Canberra Sand and Gravel Relocation – Site Suitability Report

Block 1582 – 135 Stockdill Drive, Holt ACT 2615

Prepared for:

Suburban Land Agency

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REVISIONS

Revision	Date	Description	Prepared	Approved	Distribution List
R01	11/05/2022	Final	KL	CG	Suburban Land Agency The Riverview Projects ACT Ltd
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Executive Summary

The Suburban Land Agency (SLA) engaged Lanterra Consulting Pty Ltd (Lanterra) to prepare a Site Suitability Report (SSR) for the relocation of the Canberra Sand and Gravel (CSG) facility currently located at 179 Parkwood Road, Belconnen ACT 2615 Parkwood Road to 135 Stockdill Drive, Holt ACT 2615 (part of Block 1582 Belconnen – hereafter *the Site*).

The objective of the investigation is to determine *the Site's* suitability for the proposed CSG operation from an environmental perspective. This SSR will form part of the supporting documentation for the development application (DA) for the proposed relocation and CSG operation at *the Site.*

The primary operation of CSG involves the receipt of green waste for processing into compost materials. The current Parkwood Road CSG facility is part of the West Belconnen Resource Management Centre (WBRMC) precinct. The current CSG facility is proposed for closure to facilitate the remediation and rehabilitation of the WBRMC. The location of the current CSG facility and the proposed new location is shown in **Appendix A: Figure 1** and **Figure 2.**

The following scope of work was completed as part of preparing this SSR:

- A detailed review of the previous investigation reports relevant to the Site – see **Section 3.1.**
- A review of historical aerial photographs from 1959 to 2004 assessing site conditions – see **Section 3.2.**
- A review of CSG operation and proposed development work at the Site – see **Section 7.**
- A site inspection and establishment of baseline water quality data of the site – see **Section 9.**

Lanterra's findings are summarised below:

Table 1 – Site Suitability Investigation Findings

Findings	Summary
Pesticides application	• The site is occupied by derelict grape vines. There is potential for pesticides to have been applied to the site as part of the former vineyard operations. • The EPSDD invasive plant control maps indicate that flupropanate has been used for the control of African Lovegrass across the site. • The risk associated with the potential pesticides and herbicides applied on-site is considered to present a similar risk profile to the proposed CSG operations of processing greenwaste on-site. • The proposed cut and fill activity on-site will involve cutting and grading of site-won materials, for reuse on-site for the proposed development (see **Appendix A: Figures 4**).
Surface runoff	• The proposed CSG operations are likely to generate runoff as part of the proposed construction as well as the day to day operation. • Sufficient erosion and sediment controls have been proposed to manage any runoff on-site, as well as prevent and minimise any potential impacts of runoff into the natural waterway that runs along the eastern boundary of the *Site*. • Water from the creek shall not be extracted for use in the composting operations.
Other environmental controls	• An Environmental Authorisation (EA) is expected to be issued by the EPA to regulate the operation on-site. The EA is expected to include conditions to implement environmental site controls for the site, to minimise any potential environmental impacts that may arise from the site operations, (as per the current EA for the CSG facility in Parkwood Road – EA #0642) – see **Section 7.**

The potential risks identified for the *Site* as summarised in **Table 1,** are considered to be acceptable as the potential risks can be adequately managed by the implementation of environmental site controls. Therefore, Lanterra considers the *Site* to be suitable for the proposed CSG development for greenwaste processing and composting purposes, from an environmental perspective.

This investigation has been completed based on the proposed development of a greenwaste processing and composting facility only, and has not considered other permissible landuse provided under the site's zoning of NUZ1: Broadacre. Any other potential development on-site that is considered a more sensitive landuse (e.g. residential care accommodation), will require further intrusive investigation to determine the site's suitability.

An Environmental Management Plan (EMP) prepared by a suitably qualified environmental consultant shall be developed for the proposed CSG site, providing detailed environmental site controls to be implemented for the future and on-going operation of the site as a greenwaste processing and composting facility. This is expected as a requirement to be incorporated into CSG's Environmental Authorisation (once granted). At a minimum, the recommendations in **Section 11.2** shall be implemented for the operations of the greenwaste processing and composting facility.

A construction environmental management plan (CEMP) shall also be developed to provide procedures to manage any potential risks encountered during the construction of the *Site*.

1. Introduction

The Suburban Land Agency (SLA) engaged Lanterra Consulting Pty Ltd (Lanterra) to prepare a Site Suitability Report (SSR) for the relocation of the Canberra Sand and Gravel (CSG) facility currently located at Parkwood Road.

The current Parkwood Road CSG facility is located at 150 Parkwood Road, Belconnen ACT 2615 within Block 1586 Belconnen ACT that is part of the West Belconnen Resource Management Centre (WBRMC) precinct. The primary operation of CSG involves the receipt of green waste for processing into compost materials.

The current CSG facility is proposed for closure to facilitate the remediation and rehabilitation of the WBRMC, and is proposed to be relocated to 135 Stockdill Drive, Holt ACT 2615 (part of Block 1582 – hereafter *the Site*). The location of the current CSG facility and the proposed new location is shown in **Appendix A: Figure 1** and **Figure 2.**

1.1 Objective

The objective of the investigation is to determine *the Site's* suitability for the proposed CSG operation at 135 Stockdill Drive, Holt ACT 2615 (part of Block 1582 Belconnen) from an environmental perspective. This SSR will form part of the supporting documentation for the development application (DA) for the proposed relocation and CSG operation at *the Site.*

This Site Suitability Report only assessed the site's suitability for the proposed greenwaste processing and composting facility only, and has not considered other permissible landuse provided under the site's zoning of NUZ1: Broadacre.

1.2 Scope of Work

The scope of work in preparing this SSR is as follows:

- Review available previous investigation report relevant to *the Site.*
- Review the operations of the CSG facility in Parkwood Road and the proposed operations and works involved in the proposed new location at *the Site.*
- Conduct site inspection and investigation at *the Site* to identify any potential constraints that may impact the site's suitability for the proposed CSG operations.
- Establishment of baseline water quality data for a local creek located along the eastern border of *the Site*.
- Prepare this SSR for submission to EPA as part of the DA for *the Site* which includes the following:
    - Recommendations for additional site controls (if required), to ensure the site and surrounding areas will not be impacted by CSG's operation.
    - Unexpected finds protocols to manage potential contamination.
    - Recommendations if the site is suitable for the proposed CSG use.

1.3 Regulatory Guidelines / Legislations

The investigation and preparation of this report were undertaken with reference to (but not limited to) the following regulatory guidance documents and standards:

- *ACT Government (2020) Information Sheet 11 - EPA Report Submission Requirements;*
- *ACT Government (2021) Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes;*
- *ACT EPA (2017) Contaminated Sites Environment Protection Policy;*
- *ACT EPA (2007) General Environment Protection Policy;*
- *National Environmental Protection Council (NEPC) (2013). National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended April 2013);*
- *NSW EPA (2020) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites; and*
- *The West Belconnen Concept Plan 2018.*

1.4 Limitations

The findings of the report are based on the Scope of Work outlined above, with no intrusive soil investigation completed for the site. Lanterra has performed services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties express or implied, are made.

The assessment was limited strictly to identifying typical environmental conditions associated with the subject property area and does not include an evaluation of any other issues.

The absence of any identified hazardous or toxic materials on the subject property should not be interpreted as a guarantee that such materials do not exist on the site.

The results of this assessment are based upon the site inspection and the sampling specified above conducted by Lanterra personnel and information from the Client or regulatory agencies. All conclusions and recommendations regarding the property area will be the professional opinions of the Lanterra personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability are made, Lanterra will not assume responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of Lanterra, or developments resulting from situations outside the scope of this project.

2. Site Characteristics

2.1 Site Location

The S*ite* is located at 135 Stockdill Drive, Holt ACT 2615. The *Site* is situated in the south-east corner of Block 1582 Belconnen ACT, covering an area of approximately 5.1 hectares.

A summary of the site details is presented in **Table 2** below and shown in **Appendix A: Figure 2.**

Table 2 – Summary of Site Details

Block and Division	Address
Address	135 Stockdill Drive, Holt, ACT 2615
Approximate Elevation (m AHD)	546 – 569 m
Block, Section, Division	Block 1582, Belconnen
Approximate GPS coordinates (centre of the site)	Easting: 682144.7 Northing: 6097815.7
Land Zoning	NUZ1: Broadacre Zone
Block size	621,146 m^2
Investigation Area /	51,000 m^2
Current Land Use	Agriculture (vineyard)
Proposed Landuse	Green waste processing and composting facility

2.2 Site Description and Layout / Features

Suitably qualified environmental scientists from Lanterra conducted site inspections on the 2nd of December 2021 and the 8th April 2022 to assess the site conditions. The site inspections identified the following:

- The investigation area / the *Site* is accessed via 135 Stockdill Drive, via an unsealed road as it traverses to the south-eastern portion of the block to the investigation area.
- Multiple site sheds are located at the northern portion of the block, including a large farm dam and a small solar farm. The proposed development of the CSG facility will involve converting the current unsealed road into the primary road for the proposed facility, passing through these current farm structures and a former vineyard
- The *Site* is covered by derelict grape vines from the former vineyard, with the exception of the access road that runs along the eastern, southern and western perimeter of the *Site.*
- The *Site* slope towards the east and south-east, and towards a creek that flows adjacent to the site's eastern boundary. The creek flows into the Molonglo River to the south.

A detailed site plan is presented in **Appendix A: Figure 2.**

2.3 Surrounding Land Uses

A summary of the land uses that surround the *Site* are as follows:

- **North:** Remaining vineyard and farm structures are located north of the *Site* within the same block. Agricultural paddocks and vineyards lie north of the block, with the residential

development located further north. Further north lies the urban residential areas of Strathnairn.

- **South:** More agricultural paddocks are located south of the *Site,* with the Molonglo River corridor located further south.
- **East:** A creek that runs into Molonglo River is located on the eastern boundary of the *Site,* with more agriculture paddocks located further east.
- **West:** A remnant shrubland/woodland and a rural agricultural property are located west of the *Site*. An electrical substation and the Lower Molonglo Water Quality Control Centre are located further west of the *Site.*

2.4 Sensitive Environments

A review of areas within a 500 m radius of the site that must be protected includes the following[1] (see **Appendix A: Figures 5):**

- No threatened flora and/fauna species are located within the site.
- The following are identified to be within a 500 m radius of the site:
    - Pink tailed worm lizard (PTWL) is located within a 500m radius of the site.
    - Threatened woodland (potential yellow box Blakely's Red Gum Grassy Woodland) is located within a 500 m radius of the site.
    - Multiple heritage sites are located within a 500 m radius of the site.
- A creek runs along the eastern boundary of the *Site* that flows into the Molonglo River located approximately 1,250 m south of the site.
- A remnant woodland is located approximately 200 m west.

2.5 Proposed Land Use

The *Site* is proposed for development into the Canberra Sand and Gravel green waste and composting facility, replacing the current CSG facility located at 150 Parkwood Road, Belconnen ACT 2615. Further details on the proposed facility operation are summarised in **Section 7.**

[1] ACT Government (2022) ACTMapi - Significant Species, Vegetation Communities and Registered Trees and Heritage

3. Site History

3.1 Previous Investigations

A review of previous environmental investigations relevant to the site is summarised below:

3.1.1 Preliminary Site Investigation – Block 1582 Belconnen ACT 2615 (Lanterra Consulting, November 2021)

Lanterra prepared a preliminary site investigation (PSI) for the southern half of Block 1582 Belconnen ACT 2615, to determine the site's suitability as a potential location for the Mitchell Resource Management Centre. The *Site* subject to this SSR is located within the investigation area of this PSI.

The PSI included a detailed desktop review of the site and identified the following areas of environmental concern (AEC) for the site:

Table 3 – Summary of AECs and CoPCs

AECs	Contaminants of Potential Concern (CoPCs)
AEC 1 – Grape Vines The grape vines occupy approximately 80% of Block 1582 with the application of herbicides and pesticides that may have been used on the grape vines. The Environment Planning and Sustainable Development Directorate (EPSDD) invasive plant control maps indicate that flupropanate has been used for the control of African Lovegrass at the site. CoPCs related to the grape vines include organochlorine and organophosphate pesticides (OCP/OPP). Further investigation and sampling for the potential impact of the pesticides are recommended.	• Organochlorine pesticides/organophosphorus pesticides (OCP/OPPs)
AEC 2 – Storage Sheds The site sheds north of the *Site* may have been used for the storage of equipment, machinery and chemicals for the maintenance of the vines.	• Total Recoverable Hydrocarbons (TRH) • Benzene, Toluene, Ethylbenzene, Toluene (BTEX) • Polycyclic Aromatic Hydrocarbons (PAH) • OCP/OPP • Polychlorinated Biphenyls (PCB) • Phenols • Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)
AEC 3 – Sheep Dip at Pine Ridge The contaminated land search indicated that the Pine Ridge property located on Block 1600 Belconnen (to the east of the site) has a historical sheep dip, the condition of which is not known.	• Arsenic • OCP/OPP

The PSI recommended further site investigation to determine the potential impact of the former application of pesticide on-site, and within the vicinity of the site sheds to determine the site's suitability for development as a resource management centre.

Lanterra notes that only **AEC 1** is located within the *Site,* subject to this Site Suitability Report.

3.1.2 Report on Preliminary Site Investigation for Contaminated Land Proposed Subdivision – Part Rural Block 1582 Belconnen (Douglas Partners, December 2021)

A PSI was prepared for part of Block 1582 Belconnen ACT 2615, to assess the potential contamination at the site based on past and present landuse and activities as part of a proposed subdivision for the site for future development. The *Site* subject to this SSR is located within the investigation area of this PSI.

The PSI included a detailed desktop review and a site investigation of the site and identified the following potential contamination sources for the site:

Table 4 – Summary of potential contamination sources

Potential contamination sources	Contaminants of Potential Concern (CoPCs)
Fill associated with building footprints and dam embankments.	• TRH, BTEX, PAHs, PCBs, OCP, OPP, phenols and asbestos
Potential use of herbicides and pesticides for the former vineyard	• OCP, OPP and herbicides
Aboveground fuel storage tank located west of the small solar farm.	• TRH, BTEX and PAH
Hazardous building materials from previous and current site structures.	• Asbestos, synthetic mineral fibres, lead in paint and PCB

The PSI considered that there is a low likelihood of substantial widespread contamination on-site. An intrusive soil investigation was recommended to assess the potential contamination on-site based on the potential sources identified, and a pre- hazardous materials survey prior to any demolition of the structures on-site.

3.2 Historical Aerial Photographs Review

A review of historical aerial photographs is summarised below is presented in **Appendix C.**

Table 5 – Details of the Review of Aerial Photographs

Date	Description of the Subject Site	Description of Surrounding Land
1959	The site appears to be cleared rural land, with an unsealed access road located in the north-north west corner of the block.	The surrounding land appears to be a rural area. An unsealed access road is located in north and north west areas of the surrounding area. One rural dwelling and agricultural dam are located adjacent to the north east corner of the block. A second dwelling and agricultural dam are located to the north west. Areas of erosion are apparent along the gullies to the east of the site.
1967	No discernible differences to the site are apparent.	No discernible differences in the site's surroundings are apparent.
1981	No discernible differences to the site are apparent, with the exception of signs of a vehicular track across the paddock.	An unsealed road appears to be located to the south west of the site. Shrubs/trees appear to have grown adjacent to the sealed road.
1985	No discernible differences to the site are apparent.	In the surrounding area to the north-east residential dwellings have been constructed. Shrubs/trees appear to be planted in the surrounding area directly to the north-east of the site.

Date	Description of the Subject Site	Description of Surrounding Land
1992	No discernible differences to the site are apparent.	High voltage powerlines have been constructed in the surrounding areas to the north west and east of the site. More residential dwellings, a golf course and a car park appear to have been constructed to the northeast of the site. Agricultural infrastructure appears to have been constructed in the surrounding area to the north-east and east. Agricultural dams appear to have been constructed to the east and north west of the site boundary.
2004	The site appears to have been converted into a vineyard. An unsealed access road surrounds the eastern, western and southern perimeter of the site.	Most areas of the block surrounding the site have been converted into a vineyard, with clearance of former vegetations and tree covers within the block. Three sheds and a large agricultural dam appear to have been built in the northern portion of the block. An unsealed access road that traverses from the west boundary of the block, to each portion of the vineyard has been constructed. A rural residential property, shed, farm dam and agricultural infrastructure are located to the west and north of the site. Vineyard planting appears to be located in the surrounding area to the north east, in addition to two more agricultural dams and an unsealed road to the east.
2009	No discernible differences to the site are apparent.	A sealed access road and truck wash appears to have been constructed in the surrounding area to the north west of the site.
2014	No discernible differences to the site are apparent.	Five solar panels appear to have been constructed in the northern portion of the block. A large shed has been constructed in the surrounding area to the east of the site.

3.3 ACT EPA Contaminated Site Search

A contaminated land search under Section 21 (A) of the Environment Protection Act (1997) from the ACT EPA for Block 1582 Belconnen was completed for the block (see **Section 3.1.1**).

Block 1582 Belconnen, is not recorded on the EPA's contaminated sites management database or geographic information system.

The EPA noted that the site is or was being used for the cultivation of grapes. EPA records indicate that wastewater from the Lower Molonglo Water Quality Control Centre is or was being used for irrigation at the site.

EPA records also indicate that there is or was a plunge sheep dip site located on the adjacent block, Block 1600 Belconnen, which is within 100 metres of the eastern boundary of Block 1582.

The ACT EPA Contaminated Sites Environment Protection Policy 2017 lists agricultural/ horticultural activities and sheep dip as activities associated with land contamination which may present a risk to human health or the environment.

Under the precautionary principle, all blocks adjacent to sheep dip sites are identified and persons making enquiries are made aware of the potential for impacts from these sites due to the ability of contaminants to migrate through the environment.

As part of ACT's second electrical supply project area, a portion of the block was assessed in 2018. The EPA reviewed the report titled "ACT Second Electrical Supply Project Preliminary Site Investigation" dated 2 February 2018 by WSP Australia Pty Ltd.

The EPA assessed the report and supported the consultant's findings that the areas of the blocks assessed are suitable "for development of a substation and associated transmission line network" from a contamination perspective subject to the implementation of a development area-specific construction environmental management plan (CEMP).

The EPA has not issued any orders of assessment or remediation under sections 91C (1) or 91D (1) respectively, environment protection orders under sections 125 (2) or (3), requested an audit under section 76 (2) or received an audit notification under section 76A (1) of the *Environment Protection Act 1997* (the Act) over the site and as a result the site is not recorded on the Register of contaminated sites under section 21A of the Act.

The EPA noted that this information should be cautiously used and does not rule out the existence of impact across the site.

A copy of the contaminated land search is presented in **Appendix D**.

3.4 Storage Tanks

No evidence of fuel storage tanks identified within the *Site*. It is noted an above-ground storage tank (AST) was identified near the sheds in the northern portion of the block, as well as a septic tank. The proposed CSG operations are expected to utilise storage tanks on-site for their future operations.

3.5 Hazardous Materials

There was no evidence of hazardous material contents across the *Site*.

3.6 Pesticide Use

A review of the Environment Planning and Sustainable Development Directorate (EPSDD) invasive plant control maps indicated the following spraying occurred at the site[2]:

July to April 2022: No spraying has occurred to date on the site. Spot spraying for African Lovegrass using glyphosate was used south of the site along the Molonglo River Corridor.

July 2020 – June 2021: No spraying has occurred on the site. Spot spraying for African Lovegrass using flupropanate and glyphosate was used along the road reserve of Stockdill Drive. Spot spraying of blackberry using triclopyr south-west of the site near the Molonglo River Corridor and further east of the site using grazon extra or equivalent.

July 2019 – June 2020: Boom spraying across the entire site for African Lovegrass using flupropanate.

[2]ACT Government EPSDD (2022) Environment, Invasive Control Plant Maps and Progress Reports (https://www.environment.act.gov.au/parks-conservation/plants-and-animals/biosecurity/invasive-plants#report)

July 2018 – June 2019: No spraying has occurred on the site. Spot spraying for African Lovegrass with flupropanate and glyphosate along the road reserve of Stockdill Drive, and south of the site along the Molonglo River Corridor.

Glyphosate is typically used for the control of broad leaf weeds and the typical half-life is estimated to be 47 days (Vencill, 2002). Based on this, the long-term risk glyphosate may pose as a contaminant in the soil is considered to be low due to the low volume of chemicals deployed using spot spraying delivery methods and the relatively quick half-life of the herbicide.

Flupropanate is often used for the control of serrated tussock and is considered to be a persistent pollutant due to the long typical half-life of 365 days (James and Gaw, 2015). Despite the persistent nature of flupropanate, based on the potential volume the use of the herbicide is unlikely to adversely impact the site from a soil contamination perspective. It is also noted that flupropanate is an approved herbicide for use to control serrated tussocks under the *Pest Plants and Animals Act 2005 (ACT) – Pest Plants and Animals (Serrated Tussock) Management Plan 2016.*

3.7 Chemical Storage

No chemicals were identified to be stored at the *Site*.

Chemical storage sheds and fuel storage were identified in the northern portion of the block, likely used for the agricultural practices on-site.

3.8 Manufacturing Processes

There are no known manufacturing processes that currently occur or have previously occurred on the *Site*.

3.9 Discharges to Land, Water and Air

No information regarding discharges to land, water and air was available for review at the time of writing this report. As no manufacturing operations are known to have occurred at the *Site*, it is unlikely that there may have been previous discharges to land, water or air in the past.

4. Geology and Hydrogeology

4.1 Geology

The 1:100,000 Geological Series, Canberra, New South Wales and Australian Capital Territory, Sheet 8727 (Bureau of Mineral Resources, 1992) shows that the site is underlain by the Walker Volcanics Suite of the early Surian. Comprised of purple and greenish-grey dacitic ignimbrite.

4.2 Soil Conditions

The *Soil Landscape of the Canberra 1:100 000 Sheet and Report (Jenkins, 2000)* reported the ACT portion of the site to be within the Burra soil landscape group as follows:

- Burra soil type is comprised of a complex soil distribution that includes shallow Tenosols, Red Kurosols and minor Red Kandosols on crests and upper slopes. Commonly found on undulating to rolling low hills and alluvial fans on Silurian Volcanics in the lowlands around Canberra.

4.3 Hydrogeology

A groundwater bore search was completed for the site. The purpose of the bore search was to document the location and depth of any nearby registered groundwater bores, and the associated quality of the groundwater so that potential impacts of contaminants from the site or surrounding land uses (if any) on local users of groundwater may be assessed.

This search indicated that there are no groundwater bores located at the site, or within 2,000 m of the *Site*. The nearest of these boreholes is located approximately 2,100 m to the north of the site (**Appendix A: Figure 6**).

A review of the Bureau of Mineral Resources (1984) Hydrogeology of the Australian Capital Territory and Environs indicates that groundwater is hosted in fractured aquifers with higher yielding zones associated with the upper and lower portions of the individual ash-flow tuffs and interbedded sediments of the late middle Silurian. The quality of groundwater is expected to be poor, the total dissolved solids (TDS) are anticipated to be < 500 milligrams per litre (mg/l) and the yield is estimated to be < 0.5 litres per second (l/sec).

4.4 Hydrology

Surface water on the site is expected to follow the topographic contours of the site and flow to the east and south-east of the *Site*, into a local creek that eventually flows into the Molonglo River south of the site.

4.5 Acid Sulfate Soil Risk

A review of the Australian Soil Resource Information System (ASRIS) map shows the subject site to be situated in an area of “Low probability” of occurrence of acid sulfate soil.

5. Site Reconnaissance

5.1 Topography

The digital topographic map presented in ACTmapi (available at http://www.actmapi.act.gov.au/) indicates the *Site* has an elevation of approximately 546 – 569 m above the Australian Height Datum (m AHD).

The general topography of the and the surrounding area slopes towards the east.

5.2 Cut and Fill

No signs of former filling activity were observed on-site during the site investigations. Minor cut and fill activity may have occurred during the clearance of former vegetation for the installation of grape vines.

5.3 Odours

There were no olfactory indicators of possible contamination were observed during the site assessment.

5.4 Staining

No evidence of hydrocarbon staining was observed during the site assessment.

5.5 Vegetation

No evidence of vegetation stress was identified on-site. It is noted the *Site* is predominantly occupied by derelict grape vines.

5.6 Waste

The site inspection identified old vegetative waste from the former vinery stored on-site, and within the block. Irrigation pipes are seen within the paddocks as well, likely for the former vineyard.

No significant waste issues were identified on-site.

5.7 Visible Signs of Contamination

No visual or olfactory signs of potential contamination were identified on-site during the *Site* investigations.

It is noted potential contamination may be present in the northern portion of the block, particularly in the vicinity of the site sheds with chemical and fuel storage.

6. Conceptual Site Model

Conceptual site models (CSM) are a method of presenting site contamination information and the relationships between sources of contamination, how it may have been introduced to the site, possible pathways for contaminant migration and exposure and the receptors that may be affected by contaminants.

The following conceptual site model has been prepared based on the preliminary site investigation and desktop review completed (see **Section 3**).

6.1 Areas of Environmental Concern

Based on the preliminary site investigations and desktop review completed, the following areas of environmental concern (AECs) have been defined for the *Site*.

On-site AEC

AEC 1 – Pesticides Application

The site is occupied by derelict grape vines with potential for pesticide use in the past.

The EPSDD invasive plant control maps indicate that flupropanate has been used for the control of African Lovegrass across the site.

6.2 Contaminants of Potential Concern

To comprehensively characterise the site and based on some of the activities associated with the site and its surroundings and respective AEC the following contaminants of potential concern (COPC) were identified.

Table 6 – Identified COPC and the associated AECs

AECs	COPC
AEC 1 – Grape Vines	• Organochlorine pesticides/organophosphorus pesticides (OCP/OPPs); • Herbicides; • Flupropanate; and • Heavy metals.

6.3 Exposure Pathways and Receptors

For a contaminant to pose a risk to either human health and/or the environment, there must be a potentially complete or complete pathway between the contaminant and the receptor. Identified receptors at the site are as follows:

- Current users of the site.
- Future site workers for the development of the site.
- Future users of the site.
- Future site visitors of the site.
- Ecological receptors.
- Surface water.

Common pathways for which contaminants may migrate through the environment on the site and result in exposure to receptors are summarised in **Table 7** below.

Table 7 – Summary of Exposure Pathways

Pathway	Contaminants of Concern	Exposure Pathway (Complete / Potentially Complete / Incomplete)	Receptors	Comments
Direct contact with soil including dermal contact and ingestion	OCP/OPP, Herbicides, Fluproponate, Heavy metals	Potentially Complete	• Future site workers. • Current and future site users. • Ecological receptors	The former pesticide application may have impacted the soil condition on-site, and it's likely to be 'top-down' in nature and if present may pose a risk to human and ecological receptors on the site.
Direct contact with surface water including dermal contact and ingestion	OCP/OPP, Herbicides, Fluproponate, heavy metals	Potentially Complete	• Future site workers. • Current and future site users. • Ecological receptors	The former pesticide application has the potential to impact surface water at the site and migrate into the nearby creek. The exposure pathway is considered potentially complete if there are impacted runoffs from the site flowing into the local creek.

In its current condition, there are potentially complete contaminant exposure pathways that are dependent on whether COPCs are present.

7. Canberra Sand and Gravel Operations

7.1 Proposed Operations

The current CSG facility is located at 150 Parkwood Road, Belconnen ACT 2615 as part of the WBRMC precinct. The WBRMC is currently undergoing investigation for closure and remediation for future development, and this includes the closure of the CSG facility.

The proposed relocation of the CSG facility to 135 Stockdill Drive, Holt ACT 2615 (the *Site*) will involve similar operations at the current CSG facility at Parkwood Road that operates under Environmental Authorisation (EA) #0642. The EA states the following:

- The EPA, pursuant to the section 49(1)(a) of the *Environment Protection Act 1997,* hereby authorises Canberra Sand and Gravel to conduct activity/activities for the operation of a facility that composts, or is intended by the operator to compost, more than 200 tonnes of animal waste, or 5,000 tonnes of plant waste per year.

A summary of the proposed operations to be undertaken at the CSG facility at the proposed location are as follow[3]:

- The *Site* will be a public drop-off site for greenwaste, with greenwaste processing and composting to occur on-site, as well as a landscape sales yard.
- Processing of greenwaste materials to create mulch and compost product which involve screening, shredding the greenwaste, stockpiling and irrigating. Unsuitable and oversize materials will be separated and stockpiled separately for additional processing (as required).
- The expected turnaround time for receiving greenwaste, to subsequent processing and storage and the final removal/sales of greenwaste products (i.e. compost, mulch etc.) is approximately 4 – 6 months.
- No expected volume of greenwaste that will be stored on-site is available, however it is noted that the allowance of greater than 5,000 tonnes of plant waste per year is expected to be maintained in the new EA for the proposed facility, if not increased.
- The landscape sales yard is expected to include other products in addition to compost and mulch, such as sand, landscape soils (potting mixes) and gravels.

It is noted that the *West Belconnen Concept Plan* 2018 states that no residential development is permitted within 1000m of a composting facility, due to the composting operations and the odour that it can generate. The proposed site is not located within 1000 m of residential development as shown in **Appendix A: Figure 1.**

7.2 Proposed Construction and Development

The proposed CSG facility at the Site will involve construction and development at the *Site*. Based on the information provided by the planner and architect for the facility, a summary of the proposed development work is as follow (see **Appendix A: Figures 4**):

- Removal of all current derelict grape vines.
- Construction of a private access road to access the *Site* from Stockdill Drive.

[3] Information provided by Canberra Sand and Gravel's director during interview with Lanterra on 28th March 2022

- Cut and fill activity to level the site for the construction of site structures required. This includes a site sales office building, a landscape supplies yard with materials bin (hardstand) and water tanks, a processing and stockpiling area, and preparation of the greenwaste drop-off area (see **Appendix A: Figure 4A, 4B and 4D**).
- The current proposed cut and fill activity does not include the removal of spoil materials from the site.
- Construction of a sediment control pond located in the south-east corner of the site, with drainage lines (cut-off drain and overland flow) around the perimeter of the site to divert all runoff into the pond (see **Appendix A: Figure 4C**).
- Construction of a stabilised dirt bund/batter around the perimeter of the site as an erosion and sediment control for the site.

7.3 Operational History at Parkwood Road - WBRMC

The current CSG facility at 150 Parkwood Road, Belconnen ACT 2615 operates under Environmental Authorisation (EA) #0642 which was first issued in 2008 (see **Appendix E**). Based on the review of the site history at WBRMC, the CSG facility has been operational at the WBRMC precinct since the early 1990s[4].

The EPA conducts reviews of the facility's operation as part of the EA's conditions to ensure compliance, since the EA was granted in 2008, with no known non-compliance identified to-date. A copy of the latest correspondence from EPA regarding the EA compliance was provided to Lanterra and has been included in **Appendix E[5].**

Lanterra notes that the CSG at the WBRMC precinct implements an Environmental Management Plan (EMP) in accordance with their EA's requirement. The EMP[6] identifies activities that may have an adverse impact on the environment or the potential to cause environmental harm, and details the mechanisms employed to prevent or minimise the impact of these activities.

The operations of the CSG facility implement the following site environmental controls:

- CSG is only permitted to accept greenwaste from domestic, municipal and commercial sources once a visual site inspection has been undertaken and any foreign material has been removed.
- CSG is not permitted to accept the following:
    - Waste types or streams are listed in Tables, 1, 2, 3, and 4 of the *Environment ACT (2000) ACT's Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes*[7];
    - Chemically treated timbers such as copper chrome arsenate, high temperature creosote, pigment emulsified creosote and light organic solvent preservative treated timber; and
    - Painted timber products.

[4] GHD (September 2018) West Belconnen Resource Management Centre Phase 1 Preliminary Site Investigation
[5] CSG advised that EPA has not provided correspondence for subsequent reviews, with some reviews delayed due to Covid-19 lockdown in 2020 and 2021.
[6] Robson Environmental (2019) Environmental Management Plan – Canberra Sand and Gravel Landscape Centre - Parkwood Yard, Parkwood Road Holt ACT 2615 (portions of rural block 1586, Belconnen)
[7] This guideline was updated in July 2021.

- Implementation of a series of environmental management (EM) programs that covers a diverse range of activities and potential impacts including management of organic and waste material, management of water and atmospherics, and management of housekeeping issues. The EM programs include:
    - General greenwaste recycling.
    - Screening of products prior to delivery at drop-off area.
    - Unacceptable materials management.
    - Erosion and sediment management.
    - Surface water management.
    - Air quality management.
    - Dust control.
    - Noise management.
    - Solid waste management (site generated).
    - Hazardous materials storage and use.
    - Fuel storage and refuelling management.
    - Litter control.
    - Traffic management.
    - Pest, vermin and noxious weeds.
    - Fire prevention and capacity.
    - Site security.
    - Staff/sub-contractors and training requirements.
- Annual review of the EMP.
- Reporting of environmental incidents.
- Bi-annual environmental management audits.
- Management of fuel and oil product storage on-site.
- Maintenance of records (pollution incidents, complaints, the volume of materials received and processed and disposed, etc).
- Emergency response plan for environmental emergencies.
- Unexpected find protocol to manage potential soil contamination and/or hazardous materials encountered on-site.

8. Data Quality Objectives

This section outlines the data quality objectives (DQOs) applied to the investigation.

The DQO process is a planning tool that relies on scientific methods for establishing criteria for data quality and for designing data collection programs. The DQO defines the experimental process required to test a hypothesis. The DQO process aims to ensure that efforts relating to data collection are cost-effective, by eliminating unnecessary, duplicative or overly precise data whilst at the same time, ensuring the data collected is of sufficient quality and quantity to support defensible decision making.

The DQO process consists of seven steps, which are designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process adopted for this investigation is as follows:

Step 1: State the Problem – concisely describe the problem to be studied. Review prior studies and existing information to gain a sufficient understanding to define the problem;

Step 2: Identify the Decision – identify what questions the study will attempt to resolve, and what actions may result;

Step 3: Identify the Inputs to the Decision – identify the information that needs to be obtained and the measurements that need to be taken to resolve the decision statement;

Step 4: Define the Study Boundaries – specify the time periods and spatial area to which decisions will apply. Determine when and where data should be collected;

Step 5: Develop a Decision Rule – define the statistical parameter of interest, specify the action level, and integrate the previous DQO outputs into a single statement that describes the logical basis for choosing among alternative actions;

Step 6: Specify Tolerable Limits on Decision Errors – define the decision maker's tolerable decision error rates based on a consideration of the consequences of making an incorrect decision; and

Step 7: Optimise the Design – evaluate information from the previous steps and generate alternative data collection designs. Choose the most resource-effective design that meets all DQOs.

The DQOs derived for the investigation are presented in **Table 8.**

Table 8 – DQOs derived for the Investigation

Step	Details
Step 1: State the Problem	The site is proposed as the Canberra Sand and Gravel greenwaste processing and composting facility. A site suitability report is required to determine the site's suitability for the proposed use from an environmental perspective.
Step 2: Identify the Decision	The purpose of this investigation is to assess if the site is suitable for the proposed CSG facility.
Step 3: Identify the Inputs to the Decision	• Review of previous investigations relevant to the site and available information on the site and proposed development (see **Sections 3** and **7**). • Observations from site inspections (see **Sections 5** and **9**).
Step 4: Define the Site Boundaries	The site boundary is restricted to the boundaries of the proposed development (see **Appendix A: Figure 2).** This SSR investigation was undertaken from December 2021 to May 2022.

Step	Details
Step 5: Develop a Decision Rule	• If site inspections identified features that pose constraints to the proposed site development for CSG. • If the laboratory quality assurance/quality control data are within acceptable ranges, the results will be considered suitable for use. • If the concentrations of contaminants in samples analysed exceed the adopted assessment criteria, further investigation for delineation may be required to determine the remediation/management required. • If the concentrations of contaminants in samples analysed exceed the expected background concentrations, further investigation may be required to determine the source of the elevated concentrations. • If the CoPC is reported below the laboratory detection limit in the samples applicable to a specific pathway, then it will be considered that there is no evidence of a potential complete source-pathway-receptor linkage and therefore inclusion of that pathway in further assessment may not be required. • If analytical results for COPCs are below the adopted criteria for the adopted assessment criteria, then the site may be considered suitable for the proposed CSG site.
Step 6: Specify Tolerable Limits	The tolerable limits for the investigation adopted for quality assurance/quality control (QA/QC) purposes are as follows: • The relative percentage difference (RPD) for laboratory duplicates for TRH and BTEX analysis is less than 60%; and • Recovery of matrix spikes and surrogate spikes is as per the laboratory's Quality Assurance targets accepted under their NATA accreditation. The tolerable limits for field QA/QC data are as follows: • RPD criteria of 30% or less, for concentrations > or = 5 times practical quantitation limits (PQL); Replicate data for field duplicates for inorganics, including metals and inorganics are expected to be as follows: • RPD criteria of 30% or less, for concentrations > or = 5 times PQL.
Step 7: Optimise the Design	The investigation program for this assessment is detailed in **Section 9.**

9. Water Quality and Erosion and Sediment Control

9.1 Water Quality Investigation

Based on the proposed development of a greenwaste processing and composting facility at the *Site,* with a local creek running along the eastern boundary of the site, there is a risk of surface runoff from the site flowing into the creek. The water quality of the creek may be impacted, and subsequently may potentially impact Molonglo River which is located approximately 1.25 km downstream of the *Site*.

A surface water investigation was undertaken as part of this SSR, to assess the water quality at the creek located along the eastern boundary of the *Site*, and establish a baseline water quality for the creek.

9.1.1 Assessment Criteria

Based on the objective of the water quality investigation to determine the water quality of surface water present in the creek located along the eastern boundary of the *Site*, the following assessment criteria were adopted:

- ANZG 2018, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian State and Territory Governments, Canberra ACT – Toxicant Default Guideline Values for 95% species protection in freshwater.
- *PFAS NEMP 2.0*, Ecological water quality guideline values for 99% species protection in freshwater – Table 5.

Table 9 – Surface Water Criteria

Contaminant Group	ANZG 2018 95% Species Protection for Fresh Waters (µg/L)	AQUA/2 Environment Protection Regulation 2005 (µg/L)
Heavy Metals		
Arsenic	24 (as (III)	50
Cadmium	0.2	0.2
Chromium (VI)	1	2 [a]
Copper	1.4	2
Lead	3.4	1
Nickel	11	25
Zinc	8	5
Mercury	0.6	0.1
Aluminium	0.8 / 55 [b]	5 / 100 [b]
Iron	-	300
TRH/BTEX/PAHs		
Benzene	950	300
Toluene	180	300
Ethylbenzene	80	140
Xylene	625	-
Naphthalene	16	-
Sum of PAHs	6.5[c]	3
Phenols		
Phenol	320	1
2,3,4,6-Tetrachlorophenol	20	1 [d]
2,4,6-Trichlorophenol	20	18 [d]
2,4-Dichlorophenol	160	0.2 [d]
2,4-Dimethylphenol	2	-

Contaminant Group	ANZG 2018 95% Species Protection for Fresh Waters (µg/L)	AQUA/2 Environment Protection Regulation 2005 (µg/L)
2,6-Dichlorophenol	34	0.2 [d]
2-Chlorophenol	490	7 [d]
Pentachlorophenol	10	0.05
Pesticides		
Aldrin	0.001	0.01
Azinphos Methyl	0.02	-
Chlordane	0.08	0.004
Chlorpyrifos	0.01	0.001
Dieldrin	0.01	0.002
DDE	-	0.014
DDT	0.01	0.001
Diazinon	0.01	-
Dimethoate	0.15	-
Endosulfan	0.2	0.010
Endrin	0.02	0.0023
Fenitrothion	0.2	-
Heptachlor	0.09	0.003
Lindane	0.2	0.003
Malathion	0.05	0.070
Methoxychlor	0.005	0.040
Mirex	0.04	0.001
Parathion	0.004	0.004
Sum of PCBs	0.63 [c]	0.001
Other Inorganics		
Nitrate	2400 [e]	-
Ammonia	900	-
Phosphorus	-	100 [f]
Chloride	3 [f]	2 [f]
Table 5 of PFAS NEMP 2.0 Ecological Guideline for Protection of 99% Freshwater Species (µg/L)		
PFOA	19	-
PFOS	0.13	-

Note:

[a] Total Chromium

[b] Values for aluminium for pH < 6.5 and > 6.5 respectively

[c] Summation of Anthracene, Benzo(a)pyrene, Fluoranthene, Naphthalene, and Phenanthrene for PAHs. Summation of Aroclor 1242 and Aroclor 1254 for PCBs

[d] Values for total Monophenol, Dichlorophenol, Trichlorophenol and Tetrachlorophenol.

[e] Grading value based on 95% protection for chronic protection under NIWA 2013 Updating Nitrate Toxicity Effects on Freshwater Aquatic Species

[f] Based on the criteria for total Phosphorus.

9.1.2 Sampling and Analysis Plan

The water quality investigation was completed based on the following sampling and analysis plan (SAP):

Table 10 – Sampling and analysis plan for the water quality investigation

SAP	Description
Sampling locations	• Two sampling locations were selected along the creek that runs along the eastern boundary of the *Site*; upstream and downstream (see **Appendix A: Figure 3**).

SAP	Description
	• An initial site inspection in December 2021 identified the creek to be dry. A subsequent site inspection was completed on 8th April 2022 following a rain event[8], with sufficient water flow in the creek to facilitate water sampling.
Sampling methodology	• A suitably qualified environmental consultant was mobilised to the site with appropriate sampling instruments for collecting surface water samples. • Visual and olfactory observations of the water in the creek were documented prior to sample collection. • The surface water sample was collected straight into laboratory prepared containers using disposable gloves. • Site observations were recorded including any visual or olfactory indicator of potential contamination in the surface water. • Details of the sample, including project number, sample number and date of the sample were written on each sample container. Sample containers were then placed into an ice-cooled esky prior to being sent to SGS Australia, which is a NATA accredited laboratory with accompanying COC documentation for analysis.

Analysis plan	• A total of two (2) primary samples were collected from the creek, with one field duplicate sample collected for analysis. Based on the small number of primary samples, no field triplicate sample was collected.
	• In addition to the identified CoPCs as tabulated in **Section 6.2,** additional contaminants were identified as CoPCs from the previous PSIs completed for the block (see **Section 3.1**), as well as additional general water quality parameters were analysed in the water samples to provide additional water quality data.
	• The CoPCS analysed are as follow:
	  ○ OCPs, OPPs, TRH, BTEXN, PAH, Phenols, PCBs;
	  ○ Metals (Aluminium, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Zinc);
	  ○ Anions (Chloride, Sulfate, Fluoride);
	  ○ Cations (Calcium, Magnesium, Potassium and Sodium);
	  ○ Nutrients (Nitrate, Nitrite, Phosphorus);
	  ○ Physicochemical (pH, electrical conductivity, alkalinity, acidity, water hardness); and
	  ○ Per- and poly-fluoroalkyl substances (PFAS).

9.1.3 Quality Assurance and Quality Control

The quality assurance (QA) and quality control (QC) procedures applied for this water investigation are summarised below:

Table 11 – QA/QC plan for the water quality investigation

QA/QC	Description
QA/QC sample	• One field duplicate sample was collected to calculate the relative percentage difference (RPD) to assess the precision and accuracy of the laboratory. Acceptable RPDs are listed in **Table 8.** • The duplicate sample was collected from the upstream location (i.e. primary sample upstream).

[8] The Bureau of Meteorology (BOM) recorded 13.0 mm and 19.44 mm of rain on the 7th and 8th April 2022 respectively, at the Charnwood weather station located approximately 4 km north-east of the site.

QA/QC	Description
	• Based on the RPD results (see **Appendix B: Table 2**), all RPD targets were complied with and therefore the analytical data is considered reliable for this assessment.
Field QA/QC	• Single-use disposable nitrile gloves were used to collect the surface water samples from the creek directly into laboratory-supplied containers to prevent cross-contamination. • No equipment was reused for each sampling, and therefore no equipment decontamination procedures were considered necessary.
Laboratory QA/QC	• All holding times were reported within their tolerable ranges with the exception of the extraction date for acidity and pH. As these analytes are not CoPCs identified for this investigation and were analysed to assess the water quality conditions, the extraction date outside of the recommended withholding time is considered acceptable. • All analysis was performed in NATA accredited laboratory, SGS Australia (NATA #2562). • All surrogates and spike recoveries were within the tolerable limits with the exception of the analysis of OCP, OPP, PAHs, PCBs and Phenols. Based on the results all below the laboratory limit of reporting (LOR), the failed recoveries are not considered to impact the outcome of this investigation. • All matrix spike recoveries were within tolerable limits. • All laboratory control sample results were within the tolerable limits. • All laboratory duplicate sample results were within the tolerable limits. • All method laboratory blanks were below the laboratory LOR and therefore within tolerable limits. • The laboratory quality report is included in **Appendix B.**

9.1.4 Water Quality Results

The water investigation included the water samples collected from upstream and downstream locations of the creek along the eastern boundary of the site (see **Appendix A: Figure 3**). The analytical results are tabulated in **Appendix B: Table 1** with laboratory certificates and associated chain of custody documentation shown in **Appendix B.**

A summary of the surface water results is as follow:

- BTEXN, Phenols, PAHs, OCPs, OPPs and PCBs, were below the laboratory limit of reporting (LOR). It is noted the field duplicate sample showed trace concentrations of TRH C_{10}-C_{14}. The trace concentrations could be from an organic source from local vegetation.
- One PFAS compound (Perfluorobutanoic Acid – PFBA) was detected in low concentrations across both samples, with the upstream sample with a slightly higher concentration.
- Heavy metal results were generally low and below the assessment criteria, with the exception of copper, aluminium and iron exceeding the assessment criteria. The elevated concentrations of Aluminium and iron are expected to be of natural background concentrations[9]. The metal concentrations appear to be higher in upstream samples than the downstream samples, indicating this is likely reflective of the background condition in the area (considering the water in the creek is likely rainwater).
- Water quality upstream of the *Site* is slightly acidic, with downstream location neutral.
- Both cations and anions analysis shows higher concentrations in the downstream locations.

[9] Lanterra conducted an investigation to assess background aluminium data in soil for Riverview Projects (ACT) Ltd in 2021, with water quality assessment completed by the University of Canberra on several locations across the site, identifying naturally elevated aluminium concentrations in a local stream and Murrumbidgee River – see Lanterra Consulting (2021) Strathnairn Soil 2 Assessment (ref: P21002)

- Low electrical conductivity is measured in both upstream and downstream locations, with downstream locations showing higher levels. This is consistent with the higher chloride concentrations observed in the downstream sample.
- The nutrient concentrations were generally low.

9.1.5 Summary of Water Quality Investigation

The water quality investigation included the water samples collected from upstream and downstream locations of the creek along the eastern boundary of the site.

The investigation noted the following site observation:

- The creek was generally dry, with sufficient flowing water after a rain event.
- The downstream location showed a wider creek, with both creek locations covered in vegetation (reeds).
- Water in the creek was slightly turbid in appearance, likely carrying sediment from the rain event.
- The water did not exhibit any visual or olfactory signs of contamination.

Based on the results of water quality analysis, it can be considered that the water is of reasonable quality, with indications of being impacted by the general urban environment with the presence of PFAS, trace TRH and metals concentrations.

9.2 Erosion and Sediment Control

The water quality investigation indicates the water in the creek is affected by the general urban environment, and it's reasonable to expect that any surface runoff passing through the proposed CSG site that flows into the creek may impact the natural waterway's water quality.

In order to minimise any potential impacts of runoff into the natural waterway that borders the site, a robust erosion and sediment control plan (ESCP) is required for the proposed CSG site. The proposed erosion and sediment control plan for the site is shown in **Appendix A: Figure 4C.**

A summary of the controls is provided below:

- Construction of a sediment and control pond located in the south-east corner of the site, to capture all surface runoff.
    - The sediment control pond shall be regularly monitored.
    - Any discharge from the pond shall be conducted in accordance with the ACT EPA (2011) *Environment Protection Guidelines for Construction and Land Development in the ACT.*
- Construction of drainage and channels to divert all surface runoff and overland flow of the site into the sediment control pond.
- Construction of a stabilised batter/bund around the perimeter of the site, to prevent runoff from exiting the site into the natural waterway along the eastern boundary of the site.

Lanterra considers the ESCP above to be adequate to prevent runoff from entering the creek. The following additional site controls are recommended for implementation during the proposed CSG construction work and day to day operation:

- Site workers shall visually monitor sediment load in stormwater drains when excavations are close to surface drains. This includes assessing site conditions prior to work commencing following a rain event.
- Sediment control structures (i.e. silt fencing and/or hay bales) should be implemented in accordance with *Environment Protection Guidelines for Construction and Land Development in the ACT (ACT EPA, 2011*). Hay bales used for sediment control must be certified as weed-free prior to usage.
- Weekly inspections of the condition of erosion and sediment controls must be undertaken by site workers/contractors to ensure that sediment and erosion controls are in good condition and are effective. This includes the sediment control pond where the occasional removal of accumulated sediment may be required as part of the pond maintenance.
- If a significant rain event occurs, work should cease. There shall be sediment control measures available for placement downgradient of the work area.
- After a significant rainfall event, the site (including the sediment and erosion controls) must be inspected. Where the storm has affected the site (e.g. erosion of soil has occurred or sediment and erosion controls have failed), the site must be stabilised and sediment and erosion controls repaired immediately and prior to earthworks recommencing.
- Evaluate the weather conditions prior to construction works commencing and during any change in wind direction.
- Strategic placement of such structures down-gradient of stockpiles and slopes to minimise sediment entrainment. These measures should also be placed on the up-slope side of any storm water collection channels.
- Where sediment and erosion control measures have failed and require repair, modifications to the control measures must be made to prevent similar failures in the future and regularly inspected to ensure effectiveness.
- Works shall also be conducted in a manner to minimise the potential for sediment and soil migration, whereby excavated material shall be hauled off-site as soon as practicable and/or reinstated and compacted.
- Implementation of a flood management protocol.

10. Updated Conceptual Site Model

Based on the outcomes of this investigation, the CSM has been updated to reflect the information obtained.

Table 12 – Updated Conceptual Site Model

AEC	Proposed Use	Previous Use	Likelihood of Contamination	Potentially Contaminated Media				COPCs	Exposure Pathways			Comments	Risk
				Soil	Groundwater	Surface Water	Gas / Vapour		Direct Ingestion	Dermal Contact	Inhalation		
Former pesticide use	Greenwaste processing and composting facility	Former vineyard	**Low**	✓	×	✓	×	OCP/OPP, Herbicides, Fluproponate, Metals	×	×	×	• The former pesticide application may have impacted the soil condition on-site. • The age of the vineyard and the small scale of former application of fluproponate (an approved herbicide by the ACT government), indicate the potential pesticide risk in the surface soil are like low, and comparative to the risk profile of processing green-waste and composting on-site. • No pesticide impacted surface water was identified in the creek that borders the *Site.* • Water with slightly elevated metals is identified in the creek, reflecting of background condition.	**Low** Limited exposure pathways are present, with direct contact with soil limited to future site workers during the development of the site. The future landuse of the site will involve processing a large quantity of greenwaste, posing a similar risk profile to the current soil condition on-site. No exposure pathways are expected with surface water in the creek, that will not be used for the future operation of the site.

11. Conclusions

11.1 Site Suitability

The Suburban Land Agency (SLA) engaged Lanterra to prepare this Site Suitability Report (SSR) for the proposed CSG facility at 135 Stockdill Drive, Holt ACT 2615 (part of Block 1582, Belconnen) as shown in **Appendix A: Figure 2.**

This SSR was prepared to determine the *Site's* suitability for the proposed CSG operation at 135 Stockdill Drive, Holt ACT 2615 (part of Block 1582 Belconnen) from an environmental perspective.

The following scope of work was completed as part of preparing this SSR:

- A detailed review of the previous investigation reports relevant to the *Site* – see **Section 3.1.**
- A review of historical aerial photographs from 1959 to 2004 assessing site conditions – see **Section 3.2.**
- A review of CSG operation and proposed development work at the *Site* – see **Section 7.**
- A site inspection and establishment of baseline water quality data of the *Site* – see **Section 9.**

Lanterra's findings are summarised below:

Table 13 – Site Suitability Investigation Findings

Findings	Summary
Pesticides application	• The site is occupied by derelict grape vines with potential former pesticides that may have been applied to the site as part of the former vineyard operations. • The EPSDD invasive plant control maps indicate that flupropanate has been used for the control of African Lovegrass across the site. • The risk associated with the potential pesticides and herbicides applied on-site is considered to present a similar risk profile to the proposed CSG operations of processing greenwaste on-site. • The proposed cut and fill activity on-site will involve cutting and grading of site-won materials, for reuse on-site for the proposed development (see **Appendix A: Figures 4**).
Surface runoff	• The proposed CSG operations are likely to generate runoff as part of the proposed construction as well as the day to day operation. • Sufficient erosion and sediment controls have been proposed to manage any runoff on-site, as well as prevent and minimise any potential impacts of runoff into the natural waterway that runs along the eastern boundary of the *Site*. • Water from the creek shall not be extracted for use in the composting operations.
Other environmental controls	• The site is expected to be issued an Environmental Authorisation (EA) by EPA to regulate the operation on-site. The EA is expected to include conditions to implement environmental site controls for the site, to minimise any potential environmental impacts that may arise from the site operations, (as per the current EA for the CSG facility in Parkwood Road – EA #0642).

The potential risks identified for the *Site* as summarised in **Table 13,** are considered to be acceptable as the potential risks can be adequately managed by the implementation of environmental site controls (see **Section 11.2**). Therefore, Lanterra considers the *Site* to be suitable for the proposed CSG development for greenwaste processing and composting purposes, from an environmental perspective.

This investigation has been completed based on the proposed development of a greenwaste processing and composting facility only, and has not considered other permissible landuses provided under the site's zoning of NUZ1: Broadacre. Any other potential development on-site that is considered a more sensitive landuse (e.g. residential care accommodation), will require further intrusive investigation to determine the site's suitability.

11.2 Recommendations

The proposed CSG facility at Stockdill Drive is expected to implement site environmental controls to minimise any potential adverse impacts that may arise from the proposed greenwaste processing facility on-site. It is anticipated that this will be included in the EA conditions to be issued for the site (upon DA approval). The practice of implementing environmental controls is expected to be similar to the existing site controls implemented by CSG at their Parkwood facility (see **Section 7.3**), with consideration of site-specific conditions/features at Stockdill Drive. A

An Environmental Management Plan (EMP) prepared by a suitably qualified environmental consultant shall be developed for the proposed CSG site, providing detailed environmental site controls to be implemented for the future and on-going operation of the *Site* as a greenwaste processing and composting facility. This is expected as a requirement to be incorporated into the *Site's* Environmental Authorisation (once granted). The EMP at a minimum shall include the following:

- Greenwaste processing procedures.
    - Screening of green waste on-site to remove any oversize materials not suitable for composting and foreign materials/contaminants.
    - Stockpiling procedures for greenwaste at different stages of processing and unsuitable materials to minimise cross-contamination.
- Erosion and sediment control to manage site runoffs (see **Section 9.2)**.
- Air quality management to control and minimise impact from odour, smoke and fume emission from the operation on-site.
- Dust control to manage and minimise dust emission.
- Surface water and leachate management.
    - This may include surface water (from irrigation of green waste stockpile for composting), leachate generated from greenwaste stockpiles, and runoff.
    - Flood and overland flow management procedures.
- Unexpected finds protocol to manage potential contamination identified in greenwaste materials and/or site. An example is provided in **Appendix F.**
- Waste management.
    - Isolation and storage of unacceptable/unsuitable greenwaste, solid waste generated on-site, any hazardous waste and litter.
    - Off-site disposal of the waste materials identified above.
- Chemical storage management.
    - This includes the safe storage of chemicals such as fuel, pesticides/herbicides or other chemicals.
    - Spillage and leak management procedures.
- Emergency response procedures for environmental emergencies (i.e. pollution event, significant spillage, etc.).
- Pest, vermin and noxious weeds control.
- Spontaneous combustion and bushfire control.
- Traffic management.
- Noise management.

A construction environmental management plan (CEMP) shall also be developed to provide procedures to manage any potential risks encountered during the construction of the site.

12. References

ACT EPA (2017) Contaminated Sites Environmental Protection Policy

ACT EPA (2011) *Environment Protection Guidelines for Construction and Land Development in the ACT*

ACT EPA (2020) *Contaminated Sites Information Sheet No. 11 – EPA Report Submission Requirements*

ACT EPA (2019) Spoil management in the ACT

ACT Government, Environment and Sustainable Development (2013) Environmental Authorisation #0642

ACT Government (2022) ACTMapi – Significant Species, Vegetation Communities and Registered Trees

ACT Government EPSDD (2022) Heritage in the ACT

ACT Government EPSDD (2022) Environment, Invasive Control Plant Maps and Progress Reports

ACT Government (2021) ACT's Environmental Standards: Assessment & Classification of Liquid and Non-Liquid Wastes

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13. Glossary

ACM	Asbestos-containing material
ACT	Australian Capital Territory
AHD	Australian Height Datum
AEC	Areas of Environmental Concern
ASC NEPM 2013	National Environment Protection (Assessment of Site Contamination Measure 1999' as amended 2013.
BRU	Beneficial Reuse
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene
CEMP	Construction Environmental Management Plan
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CSG	Canberra Sand and Gravel
DA	Development Application
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EA	Environmental Authorisation
EM	Environmental Management
EMP	Environmental Management Plan
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPSDD	Environment Planning and Sustainable Development Directorate
ESCP	Erosion, Sediment and Control Plan
Lanterra	Lanterra Consulting Pty Limited
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Council
NSW	New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PFAS	Per- and poly-fluoroalkyl substances
PPE	Personal protective equipment
PQL	Practical Quantitation Limit
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
SAP	Sampling and Analysis Plan
SQEC	Suitably Qualified Environmental Consultant
SLA	Suburban Land Agency
SSR	Site Suitability Report
TCCS	Transport Canberra and City Services
TRH	Total Recoverable Hydrocarbon
UFP	Unexpected Finds Protocol
VENM	Virgin Excavated Natural Materials
WBRMC	West Belconnen Resource Management Centre