader Minerals Kalgoorlie	May 2017	Meeting regarding issues raised in DMP’s submission on the PER, including consideration of a combined MCP and WFDCP. Closure planning remained separated.
Office of the EPA, DoL, DoH – RC, DMP, DER – Industry Regulation, Department of Finance – BMW	June 2017	DMA workshop on mechanisms for financial assurance, calculation of financial provisions, and monitoring during the ICP and post-closure transfer to the State. Subsequent technical meetings developed the financial provision mechanism for Sandy Ridge.
DWER EPA Services	June 2018	Meetings on development of Ministerial Conditions for the ICP and facility closure. Consultation informed the draft conditions, culminating in Ministerial Statement 1078, published 27 June 2018.
Radiation Council	2019	Meetings on operational and post-closure radiological safety and monitoring requirements, including baseline air quality, gamma emission and soil data, the ORSA and PCRSA, long-term safety assessment, and potential human intrusion scenarios.
DPLH	2019	Meetings, calls and emails on the draft WFDCP, closure risk assessment, post-closure monitoring and associated costs, including baseline soil conditions for post-closure comparison and erosion/subsidence monitoring. DPLH confirmed in December 2019 it had no further comments on the WFDCP closure objectives.
DMIRS	2019	Consultation on environmental and project risks during closure and post-closure, financial assurance, and budget allowances for ongoing monitoring, including soil, vegetation, erosion and subsidence.
State Solicitors Office	2019	Consultation on closure and post-closure planning matters, in parallel with engagement with DPLH, DMIRS and DoT.
Marlinyu Ghoorli Traditional Owners	2019-2021	Ongoing engagement on the Sandy Ridge Facility, including heritage protection and proposed future development, via the Project Relationship Committee.
DMIRS	June 2022	Meeting on the proposal to reduce the cell cap capillary break layer from 4 m to 1 m. DMIRS advised the matter was for DWER’s consideration, as DWER would become responsible for the cell on cessation of kaolin mining.
DPLH	June 2022	Meeting on the proposed reduction of the cell capillary break layer from 4 m to 1 m. DPLH advised it would seek advice from DWER on cap efficacy and provided written comments on the WFDCP for the next revision.
EPA/DWER	June 2022	Online meeting on the proposed reduction of the cell capillary break layer from 4 m to 1 m. EPA advised a section 43A

Stakeholder / Government Authority	Date	Summary
		application was required to amend the proposal referred to the EPA for assessment.
DoH Radiation Health Unit	July 2022	Meeting regarding the proposed reduction of the cell capillary break layer from 4 m to 1 m. DoH noted the proposed change.
DCCEEW	July-August 2022	Phone and email consultation regarding the proposed reduction of the cell capillary break layer from 4 m to 1 m. DCCEEW confirmed that the WA EPA would assess the proposed change and provide the outcome to DCCEEW.
DMIRS	2022 - 2023	Engagement with DMIRS regarding the Mine Closure Plan, approved 10 May 2023.
EPA	December 2024	MS1234 issued, requiring the 14 Nov 2022 WFDCP to be updated to meet its requirements, with confirmation that waste cap design specifications may be determined under Part V.
DMPE	November 2025	DMPE advised that any increase in disturbance area associated with cap beyond that approved in the current Mining Proposal would require an amended Mining Proposal (MDCP); that the proposed cap would be assessed as a waste rock landform; and that the amendment should reduce the existing pit area to 0 ha, transferring the disturbance area to the capping landform. Tellus confirmed the approved Mining Proposal and Mine Closure Plan specify that capping activities are not regulated by DMPE.
DPLH	November 2025	Tellus notified DPLH of proposed Cell 1 Capping works
DWER	July 2026	Draft Cell 1 capping works approval conditions issued to Tellus.
DoH RHU	August 2026	Meeting regarding the proposed reduction of the cell capillary break layer from 4 m to 1 m. DoH subsequently agreed in email exchange that design change has no impact on Safety Case, and new cap design is included in 2026 Safety Case Update.

4.1. Stakeholder identification

The stakeholders for Facility decommissioning rehabilitation and closure include internal and external stakeholders and are listed in 4.2.

Table 4-2 Facility decommissioning stakeholders

Internal Stakeholders	
The Tellus Board and Corporate Executive Facility Manager	
External Stakeholders	
Australian Government	Department of Climate Change, Energy, the Environment and Water (DCCEEW), formerly the Department of Agriculture, Water and Environment (DAWE)
WA Government	WA Minister for Environment and Climate Action WA Minister for Transport, Planning and Ports WA Minister for Housing, Lands, Homelessness and Local Government WA Minister for Finance, Aboriginal Affairs, Racing and Gaming, Citizenship and Multicultural Interests WA Minister for Health and Mental Health Department of Water and Environmental Regulation (DWER) Department of Planning, Lands and Heritage (DPLH) Department of Health, Radiation Health Unit (Radiological Council [RC]) Department of Mines, Industry Regulation and Safety (DEMIRS) Department of Biodiversity, Conservation and Attractions (DBCA) Department of Fire and Emergency Services (DFES)
Local Government	Shire of Coolgardie Shire of Yilgarn City of Kalgoorlie Boulder
Community	Coolgardie Southern Cross Kalgoorlie
Environmental interest groups	Conservation Council of WA Wilderness Society of WA
Adjacent landholders	Department of Finance, Building Management and Works – occupied of the Mount Walton East IWDF and associated access road

4.2. Future consultation

During the initial stages of Facility closure planning, Tellus will inform stakeholders of the closure plans for the Facility. Tellus will continue to consult with stakeholders during operations and closure of the waste cells. The purpose of communication and the method chosen will be evaluated following each engagement event and reflected upon during WFDCP reviews. The stakeholders for decommissioning and closure are listed in Table 4-2.

Table 4-3 Future consultation associated with the WFDCP

Stakeholder	Category	Topic	Timing
Marlinyu Ghoorlie Traditional Owners	Key stakeholder	Cultural heritage; closure and post-mining land use	Ongoing, regular scheduled engagement
DWER	Regulator	Decommissioning	As required
DWER	Regulator	Closure of Facility	As required
DWER	Regulator	Transition into ICP	As required
DPLH	Regulator	Transition into ICP; post-closure land tenure and management	As required
DMPE	Regulator	Decommissioning of waste infrastructure	As required
Radiation Council	Regulator	Post closure radiation monitoring	ICP
Shire of Coolgardie	Local government	Transition into closure	Ongoing and once closure dates are announced
Shire of Yilgarn	Local government	Transition into closure	Ongoing and once closure dates are announced
DCCEEW	Regulator	Decommissioning and closure	As required

5 CHANGES TO A MANAGEMENT PLAN

This WFDCP will be reviewed and revised periodically to demonstrate that it satisfies the requirements of MS 1234.

Complexity of changes	Minor revisions ☐		Moderate revisions ☐	Major revisions ☒
Number of key environmental factors:	One ☐		2-3 ☐	>3 ☒
Date revision submitted to EPA				
Proponent's operational requirement timeframe for approval of revision	< One Month ☐	< Six Months ☒	> Six Months ☐	None ☐
Reason for timeframe				
Item no.	WFDCP section no.	WFDCP page no.	Summary of change	Reason for change
1.	throughout	throughout	Alignment with MS 1234 and the EPA EMP template. The revision establishes clear linkages between closure outcomes, objectives and performance indicators; introduces an outcome-based monitoring and management framework with updated trigger and threshold criteria and response actions; clarifies monitoring requirements and interfaces with the LMMP and FVMP; and restructures the document to improve consistency and traceability. Further refinements have been incorporated following DWER review of the revised WFDCP.	To update the WFDCP from the requirements of MS 1078 to MS 1234 and incorporate feedback from DWER's review of the revised Plan dated 06 November 2025.

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APPENDIX A EXISTING STUDIES AND REPORTS

Aspect	Report title and author	Data available
Climate and weather observations	A weather station has been installed at the site and is operational. Daily and monthly data summaries are available to download from: www.weathermet.net.au	Weather observation data from May 2015 on: • Wind speed (maximum and average) • Average wind direction • Maximum peak wind gust • Relative humidity (maximum, minimum and average) • Air temperature (maximum, minimum and average) • Rainfall (total and maximum)
	Sandy Ridge Met Station Analysis (May 2015 – June 2021) (Northstar, 2021)	Summary of meteorological monitoring data collected from onsite automatic weather station between 7 May 2015 and 26 June 2021: 7 Wind speed and direction 8 Temperature 9 Precipitation 10 Monthly average conditions and summaries
Flora and vegetation	Sandy Ridge Project, Exploration Tenement E16/440 Level 1 Flora and Vegetation Survey (PGV Environmental, 2015)	11 Level 1 Flora and Vegetation Survey (desktop review)
	Sandy Ridge Project, Exploration Tenement E16/440 Flora and Vegetation Survey (PGV Environmental, 2016)	12 Level 2 Flora and Vegetation Survey (desktop review and field survey) 13 Sampling of 25 non-permanent 20 m by 20 m quadrats and several traverses through proposed road and water pipeline alignments
	Sandy Ridge Project Exploration tenement E16/440 Targeted Significant Flora Survey (Western Botanical, 2018a)	14 Targeted flora survey to determine the extent of <i>Calytrix creswellii</i> and <i>Lepidosperma lyonsii</i>
	Sandy Ridge Project IWDF Access Road Borrow Pit Sites Flora and Vegetation Survey (Western Botanical, 2018b)	15 Level 2 Flora and Vegetation Survey (desktop review and field survey) 16 Sampling of 25 non-permanent 20 m by 20 m quadrats and traverses through the proposed borrow pits
	Sandy Ridge Facility – Regional Priority Flora Search (Western Botanical, 2021)	17 Initial flora health monitoring program conducted by Western Botanical in 2019 identified a significant population of <i>Melichrus sp.</i> Bungalbin Hill (F.H. & M.P. Mollemans 3069) (P3) within the Facility 18 Western Botanical (2021) conducted a regional Priority Flora search with the aim of increasing the current knowledge and understanding of this species, along with any other significant flora species recorded in the region. This included desktop and field surveys.
	<i>Lepidosperma lyonsii</i> R.L. Barrett at Sandy Ridge – A report prepared for Western Botanical (Eubio Consulting, 2021)	19 Taxonomic assessment and comparison between specimens of <i>Lepidosperma</i> collected at the Facility against <i>L. lyonsii</i> . The purpose of the assessment was to confirm whether specimens collected at the Facility were the Priority species.
	Interim Flora and Vegetation Assessment for Tellus Holdings Sandy Ridge Operation (Western Botanical, 2022)	20 Detailed Flora and Vegetation survey 21 Sampling of 45 quadrat sites and opportunistic sightings and collections of flora or species of interest during traverses of the site.
	Detailed Flora and Vegetation Assessment for Tellus Holdings Sandy Ridge Operation (Western Botanical, 2022)	22 Detailed Flora and Vegetation survey 23 Sampling of 56 quadrat sites and opportunistic sightings and collections of flora or species of interest during traverses of the site.
Fauna	Level 1 Fauna Survey (Terrestrial Ecosystems, 2015)	Level 1 Fauna Survey (desktop review and reconnaissance survey)

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Aspect	Report title and author	Data available
	Targeted Malleefowl Survey (Bamford, 2016)	Historical Malleefowl mound locations
	Sandy Ridge Short-Range Endemic Invertebrates (Bennelongia, 2017)	Desktop review and field survey to assess potential impacts on SRE and listed invertebrate species
	Vertebrate Fauna Assessment of 14 borrow pits on Mount Waldon IWDF Access Road (Terrestrial Ecosystems, 2017)	Level 1 assessment of potential impacts and reconnaissance survey
	Sandy Ridge Borrow Pit Areas Short-Range Endemic Invertebrates (Bennelongia, 2018)	Desktop review to assess potential impacts on SRE and listed invertebrate species
	Targeted Malleefowl (Terrestrial Ecosystems, 2022)	Transect searches of a portion of the project area to record and document presence
	Fauna Assessment (Terrestrial Ecosystems, 2022)	24 Review of Terrestrial Ecosystems fauna survey database [includes WA Museum, Atlas of Living Australia (AoLA) to identify potential vertebrate fauna within the project area and surrounds 25 Review of DBCA listed Threatened and Priority species as recorded in NatureMap that are likely to occur in the project area and surrounds 26 Desktop search of the Commonwealth government's online database to identify fauna species of national environmental significance that are protected under the EPBC Act potentially occurring in the project area and surrounds 27 Review of previous fauna surveys conducted in the region and for Tellus Holdings 28 Discussion of the likelihood of EPBC Act and BC Act listed species being present in the project area
Soils	Sandy Ridge Facility – Soils Assessment (Landloch, 2015)	A baseline soils assessment (Landloch, 2015) was undertaken to characterise and quantify the soil resource within the DE. The baseline soils assessment included: 29 Desktop review of publicly available information including Geoscience Australia and Geological Survey of WA mapping, WA Department of Agriculture technical bulletins, and online journal articles 30 Field assessment, including excavation of four soil cells to 1.5 m below ground level (BGL) for collection of soil samples and logging of soil profiles 31 Physical and chemical analysis of collected soil samples and interpretation of results 32 Soil mapping
	Sandy Ridge Facility – Baseline Radiation and Metals Report E16/440, M16/540 (Terra Search, 2016)	A Baseline Radiation and Metals Report assessment covering E16/440 and M16/540 (Terra Search, 2016) was carried out as follows: 33 Review of an airborne magnetics and radiometrics survey that was flown in 1997 by World Geoscience Corporation 34 Review of rock chip sampling of the granite outcrop in the region, available from Geoscience Australia's OZCHEM database 35 Analysis of the exploration drilling at the Facility with a total of 312 assays available from the 2015 drilling program
	Sandy Ridge Landform Evolution Modelling (Landloch, 2016) and Addendum (2022)	A Landform Evolution Modelling (Landloch, 2016) assessment was carried out as follows: The main soil materials of the Facility had been previously assessed by Landloch Two models were used – WEPP and SIBERIA. The WEPP model was used to estimate long term erosion rates of the materials at typical batter configurations The SIBERIA landform evolution model was used to assess the long-term erosional durability of the waste facility design, and also assesses the operational bunds

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Aspect	Report title and author	Data available
		The baseline properties of the soil materials were assessed, and material characterisation completed Climate data (rainfall, temperature, humidity, wind speed, and direction) for the area was obtained from the Bureau of Meteorology (BoM) weather station at Menzies, located approximately 110 km to the northeast of the Facility. Climate data was also obtained from an Automated Weather Station set up within the Facility in May 2015
	Sandy Ridge Facility – Baseline Soil Audit (Landloch, 2020) and Addendum (2022)	A Baseline Soil Audit (Landloch, 2020) was undertaken for the Facility, Mt Walton Access Road and Sandy Ridge Facility Access Road. The assessment was carried out as follows: 36 Surface samples were collected 37 Testing included heavy metals, radionuclides, asbestos, PFSA and PBCs 38 The Facility sampling grid covered an area approximately 4 km by 5 km (2,000 ha). Sample spacing ranged from 250 m to 500 m 39 The Mt Walton Access Road and the Sandy Ridge Facility Access Road sampling covered ~100 km of road, with the distance between samples for the Mt Walton Access Road being ~2,500 m and for the Sandy Ridge Facility Access Road being ~900 m 40 Sampling results were compared with Environmental Investigation Levels and Health Investigations Levels 41 Each site was recorded using GPS-enabled table-based mapping package
Hydrogeology	Hydrogeological Studies for the Sandy Ridge Project Drilling, Permeability Testing and Potential Water Sources Report (Rockwater, 2015)	42 Desktop review of previous hydrogeological investigations 43 Drilling and Monitoring Bore Construction methodology 44 Monitoring bore permeability tests 45 Description of hydrogeology 46 Water Supply Assessment
	Soil moisture and temperature probes were installed in 2016 at two locations at Sandy Ridge. Data are measured and logged every 10 minutes (subject to revision)	Down-hole data on: 47 Soil moisture and temperature at depths to 1.25 m BGL 48 Opportunistic groundwater levels in monitoring bores
	Groundwater monitoring bores have been installed in 2015, 2016, and 2017 at multiple locations	Opportunistic baseline groundwater levels
	The Assessment of Long-term Recharge to Encapsulated Waste Isolation Cells – Sandy Ridge Project (CyMod, 2016) Hydrogeology Update for the Sandy Ridge Project (CyMod, 2021) Hydrogeological Update for the Sandy Ridge Project (CyMod, 2022)	49 Groundwater monitoring completed in the Kaolin Formation 50 Geophysical Survey undertaken by Geo9 51 Description of Material properties 52 Groundwater velocity 53 Infiltration and recharge rates
	Sandy Ridge Project – Seismoelectric and Electrotelluric Survey Report (Geo9, 2019)	Seismoelectric (ES) and Electrotelluric (ET) surveys were conducted in May 2019. The intent of the survey was to investigate the potential location of any groundwater on the site and identify any potential groundwater movement pathways away to the surrounding area
Hydrology	Sandy Ridge Kaolinite Project Surface Water Assessment and Management Plan (Rockwater, 2016) Sandy Ridge Kaolinite Project Surface Water Assessment and Management Plan: Addendum (Rockwater, 2016)	54 Surface Catchment Hydrology 55 Surface Catchment Runoff Hydraulics 56 Water Management Requirements

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Aspect	Report title and author	Data available
	Sandy Ridge Kaolinite Project Surface Water Assessment and Management Plan (Rockwater, 2022)	Update of the 2016 deliverable (Rockwater, 2016a) to cover any significant changes to rainfall since 2016
Geotechnical assessment of cell design	Report on Geotechnical Assessment Sandy Ridge Project Goldfields, (Douglas Partners, 2015)	57 Permeability of Compacted Iron Stained Kaolinised Granite and Kaolin Stream Waste 58 Compaction of Backfilling Materials and Backfilling Methodology 59 Capping Layer Compaction and Methodology
	New Waste Isolation Cells – Geotechnical Investigation Interpretive Report (CWM Geosciences, 2022)	60 Geotechnical investigation and slope stability analysis for the proposed waste isolation cells 61 Geophysical and test pit investigation 62 Geotechnical drilling investigation
Aboriginal heritage	Report on an Aboriginal Heritage Survey of Tellus Sandy Ridge Project (John Cecchi Heritage Management Consultancy, 2015)	63 Ethnographic background 64 Archaeological background 65 Survey methodology results
	Report on an Aboriginal Heritage Survey of Tellus Sandy Ridge Project – Addendum (John Cecchi Heritage Management Consultancy, 2022)	Further consultation with Aboriginal stakeholder groups involved in the 2015 heritage surveys was undertaken in January and February 2022
Characterisation of the clay capping material	Characterisation of the clay capping material from the Sandy Ridge Mine Site (Landloch, 2015)	Chemical and physical analysis of kaolin capping material
	Additional characterisation of stockpiled kaolin material for capping material (GHD, 2022)	Material characterisation of stockpiled kaolin overburden material for use as capping material
Air quality	Sandy Ridge Air Quality Impact Assessment (GHD, 2022)	66 An air quality assessment to evaluate the air quality impacts resulting from implementation of the Proposal 67 Deposited dust is monitored monthly for total suspended solids and is analysed for a suite of heavy metals and naturally occurring long-lived alpha activity 68 Air quality is analysed quarterly for Radon and Thoron and decay products
Radiological	Radiological risk assessment: fauna and flora (Hygiea Consulting, 2016)	An assessment was undertaken, with the intention of estimating the radiological effects that waste materials could have on the environment. This included all pathways of exposure, both during the period of operation and closure, with the view to demonstrate that potential radiological impacts were at an acceptable level of risk and manageable to safeguard fauna and flora. This assessment was undertaken using the Environmental Risk from Ionising Contaminants Assessment (ERICA) software tool.
	Sandy Ridge Facility – Baseline Environmental Gamma Radiation Survey of the Proposed Sandy Ridge Facility and Roadways (Radiation Professionals, 2019) Baseline Environmental Gamma Radiation Survey of the Proposed First Waste Cell (Radiation Professionals, 2020)	A baseline environmental gamma radiation survey of the Facility and access roads (Radiation Professionals, 2019) and of the proposed first waste cell (Radiation Professionals, 2020) were undertaken. The assessment was carried out as follows: - Measurements were recorded at each location, using a Radeye rate-meter with a large volume, energy compensated environmental Geiger-Muller tube (MC-71 probe). - Counts were recorded for a period of one minute, on three occurrences, to obtain an aggregate count, measured at one metre above ground. - The average counts at each location were used to determine the ambient gamma dose rate levels. - Locations were recorded using a Global Positioning System so that subsequent background radiation locations can be correctly compared, over time.

Aspect	Report title and author	Data available
	Sandy Ridge Facility – Radiological Safety Case (Tellus, 2022)	Tellus’ prepared a Radiological Safety Case for the Facility, that was supported by many of the detailed studies mentioned above. The Safety Case was prepared to support the submission of a Site Registration amendment application under the <i>Radiation Safety Act 1975</i> and Radiation Safety (General) Regulations 1983. The Safety Case has been submitted to the WA Radiological Council. As such, the Safety Case and many of the supporting documents (e.g., ORSA and Post Closure Safety Assessment) have not been replicated in this document

APPENDIX B RISK ASSESSMENT

Environmental aspect	Sources of risk (hazard)	Potential environmental impact (worst case)	Pre-treatment risk	Management and mitigation measures	Risk severity after treatment				
					Likelihood		Consequence		After treatment
Decommissioning of the site	Movement of plant and collision with fauna	Injury or death of Threatened/Priority fauna	Low 25	Speed limit <20km/hr	E	Rare	1	Insignificant	Low 25
Decommissioning of the site	Overturned truck/removal of tanks, forget to drain hydrocarbon lines	Hydrocarbon spill and soil contamination	Moderate 17	Front end loader onsite, clean up procedures, extent is limited by absorptive nature of the clay, presence of silcrete layer. Adequate planning of demolition. Education of contractors	D	Unlikely	2	Minor	Low 21
Fencing of the waste cells area	Exclusion of fauna from potential habitat	Forced translocation of fauna into other habitat and increased predation in new habitat. Potential for injury/death of Threatened/Priority fauna	Low 25	Removal of fencing following institutional control period	E	Rare	1	Insignificant	Low 25
Monitoring of the site	People accessing the site to complete monitoring	Accidental fire (e.g. cigarette butt) leading to loss of vegetation	Low 21	Education of contractors on fire prevention methods, vegetation is sparse and unlikely to be high fuel load	E	Rare	2	Minor	Low 23
Naturally occurring events	Bushfire at year 26	Injury or death of Threatened/Priority fauna. Damage or death of revegetation	Moderate 14	Fireback, drying climate, low fuel load	B	Likely	2	Minor	Moderate 14
Naturally occurring events	Bushfire during ICP	Injury or death of Threatened/Priority	High 10	Drying climate, low fuel load	B	Likely	2	Minor	Moderate 14

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Environmental aspect	Sources of risk (hazard)	Potential environmental impact (worst case)	Pre-treatment risk	Management and mitigation measures	Risk severity after treatment				
					Likelihood		Consequence		After treatment
		fauna. Damage or death of revegetation							
Naturally occurring events	Earthquake (minor – no surface displacement)	Slight subsidence of cell	Low 23	Multiple layer cap design, thickness and self-sealing ability of kaolin in capping layers; near surface geology and climatic conditions result in net upward water movement in top 6 m	E	Rare	2	Minor	Low 23
Naturally occurring events	Earthquake (major – with surface displacement)	Cracking of cap, water infiltration and contamination plume	Moderate 15	Multiple layer cap design; thickness and self-sealing ability of kaolin in capping layers; near surface geology and climatic conditions results in net upward water movement in top 6 m. Front end loaded to fix immediately	E	Rare	4	Major	Moderate 15
Naturally occurring events	Cyclones	Erosion of soils, and sedimentation on revegetation	Low 25	Establishment of vegetation outside of cyclone season as far as practicable	E	Rare	1	Insignificant	Low 25
Unauthorised access to the Facility	Unrestricted public access (e.g. holes in fencing) and inadvertent deep excavation/drilling into the Cell for mineral exploration	Injury or death of individual fauna by falling into cell containing chemical waste, cell becomes unstable and collapses inwards	Moderate 15	Perimeter fence. Signage. Movement detectors positioned at the waste cells	E	Rare	3	Moderate	Low 20
Terrorist attack	Plane crash, bombing of the cells	Expulsion of chemical and radioactive waste from the cell to the surface and into the atmosphere	Moderate 15	Movement detectors positioned at the waste cells, remoteness of the Facility, depth of cover (i.e. 4 m of capping layers before waste package layer), low incentive, and consequence to efforts scale poor	E	Rare	4	Major	Moderate 15

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Environmental aspect	Sources of risk (hazard)	Potential environmental impact (worst case)	Pre-treatment risk	Management and mitigation measures	Risk severity after treatment				
					Likelihood		Consequence		After treatment
Unplanned explosion during decommissioning	Diesel fuel tank and piping reticulation	Degradation of air quality (localised). Death/injury of fauna within the vicinity of the blast zone or in the path of the fire	Low 25	Adequate planning of demolition. Education of contractors	E	Rare	1	Insignificant	Low 25
Introduction of weeds	Incoming vehicles to monitor the site	Establishment of weeds on the site and competition for resources (e.g. water) with native vegetation	Low 21	Inspection/brushdown of exterior of vehicle before entering site. Brushdown of vehicle between revegetation areas. Weed removal where they become established	E	Rare	2	Minor	Low 23
Handling and storage of chemicals	Chemical spill during operations that was not remediated	Soil contamination	Low 21	Contaminated sites assessment at closure. Remediation of affected soils or disposal into waste cell for isolation	E	Rare	2	Minor	Low 23
Vegetation growing on domed clay cap (during subsidence monitoring period)	Plant roots, permeability pathways created	Potential penetration of roots into waste cell, water infiltration into the cell, plume of contamination releases which could affect flora and vegetation	Low 21	Thickness of all capping layers. Kaolin is a poor growth medium, regular monitoring and removal of vegetation that does grow during 10-year subsidence monitoring. Post-subsidence monitoring revegetation using shallow-rooted species in overburden layer	E	Rare	2	Minor	Low 23
Failure of waste cell containment, cell instability/collapse	Loss of volume or void space occurs. Backfill not completed correctly. Waste package contains liquid/gas. Generation of leachate as water infiltrates the cell	Infiltration of liquid to surrounding clay	Low 21	Cell cap construction as per detailed design and CQA requirements. Subsidence monitoring for 10 years, groundwater monitoring bores around cells.	E	Rare	2	Minor	Low 23
Closure and rehabilitation	The subsidence of a waste cell allowing infiltration of water and	Surface water infiltrating into the waste cell, and further into groundwater	Moderate M8	Waste cells will be capped with a clay dome and monitored for subsidence for 10 years before being revegetated	D	Unlikely	2	Minor	Low 5

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Environmental aspect	Sources of risk (hazard)	Potential environmental impact (worst case)	Pre-treatment risk	Management and mitigation measures	Risk severity after treatment				
					Likelihood		Consequence		After treatment
	the generation of leachate								
Closure and rehabilitation	Erosion/gullies/deep rooted vegetation creating cracks in the clay capping	Surface water infiltrating into the waste cell, and further into groundwater	Moderate M8	All waste cells will be rehabilitated (i.e. growth medium returned and vegetation established), with vegetation monitoring undertaken for 10 years	D	Unlikely	2	Minor	Low 5
Direct rainfall events	Low saturated hydraulic conductivity of kaolin will result in high rainfall runoff from exposed clay caps, potentially causing erosion	Erosion of the domed clay cap, water infiltration into the cell, plume of contamination releases which could affect flora and vegetation	Low 21	Place topsoil/subsoil (minimum 1.7 m thick) over clay cap at the end of the subsidence monitoring period. The low infiltration rate minimises the risk of water penetrating into the cell. In the event that erosion occurs then onsite earthmoving equipment can quickly fix damage. The presence of a second capping layer deeper in the soil profile provides an added safeguard. The surrounding soils are naturally extremely dry and will act to absorb any water that may penetrate the cap. Bunding and V drains around each waste cell will direct water away from the cap	E	Rare	2	Minor	Low 23
Surface water runoff	Surface water flows in extreme rainfall events may act to erode caps	Erosion of the domed clay cap, water infiltration into the cell, plume of contamination releases which could affect flora and vegetation	Low 21	The site is at the very top of a watershed in a very low rainfall environment. The topography is very flat and there are few defined waterways. Modelling suggests only limited surface water flows in extreme rainfall events. Tellus will install bunding to direct surface water flows away from the waste cells. Place topsoil/subsoil (minimum 1.7 m thick) over clay cap at the end of	E	Rare	2	Minor	Low 23

Waste Facility Decommissioning and Closure Plan

Environmental aspect	Sources of risk (hazard)	Potential environmental impact (worst case)	Pre-treatment risk	Management and mitigation measures	Risk severity after treatment				
					Likelihood		Consequence		After treatment
				the subsidence monitoring period. The low infiltration rate minimises the risk of water penetrating into the cell. In the event that erosion occurs then onsite earthmoving equipment can quickly fix damage. The presence of a second capping layer deeper in the soil profile provides an added safeguard. The surrounding soils are naturally extremely dry and will act to absorb any water that may penetrate the cap. Bunding and V drains around each waste cell will direct water away from the cap					
Revegetation of waste cells	Topsoil degraded – no seed bank. Erosion of topsoil before seeds could establish. Seeds pre-treatment not undertaken, and seeds remain dormant. No tubestock available. Fire earthquake, cyclone, fauna predation, weed invasion	Failure of revegetation	Moderate 12	Research and trials to grow vegetation prior to cell rehabilitation attempts. Revegetation establishment procedure to include a selection of species with appropriate root morphology. Collect seed from undisturbed areas of the mining lease	E	Rare	4	Major	Moderate 15