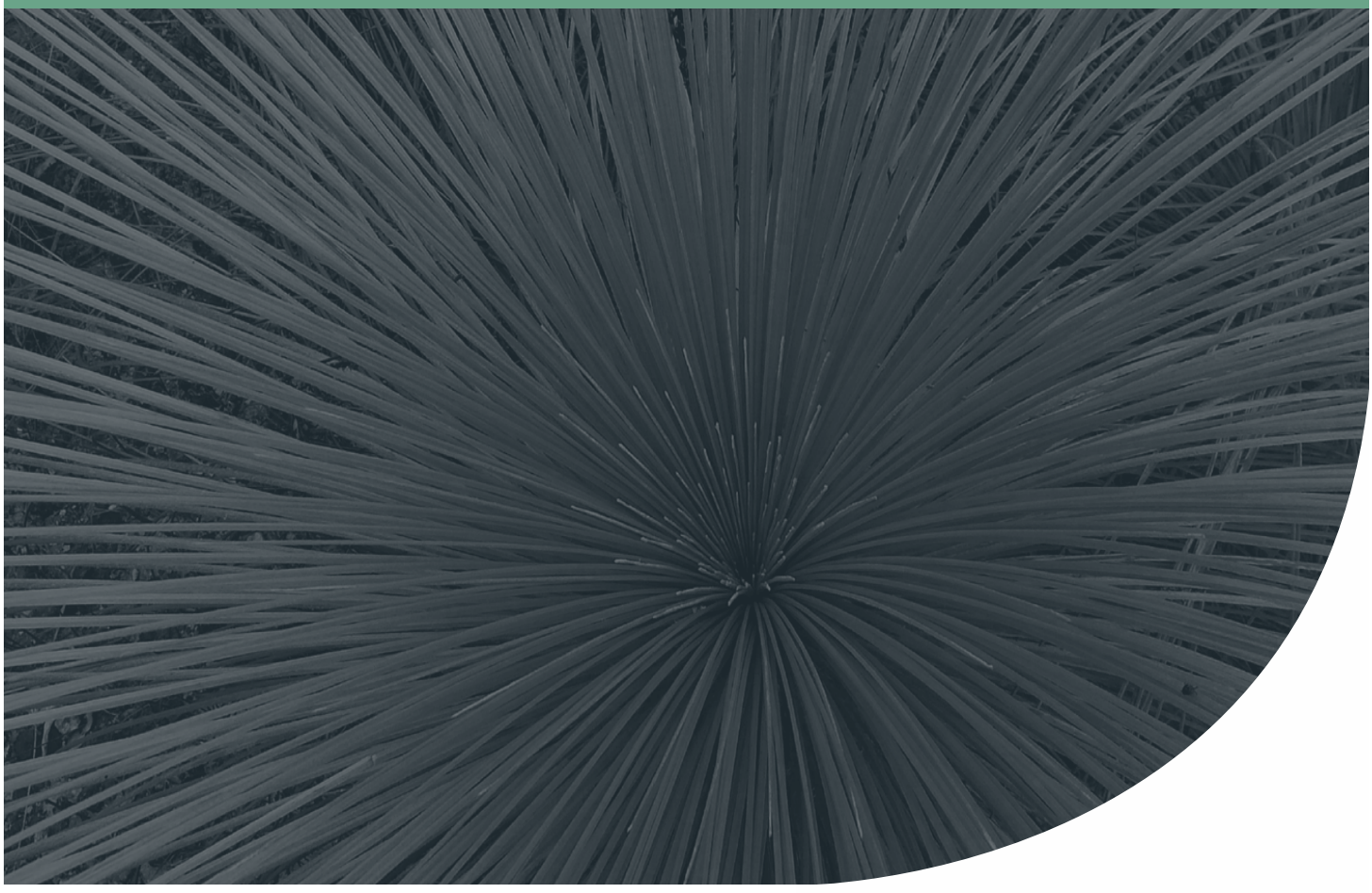
Hilton Park North Environmental Management Plan

138 Lefroy Road, Beaconsfield

Project No: EP23-053(13)

Prepared for the City of Fremantle
March 2026



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Executive Summary

Emerge Environmental Services Pty Ltd (Emerge Associates) was engaged by the City of Fremantle to undertake an environmental management plan (EMP) for works within Hilton Park North. The City intends to redevelop Hilton Park to increase accessibility and participation in a diverse range of sports.

The purpose of this document is to undertake a detailed environmental assessment of known environmental considerations within Hilton Park and asses any impact of the proposed works.

This EMP includes:

- Identification of existing environmental considerations of the site's disturbance footprint of proposed works
- Discussion of the potential impacts to known environmental considerations
- Summarised contaminated land investigations
- Summarised hydrological investigations
- Summarised ecological investigations
- Discussion of any environmental planning and approval considerations related to the proposed works.
- A risk assessment for proposed works to impact to known environmental considerations
- Recommended management actions to reduce impact to known environmental considerations that can be incorporated into tender documentation for the proposed construction works.

The following summarises the contaminated land, hydrology, ecological and environmental regulatory assessment:

- No threatened or priority flora species were recorded or are considered likely to occur.
- One vegetation unit was identified across the site, **planted/non-native,** which occurs in 'completely degraded' condition.
- No TECs or PECs were recorded or are considered likely to occur.
- Two broad fauna habitats were identified: **scattered trees and turf** and **bare ground and grassland**.
- No conservation significant fauna species were recorded within the site.
- Three conservation significant fauna species were considered to have a high or moderate likelihood of occurrence:
    - Carnaby's black cockatoo (EN)
    - forest red-tailed black cockatoo (VU)
    - Pacific swift (MI).
- The site contains black cockatoo breeding habitat, with 18 'potential nesting trees' with no suitable hollows. According to the impact to trees figure 5 and the ecological assessment figure 6 in attachment D, no habitat trees are proposed to be impacted.
- No roosting evidence was recorded. Some tall trees in the site may provide roosting habitat for black cockatoos.

- A total of 0.93 ha of foraging habitat for Carnaby's black cockatoo was recorded, comprising 0.04 ha of native primary plants, 0.57 ha of native secondary plants, 0.10 ha of non-native primary plants and 0.22 ha of non-native secondary plants.
- A total of 0.50 ha of foraging habitat for forest red-tailed black cockatoo was recorded, comprising 0.04 ha of native primary plants, 0.35 ha of native secondary plants and 0.11 ha of non-native secondary plants. No non-native primary foraging habitat was recorded.
- Black cockatoo foraging habitat combined where foraging for both Carnaby's black cockatoo and retention is 0.84 ha and the impact to the disturbance footprint for foraging removal is 0.13 ha. The retention area is based on a combination of the two black cockatoo foraging preferences.
- A total of 271 trees were recorded within the site, comprising 133 native species to the Swan Coastal Plain and 138 non-native. All native trees within the site have been planted and are not classified as native vegetation under the EP act.
- Out of the 271 trees recorded, 23 were classified as having high retention value due to ecological or amenity significance. Most of the remaining trees were classified as having moderate retention value, and <10% were classified as having low retention value. There are 30 moderate retention value trees to be removed as part of the disturbance footprint.
- Contaminated soil in the south-eastern corner does contain small amounts of asbestos contaminated material (ACM) the soil from this area must be removed from site to a controlled waste facility as per DWER regulations.
- Hydrology across the site has been assessed and recommendations made for further extension to existing basins as well the need to design and implement new swales, biofilter retention areas and flood storage areas.
- No native vegetation under the definition of the Environmental Protection Act 1986 occurs on site and as such no clearing permit will be required.
- The removal of 0.13 ha of black cockatoo foraging habitat is under the Commonwealth threshold of 1ha which would require a referral under the Environmental Protection and Biodiversity Conservation Act 1999.
- The City has drafted conceptual design and revisited this to avoid known areas of environmental consideration which is consistent with its environmental strategies and policies.

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Appendices

Appendix A
Concept Plan

Appendix B

Contaminated Lands Report

Appendix C

Hydrology Report

Appendix D

Ecological Assessment

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Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
ANZECC	Australian and New Zealand Environment and Conservation Council
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department Climate Change Energy, Environment and Water
DEC	Department of Environment and Conservation (now DBCA)
DEP	Department of Environmental Protection (now DWER)
DWER	Department of Water and Environmental Regulation
DPLH	Department Planning Lands and Heritage
EPA	Environmental Protection Authority

Table A2: Abbreviations – General terms

General terms	
CCW	Conservation category wetland
ESA	Environmentally sensitive area
FCT	Floristic community type
IBRA	Interim Biogeographic Regionalisation of Australia
MUW	Multiple use wetland
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
P5	Priority 5
PEC	Priority ecological community
REW	Resource enhancement wetland
T	Threatened
TEC	Threatened ecological community
UFI	Unique feature identifier

Table A3: Abbreviations –Legislation

Legislation	
CS Act	Contaminated Sites Act 2003
BC Act	Biodiversity Conservation Act 2016
EP Act	Environmental Protection Act 1986
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPP	Environment Protection Policy

Table A4: Abbreviations – units of measurement

Units of measurement	
cm	Centimetre
ha	Hectare
m	Metre
m^2	Square metre
m AHD	m in relation to the Australian height datum
mm	Millimetre
Km	Kilometre

1 Introduction

1.1 Project background

Emerge Environmental Services Pty Ltd (Emerge Associates) was engaged by the City of Fremantle (the City) to undertake an environmental management plan (EMP) which includes contaminated site investigation, ecological tree survey, hydrological reporting and environmental planning considerations.

Hilton Park North is located within the City of Fremantle in the suburb of Beaconsfield. The site comprises Lot 551 Lefroy Road and part Lot 839 Carrington Street in Beaconsfield and extends over approximately 6.16 hectares (ha). It is bounded by Lefroy Road to the north, Shepherd Street to the west, Walton Way to the south and Carrington Street to the east. The location and extent of the site is shown in **Figure 1**.

The City intends to redevelop the site to increase accessibility and participation in a diverse range of sports and to address key priorities in its Strategic Community Plan 2024-2034 and Public Open Space Strategy 2024-2034. The Hilton Park serves as both a neighbourhood and district open space which aligns with the Department of Local Government, Sport, and Cultural Industries (DLGSC) classification framework for Public Open Space (POS).

The Hilton Park precinct plan (UDLA 2025) is provided in **Appendix A** and the main works proposed in the site include:

- Realignment of the main oval (i.e. Dick Lawrance Oval)
- Cut/fill balance and grading of the southeastern corner of the site to convert space to junior sporting oval
- Creating a main oval running track loop
- Bleachers (seating, including limestone retaining walls) to provide a stepped interface between the main and junior ovals.
- Sporting activity spaces including cricket nets, bicycle pump track and 18-hole frisbee golf course
- Perimeter paths and car parking around the site.

1.2 Purpose of this document

The purpose of this document is to undertake a detailed environmental assessment of known environmental considerations within Hilton Park and asses any impact of the proposed works. This EMP summarises works from an ecological tree assessment, contaminated land and hydrological investigation, as well as providing an environmental approvals strategy.

This EMP will therefore include:

- Identification of existing environmental considerations of the site's disturbance footprint of proposed works
- Discuss the potential impacts to known environmental considerations
- Summarise contaminated land investigations
- Summarise hydrological investigations

- Summarise ecological investigations
- Discuss any environmental planning and approval considerations related to the proposed works.
- Provide a risk assessment for proposed works to impact to known environmental considerations
- Recommend management actions to reduce impact to known environmental considerations that can be incorporated into tender documentation for the proposed construction works.

This EMP applies to the proposed works disturbance footprint within Hilton Park shown in **Figure 2** and is intended to be circulated to construction and engineering professionals for the purpose of informing landscape architecture and engineering deliverables.

1.3 Management targets

This EMP is 'management based' and documents management actions required within the disturbance footprint during the construction stage of implementing the proposal.

The following management targets have been identified for construction works within the disturbance footprint:

- Minimise impacts to vegetation on Hilton Park whether native or not, unless within the disturbance footprint through effective design and construction implementation.
- Minimise impact on native fauna that may utilise the site vegetation for roosting, feeding or breeding.
- Appropriately manage the soil within the site identified as containing asbestos containing material.
- Manage stormwater within the site via design and infrastructure to reduce impact of hydrology on recreational facilities.
- Ensure effective implementation, monitoring and maintenance of environmental mitigation measures throughout the construction phase of the proposed development.

1.4 Planning and Approvals Context

The site is approximately 6.16 ha currently zoned as 'public open space' designated for community use as a park and sports facility under the Metropolitan Region Scheme (MRS) which supports the existing land use. The site has been established since at least 1953.

The site is situated within the City of Fremantle Local Planning Scheme (LPS) No. 4 which has no zoning, restrictions or additional uses associated with the land. The site parcel is identified as lot 551 on Deposited Plan 226147 and lot 839 on Deposited Plan 152954 and is situated within an area surrounded by established residential and some commercial development.

The following City of Fremantle Strategies, Plans, Council Policy and Local Planning Policies apply to environmental considerations within the City. This site should have due consideration to these documents.

Table 1: City of Fremantle Strategies, Plans and Policies applicable to Hilton Park Project

Council Document	Reference to project
Strategies	
Strategic Community Plan 2024-2034	Sustainable design and optimised urban and natural environments, the community can access and enjoy natural areas and green spaces for passive and active recreation. Increasing tree canopy that enhances biodiversity and helps cool our urban environments.
Local Planning Strategy (February 2026)	Continue in the pursuit of a Green Fremantle and increased urban canopy on both public and private land whilst still accommodating new development.
Public Open Space Strategy 2024-2034	Ensure the needs of relevant stakeholder groups are considered in the design and development of new and re-developed existing POS and community infrastructure.
Greening Fremantle Strategy (2020)	• Design adaptable open space that allows for future flexibility as the community and open space function and needs that change over time. • Develop links that increase the amount of flora/vegetation and increase habitat for native fauna and encourage their movement between green spaces and to increase and improve biodiversity areas • Investigation and identification for accessing POS in priority areas such as Beaconsfield • Undertaking an Urban Forest Plan to managed and guide tree and vegetation population across the public and private realm. • Prepare planting plans for green links including links between green spaces and activity centres. • Detailed canopy mapping undertaken to inform the Urban Forest Plan where Beaconsfield had the second highest vegetation cover in 2015. • Increase and improve linkages between green spaces and areas of biodiversity. (Lefroy Rd – 'Local Biodiversity' and Carrington St – 'Green Space' being noted as 'Green Linkages'.
Plans	
Urban Forest Plan (2017)	Vision is to protect the existing green spaces and trees and progressively grown and diversity the City's tree population for adaptive climate management and amenity; to collaborate effectively to plant, plan, design and sustainably fund programs to create a resilient urban forest. • Assist in maintaining and enhancing green areas/trees • Increase canopy cover and biodiversity to mitigate urban heat island effect.
Hilton Park Precinct Plan – Masterplan (2024)	• Outlines Green and Blue systems for the park. • The park is a beneficial sustainable island • The project will contribute to the City's focus on greening and increasing biodiversity and tree canopy cover. • The guiding ecological principal is for a cool, green and biodiverse parkland where areas not defined or allocated to sporting or community function will be regenerated to provide ecological benefit and habitat creation with specific focus on endemic flora and tree canopy. • The ambition is to maximise tree canopy through landscape planning linking movement systems, tree planting and ecological corridors.
Hilton Park Precinct Planning – Community Engagement Outcomes Report (2024)	• Community consultation noted sustainability measures that can be used on site and the provision of details of how the plan balances existing activities and the environment.
Policies	

Council Policy – Trees on City Owned or Managed Land	• If the City determines that a tree on City owned or managed land requires removal due to a City led or managed development, the tree will be replaced with a minimum of two trees (Min pot size 30 litres, reaching a mature height of at least 8 metres and planted in ground at or near the removed tree location. • Trees adjacent to development zones shall be protected during the duration of the works. • A Tree Protection Zone (TPZ) shall be provided using temporary construction fencing in accordance with AS 4970-2009 Protection of Trees on Development Sites • Temporary TPZ fencing must be a minimum 2m by 2m around the trunk and not obstruct footpaths or roads. • Trees damaged, decline or die because of development will have costs reclaimed under the City's Local Government Property Local Law 2002. Costs will include full tree valuation, removal, replacement purchase, planting and watering over establishment period.
Local Planning Policy 2.26 Tree Protection	• A likely exemption will apply from development approval for removal of trees as the works under 2.1(i) is a tree damaging activity that is carried out by the local government on a City owned or managed tree. • The City's Significant Tree Register has been paused whilst the City assesses LPP 2.26 Tree Retention on the basis that most trees in the City now have protection. • The Tree Retention Policy and Significant Tree Register will be reviewed in 2026.
Local Planning Policy 2.23 Register of Significant Trees and Vegetation Areas	Although the Significant Tree Register is being reviewed, there are no registered trees or vegetation areas associated with Hilton Park in Appendix B of LPP 2.23.
Local Planning Policy 3.5 – Local Planning Area 5 – Beaconsfield	LPP 3.5 is specific to private property development requirements and not related to the Hilton Park project.

1.4.1 EPBC Act

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) protects listed Matters of National Environmental Significance (MNES), and it is an offence to implement any action that would result in a significant impact on any MNES without relevant approvals. If a proponent believes their proposed action is likely to have a significant impact on any MNES (or if the proponent is uncertain whether the proposed action will result in significant impacts), then they are required to refer their proposal to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). The Minister (via a delegate) will decide whether the proposed action may result in significant impacts on MNES and consider the action a 'controlled action' requiring environmental assessment and subsequent approval or 'not a controlled action' with the proposed action not requiring environmental approval under the EPBC Act (noting State EP Act obligations will still apply).

The MNES have been considered for Hilton Park following on site investigations and interpretation of the EPBC Act requirements. The MNES and conclusions are listed below:

- Black cockatoo species, both Carnaby's and Forest red-tailed are two threatened species relevant to this park and surrounding area.
- The extent of breeding and foraging habitat for Carnaby's and Forest red-tailed black cockatoos was mapped, and results conclude there is less than 1 ha of foraging habitat across the site.

- The Commonwealth's Referral guidelines for Three WA threatened black cockatoo species (Commonwealth of Australia 2022) applies. This guideline considers breeding, foraging, and roosting of black cockatoos and whether a referral under the EPBC Act should be undertaken.
- A referral is unlikely to be required where less than 1 ha of quality foraging habitat for black cockatoos is cleared.
- Further to foraging habitat Breeding habitat (known nesting trees, suitable nesting trees, suitable nest hollow, potential nesting trees) is to be considered.
- A 'potential nesting tree' has a suitable diameter at breast height (DBH) (300-500 mm) to develop a nest hollow but does not currently have hollows.
- Trees were mapped within Hilton Park resulting in 18 potential nesting trees with no suitable hollows for black cockatoo breeding.
- Further, the disturbance footprint within the proposed site works has an opportunity to avoid some of these trees.

The overall black cockatoo foraging habitat to be removed is 0.13 ha and no potential habitat trees are impacted by the disturbance footprint of the works. It can therefore be concluded there are no likely significant impacts to matters of national environmental significance, meaning a referral under the EPBC Act is not required.

1.4.2 Clearing permit

Under the *Environmental Protection Act 1986* (EP Act) it is an offence to clear native vegetation unless the clearing is done in accordance with a clearing permit, or an exemption applies. 'Native vegetation' is defined in section 3(1) and 51A of the EP Act and Regulations as follows:

'Indigenous aquatic or terrestrial vegetation, that includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation'.

The site is not within a mapped environmentally sensitive area (ESA) meaning exemptions under the Clearing Regulations 2004 and Part V of the Environmental Protection Act 1986 (EP Act) can apply.

Vegetation clearing is exempt under Environmental Protection (Clearing of native vegetation) Regulations 2004 due to the definition of 'native vegetation'. Under section 51A of the EP Act 'native vegetation' does not include vegetation that is intentionally sown, planted or propagated, even if this vegetation is considered endemic to WA.

Following Emerge's site investigation by a qualified ecologist of 271 trees, it is concluded there is no 'native vegetation' existing within the Hilton Park based on the definition of the Regulations'. All trees within Hilton Park are considered to be 'planted' based on historical aerial imagery and therefore, Part V of the Environmental Protection Act does not apply and a clearing permit is not required to remove vegetation within the site even though some species are considered "native" by their endemic nature to Western Australia.

2 Existing Environmental Conditions

A site visit was undertaken on the 7th of October 2025 by qualified environmental consultants from Emerge Associates to inspect the current environmental site conditions.

The following sections provide a summary of the environmental considerations present within the site and particularly the disturbance footprint. A range of information sources, including local and regional reports, datasets, mapping, as well as previous site-specific investigations have informed this assessment.

2.1 Historical clearing

The site has been subject to historical disturbance and has undergone previous clearing to facilitate the establishment of Hilton Park. This includes cleared areas associated with car parks, building and drainage infrastructure, and recreational ovals. Historical photographs are provided in the *Hilton Park Precinct Plan – Masterplan (2024).*

A review of historic aerial photography indicates that the site has been cleared of vegetation in various stages as parks infrastructure was developed, since circa 1953. This is when the residential areas surrounding the park were developed during the post WW2 construction boom in the late 1940's early 1950's, with the retention of minimal native remnant trees along the northern, southern and western boundary. The current existing vegetation within the site includes a mixture of planted native and non-native trees, the latter which can be seen in linear lines throughout the park.

2.2 Topography

Topographic mapping indicates the site is generally flat in the northern portion of the park and undulating in the southern portion of the park, with elevations ranging from approximately 42 m Australian Height Datum (AHD) in the southern portion of the site to 33 m AHD in the northern portion of the site. Topographic contours across the site are shown in **Figure 1**.

2.3 Soil and Landforms

The site is situated on the Perth Basin on the Swan Coastal Plain. The Swan Coastal Plain is characterised by a series of old dunes which run parallel to the coast. The youngest (Holocene) dunes are the Quindalup dunes near the contemporary coastline, with the secondary (Spearwood dunes) and oldest (Bassendean dunes) occurring further inland. The soil is typically sandy with limestone and some clay, and a series of wetlands occurs within Spearwood and Bassendean dune swales.

Soil Landscape mapping provided by the Department of Primary Industries and Regional development (DPIRD) has identified that the site is within the Spearwood system.

The environmental geology of the site is predominantly sandy and has been mapped by the Geological Survey of Western Australia (Gozzard 1986), which identifies the following soil unit within the site:

Table 2: Environmental Geology Series Map Unit Descriptions (Gozzard 1986)

Geological Unit	Equivalent On Geological Maps	Description
S7	Sand	Pale and olive yellow, medium to coarse-grained, sub-angular to sub-rounded quartz, trace of feldspar, moderately sorted, of residual origin

2.4 Geo Heritage

A review of the Department of Mines, Industry Regulation and Safety (DMIRS) Geoheritage mapping indicates that there are no significant geo-heritage features or formations within or surrounding the site. No limitations or issues are likely to arise within the site associated with geo-heritage features.

2.5 Acid Sulfate Soils

Acid sulfate soils (ASS) refer to naturally occurring soils and sediment containing iron sulphide (iron pyrite) materials. In their natural state, present in waterlogged and/or anoxic conditions, ASS generally do not present any risk to the environment. However, when oxidised, ASS can pose issues through sulphuric acid production, which can present a range of risks for the surrounding environment, infrastructure, and human health.

Available regional mapping from Landgate has identified the site as having no risk of Acid Sulfate soils (ASS) occurring within 3 m of the natural soil surface. This is further confirmed by the absence of wetland or dampland characteristics within and surrounding the site. Therefore, no further ASS management will be required.

2.6 Contaminated Site Investigation

Emerge Associates undertook a contaminated site preliminary investigation (November 2025) in the south-eastern portion of Hilton Park (**Attachment B**). The investigation was undertaken to identify potential contamination associated with uncontrolled fill at the site which covered an area of approximately 18,000 m^2 as well as evaluating risks to human health and the environment.

Following a review of historical aerial images, a bicycle track appears to have been constructed early 1980's with stockpiles removed approximately 1989 which could suggest the material was removed or covered. The track was absent in 1995 aerial photographs. Should the stockpiles be buried on site, there is potential for uncontrolled fill to be a source of contamination which increases the likelihood of asbestos containing material (ACM).

A search of the Department of Water and Environmental Regulation (DWER) contaminated sites database of known and reported sites showed no records and no contaminated properties within a 500m radius of the site.

A site investigation was conducted in October 2025 by Emerge Associates and field investigations undertaken with 18 pits excavated, the results of which are provided in detail in **Attachment B**.

Results of the field investigations concluded:

- Laboratory analysis of soil samples confirmed no evidence of chemical contamination, with concentrations well below the adopted assessment levels for recreational land use, indicating no risk to human health or the environment.
- ACM was identified throughout the northern mound. This soil must be managed as controlled waste if soil disturbance occurs at this depth in accordance with the Environmental Protection (Controlled Waste) Regulations 2004 (DWER 2004). The material cannot be disposed of at a standard landfill and must be transported to a licensed asbestos waste facility. Prior to removal, the soil should be appropriately segregated, contained, and clearly labelled 'CAUTION ASBESTOS' to prevent fibre release during handling and transport. Disposal should be coordinated with the facility operator, and all handling must comply with regulatory requirements to ensure safe and compliant management of the ACM.
- The remainder of the site is generally suitable for recreational use, and the fill material is appropriate for the proposed future land use. With proper segregation during excavation, clean fill can be reused on site, while C&D material can be managed appropriately.

2.7 Site Hydrology

Emerge was engaged to undertake a hydrological assessment for Hilton Park (December 2025) the result of which are provided in **Attachment C** and summarised below. The characteristics of the site and surrounding drainage infrastructure have been assessed concurrent with the proposed works to inform the most appropriate water management for the site.

The site was split into 10 different sub-catchments as shown in Table 2 below.

Table 3: Pre-development catchment areas and land use descriptions.

Sub-catchment	Land use description	Catchment area (ha)
Ct 1	• Brad Hardie Clubrooms • Carpark • Path • Playground	0.767
Ct 2.1	• Lefroy Road and Carrington Street	0.336
Ct 2.2	• Main Oval • Portion of Walton Way	2.499
Ct 2.3	• Carr Street, Shepherd Street and Gibson Street	0.672
Ct 2.4	• Public open space (POS) • Portion of Walton Way	0.256
Ct 2.5	• POS • Basketball court • Toilet building • Portion of Walton Way	1.840

Table2: Pre-development catchment areas and land use descriptions continued.

Sub-catchment	Land use description	Catchment area (ha)
Ct 2.6	• Portion of Carrington Street	0.357
Ct 3.1	• POS • Basketball court	1.837
Ct 3.2	• Portion of Carrington Street, Farrell Street, Rennie Crescent and Lynn Street	1.346
Ct 3.3	• Portion of Lennie Crescent north and Paget Street	0.478

A summary of the recommendations of the hydrological assessment includes:

- Adopt an at source infiltration approach in the northwestern corner of the site, which will otherwise contribute runoff to Lefroy Road, potentially exacerbating existing downstream flooding. This could be achieved by raising the perimeter path (Pavement 1) 100 mm above the adjacent POS, creating a physical barrier that will force infiltration into the turfed area and reduce the post development outflow to lower than the pre-development outflow volume.
- Adopt and design swales to intercept runoff at source within the carparks and footpaths surrounding the Brad Hardie Pavillion. This will ensure that runoff from new and existing carparks/paths is fully retained and contributes no runoff to the downstream environment.
- Adopt and design a bio-retention/flood storage area in the southeast corner of the site (to accommodate approximately 150 m^3 of runoff from Carrington Street). A storage area of this size will ensure that runoff up to the 1% AEP will be retained and therefore mitigate erosion issues along the eastern part of Walton Way.
- Adopt treatment swales along Walton Way carparks to mitigate erosion and provide more at source treatment of runoff from the road and carpark pavement. A total volume of 37 m^3 will be required to manage up to the 1% AEP event.
- Design bunding at the outlet of the existing bio-retention area in the northeast corner to increase its storage capacity. This should increase the spillway invert from 35 mAHD to 35.4 mAHD, resulting in increases storage capacity (387 m^3). Increasing this storage area reduces the downstream flood storage that currently occurs on the northeastern side of the oval, allows the retention of all runoff up to the 1% AEP event from this catchment – reducing the flood inundation depth in the main oval.
- Under the current site conditions the southwestern portion of the oval may inundate up to 130mm depth (in localised low points) in response to a 1% AEP storm event. The proposed stormwater strategy achieves a 48% reduction in the extent of saturated/ponding areas within the Oval limiting inundation to approximately 0.25 ha and to a maximum localised depth of 100mm. This inundation is at the peak of the storm event and would be temporary - until such time as infiltration occurs. Accommodating the 141m3 of runoff outside the main oval into a smaller footprint storage could be possible however would require an additional flood storage area. Given the temporary and infrequent expectation for inundation of the oval, the predicted outcome may be considered acceptable.

2.8 Groundwater

A review of the Department of Water and Environmental Regulations (DWER) Water Register indicates that the site is found within the 'Perth' groundwater area, the 'City of Fremantle South' sub aquifer, and the Perth-Superficial Swan Confined Aquifer (Level 1). A current groundwater license for the site is held by the City of Fremantle.

The Gnangara Jandakot depth to Groundwater contours (DWER 2021a) show that groundwater lies approximately 30-35 meters below ground level. The site is not located within a Public Drinking Water Source Area (PDWSA).

2.9 Surface water, drainage and wetlands

DWER's linear hydrography dataset was reviewed and found that no major drain lines were identified within the site or any of the surrounding areas.

A review of the Geomorphic Wetlands, Directory of Important Wetlands - Western Australia (DBCA-045) does not indicate any existing wetlands within the site.

No wetlands of international importance listed under the Ramsar convention are located within the site.

2.10 Bushfire

Bushfire Prone Area mapping prepared by the Office of Bushfire Risk Management (OBRM 2024) map Bushfire Prone Areas (BPA) that may or are likely to be subject to bushfire attack, in accordance with Australian Standard (AS) 3959-2009 Construction of buildings in bushfire prone areas. A BPA is applied to areas within 100 m of an 'Extreme' or 'Moderate' bushfire hazard.

A review of the OBRM map of BPA indicates that the site is not located within a BPA. Therefore, no further bushfire management will be required. The closest BPA is located approximately 900 m to the southwest of the site.

2.11 Environmentally Sensitive Areas and Bush Forever sites

A search of the DWER database of Environmentally Sensitive Areas (ESA) indicates there are no ESA's located within the site.

No Bush Forever sites occur within the site nor have Regional Ecological Linkages been identified within or immediately adjacent to the site.

2.12 Flora and Vegetation and Fauna values

Emerge were engaged to undertake a flora, vegetation, fauna, black cockatoo and tree retention assessment (December 2025). The assessment provided information on threatened and priority flora, ecological communities and fauna species, habitat for threatened species of black cockatoo and tree retention values.

The following tasks were undertaken:

- Desktop study to provide contextual information and determine the likelihood of occurrence of threatened and priority flora, ecological communities and fauna.
- Field surveys to record flora, vegetation units, vegetation condition, fauna and black cockatoo habitat values and tree retention values.
- Analysis and mapping of threatened and priority flora, ecological communities and fauna, vegetation units, vegetation condition, black cockatoo habitat and tree retention values.
- Documentation of the desktop study, methods, results, discussion and conclusions.

The ecological assessment is provided in **Attachment D.** The summary of the ecological assessment is provided below:

- No threatened or priority flora species were recorded, and none are considered likely to occur given the high level of disturbance and human impact throughout the site.
- One vegetation unit (**planted/non-native**) was identified within the site and comprises scattered planted and non-native trees over non-native grasses/herbs and cleared areas. The vegetation unit extends over the whole site (6.16 ha). (**Figure 3**).
- The whole site vegetation condition has been classified as 'completely degraded' (6.16 ha). The vegetation within the site shows evidence of historical disturbance, with all understory vegetation cleared and weeds throughout. The remaining trees have been identified as either planted natives or non-native species. (**Figure 3**)
- In order to determine whether the tuart woodland TEC/PEC is present, vegetation units were assessed against the diagnostic characteristics and size and vegetation condition thresholds outlined in DoEE (2019). Multiple tuart trees occur within the site, particularly in the eastern portion. However, when the canopy of these trees is mapped and appropriate buffer applied, the patches do not meet minimum size and condition thresholds specified in DoEE (2019).
- No threatened, specially protected or priority fauna species were recorded in the site.
- Three conservation significant fauna species were considered to have a high or moderate likelihood of occurring in the site:
    - Pacific swift (MI) are highly mobile species that may opportunistically fly over or forage in the site for short periods of time as part of a much larger home range. The species would not breed within the site. Any occurrence of pacific swift in the site would likely be in the air space and largely independent from terrestrial habitat.
    - While Carnaby's black cockatoos (EN) and forest red-tailed black cockatoos (VU) were not directly recorded, both species are considered likely to occur given their widespread distribution across the Swan Coastal Plain and the presence of foraging habitat within the site.
- The site comprises **turf, bare ground and grassland** habitat (4.52 ha) which provides limited habitat to fauna given the high level of disturbance and lack of microhabitats. In addition, the site is bounded by roads/urban areas, acting as a significant barrier for ground dwelling species dispersing from nearby vegetation or reserves. The other fauna habitat is **scattered trees** (1.65 ha) which mostly provides habitat for birds due to the lack of understorey vegetation for refuge.

2.13 Black Cockatoos

The site lies within the modelled distribution range and non-breeding range of Carnaby's black cockatoo, within the distribution range and breeding range of forest red-tailed black cockatoo, and outside of the modelled distribution of Baudin's black cockatoo. As such, breeding habitat only applies to forest red-tailed black cockatoo and foraging habitat applies to both Carnaby's black cockatoo and forest red-tailed black cockatoo.

As none of the habitat trees contain hollows suitable for use by black cockatoos for breeding, the site does not currently provide nesting habitat for black cockatoos. The habitat trees within the site have the potential to form suitable hollows in the future. However, it will likely take many decades for hollows to form that are large enough to be suitable for use by black cockatoos for breeding.

The EPBC Act defines potential nesting trees as per Table 3 below.

Table 4: Habitat tree categories (DAWE 2022)

Category	Specifications
Known nesting tree	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting tree	Trees with suitable nesting hollows present, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding.
Potential nesting tree	Trees that have a suitable DBH to develop a nest hollow, but do not currently have suitable nesting hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note that many species of eucalypt may develop suitable hollows for breeding.

No secondary evidence of roosting such as branch clippings, droppings or feathers were observed within the site. Therefore, there is no reason to suspect that roosting by black cockatoos has recently occurred in the site. Nevertheless, the site contains a small number of tall trees and groups of tall trees that have the potential to provide roosting habitat for black cockatoos.

The site contains native foraging habitat for both Carnaby's black cockatoo (0.14 ha) and forest red-tailed black cockatoo (0.04 ha). The highest value foraging resource in the site for both black cockatoos is associated with the planted marri trees scattered throughout the site and the *Pinus pinea* trees which are favoured by Carnaby's black cockatoo.

The secondary foraging habitat for both Carnaby's black cockatoo (0.79 ha) and forest red-tailed black cockatoo (0.46 ha) is predominantly associated with scattered tuart, *Corymbia citriodora* and non-native eucalypt trees. The scattered *Agonis flexuosa* and *Araucaria heterophylla* also provide secondary foraging habitat for Carnaby's black cockatoo. While there are records of Carnaby's black cockatoo and forest red-tailed black cockatoo consuming the fruit of these plants (DoEE 2017; Groom 2011), they are likely to be secondary options that are opportunistically consumed rather than relied upon.

Table 5: Summary of Black Cockatoo Foraging Habitat

Foraging habitat	Black cockatoo species and area of foraging habitat (ha)	
	Carnaby's	Forest red-tailed
Native primary	0.04	0.04
Non-native primary	0.10	0.00
Native secondary	0.57	0.35
Non-native secondary	0.22	0.11
Total	0.93	0.50

Figure 4 provides the impacts on black cockatoo foraging habitat. There is 0.84 ha of foraging habitat for retention and only 0.13 ha of foraging habitat impacted by the proposed works to be removed. This sits below the 1 ha threshold of referral under the DCCEEW guidelines. It should be noted that both species of black cockatoo forage on similar but slightly different plant species and this accounts for the differences in the total ha of foraging habitat.

2.14 Tree Survey and Assessment

A qualified ecologist from Emerge visited the site (November 2025) to record all trees with a DBH ≥10 centimetres (cm) the results of which are provided in **Attachment D**.

The following attributes were recorded for each tree:

Table 6: Tree attributes recorded on site

Attribute	Description
Tag number	An individually numbered aluminium tags was attached to each tree
GPS location	The location was recorded using a handheld GPS unit
Tree species	Species and common name were identified
Diameter at breast height (DBH) (cm)	DBH was measured at breast height (1.3 m) using a diameter tape
Hollows present	The presence of any hollows was recorded.
Health	Health rating (excellent, good, average, poor or dead)
Structure	Appearance rating based on structure (good, acceptable or poor)
General notes	Any additional observations

Tree retention values were calculated including useful life expectancy, significance, retention value, tree protection zone and structural root zone.

Useful life expectancy (ULE) was classified as 'greater than 40 years', '15 – 40 years', '5 – 15 years' and 'less than 5 years' by considering the typical lifespan of a species and the health and structural score of each tree.

Significance of each tree was classified by considering the ecological, cultural and amenity values and retention value was classified as 'high', 'moderate' and 'low' by considering the useful life expectancy and ecological or cultural significance of each tree.

Retention value was classified as high, moderate and low and is calculated using the useful life expectancy and ecological or cultural significance of each tree.

AS 4970-2025 Protection of Trees on Development Sites requires application of notional root zone (NRZ) and tree protection zones (TPZ) to protect trees during development (Standards Australia 2025). These zones theoretically are required to sustain a tree's health and long-term viability. The TPZ refers to the physical area on a development site that is protected during development.

2.14.1 Tree survey results

During the site visit 271 trees were recorded. Twenty-three (23) of these were considered high retention value due being either habitat trees (native eucalypts for black cockatoos) or amenity significance. A summary of the retention values is provided in **Table 7** below.

Table 7: Summary of tree retention values for the site

Retention value	No. of trees
High	23 (8.49%)
Moderate	230 (84.87%)
Low	18 (6.64%)

Figure 2 shows the trees to be retained and removed as part of the disturbance footprint for the works within the site. Overall, there are 241 trees retained and 30 trees to be removed. Of the 30 trees to be removed F**igures 5&6** summarise the impact to species and retention value:

- 11 are *Agonis flexuosa*
- 6 are Araucaria heterophylla
- *8* are *Corymbia citriodora*
- *2* are *Corymbia maculata* and
- 3 are Eucalyptus gomphocephala

The 30 trees to be removed are all considered to be moderate in retention value. All 30 high retention value trees are being retained (**Figure 6**)

2.15 Social environment

2.15.1 Aboriginal heritage

In WA, Aboriginal cultural heritage is currently managed pursuant to the *Aboriginal Heritage Act 1972* (AH Act). The Department of Planning, Lands and Heritage (DPLH) maintain the Aboriginal Cultural Heritage Inquiry System (ACHIS), which is a directory containing locations and information about Aboriginal Cultural Heritage (ACH) in the state.

Hilton Park is located within an area under the traditional ownership of the Ballaruk people within the Whadjuk territorial boundaries of the lands of the Ballaruk peoples (Machin, 1994).

A desktop assessment of the ACHIS did not identify any ACH sites extending across the Development Envelope or immediate surroundings. Therefore, no approvals under the *Aboriginal Heritage Act 1972* (WA) are required.

The nearest registered ACH site is 'Clontaf Hill' (ID18332) which is a significant Aboriginal cultural heritage place in artifacts, camp, ceremonial, hunting and massacre. (**Plate 1).**

A historical site (ID 36485) exists to the east in the suburb of Hilton which is noted as Fremantle Women's Conception Site.

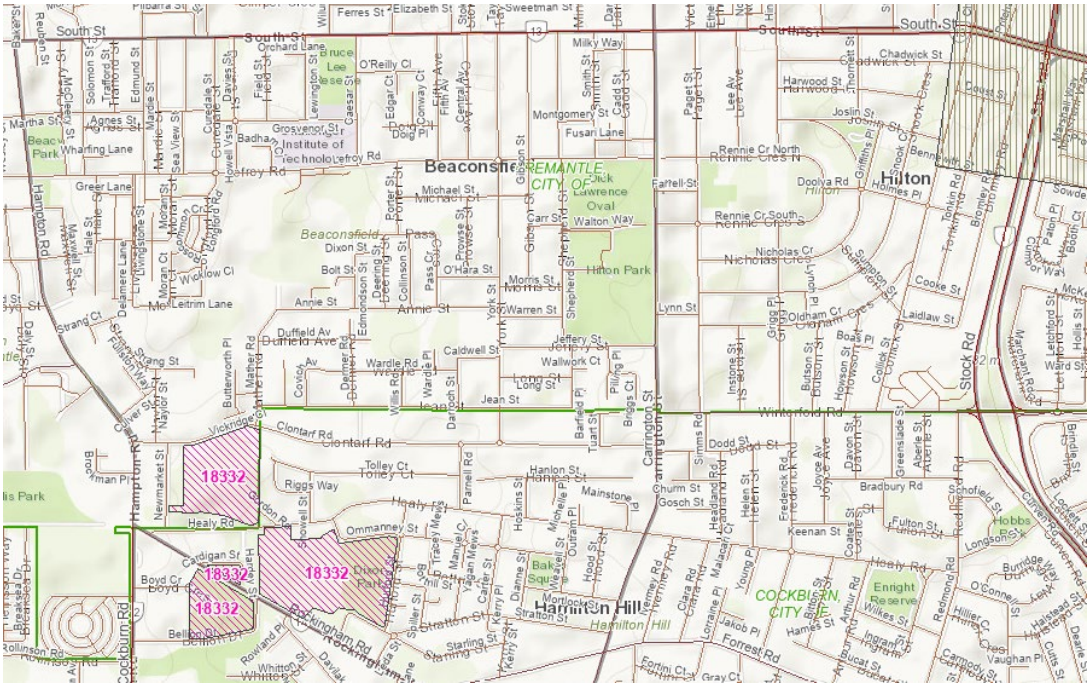


Plate 1: Aboriginal Heritage Survey Results

2.15.2 Non-indigenous heritage

A desktop search of the City of Fremantle Municipal Inventory List and the Department of Planning Heritage and Lands heritage database has indicated there are no state or local registered heritage sites located within Hilton Park.

2.15.3 Bush Forever

There are no registered Bush Forever sites in Hilton Park.

3 Potential Environmental Impacts and Risks Assessment

Environmental impacts and potential risks to environmental values due to construction within the project's disturbance footprint have been identified below.

A risk assessment has been prepared as part of the assessment of potential impacts and risks and identifies the residual risk of the proposed impacts after implementation of the proposed management measures. It should be noted that there will be some opportunities for certain environmental values to be retained within the disturbance footprint however this will be dependent on detailed design at later stages of the planning and development process.

3.1.1 Environmental Impacts

The direct environmental impacts related to the disturbance footprint within the site are:

- 0.13 ha black cockatoo foraging habitat to be removed
- 30 trees to be removed
- 5 different species of tree are being removed
- The 30 trees to be removed are of 'moderate' retention value.
- No potential habitat trees are being removed.
- No trees considered 'high' retention value are being removed.

3.1.2 Environmental risks

The following is a list of potential environmental risks (direct and/or indirect) associated with the proposed works in Hilton Park.:

- Accidental and/or unauthorised clearing outside the approved clearing boundary or unapproved removal of vegetation in general.
- Spread of weeds and diseases into the surrounding environment.
- Dust emissions.
- Erosion – through water hydrology changes
- Increased risk of fauna interactions through vegetation clearing activities and the operation of plant and equipment.
- Change in hydrology across the site
- Contaminated land – known ACM areas

3.2 Risk assessment

A risk assessment has been prepared to manage potential impacts during construction. The assessment is based on the guidance provided in *SA/NZS ISO 31000:2018 Risk management – Guidelines (*AS/NZS 31000) (Standards Australia Limited 2018).

AS/NZS 31000 identifies a requirement for a risk assessment to assess the likelihood and consequence of each potential impact to ensure that risks are translated into controls, mitigation and management actions.

Environmental risk has been rated in accordance with the risk assessment matrix (**Table 8**). The risk matrix uses the risk categories outlined in the Department of Water and Environmental Regulation's Risk Assessments Guidelines (DWER 2020) utilising the Australian Standard (AS) 4360:2004: Risk Management and AS 31000:2009 Risk Management – Principles and Guidelines.

The consequence classification systems and likelihood criteria provided in **Table 9** and **Table 10**. The environmental risk register for the project is provided in **Table 11**. The risk assessment has calculated the inherent risk and the residual risk of the proposed impacts when implementation of the proposed management actions (controls), detailed in **Section 5**, are considered. Proactive planning, installation and maintenance of appropriate environmental controls and ongoing monitoring will reduce the risk associated with each environmental impact identified for the project.

Controls to manage the identified risk align with the management and monitoring actions detailed in **Section 5** and listed in **Table 14.**

Table 8: Risk assessment matrix

	Consequence/Impact				
Probability/Likelihood	**Slight (A)**	**Minor (A)**	**Moderate (C)**	**Major (D)**	**Severe (E)**
Almost certain (5)	Low	Moderate	High	Extreme	Extreme
Likely (4)	Low	Low	Moderate	High	Extreme
Possible (3)	Low	Low	Moderate	High	Extreme
Unlikely (2)	Very Low	Low	Low	Moderate	High
Rare (1)	Very Low	Very Low	Low	Moderate	Moderate

Table 9: Criteria to assess the consequence of a risk event occurring (based on DWER 2020)

Consequence	Criteria
Severe	• Onsite impacts: catastrophic • Offsite impacts local scale: high level or above • Offsite impacts wider scale: mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance Specific Consequence Criteria (for environment) are significantly exceeded
Major	• Onsite impacts: high level • Offsite impacts local scale: mid-level • Offsite impacts wider scale: low level • Short-term impact to an area of high conservation value or special significance Specific Consequence Criteria (for environment) are exceeded
Moderate	• Onsite impacts: mid-level • Offsite impacts local scale: low level • Offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met
Minor	• Onsite impacts: low level • Offsite impacts local scale: minimal • Offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met
Slight	• Onsite impact: minimal Specific Consequence Criteria (for environment) met

Table 10: Criteria to assess the likelihood of a risk even occurring (based on DWER 2020)

Likelihood	Criteria
Almost certain	The risk event is expected to occur in most circumstances.
Likely	The risk event will probably occur in most circumstances.
Possible	The risk even could occur at some time.
Unlikely	The risk event will probably not occur in most circumstances.
Rare	The risk event may only occur in exceptional circumstances.

Table 11: Risk assessment register

Potential environmental risk (source)	Potential causes (pathway)	Potential impacts/receptors	Risk without controls			Risk with controls			
			Likelihood	Consequence	Inherent risk rating	Management action (control) and monitoring measures (see Table 15)	Likelihood	Consequence	Residual risk rating
Erosion and sedimentation									
Erosion of soils within the construction area deposition offsite in surrounding environment.	Rainfall events cause erosion of exposed soils and transport outside of the disturbance footprint.	Sedimentation of adjacent areas or within stormwater system.	Possible	Moderate	Moderate	MA3, MA4, MA5, MR2, MR3	Unlikely	Insignificant	Low
Contamination									
Soil must be managed as controlled waste as per DWER Controlled Waste Regulations 2004 if soil disturbance occurs within the northern mound where ACM identified.	ACM spread to unwanted areas with fibres airborne.	Contractor exposure and ACM fragments spread across site.	Possible	Major	High	MA6, MR4	Possible	Moderate	Moderate
Noise, vibration and Dust									
Vehicle and machinery movement and operation causing excessive noise, dust and vibration.	Operation of plant and equipment.	On site personnel, nearby residents, and any displacement of fauna present onsite and in nearby vegetation.	Possible	Minor	Low	MA7, MA8, MA9, MR 5, MR6, MR7, MA10, MA11, MR8	Unlikely	Minor	Low
Vegetation									
Removal and/or damage of vegetation proposed for retention or external to the site.	Operation outside of designated areas causing damages to retained flora.	Existing vegetation proposed for retention, vegetation external to the site.	Possible	Moderate	Moderate	MA12, MA13, MA14, MR9, MR10	Possible	Minor	Low
Stormwater									
Stormwater is not managed appropriately and causes erosion or flooding.	Drainage basins and stormwater management not constructed correctly.	Nearby residential areas or playing fields are flooded, soil and water material are transported off site into nearby areas and stormwater.	Possible	Moderate	Moderate	MA15, MR11	Unlikely	Moderate	Low
Fauna									
Fauna habitat within the site is damaged or destroyed.	Fauna being in areas subject to clearing and/or earthworks, vehicle movements.	Vehicle strikes causing Injury or death to fauna within and external to the site.	Likely	Moderate	Moderate	MA16, MA17, MA18, MA19, MR12	Possible	Moderate	Moderate
Weeds and diseases									
Introduction and/or spread of weeds and plant diseases.	Vehicle movements to and from the site, importation of fill material.	Areas not subject to disease exposed, surrounding areas have invasive weeds introduced.	Possible	Moderate	Moderate	MA20, MA21, MA22, MR15	Unlikely	Moderate	Low

4 Roles and Responsibilities

It is envisaged that the implementation of this EMP will be the responsibility of the contractor engaged by the City of Fremantle under contractual arrangements associated with the project.

All personnel will be required to comply with the requirements of applicable environmental legislation, regulations, codes of practice and standards as well as this EMP. All personnel (including sub-contractors) have a general environmental duty of care and are responsible for their own environmental performance whilst on the project.

4.1 Key personnel

The key roles relevant to the implementation of the EMP are presented in **Table 12.**

Table 12: Key environmental management roles

Role	Organisation	Responsibility
Project Manager	**TBC**	• Responsible for the long-term implementation of the project. • Ensure compliance with all applicable legal, approval and project environmental obligations including but not limited to this EMP. • Ensure all project staff have a clear understanding of the environmental requirements relevant to their area/scope of work. • Ensure all project staff are competent to undertake their duties including fulfilment of the general environmental duty, regarding appropriate education, training and experience.
Environmental manger	**TBC**	• Conduct (or assist in) environmental briefings and toolbox meetings to inform construction staff addressing relevant issues. • Conduct environmental site inspections and investigate any issues that have potential to cause environmental impact. • Identify and report non-conformances to the project manager. • Monitor the implementation and effectiveness of the EMP. • Provide advice and direction on environmental matters, incident response and corrective actions. • Monitor and ensure compliance with all applicable legal, approvals and project environmental obligations including but not limited to this EMP.
Superintendent and lead contractor site supervisors	**TBC**	• Implement all environmental actions as outlined in this EMP as required to avoid and minimise actual or potential environmental harm. • Ensuring resources are provided and maintained through the project to manage environmental risk. • Ensure non-conformances are identified through monitoring, recorded and reported to the project manager. • Ensure implementation of corrective actions where an issue has been identified. • Ensure that instructions are issued, and adequate information is provided to field-based personnel that relates to environmental risks on site including via pre-start meetings and regular toolbox meetings that address environmental issues and controls including the requirements of this EMP.

Table 12: Key environmental management roles (continued)

Role	Organisation	Responsibility
Construction personnel/general site personnel	**TBC**	• Attend all environmental training required and adhere to and remain familiar with the principles covered in the training session(s). • Undertake all activities in accordance with agreed procedures and work methods to be discussed during startup and ongoing meetings. • Ensure that they are aware of the contact person for environmental matters. • Immediately report any activity that has resulted in an environmental incident to the supervisor and/or environmental manager.

4.2 Environmental training and induction

To ensure the EMP is implemented effectively, the City or its appointed contractor is responsible for ensuring employees and contractors are trained and are aware of their environmental responsibilities and the measures to be implemented to protect the environment under this EMP.

Environmental training will include:

- Site inductions to be completed prior to commencing work, identifying the type and location of sensitive environmental areas and potential threats.
- Familiarisation and understanding of the requirements of this EMP.
- Specific training for individuals who have responsibilities for environmental issues and in this case vegetation clearing, contaminated soil removal and fauna handling.
- Emergency response training to manage unforeseen environmental incidents.

4.2.1 Emergency contacts and procedures

Upon work commencing, emergency contact details will be signposted at appropriate locations within the site, to enable immediate contact and response in the event of an emergency/environmental incident observed by personnel, contractors or the public. Emergency response procedures will be followed in the event of an emergency/environmental incident. General and emergency contacts for the proposed development are provided in **Table 13** below.

Table 13: Emergency contact details

Name	Contact number
Ambulance / Police / Fire	000
Department of Water and Environmental Regulation (24/7 Pollution Response Services)	1300 784 782
City of Fremantle – Community Safety Officers	1300 360 666
City of Fremantle – Senior Building Officer	1300 693 736

4.2.2 Incident and emergency management

In the event of any incident, the safety of all personnel, including site workers, visitors and the community in the immediate vicinity of the site will be the first priority. Following this, all practical steps will be taken to minimise the risk of further environmental damage as soon as possible after the event through the implementation of appropriate incident management or contingency plan procedures.

Environmental incidents are defined as any breach of the management procedures detailed in this EMP or unplanned actions (or actions within an unplanned location i.e., impacts external to the site) which are detrimental to the environment.

If the incident results in a significant impact or material or serious environmental harm, an incident report will be generated and depending on the nature of the impacts and statutory obligations may need to be raised with other key State Government authorities (i.e. DWER, DBCA).

5 Management and Monitoring Requirements

As outlined in the risk assessment, works associated with the project have the potential to impact aspects of the environment within or immediately surrounding the site. To avoid, mitigate and/or minimise potential impacts, a range of management actions have been identified as part of the risk assessment process. The key management considerations as well as objectives and targets are identified in this section**.** The schedule of all prescribed management actions required for implementation of this EMP is detailed in **Table 14.**

Regular ongoing monitoring such as inspections or observations will also be undertaken to assess compliance with the EMP and assessed against the objective and target. Monitoring activities for the project are identified in **Table 14.**

5.1 Erosion and Sedimentation

It is possible that erosion and/or sedimentation could occur as part of the construction works, or where soil is stockpiled (including fill) on site and is moved by wind and water. Sediment traps (i.e. silt curtain/fencing) or surface stabilisation are to be applied at locations where water has the potential to leave the site, to capture soil that may move offsite into the adjacent areas. Soil should be stabilised as soon as possible, including planting of vegetation with application of mulch.

Monitoring of bare ground, stockpiles and newly contoured land will be undertaken to inspect for signs of erosion. Inspections will be undertaken on a regular basis or after rainfall events. Where erosion or sedimentation is identified as moving offsite, rectification measures will need to be implemented.

Objective

To minimise and mitigate soil erosion and sedimentation impacting areas within and external to the site. This can be achieved through the following mitigation measures:

- Installing sediment traps (silt curtain fencing) to capture and reduce sediment runoff.
- Revegetating unstable perched soil using local native species.
- Applying a hydro mulch or non-seeded polymer spray to the soil to prevent erosion

Performance target

No erosion and/or sedimentation observed within or external to the site.

5.2 Contamination

ACM was identified throughout the northern mound within the site. This soil must be managed as controlled waste if soil disturbance occurs at this depth in accordance with the Environmental Protection (Controlled Waste) Regulations 2004 (DWER 2004). The material cannot be disposed at a standard landfill and must be transported to a licensed asbestos waste facility. Prior to removal, the soil should be appropriately segregated, contained, and clearly labelled 'CAUTION ASBESTOS' to prevent fibre release during handling and transport. Disposal should be coordinated with the facility operator, and all handling must comply with regulatory requirements to ensure safe and compliant management of the ACM.

Objective:

To safely managed soil which may contain asbestos in the northern mound of the site.

Performance target

ACM soil is managed and disposed of in accordance with DWER regulations.

5.3 Dust

The site is located within 100 m of residential areas. The site is likely to be subject to wind erosion, particularly when dry, and therefore may produce dust during dry periods of weather or windy conditions. Dust is to be managed through a range of measures, including use of water carts (or similar) as required, implementation of temporary wind fencing and modifying site activities if weather conditions indicate risk is high.

Objective

To minimise dust leaving the site to avoid loss of amenity and minimise health risks affecting nearby residents, site personnel and retained vegetation.

Performance target

Dust complaints are responded to within 24 hours.

5.4 Noise and Vibration

The site is located within 100 m of residential areas. Noise and vibration generated during construction has the potential to cause nuisance for nearby residents. Works will be managed in accordance with the *Environmental Protection (Noise) regulations 1997* or approved noise management plans. The regulations stipulate working hours and requirements to maintain equipment to relevant standards.

Objective

To manage noise and vibration within permitted statutory noise levels.

Performance target

Any noise or vibration complaints are responded to within 24 hours.

5.5 Vegetation

Vegetation clearing will occur within the disturbance footprint to facilitate the proposed works, with opportunities to retain existing vegetation (**Figure 2**). All activities must be confined within the disturbance footprint, and no unauthorised clearing is to occur on site.

Vegetation proposed for retention will be clearly delineated using visual markers and/or protective fencing under AS 4970-2025 Protection of trees on development sites. Where relevant, arborist advice should be followed to ensure vegetation health is maintained.

Objective

To prevent unauthorised clearing.

Performance target

No unauthorised damage or clearing is to be undertaken.

5.6 Fauna Spotting

Clearing will be completed in conjunction with an experienced zoologist/ecologist. This role will involve:

- Active searching for fauna in areas to be cleared and areas just cleared. This search will aim to identify the presence of bird or marsupial species in trees and more common ground dwelling fauna species, such as small mammals, lizards, and snakes.
- If encountered, fauna will be assisted to disperse to nearby vegetation, if appropriate, or translocated in accordance with relevant fauna licences.
- Should injured fauna be encountered, the severity of injuries will be assessed. If the experienced fauna specialist considers that an injured native animal has a reasonable chance of being satisfactorily rehabilitated, it will be transferred to a registered Department of Biodiversity, Conservation and Attractions (DBCA) wildlife carer. Where the experienced fauna specialist considers that any injured fauna is unlikely to be satisfactorily rehabilitated, they will be humanely euthanised.

Objective

To prevent any native fauna from injury or death resulting from clearing and construction activities.

Performance target

No native fauna is injured or killed as a result of clearing and construction activities within the Development Envelope.

5.7 Weed and Dieback

The purpose of weed and dieback management measures is to prevent the spread and/or introduction of weed species or dieback within the site. All construction activities will adopt hygiene management of machinery and soil movement. It is unknown if dieback is present currently, however works will focus on preventing introduction.

Targeted monitoring and ongoing weed management via fill importation or landscape works will be required to prevent the spread of weeds into the site. Following the completion of construction works and as outlined in the contract agreement, the City of Fremantle will be responsible for implementing ongoing weed management as part of the maintenance of Hilton Park.

Objective

Construction activities will not result in the introduction of any weeds or dieback. Measures will be implemented to prevent the spread of weeds into the park through soil and landscape works.

Performance target

Weed foliage cover will be less than 10%.

5.8 Stormwater

In the event of rainfall, existing stormwater will be required to be managed and contained within the site. The site already contains drainage features. The management mitigation for stormwater is to:

- Adopt an at source storage approach.
- Adopt and design swales to intercept runoff at source.
- Design and implement bioretention storage area, treatment swales and follow the attached hydrology stormwater strategy to prevent erosion.

Objective

Stormwater discharge to be managed using appropriate design controls as outlined in the hydrological assessment (**Attachment C**)

Performance target

No change in the quality or quantity of stormwater existing in the site during and post construction.

5.9 Summary of Environmental Management and Monitoring Requirements

Table 14 summarises the management and monitoring actions to be implemented as part of this EMP, to address the objectives and targets identified in the preceding sections.

Table 14: Management and monitoring actions to be implemented

Management aspect	Action No	Implementation action	Responsibility	Frequency/Timing
General	**Management Action**			
	MA1	All personnel undertaking works associated with construction, including visitors, will undertake site induction training and participate in targeted toolbox talks established by the lead contractor.	Contractor and all site personnel	Prior and during construction activities.
	MA2	Temporary barrier fencing is to be installed around the site to prevent public access and/or unauthorised activities outside the site boundary.	Contractor	Prior to construction activities commencing and maintained throughout.
	Monitoring requirement			
	MR 1	Inspections of works area to be conducted.	Contractor	Weekly during construction.
Erosion and sedimentation	**Management action**			
	MA3	Sediment control measures, such as sediment traps, to be installed if required.	Contractor	As required.
	MA4	Stabilise soil stockpiles and bare ground with mulch.	Contractor	During construction/landscaping
	MA5	All vehicle movements will be kept to defined areas (as much as possible) to minimise unnecessary ground disturbance.	Contractor	Daily during construction activities.
	Monitoring requirement			
	MR2	Areas of bare ground and soil stockpiles to be visually inspected for signs of erosion	Contractor	Following rainfall events
	MR3	Surrounding roadways to be visually inspected for sediment carried from the site.	Contractor	Following rainfall events

Table 14: Management and monitoring actions to be implemented (continued)

Management aspect	Action No	Implementation action	Responsibility	Frequency/Timing
Contamination	**Management action**			
	MA6	Contaminated soil is disposed of correctly as per DWER guidelines.	Contractor	Prior to and during construction activities
	Monitoring requirement			
	MR4	Visual and/or site inspection is conducted as necessary to provide evidence of ACM removed.	Contractor	During construction.
Dust	**Management action**			
	MA7	If dust is observed, implement dust suppression measures such as (but not limited to): the application of water; use of mulch or hydro mulch if stockpiles/bare areas or other agents to areas of bare soil as required to minimise the creation of dust disturbance.	Contactor	During construction and following reported dust compliant
	MA8	If strong winds are predicted, cease works that generate dust emissions	Contractor	During construction
	MA9	Low vehicle speeds will be implemented within the site. Signage will be erected to indicate appropriate vehicle speeds.	Contractor	During construction
	Monitoring requirement			
	MR5	Regular visual inspection of dust suppression measures.	Contractor	Weekly, during works
	MR6	Monitoring of wind conditions via Bureau of Meteorology website.	Contractor	Daily
	MR7	Investigate dust complaints within 24 hours.	Contractor	As required.

Table 14: Management and monitoring actions to be implemented (continued)

Management aspect	Action No	Implementation action	Responsibility	Frequency/Timing
Noise and vibration	**Management action**			
	MA10	Works to be carried out between 0700 Monday to 1900 Saturday and not during Sunday or Public holidays in accordance with the *Environmental Protection (Noise) Regulations 1997* (unless permission is granted).	Contractor and project manger	During construction
	MA11	Ensure all machinery and plant is services and operating correctly and if required, fitted with noise attenuation equipment and is serviced and operating as intended (no faulty or inefficient mufflers/noise dampeners) to avoid unnecessary disturbance.	Contractor	Prior to and during construction activities
	Monitoring requirement			
	MR8	Investigate noise and nuisance complaints within 24 hours.	Contractor	As required
Vegetation clearing	**Management action**			
	MA12	Prior to ground disturbance activities ensure all trees to be removed are clearly demarcated and contractors to have copy of tree retention map.	Contractor	Prior to construction activities
	MA13	Tree Protection Zones (TPZ) for any identified trees to be fenced in accordance with AS 4970 or as per arborist advice.	Contractor	Prior to construction activities commencing and maintained throughout
	MA14	Ensure site access and laydown areas for vehicles and plant is arranged to utilise designated tracks and existing areas cleared of vegetation to minimise vegetation disturbance. No material stockpiles, plant, machinery or vehicles to occur under retained vegetation.	Contractor	Prior to construction activities
	Monitoring requirement			
	MR9	Visually inspect site to check no material stockpiles, plant, machinery or vehicles occur under retained vegetation.	Contractor	Daily during works
	MR10	Visually inspect flagging/temporary fencing for retained vegetation and trees where within active works area, to check it is still present and/or is not damaged.	Contractor	Weekly during works

Table 14: Management and monitoring actions to be implemented (continued)

Management aspect	Action No	Implementation action	Responsibility	Frequency/Timing
Stormwater	**Management action**			
	MA15	Follow advice of hydrology report for management of stormwater to address pre and post construction flows.	Contractor	Prior to works commencing and throughout works
	Monitoring requirement			
	MR11	Ensure works have mitigation activities applied to address rainfall discharge.	Contractor	Weekly and following rainfall events
Fauna management	**Management action**			
	MA16	Obtain relevant licenses for the handling and relocation of fauna (i.e. fauna taking (relocation) license). Complete a pre-clearing fauna inspection of vegetation to be removed to identify fauna habitat and the potential for fauna interactions during clearing and recent evidence of native fauna activity. All trees in the site will be inspected for nests and where observed these will be examined for signs of current use (e.g. nesting). This should be completed by a suitably qualified fauna specialist.	Contractor	Prior to clearing or ground disturbance commencing
	MA17	Where fauna species are identified during pre-construction targeted searches, a suitable fauna specialist is to be available on-site during clearing of vegetation, or as required to relocate turtles/fauna in accordance with relevant licenses.	Contractor	Prior to clearing or ground disturbance commencing and where required.
	MA18	If injured fauna is encountered, they are to be promptly taken to an experienced wildlife veterinarian or approved wildlife rehabilitation facility. Call DBCA WildCare Helpline (08 9474 9055) and located to an approved facility.	Contractor	Where required during ground disturbance.
	MA19	Ensure that the work area is maintained in a clean and tidy manner to ensure that feral and other species are not attracted to site.	Contractor	At all times
	Monitoring requirement			
	MR12	Undertaken monitoring as per the requirements of the EMP. If injured or sick native fauna are encountered, the Department of Biodiversity, Conservation and Attractions Wildcare Helpline is to be called immediately on (08) 9474 9055.	Contractor	As required.

Table 14: Management and monitoring actions to be implemented (continued)

Management aspect	Action No	Implementation action	Responsibility	Frequency/Timing
Weeds and dieback	**Management action**			
	MA20	The following vehicle hygiene measures will be followed: • Vehicle and plant/machinery inspection to ensure the vehicle is free from obvious soil/organic material. • Cleaning may include, brushing and scarping of debris, and/or wash down of contaminated vehicles and machinery with approved product such as *phytoclean* (as required). Material should be collected and disposed offsite	Contractor	Daily during construction or when new plant/machinery is entering site
	MA21	Ensure any landscape materials (soil, mulch and plant stock) brought into the site is free from pathogens and heavy metals and produced in accordance with *Australian Standard AS 4454-2003 Composts, Soil Conditioners and Mulches*.	Contractor	During construction
	MA22	Undertake weed control – spot spray and manual removal as required in landscape works	Contractor	Monthly, or as required by works contract following planting and until handover
	Monitoring requirement			
	MR15	Inspection of the site including bare ground to identify the emergence of weed species.	Contractor / Department of Justice	Monthly, or as required by works contract following planting until handover.

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Figure 1: Site Location and topography

Figure 2: Tree retention and removal

Figure 3: Vegetation unit and condition

Figure 4: Impacts on black cockatoo foraging habitat

Figure 5: Impact to trees (species)

Figure 6: Impact to trees (retention value)

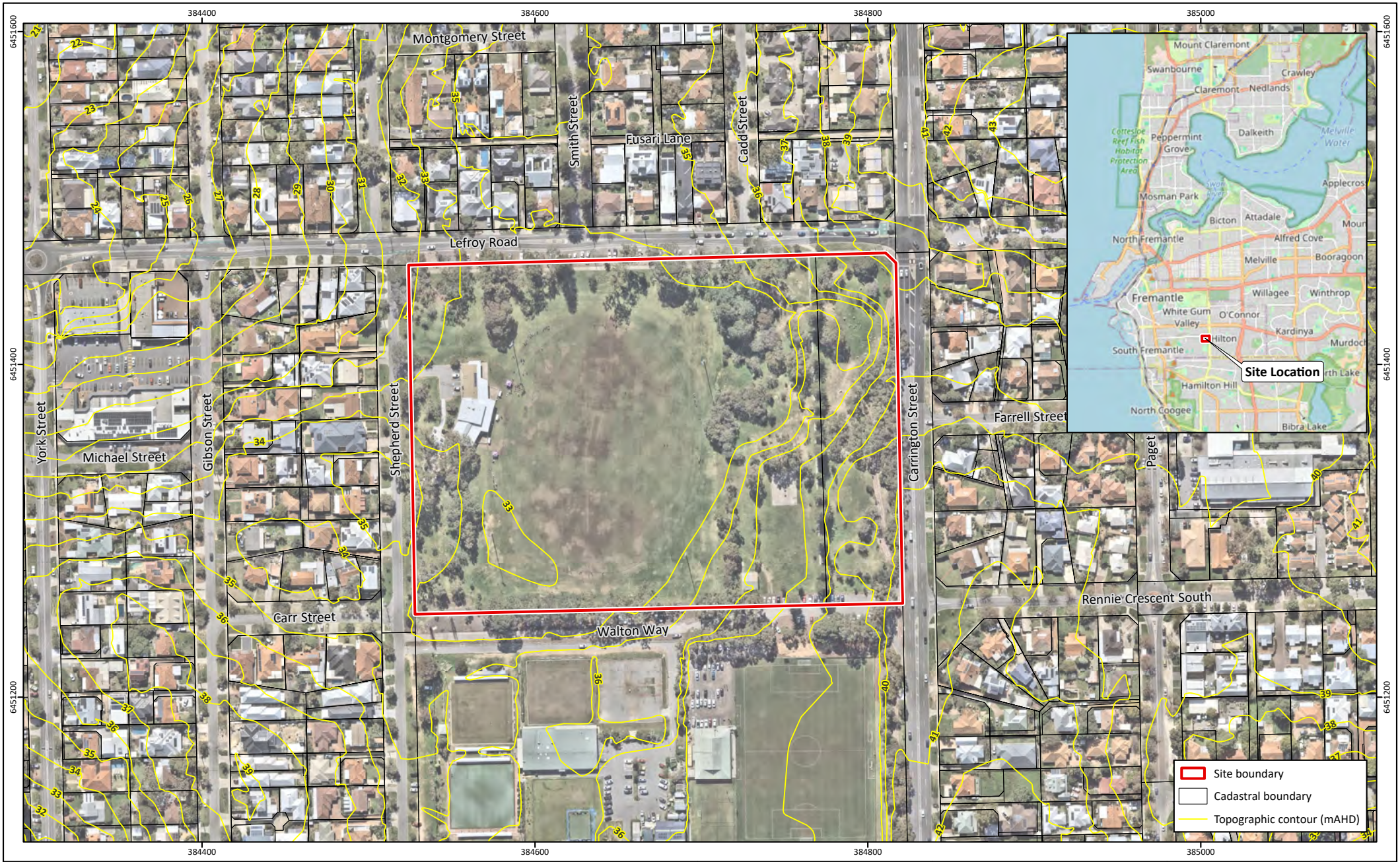


Figure 1: Site Location and Topography

Project:	Environmental Management Plan Hilton Park North
Client:	City of Fremantle

Plan Number:
EP25-108(06)--F19

Drawn:	GAR
Date:	05/03/2026
Checked:	TB
Approved:	TB
Date:	10/03/2026

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Metres

Scale: 1:3,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used
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Figure 2: Trees Retention and Removal

Project: Environmental Management Plan
Hilton Park North
Client: City of Fremantle

Plan Number:
EP25-108(06)--F20
Drawn: LAM
Date: 06/03/2026
Checked: TB
Approved: TB
Date: 10/03/2026

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GDA2020 MGA Zone 50

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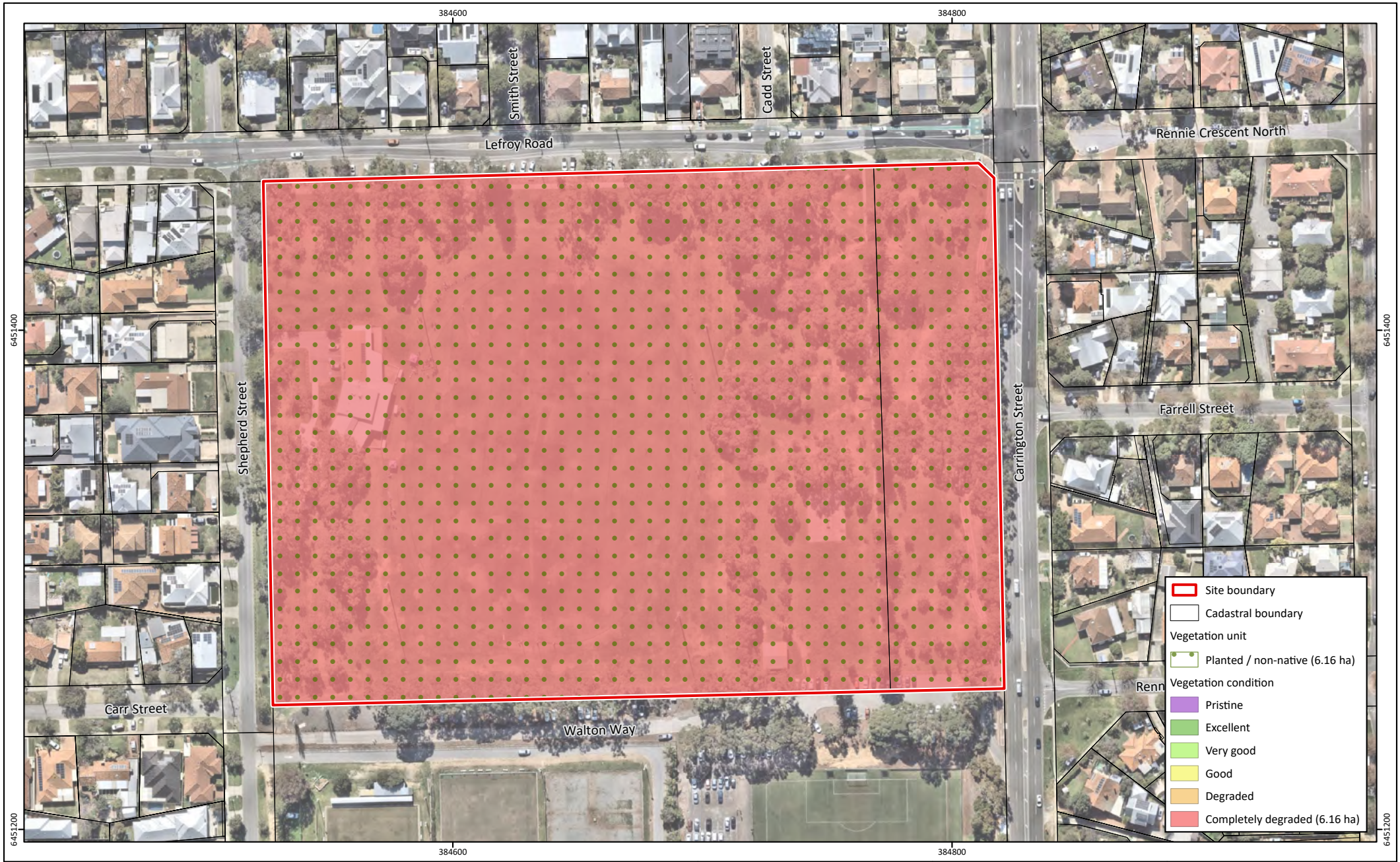


Figure 3: Vegetation Unit and Condition

Project: Environmental Management Plan
Hilton Park North
Client: City of Fremantle

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Checked: TB
Approved: TB
Date: 10/03/2026

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GDA2020 MGA Zone 50

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Figure 4: Impacts on Black Cockatoo Foraging Habitat

Project: Environmental Management Plan
Hilton Park North
Client: **City of Fremantle**

Plan Number:
EP25-108(06)--F22
Drawn: LAM
Date: 06/03/2026
Checked: TB
Approved: TB
Date: 10/03/2026

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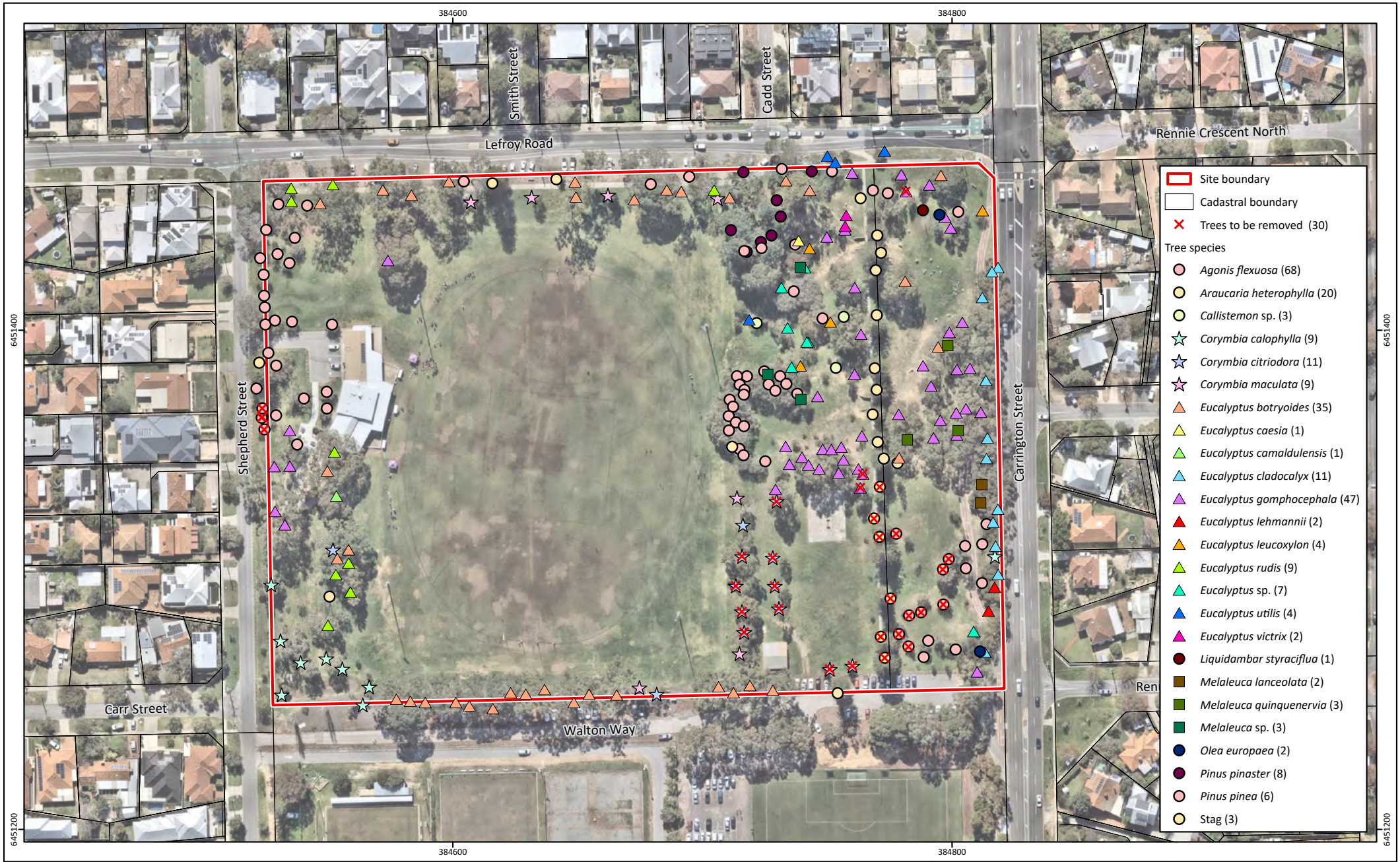


Figure 5: Impact to Trees (Species)

Project: Environmental Management Plan
Hilton Park North
Client: City of Fremantle

Plan Number:
EP25-108(06)--F23
Drawn: LAM
Date: 06/03/2026
Checked: TB
Approved: TB
Date: 10/03/2026

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Scale: 1:2,000@A4
GDA2020 MGA Zone 50

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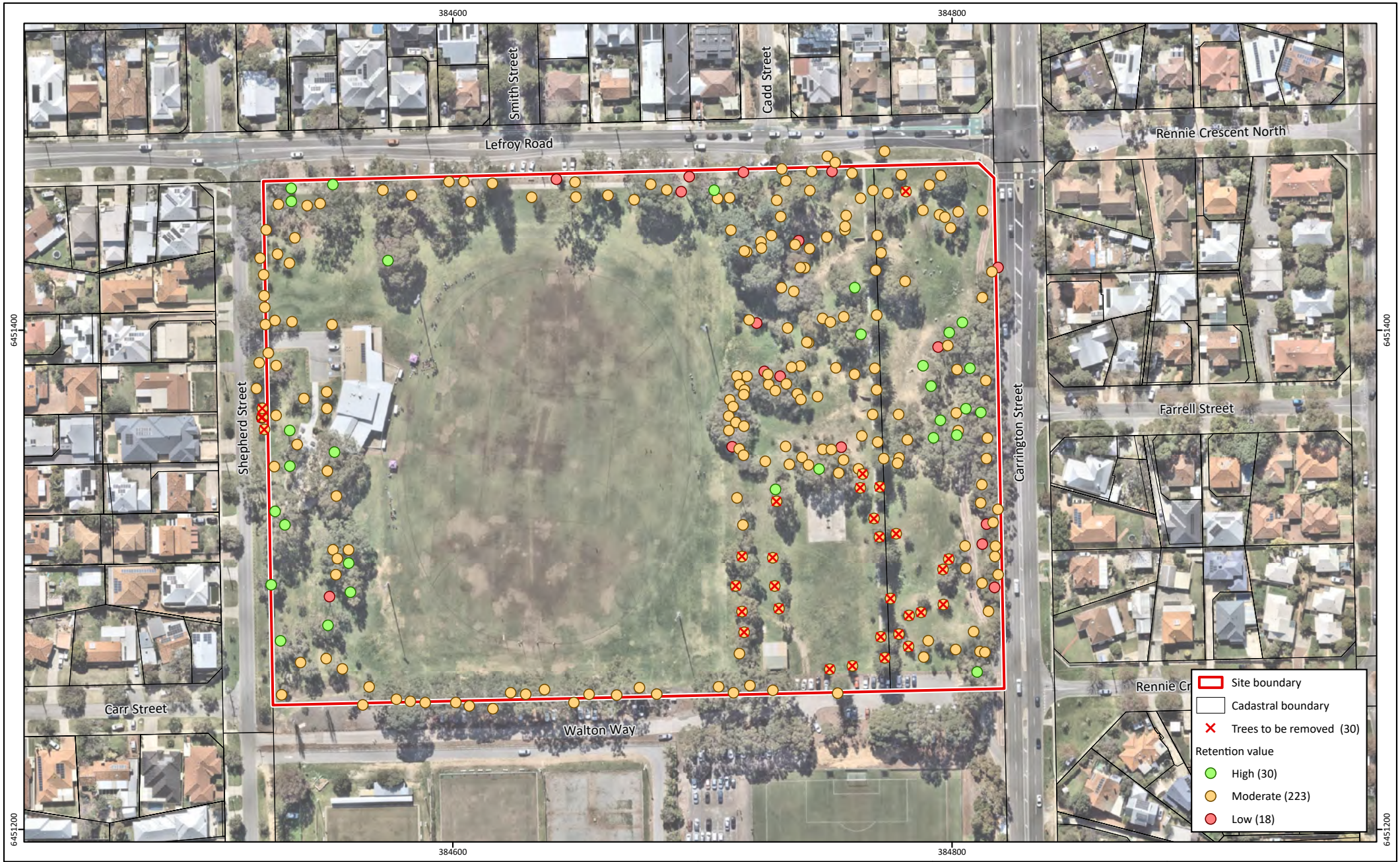


Figure 6: Impact to Trees (Retention Value)

Project: Environmental Management Plan
Hilton Park North
Client: City of Fremantle

Plan Number:
EP25-108(06)--F24
Drawn: LAM
Date: 06/03/2026
Checked: TB
Approved: TB
Date: 10/03/2026

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Metres
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Appendix A

Concept Plan

CITY OF
Fremantle



HILTON PARK PRECINCT PLAN
NORTH ZONE CONCEPT

UDLA

TABLE 1 EDITION DETAILS

PROJECT NAME	
Title	Hilton Park North Zone Concept Report
Production Date	27th June 2025
Prepared By	UDLA
Author	Nadia Long
Status	B
UDLA Project Code	FREHIL

TABLE 2 DOCUMENT REGISTER

DOCUMENT REGISTER

Version	Date	Amendments	Prepared By
DRAFT	01/05/25	Issued to CoF for initial feedback.	NL
A	20/06/25	Issued to CoF following feedback.	NL
B	27/07/25	Issued to CoF	NL

Prepared for: City of Fremantle

CITY OF Fremantle

Contact: Emily Parsons
Position: Senior Landscape Architect
Email: emilyp@fremantle.wa.gov.au

Prepared by: UDLA

UDLA

Contact: Dan Firns
Position: UDLA Director
Phone: (08) 9336 7577
Email: dan@udla.com.au

UDLA WA: WHADJUK COUNTRY
UDLA VIC: WURUNDJERI COUNTRY
HELLO@UDLA.COM.AU | (08) 9336 7577
WWW.UDLA.COM.AU



We acknowledge the Whadjuk Noongar people as the Traditional Owners of the land on which Hilton Park site stands today. We pay respect to the Whadjuk people, and Elders both past and present whose knowledge and wisdom has and will ensure the continuation of cultural and traditional practices.

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NORTH ZONE GRAPHIC PLAN 8
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TURF BLEACHERS LEVEL PLAN 12
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NORTH ZONE STRATEGY
CLEARINGS IN THE FOREST

MATURE TREES CREATING SPACES

This zone, currently containing an established urban forest, presents an opportunity to develop a community park that highlights the local context through thoughtfully designed spaces.

These spaces will be characterised by large trees and diverse underplanting. It will contain sports grounds, cultural spaces, pump track, and shaded viewing amentities.

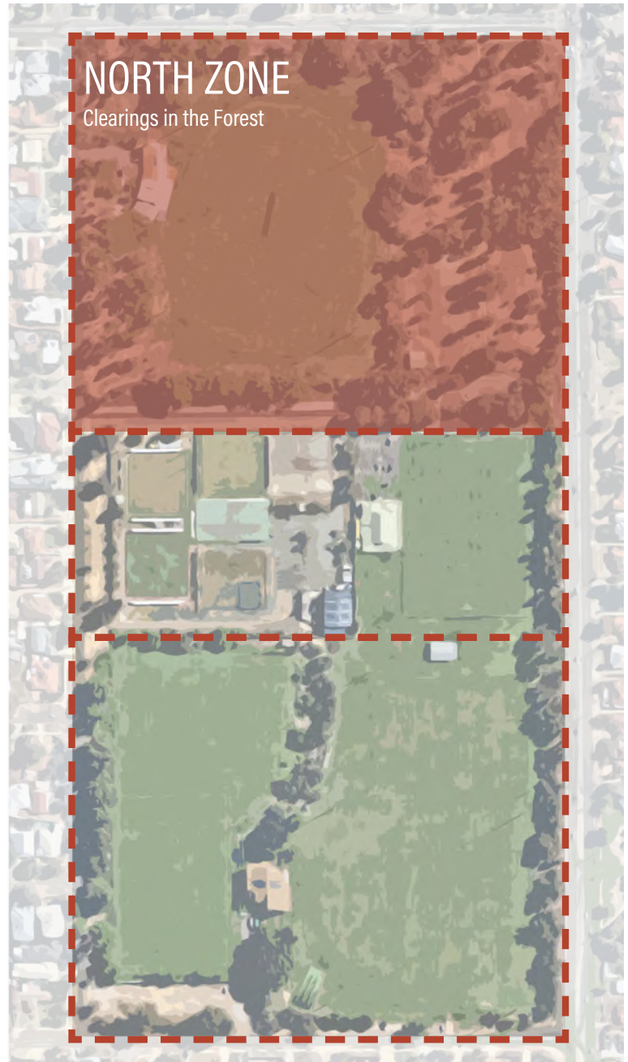
SITE IMAGES







LOCATION MAP



OBJECTIVES

The strategy for this zone includes:

- Public realm that blends vegetated and open spaces, integrating ecological zones with recreation areas to enhance user experience.
- Natural clearings within the park to provide open spaces for sports and leisure, whilst preserving the appeal of the surrounding planted areas.
- Plant species that are well-suited to the local climate and environmental conditions.
- Parkland spaces that are comfortable and inviting, though the incorporation of heavily shaded areas for gathering and/or resting.
- Pathways and seating areas that are easily accessible to all users, with clear signage to guide visitors through the park.

Examples that demonstrate similar objectives and values:

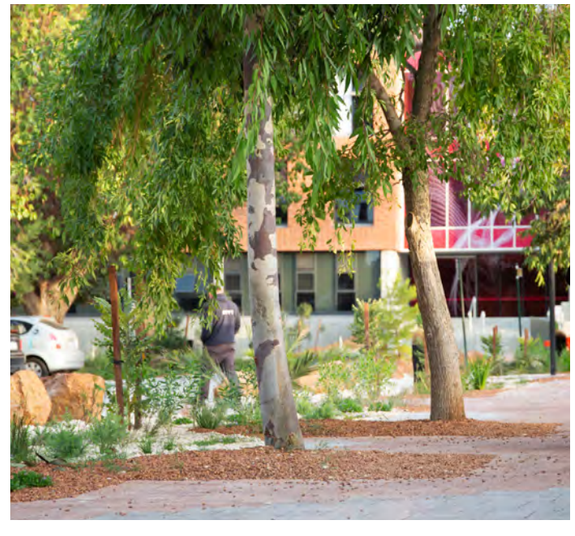
- Booyeembara Park, Fremantle, WA
- Lathlain Precinct Community Park, Lathlain, WA
- Subi East, Subiaco, WA
- Lizard Log Park, NSW

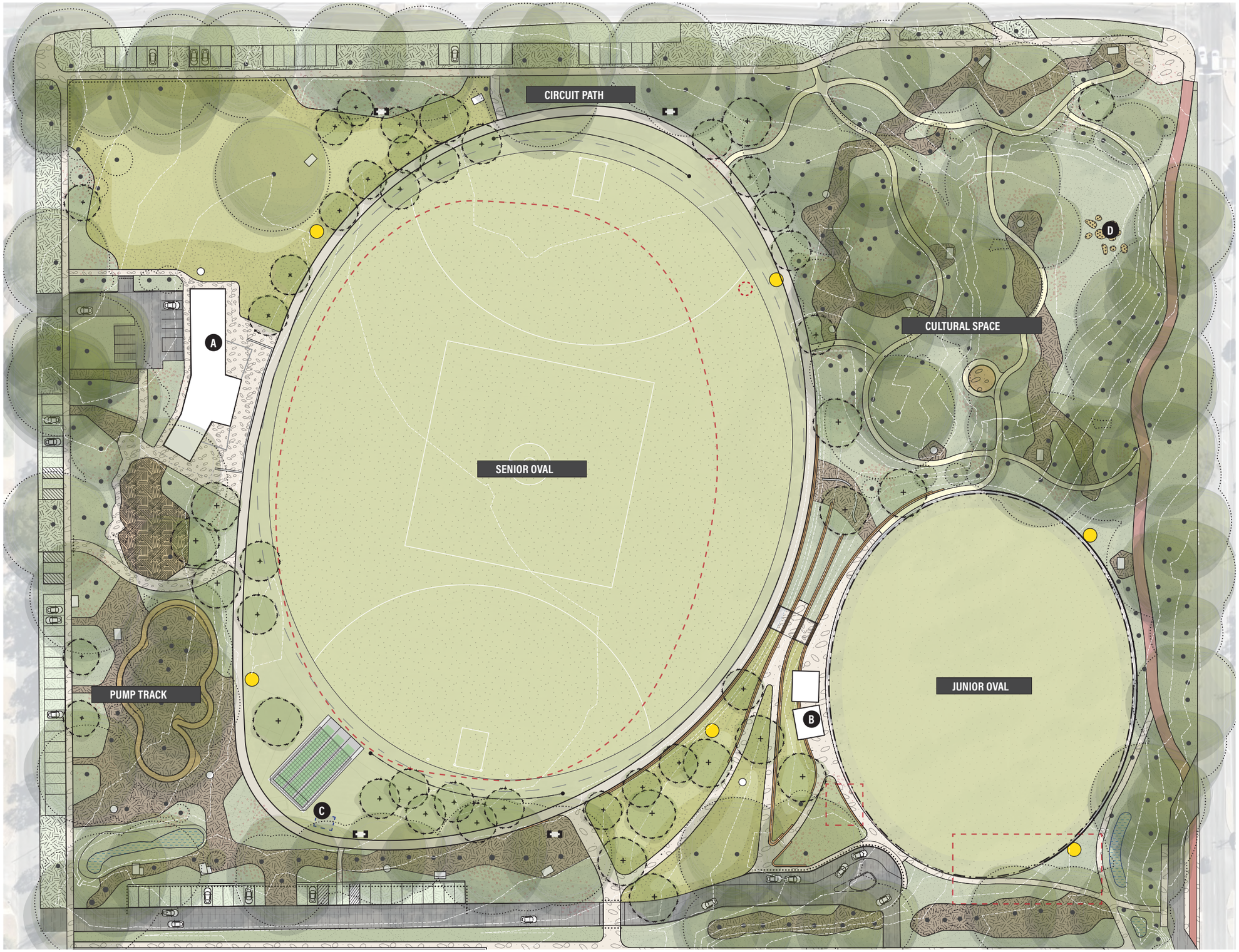
EXAMPLE











KEY

- Sport turf.
- Irrigated recreational turf.
- Garden bed with local planting.
- Existing Trees.
- Proposed Trees.
- Flood lighting to sport fields.
- Removed Infrustructure.
- Jogging Circuit
- Existing irrigation valve boxes / seats.
- A Brad Hardie Pavilion.
- B Junior Oval Shade Shelter.
- C Potential location of future toilet block.
- D Existing Pinnacles.

N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDEVELOPMENT

NORTH ZONE GRAPHIC PLAN

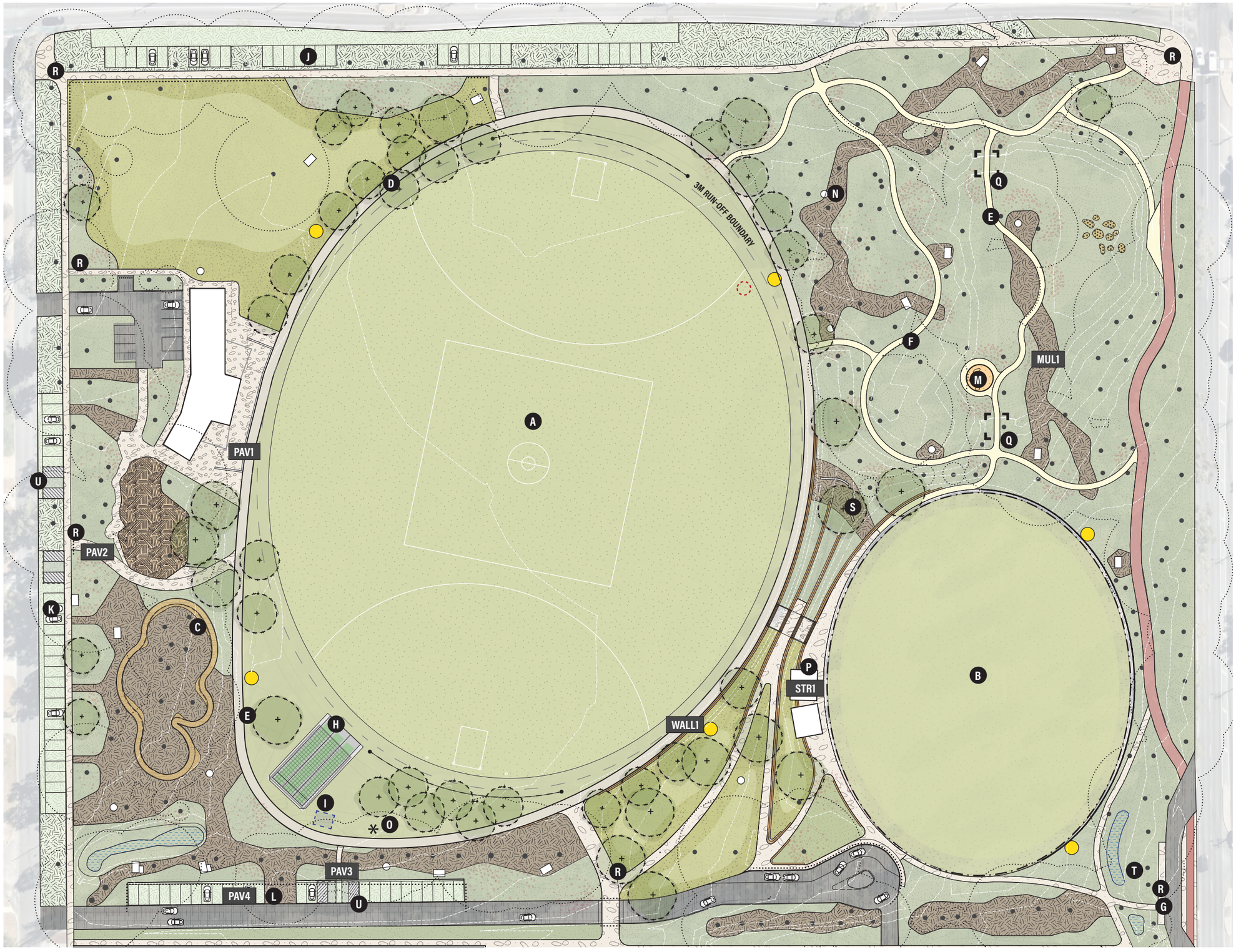
DRAWING NUMBER
L0001

ISSUE DATE
JUNE 2025

REVISION
B

SCALE
1:1000 @ A3

DRAWN BY
NL



KEY

- A Senior Oval (Resized to 165 x 135m).
- B Junior Oval/Dog oval, fenced.
- C Pump Track
- D Oval Track / Loop Path (PAV1).
- E Primary Concrete Path (PAV2).
- F Internal Activity Path (PAV3).
- G Bus Stop Pedestrian Entry.
- H Cricket Nets.
- I Future location for UAT block.
- J Parking zone 01 (PAV4).
- K Parking zone 02 (PAV4).
- L Parking zone 03 (PAV4).
- M Cultural Place & Shelter, subject to changes following engagement.
- N 18-Hole Frisbee Golf with mulch run (MUL1).
- O Turf space for Bocce, with retention of existing seating marked. *
- P Propriety shade structure (STR1).
- Q Retention of existing bridges.
- R Wayfinding - Main entry sign location for the North zone (to be further developed in later phase).
- S Custom slide in garden bed (size and length TBC)
- T Swale opportunity
- U ACROD Bays.

N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDEVELOPMENT

NORTH ZONE CONCEPT PLAN

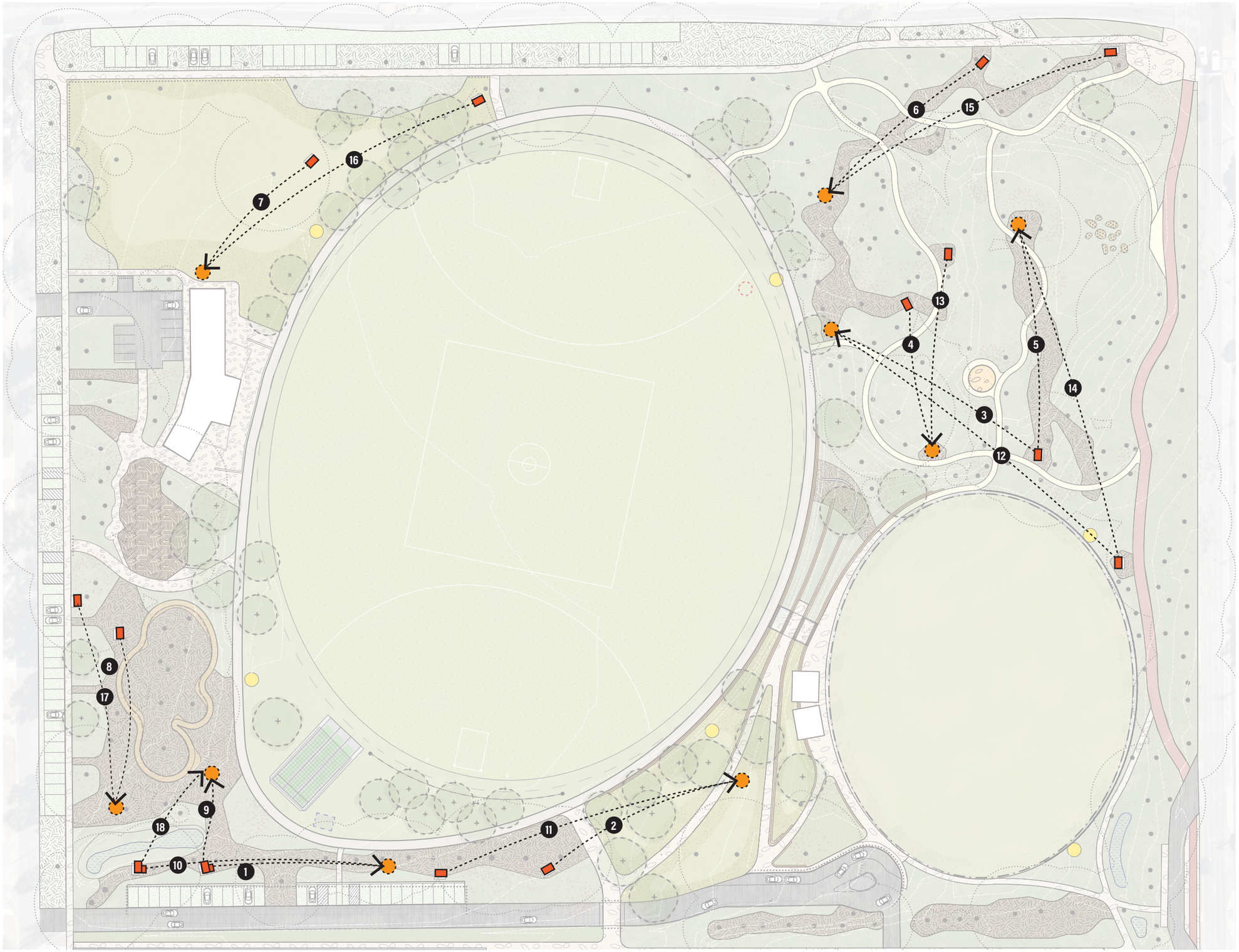
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ISSUE DATE
JUNE 2025

REVISION
B

SCALE
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DRAWN BY
NL



N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDELOPMENT

DRAWING
NORTH ZONE DISC GOLF

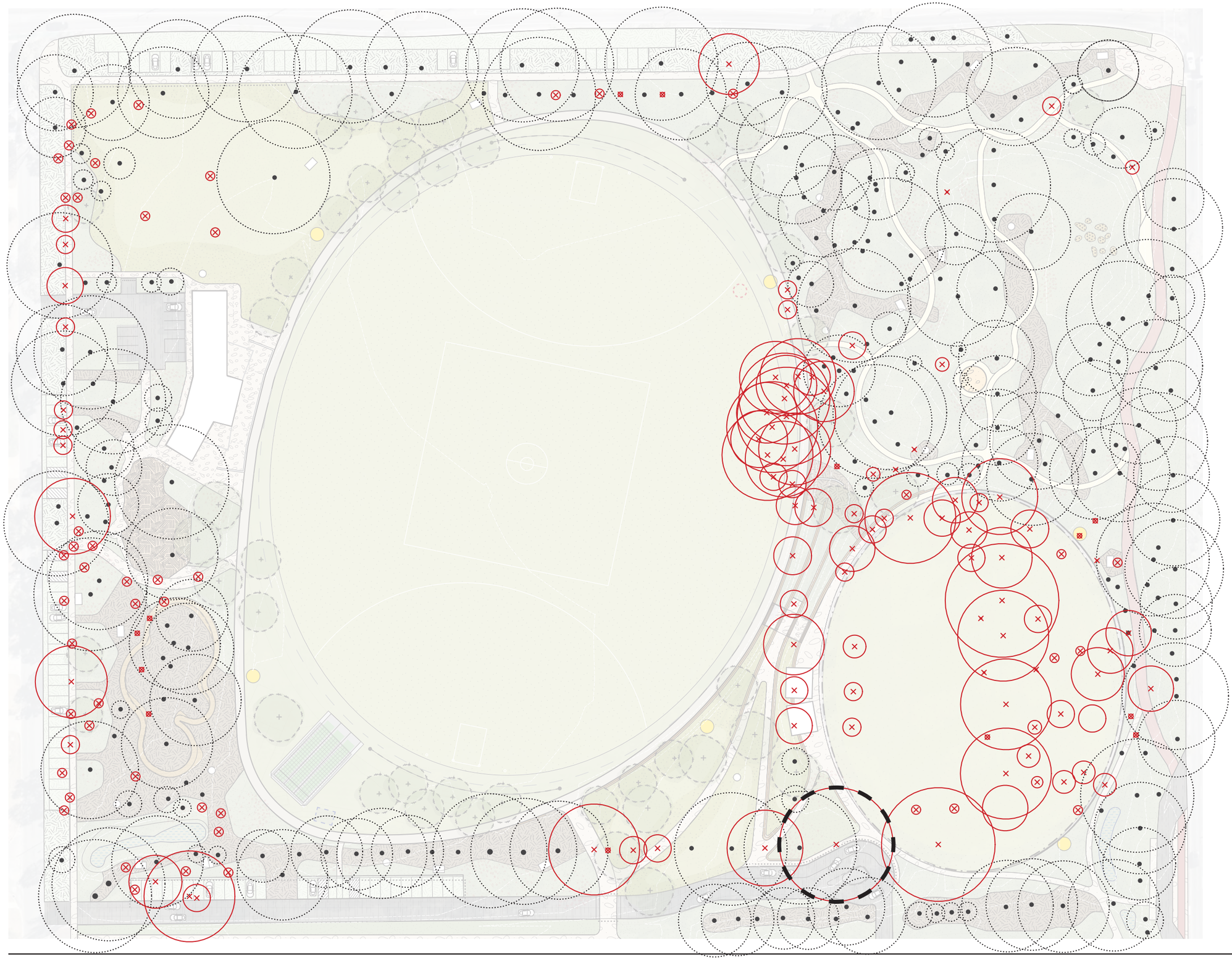
DRAWING NUMBER
L0003

ISSUE DATE
JUNE 2025

REVISION
B

1:100 @ A3

DRAWN BY
NL



KEY

- Existing trees to be retained.
- Existing trees to be demolished/ removed.
- Subject to changes following design review - Potential for tree to be retained,

N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDEVELOPMENT

DRAWING
TREE RETENTION / DEMOLITION PLAN

DRAWING NUMBER
L0004

ISSUE DATE
JUNE 2025

REVISION
B

SCALE
1:1000 @ A3

DRAWN BY
NL



KEY

- A — Turf mound.
- B — Turf bleachers at minimum 2.5m depth for accessibility & maintenance.
- C — Junior Footy Oval shelter.
- D — 2 x 450m high limestone or rammed earth walls.
- Sport turf.
- Irrigated recreational turf.
- Garden bed with native planting.
- Existing Trees.
- Proposed Trees.

N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDEVELOPMENT

DRAWING
TURF BLEACHERS LEVEL PLAN

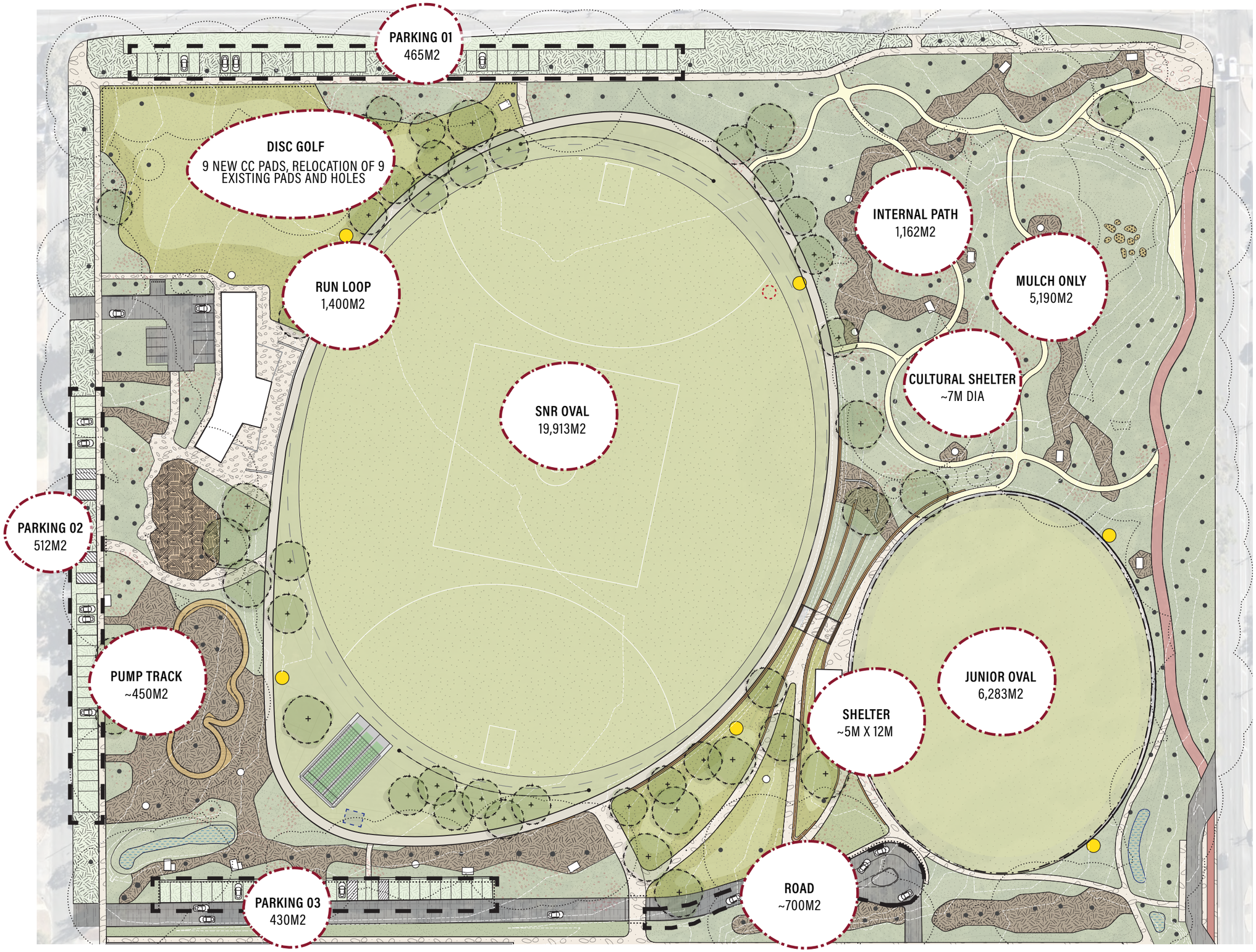
DRAWING NUMBER
L0005

ISSUE DATE
JUNE 2025

REVISION
B

SCALE
1:500 @ A3

DRAWN BY
NL



GRANTS NOTED

- Cricket nets - $74,000 Grant, with additional $40,000 through Cricket Australia
- Roads and Parking - $349,660 Grant
- Play - $5,000
- Wayfinding, Art, Signage, Entries - $52,862 Grant [to be further developed at later stage]
- Planting, Soil Cond. & Mulch - $1,045,315 Grant
- Pump Track - $200,000 Grant
- AFL Oval resizing - $880,015 Grant
- Path networks [Internal Path network, Loop Path network] - $733,800 Grant
- Perimeter path - $127,440 Grant, [$224,520 wanted]
- Junior footy oval Shelter - $0 Grant [$100,000 wanted]
- Cultural Shelter - $58,500 Grant [$241,500 extra wanted]
- Furniture - $15,000 Grant [$25,000 wanted, with consideration of proposed limetsone / rammed earth walls]
- Disc Golf - $0 Grant [$25,000 wanted]

N

0 10 20 40

UDLA

LEVEL 2 ATWELL BUILDING, 3 CANTONMENT ST, FREMANTLE WA 6160
08 9336 7577

CLIENT
CITY OF FREMANTLE

PROJECT
FREHIL HILTON PARK REDEVELOPMENT

NORTH ZONE COSTING & GRANTS

DRAWING NUMBER
L0006

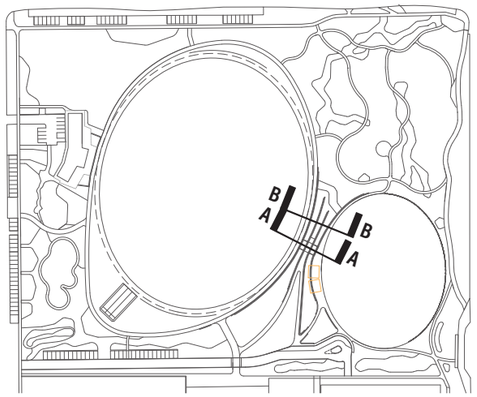
ISSUE DATE
JUNE 2025

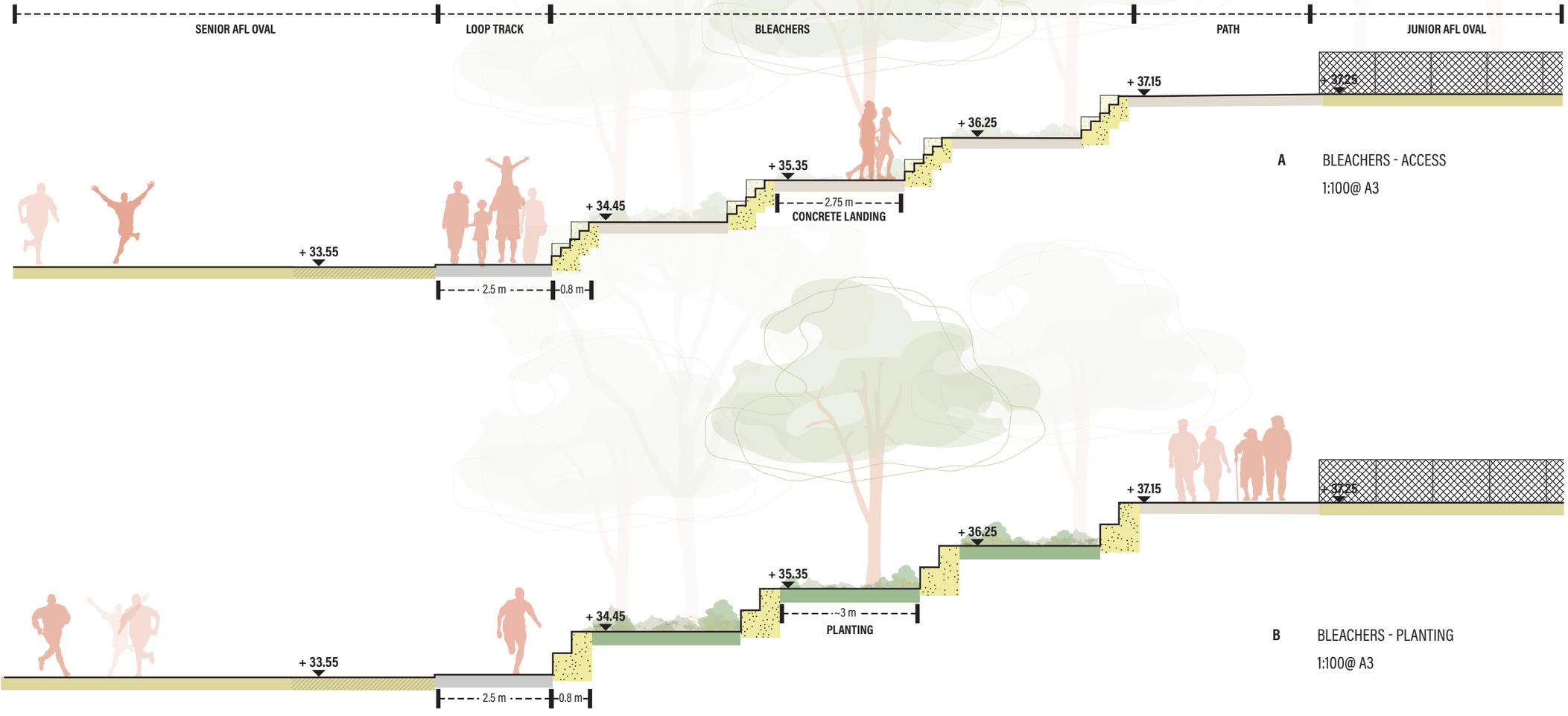
REVISION
B

SCALE
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NL

SECTIONS
THE BLEACHERS



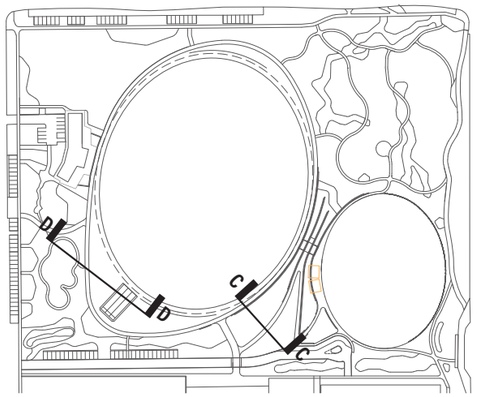


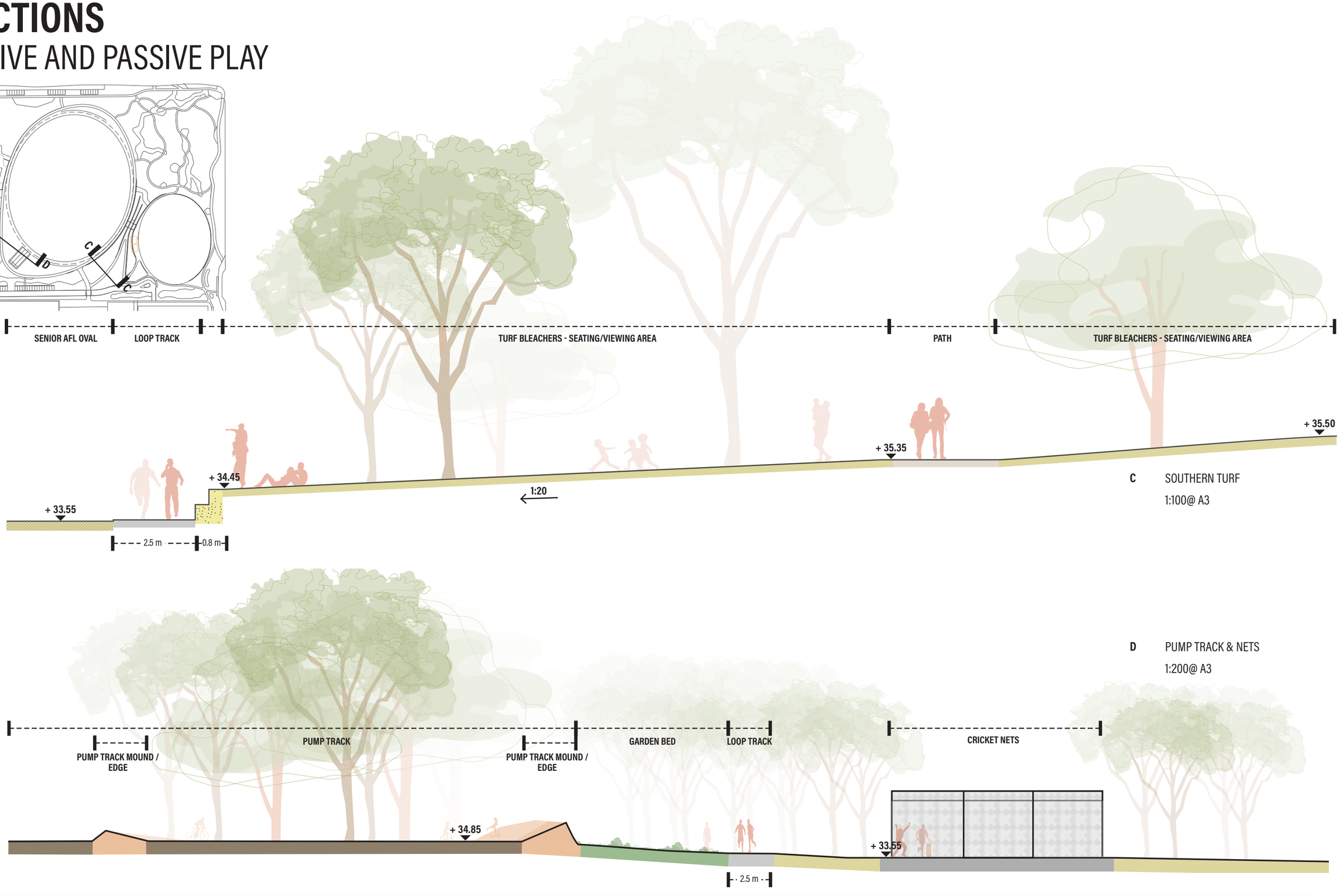
A BLEACHERS - ACCESS
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B BLEACHERS - PLANTING
1:100@ A3

SECTIONS

ACTIVE AND PASSIVE PLAY





C SOUTHERN TURF
1:100@ A3

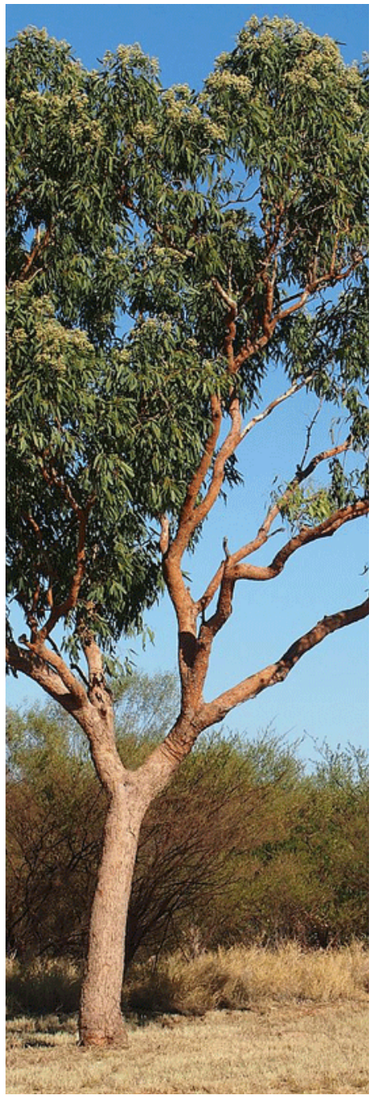
D PUMP TRACK & NETS
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INDICATIVE TREE PLANTING

NORTHERN PRECINCT TREES

The selection of tree species for the Northern Precinct of Hilton Park has been considered to reflect both the existing local character and future ecological resilience of the area.

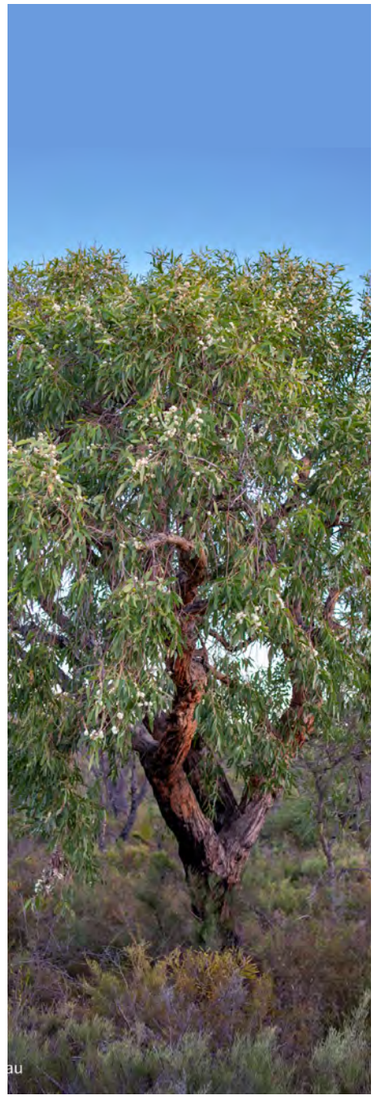
Drawing inspiration from the established urban landscape of nearby Fremantle, the chosen species are not only visually familiar but also well-adapted to the sandy, well-drained soils typical of the area. These trees play a vital role in supporting local biodiversity, offering habitat and food sources for birds, insects, and small mammals. Their integration into the park design will ensure a strong sense of place, enhance ecological function, and contribute to long-term amenity of the park and surrounds.



CORYMBIA CALOPHYLLA,
MARRI
H: 15-40M X W: 8M



EUCALYPTUS GOMPHOCEPHALA,
TUART
H: 30M X W: 15M



EUCALYPTUS TODTIANA,
COASTAL BLACKBUTT
H: 6M X W: 4-10M



AGONIS FLEXUOSA,
WA WEEPING PEPPERMINT
H: 4-10M X W: 4-10M

INDICATIVE SHRUB PLANTING

NORTHERN PRECINCT SHRUBS

The indicative planting palette has been developed to reintroduce endemic species into an urban park context, with the dual aim of enhancing local biodiversity and reinforcing a sense of place.

The planting strategy focuses on native species that are well-adapted to the local soil and climatic conditions, ensuring long-term resilience and reduced maintenance requirements. By proposing species commonly found in the area, the design reinforces a visual and ecological continuity with the broader landscape, while promoting a strong sense of place within the park itself.

Incorporating hardy, waterwise, and flowering species will not only enrich the character of the park, but also contribute significantly to local biodiversity, providing important habitat for native fauna.



BANKSIA BLECHNIFOLIA
BANKSIA
H: 0.3M X W: 2M



EREMOPHILA GLABRA
EMU BUSH
H: 0.2M X W: 2M



GREVILLEA OBTUSIFOLIA 'GIN GIN GEM'
GREVILLEA
H: 0.5M X W: 3M



MYOPORUM PARVIFOLIUM
CREEPING BOOBIALLA
H: 0.7M X W: 1M



CONOSTYLIS CANDICANS
GREY COTTONHEAD
H: 0.3M X W: 0.5M



DIANELLA REVOLUTA
BLUE FLAX-LILY
H: 1M X W: 1.5M



PATERSONIA OCCIDENTALIS
PURPLE FLAG
H: 0.8M X W: 0.3-0.6M



ISOLEPIS CERNUA
LOW BULRUSH
H: 0.3M X W: 0.3M



BANKSIA NIVEA
HONEYPOT DRYANDRA
H: 0.7M X W: 1M



CALOTHAMNUS QUADRIFIDUS
ONE SIDED BOTTLEBRUSH
H: 2.5M X W: 2.5M



GREVILLEA THELMANNIANA
SPIDER NET GREVILLEA
H: 1.5M X W: 1.5M



MYOPORUM INSULARE
COMMON BOOBIALLA
H: 5M X W: 2M



OLEARIA AXILLARIS
COASTAL DAISY BUSH
H: 1-2M X W: 1-2M



SCAEVOLA CRASSIFOLIA
THICK-LEAVED FAN FLOWER
H: 1.5M X W: 1.5M

MATERIAL & FURNITURE FINISHES SCHEDULE

PLEASE REFER TO DESIGN GUIDELINES FOR DETAILED FURNITURE AND FIXTURE PALETTE

Code	Location	Material / Finish	Supplier
PAV1	Oval Track / Loop Path	Insitu concrete, broom finish [*Potential for wayfinding inprints/art elements]*	Boral or similarly approved by CoF
PAV2	Primary Path	Insitu concrete, exposed aggregate	Boral or similarly approved by CoF
PAV3	Internal Activity Path	Bitumen stabilised limestone	Creation Landscape Supplies or similarly approved by CoF
PAV4	Perimeter Parking	Compacted limestone	Creation Landscape Supplies or similarly approved by CoF
MUL1	Disc Golf Runs	Aquamore blowable mulch	Eclipse Soils

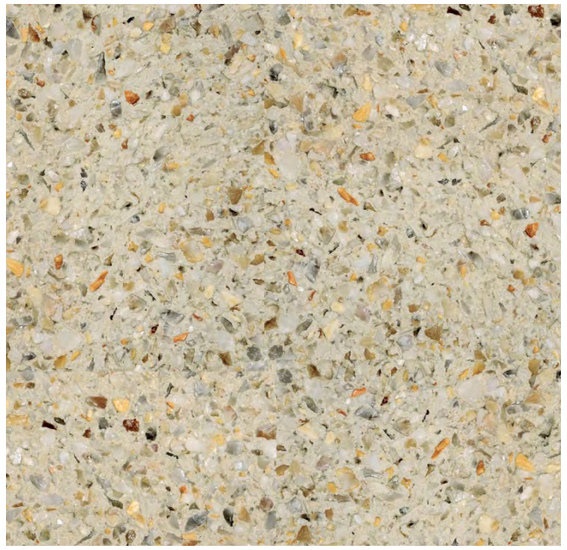
Code	Location	Item	Product / Finish	Supplier
STR1	As noted on drawings	Cantilever	Designer Cantileve, hot-dipped galvanised posts and frame; powder coating finish	Landmark or similarly approved by CoF
FURN1	*[location not shown on drawings]*	Freestanding Seat	Linea Seat	Street Furniture Australia or similarly approved by CoF
FURN2	*[location not shown on drawings]*	Freestanding Bench	Linea Bench	Street Furniture Australia or similarly approved by CoF
WAL1	As noted on drawings	Wall seating	Natural limestone blocks	Supplier to be confirmed
FIX1	*[location not shown on drawings]*	Bollard	Basso (BAS10)	Exteria or similarly approved by CoF
FIX2	*[location not shown on drawings]*	Drink Fountain	Arquar Station with Dog Bubbler	Street Furniture Australia or similarly approved by CoF
FIX3	*[location not shown on drawings]*	Bike Parking	Single Bicycle Stand	Landmark or similarly approved by CoF
FIX4	*[location not shown on drawings]*	Bin	Escola Bin Enclosure	Street Furniture Australia or similarly approved by CoF

MATERIAL PALETTE



PAV1. INSITU CONCRETE

Location: Running Loop Path
Finish: Frameless Broom
Supplier: Boral or similar



PAV2. INSITU CONCRETE EXPOSED AGG

Location: Primary Paths
Finish: Exposed Aggregate
Supplier: Boral or similar



PAV3. BITUMEN STABILISED LIMESTONE

Location: Internal Activity Path
Supplier: Creation Landscape Supplies



PAV4. COMPACTED LIMESTONE

Location: Perimeter Parking
Supplier: Creation Landscape Supplies



MUL1. MULCH ONLY

Location: Disc Golf Runs
Type: Aquamore blowable mulch
Supplier: Eclipse Soils

Appendix B

Contaminated Lands Report

TECHNICAL MEMORANDUM
Soil Contamination Assessment
Hilton Park Development Support

PROJECT NUMBER	EP25-108(04)	**DOC. NUMBER**	EP25-108(04)--007 AMR
PROJECT NAME	Hilton Park North	**CLIENT**	City of Fremantle
AUTHOR	Alex Mazzey	**REVIEWER**	Matt James
VERSION	B	**DATE**	4/11/2025

1. Introduction

Emerge Associates was engaged by the City of Fremantle (CoF) to undertake a soil contamination assessment of the northern portion of Hilton Park (subsequently referred to as the 'site'), as shown in **Figure 1** (**Attachment 1**). The assessment aims to identify and quantify potential contamination associated with uncontrolled fill at the site, which covers an area of approximately 18,000 m². The investigation will also evaluate risks to human health and the environment and determine whether the fill material is suitable for the proposed future land use or requires management during redevelopment of the site.

Hilton Park is in Beaconsfield within the CoF, bordered by Carrington Street to the east, Lefroy Road to the north, Shepard Street to the west, and Walton Way to the south and the legal description of the site includes the following land parcels, both covered by Certificate of Title 1387/97:

- Lot 551 on Deposited Plan 226147 known as Lot 551 Lefroy Road, Beaconsfield WA 6162
- Lot 839 on Deposited Plan 152954 known as 213-311 Carrington Street, Beaconsfield WA 6162

The proposed redevelopment of the site involves transforming the area into an enhanced community recreation precinct. Planned works include developing a new community gathering space with BBQ facilities and shelters, constructing a new ceremonial shelter with a BBQ station in the north-west eco-zone, providing additional shade amenities for the new AFL oval, and constructing a new junior AFL oval to relieve pressure on the existing southern facilities. The project also includes consolidating the central vehicle entry into a single access road with formalised parking for the junior oval, creating new pedestrian entry statements, and reconfiguring and expanding the Disc Golf course with an additional nine holes (REALMstudios 2024).

2. Scope of work

The scope of work undertaken for the assessment comprised:

- A review of historical aerial photographs to assess historical land use and activities that may have impacted the site.
- A review of the Department of Water and Environmental (DWER) Contaminated Sites Database for registered contaminated sites in proximity to the site.
- A review of the Basic Summary of Records (BSR) from DWER, associated with the site.
- A site inspection undertaken on 8 October 2025 to observe current site conditions and identify any potential sources of contamination.

- A soil investigation undertaken on 10 October 2025 that comprised:
  - Excavation of 18 test pits (TP) to a maximum depth of 2.4 metres below ground level (mBGL).
  - Soil samples for chemical analysis were collected from the surface and at approximately 0.5 m intervals to the base of each TP. Additional samples were collected where indications of contamination were observed to more accurately characterise the impacted material.
  - Collection of 66 primary soil samples and two quality control samples.
  - Submission of 34 primary soil samples and two quality control samples to National Association of Testing Authorities (NATA) accredited laboratory for analysis of contaminants of potential concern (CoPC).
  - Collecting, weighing, and sieving 10 litre (L) soil samples using a 7 millimetre (mm) sieve to inspect the retained fraction for suspected bonded ACM fragments at 0.25 m intervals of soil excavated in every TP.
  - Review of analytical data obtained from samples collected during this investigation and comparison against adopted assessment levels for the ongoing recreational land use.

- **Historical aerial review**

Based on historical aerial photographs, the northern portion of Hilton Park appears to have undergone minimal disturbance over time. Evidence of site activity first becomes apparent in 1981 (**Plate 1**), including what appears to be a bicycle track in the southwest corner of the site. By 1985 (**Plate 2**), the bicycle track is more pronounced, and stockpiles are visible in the southwest area of the main oval. These stockpiles are no longer visible from 1989 imagery, suggesting the material may have been moved or covered. The bicycle track itself is no longer present by 1995. Although no specific potentially contaminating land uses are evident within the site boundaries, the presence and subsequent disappearance of stockpiled material indicate that fill of unknown origin may have been placed, relocated, or buried on-site. Such general earthworks and the potential placement of uncontrolled fill represent possible sources of contamination, increasing the likelihood that asbestos containing material (ACM) may be present in the soil.



Plate 1: Aerial photograph 13/06-30/08/1981 (Landgate).



Plate 2: Aerial photograph 20/04-19/06/1985 (Landgate).

4. DWER Contaminated Sites Database

The state government, through the DWER, has the overall responsibility for developing, administering, and enforcing the CS Act and its associated procedures. Part of this responsibility includes maintenance of the Contaminated Sites Database (DWER 2024).

The Database provides information on known contaminated sites that have been classified by the DWER as:

- *Contaminated - remediation required*
- *Contaminated - restricted use*
- *Remediated for restricted use*

A search of the DWER Contaminated Sites Database on 11 November 2025 confirmed that the site is not recorded on the database, and no contaminated properties were identified within a 500 m radius. A screen print of the database search results is provided in **Plate 3**.



Plate 3: Contaminated Sites Database on 11 November 2025 (500 m radius shown).

5. DWER Reported Sites Register

In addition to the Contaminated Sites Database, the DWER maintains a register of reported sites.

The register consists of sites that have been reported to the DWER that have been classified as:

- *Report not substantiated*
- *Possibly contaminated - investigation required*
- *Not contaminated - unrestricted use*
- *Decontaminated*

A BSR provides a method to search this register to identify properties which have been reported to the DWER but are not included on the Contaminated Sites Database.

A BSR was submitted to the DWER on 17 October 2025. The results of the BSR search received on 21 October 2025 advised the site has not been reported to the DWER as a known or suspected contaminated site.

6. Assessment levels

This document focuses on assessment levels appropriate for the site's ongoing recreational land use. These levels have been adopted to ensure the soil assessment provides reliable information to support site management and planning decisions.

The primary assessment levels for potential chemical contamination in the soil for the site were determined by referring to the numerical criteria detailed in the *National Environment Protection (Assessment of Site Contamination) Measure 1999: Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater* (NEPC 2013), as implemented through the DWER guideline titled *Assessment and Management of Contaminated Sites* (DWER 2021)

For the proposed recreational land use, Health Investigation Level C (HIL-C) is applicable, as it is intended for developed open spaces such as parks, playgrounds, playing fields, secondary schools, and footpaths. In such settings, exposure to soil is expected to occur less frequently and for shorter durations than in typical residential environments.

In addition to these human health criteria, the assessment also refers to Ecological Investigation Levels (EILs) for urban residential and public open space land uses, as defined by *Schedule B5- National Environment Protection Council* (NEPC 2013). These guidelines provide a framework for assessing soil and groundwater contamination to protect terrestrial ecosystems in these specific areas, using a risk-based approach that considers the toxicity of contaminants to a range of species.

The applicable assessment level for bonded ACM in soil corresponds to Recreational C, which is 200 mg/kg (0.02% w/w asbestos), as outlined in the Department of Health (DoH 2021) *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*. This level provides an appropriate balance between health protection and the intended recreational use of the site.

For determining the concentration of asbestos (as ACM) in the soil, the adopted protocols involved considering all fibre cement material to be ACM, with the concentration of asbestos within the ACM assumed to be 15% by weight.

7. Site observations

A site inspection was conducted on 8 October 2025 to observe current site conditions and to determine if any additional potential sources of contamination were evident, including ACM and/ or C&D rubble.

The site is predominantly covered with grass. Trees line the perimeter of the oval, with a scattered arrangement of trees and bushes along the edges of the site. Denser clusters of trees and natural vegetation are concentrated toward the northern section, where the vegetation appears thicker and more natural compared to the rest of the area. This appearance is consistent with the most recent historical aerial photograph, illustrated in the Site Plan in **Figure 1** (**Attachment 1**).

The key findings of the visual inspection are as follows:

- Observations across the site revealed:
    - A concrete path runs from south to north across the site, including a small bridge over a drainage channel, as shown in **Plate 4**. The path provides clear access across the site and guides movement through vegetated and open areas.
    - Disk golf stations are installed as illustrated in **Plate 5**. The arrangement of the stations suggests active recreational use while retaining natural vegetation.

- Observations in the southern portion of the site revealed:
    - A toilet building is noted in the southern part of the site, as illustrated in **Plate 6**. The building appeared intact and functional, with no obvious signs of structural damage or contamination.
    - A basketball court is present, as illustrated in **Plate 7**. The court surface appeared well-maintained, with clear markings, and is integrated within the open recreational area.
    - Two mounds were present, as illustrated in **Plate 8**. These mounds are noticeable features of the site's topography.



Plate 4: Concrete path through the site and bridge.



Plate 5: Disk golf stations and trees on the site.



Plate 6: Toilet building in the southern part of the site



Plate 7: Basketball court in the middle-southern part of the site.



Plate 8: Two mounds in the southwestern part of the site.

8. Soil Assessment

The following sections detail the results of the soil assessment.

8.1. Field observations

The soil investigation was completed on 10 October 2025. A total of 18 TP were excavated using a mini excavator. Their locations are shown in the Sampling Plan on **Figure 2** (**Attachment 1**), and the corresponding logs are illustrated in **Attachment 2**.

The lithology encountered across the site comprised the following:

- Southwestern site corner adjacent to the oval (TP01-TP05)
    - TP01 and TP02: Topsoil over sandy soils with varying amounts of silt, extending to approximately 1.3 mBGL. The material transitioned from dark brown near the surface to lighter brown sand at depth.
    - TP03: Sand and silt, progressively lighter in colour with depth, with large limestone fragments encountered at approximately 1.2 mBGL, indicating transition to natural material.
    - TP04: Crushed limestone and minor C&D rubble between 0.1 and 0.5 mBGL (**Plate 9**), underlain by light brown sand with silt to 1.2 mBGL.
    - TP05: Road base material and C&D fragments between 0.5 and 0.6 mBGL, followed by sand with silt to at least 1.2 mBGL (**Plate 10** and **Plate 11**).
- Middle-southern portion of the site around the basketball court (TP06-TP11)

- TP06 and TP07: Sand and silt to 0.7 mBGL, underlain by limestone from 0.7-1.0 mBGL, followed by sand with silt to 1.2 mBGL.
- TP08: Topsoil over light brown to red sand with silt and gravel to approximately 1.1 mBGL, without limestone.
- TP09: Fill and sand to 1.1 mBGL, with small rubble fragments at approximately 0.5 mBGL.
- TP10: Uncontrolled fill to 1.4 mBGL, containing C&D fragments, a polyvinyl chloride (PVC) pipe (**Plate 12**) at 0.2 mBGL, and a glass fragment at 0.5 mBGL, underlain by natural sand to 1.9 mBGL.
- TP11: Uncontrolled fill with minor rubble to 0.4 mBGL, overlying sand to 1.1 mBGL.

- Southeastern corner of the site, representing the mounds (TP12-TP15)
  - TP12: Clean fill with small stones to approximately 0.35 mBGL, underlain by natural sand to 1.7 mBGL.
  - TP13: Fill sand to 2.3 mBGL, with limestone encountered at approximately 0.4 mBGL.
  - TP14: Complex fill profile, consisting of sand and gravel with C&D fragments, a tyre (**Plate 13**) at approximately 1.5 mBGL, and a grey gravel layer at 1.7 mBGL.
  - TP15: Fill and road base materials to approximately 1.6 mBGL, transitioning to sand (possibly natural) to 2.0 mBGL.
  - During the excavation of this test pits, three pieces of ACM were found: one at 1.00 mBGL in TP14, one at 0.25 mBGL in TP15, and one at 1.50 mBGL in TP15.
- Northern portion of the site (TP16-TP18)
  - TP16, TP17, TP18: Topsoil to 0.1 mBGL, overlying medium-coarse grained sand and silt (dark brown near surface, grading to light brown - yellow at depth) to 1 mBGL. No visible deleterious materials or signs of contamination were observed.

No visible or olfactory signs of hydrocarbon contamination or staining were observed in any of the TP.



Plate 9: Limestone profile and minor C&D rubble at TP04, between 0.1-0.5 mBGL.



Plate 10: Road base and C&D material at TP05, between 0.5-0.6 mBGL.



Plate 11: Road base and C&D material at TP05, between 0.5-0.6 mBGL.



Plate 12: Piece of PVC at TP10, at 0.2 mBGL.



Plate 13: Tyre and C&D material at TP14, approximately 1.5 mBGL.

8.2. Investigation results

8.2.1. Chemical analysis

A total of 66 primary soil samples were collected from all TP at routine 0.5 m intervals to provide representative coverage of the soil profile and where indications of contamination were observed. Of these, 34 primary samples, along with two quality control samples (field duplicates), were submitted for analysis for:

- Organochlorine pesticides (OCs) and organophosphate pesticides (OPs).
- A suite of eight metals.

A review of the laboratory results identified the following:

- The OC/OP pesticides were generally reported at concentrations that were below the laboratory Limit of Reporting (LoR), which are also below the available adopted assessment levels. The only exception was the sample TP10-0.50, which recorded a minor concentration of Aldrin + Dieldrin (0.27 mg/kg), nevertheless it is below the level of HIL C which is 10 mg/kg.
- Metals, including chromium (III+VI), copper, lead, mercury, nickel, and zinc, were reported at concentrations above their respective LoR in various samples. However, all detected metal concentrations were significantly below their adopted assessment levels. These concentrations are considered indicative of likely natural or background levels.
- For the purposes of this investigation, an acceptance target of less than 30% to 50% was applied to field duplicate samples. Replicate data with concentrations greater than 10 times the LoR should have an RPD of less than 30%, while replicate data with concentrations less than 10 times the LoR should have an RPD of less than 50%. All calculated RPD values for soil samples were below the target criteria.

The combined soil observations and laboratory results (**Attachment 3**) identified no evidence within the soils across the site of chemical contamination above the adopted assessment criteria for the continuing recreational land use.

8.2.2. ACM assessment

As per the calculation method outlined in DoH (2021), ACM fragments were recovered and weighed to determine the concentration of asbestos in soil. This was conducted by sieving a total a total of 87 10 L soil samples through a 7 mm sieve at 0.25 m intervals throughout every TP excavation. The results identified the following:

- TP14-1.00: One sheeting fragment (60 × 30 × 5 mm) weighing 19.7 g, recovered from the C&D rubble layer (0.5 - 1.7 m). Concentration calculated at 0.0228% w/w (228 mg/kg).
- TP15-0.25: One sheeting fragment (30 × 25 × 4 mm) weighing 4.46 g, recovered from of the C&D rubble layer (0.1 - 1 m). Concentration calculated at 0.0057% w/w (57 mg/kg).
- TP15-1.50 mBGL: One sheeting fragment (30 × 15 × 4 mm) weighing 3.52 g, recovered from sand fill (1 - 1.6 m), underlying C&D material. Concentration 0.0041% w/w (41 mg/kg).

The calculations indicated that the only sample exceeding the guideline screening level for recreational land use (0.02% w/w) was the fragment recovered from TP14 at 1.0 mBGL. The results of the assessment are provided in **Attachment 4**.

8.2.3. Summary

The soil assessment confirmed:

- While minor concentrations of OC/OP pesticides were detected in TP10 at 0.5 mBGL, the chemical concentrations of all CoPC in all samples were well below the adopted assessment criteria for recreational land use and are therefore unlikely to pose a risk to human health or the environment.
- C&D rubble or fill layers. The assessment identified the following:
    - Adjacent to the oval, TP04 contained C&D rubble from 0.1 to 0.5 mBGL, while TP05 had C&D rubble and road base from 0.5 to 0.6 mBGL.
    - Adjacent to the basketball court, TP09 contained C&D rubble from 0.2 to 0.5 mBGL. TP10 had uncontrolled fill with C&D rubble extending from 0.2 to 1.4 mBGL, including miscellaneous debris such as PVC pipe and glass fragments. TP11 contained uncontrolled fill with minor C&D rubble from 0.1 to 0.4 mBGL.
- Evidence of ACM in the soil profile associated with C&D material:
    - Northern mound, TP14 included C&D material from 0.5 to 1.5 mBGL, with one ACM fragment recovered at 1.0 mBGL exceeding the recreational screening level. TP15 contained rubble and road base to 1.6 mBGL, with two ACM fragments identified at 0.25 and 1.5 mBGL, both below the guideline threshold.

9. Closing

Based on the assessment undertaken the following conclusions are made:

- Laboratory analysis of soil samples confirmed no evidence of chemical contamination, with concentrations well below the adopted assessment levels for recreational land use, indicating no risk to human health or the environment.
- ACM was identified throughout the northern mound. This soil must be managed as controlled waste if soil disturbance occurs at this depth in accordance with the *Environmental Protection (Controlled Waste) Regulations 2004* (DWER 2004). The material cannot be disposed of at a standard landfill and must be transported to a licensed asbestos waste facility. Prior to removal, the soil should be appropriately segregated, contained, and clearly labelled 'CAUTION ASBESTOS' to prevent fibre release during handling and transport. Disposal should be coordinated with the facility operator, and all handling must comply with regulatory requirements to ensure safe and compliant management of the ACM.
- The remainder of the site is generally suitable for recreational use, and the fill material is appropriate for the proposed future land use. With proper segregation during excavation, clean fill can be reused on site, while C&D material can be managed appropriately.

10. Attachments

The list of attachments referred to in this advice is detailed in **Table 1**.

Table 1: List of attachments

Attachment no.	Attachment
Attachment 1	Figures
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11. References

Department of Health (DoH) 2021, *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*, Government of Western Australia, Perth.

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Department of Water and Environmental Regulation (DWER) 2024, *Contaminated Sites Database*, Western Australia, <https://catalogue.data.wa.gov.au/dataset/contaminated-reported-sites-dwer-059>.

National Environment Protection Council (NEPC) 2013, *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 - Schedule B1 Guideline on Investigation Levels for Soil and Groundwater*.

REALMstudios 2024, *City of Fremantle Hilton Park Precinct Plan*, Version C.

Attachment 1

Figures



Figure 1: Site Plan

Project: Soil Contamination Assessment
Hilton Park Development Support

Client: City of Fremantle

Plan Number:
EP25-108(04)--F02

Drawn:	WJC
Date:	24/10/2025
Checked:	AMR
Approved:	MDJ
Date:	18/11/2025

N

0 20 40
Metres

Scale: 1:1,500@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used.
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Figure 2: Sample Plan

Project: Soil Contamination Assessment
Hilton Park Development Support

Client: City of Fremantle

Plan Number:
EP25-108(04)--F03

Drawn:	WJC
Date:	24/10/2025
Checked:	AMR
Approved:	MDJ
Date:	18/11/2025

N

0 10 20 30
Metres

Scale: 1:1,250@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used.
©Landgate (2025). Nearmap Imagery date: 16/08/2025

Attachment 2

Test Pit Logs

Test Pit ID: TP01

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384673
METHOD: Excavator
NORTHING: 6451265
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.40 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY SILTY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: CLAYEY SILTY SAND: light yellow/brown, medium to coarse grained.	Dry To Moist	TP01-0.10
			0.2m: SILTY SAND: dark brown, medium to coarse grained.	Dry To Moist	
					TP01-0.50
			0.8m: SILTY SAND: light brown, medium to coarse grained.	Dry To Moist	
	33				
1					TP01-1.00
					TP01-1.30
			Total depth: 1.4 mBGL		

COMMENTS:

Test Pit ID: TP02

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384684
METHOD: Excavator
NORTHING: 6451270
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.20 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY SILTY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: dark brown/red, medium to coarse grained.	Dry To Moist	TP02-0.10
	34				
					TP02-0.50
			0.8m: SILTY SAND: light brown/red, medium to coarse grained.		
1					TP02-1.00
			Total depth: 1.2 mBGL		

COMMENTS:

Test Pit ID: TP03

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384706
METHOD: Excavator
NORTHING: 6451267
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.30 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: dark brown/red, medium to coarse grained, colour becoming lighter with depth.	Dry To Moist	TP03-0.10
	35				
					TP03-0.50
1					TP03-1.00
			1.1m: SANDY LIMESTONE: light brown/red, medium to coarse grained, hit limestones at 1.2m, big fragments of limestone.	Dry To Moist	
	34				TP03-1.20
			Total depth: 1.3 mBGL		

COMMENTS:

Test Pit ID: TP04

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384698
METHOD: Excavator
NORTHING: 6451283
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.30 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SANDY CRUSHED LIMESTONE: light brown/red, coarse grained, construction and demolition(C&D).	Dry To Moist	TP04-0.10
					TP04-0.40
			0.5m: SILTY SAND: light brown/red, medium to coarse grained, colour becoming lighter with depth.	Dry To Moist	
	34				TP04-0.80
1					TP04-1.20
			Total depth: 1.3 mBGL		

COMMENTS:

Test Pit ID: TP05

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384705
METHOD: Excavator
NORTHING: 6451296
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.20 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY CLAYEY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: dark brown/red, medium to coarse grained.	Dry To Moist	TP05-0.10
					TP05-0.30
			0.5m: SANDY ROAD BASE: dark brown/red, medium to coarse grained, C&D.	Dry To Moist	TP05-0.50
	34		0.6m: SILTY SAND: dark brown/red, medium to coarse grained.	Dry To Moist	
1					TP05-1.00

Total depth: 1.2 mBGL

COMMENTS:

Test Pit ID: TP06

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384740
METHOD: Excavator
NORTHING: 6451278
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.20 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: light brown/yellow, medium to coarse grained.	Dry To Moist	TP06-0.10
			0.3m: SILTY SAND: dark brown/black, medium to coarse grained.	Dry To Moist	TP06-0.50
			0.7m: SANDY LIMESTONE: light brown/white, medium to coarse grained.	Dry To Moist	TP06-0.70
	36		0.8m: SILTY SAND: dark brown/red, medium to coarse grained.	Dry To Moist	
1					TP06-1.00
			Total depth: 1.2 mBGL		

COMMENTS:

Test Pit ID: TP07

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384759
METHOD: Excavator
NORTHING: 6451279
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.00 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark brown/black, coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: dark brown/red, medium to coarse grained.	Dry To Moist	TP07-0.10
			0.3m: SILTY SAND: light brown/red, medium to coarse grained.	Dry To Moist	TP07-0.50
					TP07-0.80
	36		0.9m: SANDY LIMESTONE: light brown/white, medium to coarse grained.	Dry To Moist	
1			Total depth: 1 mBGL		

COMMENTS:

Test Pit ID: TP08

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384758
METHOD: Excavator
NORTHING: 6451303
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.10 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SILTY GRAVELLY SAND: light brown/grey, coarse grained.	Dry To Moist	TP08-0.10
			0.4m: SILTY SAND: light brown/red, medium to coarse grained.	Dry To Moist	TP08-0.50
	36				
1					TP08-1.00

Total depth: 1.1 mBGL

COMMENTS:

Test Pit ID: TP09

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384744
METHOD: Excavator
NORTHING: 6451306
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.10 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	TP09-0.10
			0.2m: SANDY FILL: light brown, medium to coarse grained, rubble to 0.5m.	Dry To Moist	
	36		0.5m: SAND: brown, medium grained, natural at 0.5m.	Dry To Moist	TP09-0.50
1					TP09-1.00

Total depth: 1.1 mBGL

COMMENTS:

Test Pit ID: TP10

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384739
METHOD: Excavator
NORTHING: 6451318
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.90 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SILTY SANDY TOPSOIL: dark black/brown, coarse grained.	Dry To Moist	
			0.1m: SANDY UNCONTROLLED FILL: light brown/grey, coarse grained, C&D and piece of PVC .	Dry To Moist	TP10-0.10
					TP10-0.50
	36				
1					TP10-1.00
			1.4m: SILTY SAND: light brown/red, medium to coarse grained, natural at 1.4 m.	Dry To Moist	
	35				TP10-1.70
			Total depth: 1.9 mBGL		

COMMENTS:

Test Pit ID: TP11

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384764
METHOD: Excavator
NORTHING: 6451324
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.10 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY TOPSOIL: dark brown/black, medium to coarse grained.	Dry To Moist	
			0.1m: SANDY UNCONTROLLED FILL: light grey/brown, medium to coarse grained, rubble to 0.4 m.	Dry To Moist	TP11-0.10
	37				
			0.4m: SAND: light brown, fine grained.	Dry To Moist	TP11-0.50
1					TP11-1.00
			Total depth: 1.1 mBGL		

COMMENTS:

Test Pit ID: TP12

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384801
METHOD: Excavator
NORTHING: 6451279
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.70 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: TOPSOIL: dark brown/black, medium to coarse grained.	Dry To Moist	
	40		0.1m: SANDY FILL: dark yellow/brown, medium to coarse grained, clean fill with small stones.	Dry To Moist	TP12-0.10
			0.4m: SANDY FILL: light black/brown, medium to coarse grained.	Dry To Moist	
			0.6m: FILL: light yellow/black, medium grained.	Dry To Moist	TP12-0.50
1					TP12-1.00
	39		1.4m: SAND: light brown/green, medium grained.	Dry To Moist	TP12-1.60
			Total depth: 1.7 mBGL		

COMMENTS:

Test Pit ID: TP13

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384791
METHOD: Excavator
NORTHING: 6451283
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 2.30 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY TOPSOIL: dark brown/black, medium to coarse grained.	Dry To Moist	
			0.1m: SANDY FILL: dark brown, medium to coarse grained.	Dry To Moist	TP13-0.10
	40				
					TP13-0.50
			0.8m: SANDY FILL: light yellow, medium to coarse grained, fill to depth, cleaner as you get deeper.	Dry To Moist	
1			1.0m: SANDY FILL: light brown, medium to coarse grained, limestone at 0.4 m.	Dry To Moist	TP13-1.00
	39				
					TP13-1.50
2					TP13-2.00
			Total depth: 2.3 mBGL		

COMMENTS:

Test Pit ID: TP14

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384790
METHOD: Excavator
NORTHING: 6451316
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 2.40 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY TOPSOIL: dark brown/black, coarse grained.	Dry To Moist	
	40		0.1m: GRAVELLY SANDY FILL: dark brown/grey, medium to coarse grained, 0.5-1 m C&D material.	Dry To Moist	TP14-0.10
					TP14-0.50
					TP14-0.80
1					TP14-1.00
	39				TP14-1.50
			1.7m: GRAVELLY FILL: dark grey, medium to coarse grained, tyre found at 1.5 m, grey gravel layer at 1.7 m.	Dry To Moist	
2			2.0m: SANDY FILL: dark brown/red, medium grained, possible natural.	Dry To Moist	TP14-2.00
	38				
			Total depth: 2.4 mBGL		

COMMENTS:

Test Pit ID: TP15

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384792
METHOD: Excavator
NORTHING: 6451333
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 2.00 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: TOPSOIL: dark brown, medium to coarse grained.	Dry To Moist	
			0.1m: GRAVELLY SANDY FILL: dark brown/orange, medium to coarse grained, rubble/road base to 1.6 m.	Dry To Moist	TP15-0.10
					TP15-0.25
					TP15-0.50
	39				
1			1.0m: SANDY FILL: dark brown, medium to coarse grained.	Dry To Moist	TP15-1.00
					TP15-1.50
			1.6m: SAND: dark brown, medium to coarse grained.	Dry To Moist	
	38				
2			Total depth: 2 mBGL		

COMMENTS:

Test Pit ID: TP16

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384753
METHOD: Excavator
NORTHING: 6451364
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.10 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: SANDY TOPSOIL: dark brown/black, medium to coarse grained.	Dry To Moist	
	34		0.1m: SILTY SAND: dark brown, medium to coarse grained.	Dry To Moist	TP16-0.10
			0.4m: SILTY SAND: light brown/yellow, medium to coarse grained.	Dry To Moist	TP16-0.50
1					TP16-1.00

Total depth: 1.1 mBGL

COMMENTS:

Test Pit ID: TP17

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384717
METHOD: Excavator
NORTHING: 6451398
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.10 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0			0.0m: TOPSOIL: dark brown/black, medium to coarse grained.	Dry To Moist	
			0.1m: GRAVEL: light grey/brown, coarse grained, gravel layer.	Dry	TP17-0.10
	33		0.2m: SILTY SAND: light orange/brown, fine to medium grained.	Dry To Moist	
					TP17-0.50
1					TP17-1.00

Total depth: 1.1 mBGL

COMMENTS:

Test Pit ID: TP18

PROJECT NUMBER: EP25-108(04)
PROJECT NAME: Hilton Park Soil Contamination Assessment
CLIENT: City of Fremantle
PROJECT LOCATION: Hilton Park, Beaconsfield, WA, 6162

DATE INSTALLED: 10/10/2025
SURVEY SOURCE: Field GPS
CONTRACTOR: Perth Coast Mini Excavator Services
EASTING: 384731
METHOD: Excavator
NORTHING: 6451435
LOGGED BY: AMR/LJ
PROJECTION: MGA Zone 50, GDA2020 **TOTAL DEPTH:** 1.00 mBGL

DEPTH (mBGL)	DEPTH (mAHD)	LOG	MATERIAL DESCRIPTION	MOISTURE CONTENT	SAMPLE ID
0	33		0.0m: TOPSOIL: brown/black, medium to coarse grained.	Dry To Moist	
			0.1m: SILTY SAND: brown/orange, fine to medium grained, limestone at 0.6 m.	Dry To Moist	TP18-0.10
					TP18-0.50
1			Total depth: 1 mBGL		

COMMENTS:

Attachment 3

Laboratory Documents and Results Tables

		Metals								Organochlorine Pesticides				
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		5	1	2	5	5	0.1	2	5	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Rec C		300	90		17,000	600	80	1,200	30,000				10	
NEPM 2013 Table 1B(5) Generic EIL		100												
Field ID	**Date**													
TP01-0.10	**10/10/2025**	<5	<1	10	<5	11	<0.1	<2	14	<0.05	<0.05	<0.05	<0.05	<0.05
TP02-0.10	**10/10/2025**	<5	<1	10	<5	21	<0.1	<2	10	<0.05	<0.05	<0.05	<0.05	<0.05
TP03-0.10	**10/10/2025**	<5	<1	12	<5	12	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP04-0.8	**10/10/2025**	<5	<1	15	<5	<5	<0.1	<2	<5	-	-	-	-	-
TP04-0.40	**10/10/2025**	<5	<1	26	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP05-0.50	**10/10/2025**	<5	<1	14	39	44	0.5	2	114	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-0.10	**10/10/2025**	<5	<1	15	<5	8	<0.1	<2	6	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-1.00	**10/10/2025**	<5	<1	19	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP07-0.10	**10/10/2025**	<5	<1	15	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP08-0.10	**10/10/2025**	<5	<1	11	<5	12	<0.1	<2	15	<0.05	<0.05	<0.05	<0.05	<0.05
TP09-0.50	**10/10/2025**	<5	<1	12	<5	7	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP10-0.50	**10/10/2025**	<5	<1	10	5	28	<0.1	<2	33	<0.05	<0.05	<0.05	0.27	<0.05
TP11-0.50	**10/10/2025**	<5	<1	8	14	19	<0.1	2	18	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.10	**10/10/2025**	<5	<1	13	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.50	**10/10/2025**	<5	<1	8	<5	20	<0.1	<2	6	-	-	-	-	-
TP12-1.00	**10/10/2025**	<5	<1	4	<5	33	<0.1	<2	12	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-1.60	**10/10/2025**	<5	<1	17	<5	<5	<0.1	<2	<5	-	-	-	-	-
TP13-0.10	**10/10/2025**	<5	<1	17	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-0.50	**10/10/2025**	<5	<1	10	7	70	<0.1	<2	66	-	-	-	-	-
TP13-1.00	**10/10/2025**	<5	<1	12	6	67	<0.1	<2	12	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-1.50	**10/10/2025**	<5	<1	7	<5	50	<0.1	<2	16	-	-	-	-	-
TP13-2.00	**10/10/2025**	<5	<1	7	7	21	<0.1	<2	14	-	-	-	-	-
TP14-0.10	**10/10/2025**	<5	<1	7	6	10	<0.1	<2	24	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-0.50	**10/10/2025**	<5	<1	8	<5	10	<0.1	<2	13	-	-	-	-	-
TP14-1.00	**10/10/2025**	<5	<1	8	9	19	<0.1	<2	28	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-1.50	**10/10/2025**	<5	<1	8	8	17	<0.1	<2	14	-	-	-	-	-
TP14-2.00	**10/10/2025**	<5	<1	13	<5	<5	<0.1	<2	5	-	-	-	-	-
TP15-0.10	**10/10/2025**	<5	<1	17	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-0.50	**10/10/2025**	<5	<1	13	<5	9	<0.1	<2	11	-	-	-	-	-
TP15-1.00	**10/10/2025**	<5	<1	15	<5	<5	<0.1	<2	7	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-1.50	**10/10/2025**	<5	<1	7	<5	8	<0.1	<2	18	-	-	-	-	-
TP16-0.10	**10/10/2025**	<5	<1	12	<5	5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP17-0.50	**10/10/2025**	<5	<1	14	<5	<5	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05
TP18-0.10	**10/10/2025**	<5	<1	20	<5	6	<0.1	<2	<5	<0.05	<0.05	<0.05	<0.05	<0.05

		Organochlorine Pesticides												
		Chlordane	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Rec C		70						400		340				20
NEPM 2013 Table 1B(5) Generic EIL							180							
Field ID	**Date**													
TP01-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP02-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP03-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP04-0.8	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04-0.40	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP05-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP07-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP08-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP09-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP10-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	0.27	<0.05	<0.05	<0.05	<0.05	<0.05
TP11-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-1.60	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP17-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP18-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

		Organochlorine Pesticides						Organophosphorous Pesticides						
		Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Rec C					10		400					250		
NEPM 2013 Table 1B(5) Generic EIL														
Field ID	**Date**													
TP01-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP02-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP03-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP04-0.8	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04-0.40	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP05-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP06-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP07-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP08-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP09-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP10-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP11-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP12-1.60	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP13-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP14-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP15-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP17-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP18-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

		Organophosphorous Pesticides								Pesticides				Halogenated Benzenes
		Dichlorvos	Dimethoate	Ethion	Fenthion	Malathion	Methyl parathion	Monocrotophos	Prothiofos	Demeton-S-methyl	Fenamiphos	Parathion	Pirimphos-ethyl	Hexachlorobenzene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	0.2	0.2	0.05	0.05	0.05	0.2	0.05	0.05
NEPM 2013 Table 1A(1) HILs Rec C														10
NEPM 2013 Table 1B(5) Generic EIL														
Field ID	**Date**													
TP01-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP02-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.3	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP03-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP04-0.8	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP04-0.40	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP05-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP06-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP06-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP07-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP08-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.10	<0.05	<0.05	<0.2	<0.05	<0.05
TP09-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP10-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP11-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP12-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP12-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP12-1.60	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP13-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP13-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP14-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP14-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-2.00	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP15-0.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-1.00	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP15-1.50	**10/10/2025**	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP17-0.50	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05
TP18-0.10	**10/10/2025**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05

			EP2516926 TP06-1.00 10/10/2025 Soil	EP2516926 QAQC01 10/10/2025 Soil	RPD	EP2516926 TP12-1.60 10/10/2025 Soil	EP2516926 QAQC03 10/10/2025 Soil	RPD
	Unit	EQL						
Halogenated Benzenes								
Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Metals								
Arsenic	mg/kg	5	<5	<5	0	<5	<5	0
Cadmium	mg/kg	1	<1	<1	0	<1	<1	0
Chromium (III+VI)	mg/kg	2	19	23	19	17	13	27
Copper	mg/kg	5	<5	<5	0	<5	<5	0
Lead	mg/kg	5	<5	<5	0	<5	<5	0
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	2	<2	<2	0	<2	<2	0
Zinc	mg/kg	5	<5	<5	0	<5	<5	0
Organophosphorous Pesticides								
Azinophos methyl	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Carbophenothion	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlorpyrifos-methyl	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Diazinon	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Dichlorvos	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Dimethoate	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Ethion	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Fenthion	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Malathion	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Methyl parathion	mg/kg	0.2	<0.2	<0.2	0		<0.2	
Monocrotophos	mg/kg	0.2	<0.2	<0.2	0		<0.2	
Prothiofos	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Organochlorine Pesticides								
4,4-DDE	mg/kg	0.05	<0.05	<0.05	0		<0.05	
a-BHC	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Aldrin	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	0		<0.05	
b-BHC	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlordane	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlordane (cis)	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Chlordane (trans)	mg/kg	0.05	<0.05	<0.05	0		<0.05	
d-BHC	mg/kg	0.05	<0.05	<0.05	0		<0.05	
DDD	mg/kg	0.05	<0.05	<0.05	0		<0.05	
DDT	mg/kg	0.2	<0.2	<0.2	0		<0.2	
DDT+DDE+DDD	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Dieldrin	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endosulfan	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endosulfan I	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endosulfan II	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endrin	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Endrin ketone	mg/kg	0.05	<0.05	<0.05	0		<0.05	
g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Heptachlor	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Methoxychlor	mg/kg	0.2	<0.2	<0.2	0		<0.2	
Pesticides								
Demeton-S-methyl	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Fenamiphos	mg/kg	0.05	<0.05	<0.05	0		<0.05	
Parathion	mg/kg	0.2	<0.2	<0.2	0		<0.2	
Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	0		<0.05	

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary la**

CHAIN OF CUSTODY

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Integrated Science & Design

CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 1 of 5
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	**ALS LABORATORY: Perth**
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED										
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	8 Metals	OC / OP Pesticides S-12	Hold								Additional information (likely contaminants, dilutions or specific QC analysis)
1	TP01-0.10	S	10/10/25	1 X J	1	X	X									
2	TP01-0.50	S	10/10/25	1 X J	1			X								
3	TP01-1.00	S	10/10/25	1 X J	1			X								
4	TP01-1.30	S	10/10/25	1 X J	1			X								
5	TP02-0.10	S	10/10/25	1 X J	1	X	X									
6	TP02-0.50	S	10/10/25	1 X J	1			X								
7	TP02-1.00	S	10/10/25	1 X J	1			X								
8	TP03-0.10	S	10/10/25	1 X J	1	X	X									
9	TP03-0.50	S	10/10/25	1 X J	1			X								
10	TP03-1.00	S	10/10/25	1 X J	1			X								
11	TP03-1.20	S	10/10/25	1 X J	1			X								
12	TP04-0.10	S	10/10/25	1 X J	1			X								
13	TP04-0.40	S	10/10/25	1 X J	1	X	X									
69	TP04-0.80	S	10/10/25	1 X J	1	X										
TOTAL																

Environmental Division
Perth
Work Order Reference
EP2516926

Telephone : + 61-8-9406 1301

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME: LD AL	DATE: 14/10	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME: 1736	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

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CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 2 of 5
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	ALS LABORATORY: Perth
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED									
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	8 Metals	OC / OP Pesticides S-12	Hold							Additional information (likely contaminants, dilutions or specific QC analysis)
15	TP04-1.20	S	10/10/25	1 X J	1			X							
16	TP05-0.10	S	10/10/25	1 X J	1			X							
17	TP05-0.30	S	10/10/25	1 X J	1			X							
18	TP05-0.50	S	10/10/25	1 X J	1	X	X								
19	TP05-1.00	S	10/10/25	1 X J	1			X							
20	TP06-0.10	S	10/10/25	1 X J	1	X	X								
21	TP06-0.50	S	10/10/25	1 X J	1			X							
22	TP06-0.70	S	10/10/25	1 X J	1			X							
23	TP06-1.00	S	10/10/25	1 X J	1	X	X								
24	TP07-0.10	S	10/10/25	1 X J	1	X	X								
25	TP07-0.50	S	10/10/25	1 X J	1			X							
26	TP07-0.80	S	10/10/25	1 X J	1			X							
27	TP08-0.10	S	10/10/25	1 X J	1	X	X								
28	TP08-0.50	S	10/10/25	1 X J	1			X							
TOTAL															

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME:	DATE:	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME:	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

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CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 3 of 5
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	**ALS LABORATORY: Perth**
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED										
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	8 Metals	OC / OP Pesticides S-12	Hold								Additional information (likely contaminants, dilutions or specific QC analysis)
29	TP08-1.00	S	10/10/25	1 X J	1			X								
30	TP09-0.10	S	10/10/25	1 X J	1			X								
31	TP09-0.50	S	10/10/25	1 X J	1	X	X									
32	TP09-1.00	S	10/10/25	1 X J	1			X								
33	TP10-0.10	S	10/10/25	1 X J	1			X								
34	TP10-0.50	S	10/10/25	1 X J	1	X	X									
35	TP10-1.00	S	10/10/25	1 X J	1			X								
36	TP10-1.70	S	10/10/25	1 X J	1			X								
37	TP11-0.10	S	10/10/25	1 X J	1			X								
38	TP11-0.50	S	10/10/25	1 X J	1	X	X									
39	TP11-1.00	S	10/10/25	1 X J	1			X								
40	TP12-0.10	S	10/10/25	1 X J	1	X	X									
41	TP12-0.50	S	10/10/25	1 X J	1	X										
42	TP12-1.00	S	10/10/25	1 X J	1	X	X									
TOTAL																

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME:	DATE:	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME:	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

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CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 4 of 5
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	**ALS LABORATORY: Perth**
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED										
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	8 Metals	OC / OP Pesticides S-12	Hold								Additional information (likely contaminants, dilutions or specific QC analysis)
43	TP12-1.60	S	10/10/25	1 X J	1	X										
44	TP13-0.10	S	10/10/25	1 X J	1	X	X									
45	TP13-0.50	S	10/10/25	1 X J	1	X										
46	TP13-1.00	S	10/10/25	1 X J	1	X	X									
47	TP13-1.50	S	10/10/25	1 X J	1	X										
48	TP13-2.00	S	10/10/25	1 X J	1	X										
49	TP14-0.10	S	10/10/25	1 X J	1	X	X									
50	TP14-0.50	S	10/10/25	1 X J	1	X										
51	TP14-1.00	S	10/10/25	1 X J	1	X	X									
52	TP14-1.50	S	10/10/25	1 X J	1	X										
53	TP14-2.00	S	10/10/25	1 X J	1	X										
54	TP15-0.10	S	10/10/25	1 X J	1	X	X									
55	TP15-0.50	S	10/10/25	1 X J	1	X										
56	TP15-1.00	S	10/10/25	1 X J	1	X	X									
TOTAL																

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME:	DATE:	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME:	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

CHAIN OF CUSTODY

emerge ASSOCIATES
Integrated Science & Design

CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 5 of 5
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	**ALS LABORATORY: Perth**
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED										
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	8 Metals	OC / OP Pesticides S-12	Hold								Additional information (likely contaminants, dilutions or specific QC analysis)
57	TP15-1.50	S	10/10/25	1 X J	1	X										
58	TP16-0.10	S	10/10/25	1 X J	1	X	X									
59	TP16-0.50	S	10/10/25	1 X J	1			X								
60	TP16-1.00	S	10/10/25	1 X J	1			X								
61	TP17-0.10	S	10/10/25	1 X J	1			X								
62	TP17-0.50	S	10/10/25	1 X J	1	X	X									
63	TP17-1.00	S	10/10/25	1 X J	1			X								
64	TP18-0.10	S	10/10/25	1 X J	1	X	X									
65	TP18-0.50	S	10/10/25	1 X J	1			X								
66	TP18-1.00	S	10/10/25	1 X J	1			X								
67	QAQC01	S	10/10/25	1 X J	1	X	X									
68	QAQC03	S	10/10/25	1 X J	1	X	X									
TOTAL																

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME:	DATE:	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME:	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; **STT** = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

CERTIFICATE OF ANALYSIS

Work Order	: **EP2516926**	Page	: 1 of 25
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assessment	Date Samples Received	: 13-Oct-2025 16:15
Order number	: EP25-108(4)	Date Analysis Commenced	: 17-Oct-2025
C-O-C number	: ----	Issue Date	: 23-Oct-2025 17:26
Sampler	: Alex Massey		
Site	:		
Quote number	: EPBQ/009/21		
No. of samples received	: 72		
No. of samples analysed	: 36		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Efua Wilson	Metals Chemist	Perth Inorganics, Wangara, WA
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP068: High LCS and MS recovery deemed acceptable as all associated analyte results are less than LOR.
- EP068: LOR has been raised for samples in WO "EP2516926" due to matrix effects and interferences.
- EG035: Positive Hg result for sample EP2516926-018 has been confirmed by re-preparation and re-analysis.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP01-0.10	TP02-0.10	TP03-0.10	TP04-0.40	TP05-0.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-001	EP2516926-005	EP2516926-008	EP2516926-013	EP2516926-018
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**20.4**	**10.8**	**17.9**	**8.6**	**6.2**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**10**	**10**	**12**	**26**	**14**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	**39**
Lead	7439-92-1	5	mg/kg	**11**	**21**	**12**	<5	**44**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	**2**
Zinc	7440-66-6	5	mg/kg	**14**	**10**	<5	<5	**114**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.5**
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP01-0.10	TP02-0.10	TP03-0.10	TP04-0.40	TP05-0.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-001	EP2516926-005	EP2516926-008	EP2516926-013	EP2516926-018
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.3	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP01-0.10	TP02-0.10	TP03-0.10	TP04-0.40	TP05-0.50
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-001	EP2516926-005	EP2516926-008	EP2516926-013	EP2516926-018
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**86.3**	**87.6**	**91.9**	**89.8**	**86.0**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**105**	**109**	**117**	**112**	**109**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP06-0.10	TP06-1.00	TP07-0.10	TP08-0.10	TP09-0.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-020	EP2516926-023	EP2516926-024	EP2516926-027	EP2516926-031
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.4**	**4.2**	**5.6**	**32.7**	**4.0**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**15**	**19**	**15**	**11**	**12**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	**8**	<5	<5	**12**	**7**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**6**	<5	<5	**15**	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP06-0.10	TP06-1.00	TP07-0.10	TP08-0.10	TP09-0.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-020	EP2516926-023	EP2516926-024	EP2516926-027	EP2516926-031
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP06-0.10	TP06-1.00	TP07-0.10	TP08-0.10	TP09-0.50
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-020	EP2516926-023	EP2516926-024	EP2516926-027	EP2516926-031
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.10	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**83.7**	**77.0**	**78.7**	**79.7**	**86.5**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**123**	**87.7**	**97.3**	**99.8**	**105**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP10-0.50	TP11-0.50	TP12-0.10	TP12-0.50	TP12-1.00
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-034	EP2516926-038	EP2516926-040	EP2516926-041	EP2516926-042
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.9**	**3.7**	**2.1**	**4.2**	**22.8**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**10**	**8**	**13**	**8**	**4**
Copper	7440-50-8	5	mg/kg	**5**	**14**	<5	<5	<5
Lead	7439-92-1	5	mg/kg	**28**	**19**	<5	**20**	**33**
Nickel	7440-02-0	2	mg/kg	<2	**2**	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**33**	**18**	<5	**6**	**12**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	**0.27**	<0.05	<0.05	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP10-0.50	TP11-0.50	TP12-0.10	TP12-0.50	TP12-1.00
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-034	EP2516926-038	EP2516926-040	EP2516926-041	EP2516926-042
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		**0.27**	<0.05	<0.05	----	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP10-0.50	TP11-0.50	TP12-0.10	TP12-0.50	TP12-1.00
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-034	EP2516926-038	EP2516926-040	EP2516926-041	EP2516926-042
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	----	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**84.0**	**79.6**	**76.9**	----	**77.8**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**108**	**99.0**	**96.0**	----	**92.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP12-1.60	TP13-0.10	TP13-0.50	TP13-1.00	TP13-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-043	EP2516926-044	EP2516926-045	EP2516926-046	EP2516926-047
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.6**	**1.0**	**3.5**	**4.2**	**5.0**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**17**	**17**	**10**	**12**	**7**
Copper	7440-50-8	5	mg/kg	<5	<5	**7**	**6**	<5
Lead	7439-92-1	5	mg/kg	<5	<5	**70**	**67**	**50**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	<5	<5	**66**	**12**	**16**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	<0.05	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP12-1.60	TP13-0.10	TP13-0.50	TP13-1.00	TP13-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-043	EP2516926-044	EP2516926-045	EP2516926-046	EP2516926-047
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP12-1.60	TP13-0.10	TP13-0.50	TP13-1.00	TP13-1.50
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-043	EP2516926-044	EP2516926-045	EP2516926-046	EP2516926-047
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	<0.05	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**79.2**	----	**77.0**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**94.0**	----	**92.4**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP13-2.00	TP14-0.10	TP14-0.50	TP14-1.00	TP14-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-048	EP2516926-049	EP2516926-050	EP2516926-051	EP2516926-052
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**5.8**	**3.0**	**3.7**	**4.0**	**4.2**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**7**	**7**	**8**	**8**	**8**
Copper	7440-50-8	5	mg/kg	**7**	**6**	<5	**9**	**8**
Lead	7439-92-1	5	mg/kg	**21**	**10**	**10**	**19**	**17**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**14**	**24**	**13**	**28**	**14**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	<0.05	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP13-2.00	TP14-0.10	TP14-0.50	TP14-1.00	TP14-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-048	EP2516926-049	EP2516926-050	EP2516926-051	EP2516926-052
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP13-2.00	TP14-0.10	TP14-0.50	TP14-1.00	TP14-1.50
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-048	EP2516926-049	EP2516926-050	EP2516926-051	EP2516926-052
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	<0.05	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**79.1**	----	**88.3**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**90.0**	----	**92.5**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP14-2.00	TP15-0.10	TP15-0.50	TP15-1.00	TP15-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-053	EP2516926-054	EP2516926-055	EP2516926-056	EP2516926-057
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**3.6**	**1.9**	**2.4**	**4.2**	**3.2**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**13**	**17**	**13**	**15**	**7**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	<5	<5	**9**	<5	**8**
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	**5**	<5	**11**	**7**	**18**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	<0.05	----
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP14-2.00	TP15-0.10	TP15-0.50	TP15-1.00	TP15-1.50
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-053	EP2516926-054	EP2516926-055	EP2516926-056	EP2516926-057
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP14-2.00	TP15-0.10	TP15-0.50	TP15-1.00	TP15-1.50
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-053	EP2516926-054	EP2516926-055	EP2516926-056	EP2516926-057
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	<0.05	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	**73.2**	----	**74.8**	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	**78.2**	----	**77.6**	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP16-0.10	TP17-0.50	TP18-0.10	QAQC01	QAQC03
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-058	EP2516926-062	EP2516926-064	EP2516926-067	EP2516926-068
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**2.3**	**2.8**	**3.4**	**4.3**	**3.6**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**12**	**14**	**20**	**23**	**13**
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	**5**	<5	**6**	<5	<5
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP16-0.10	TP17-0.50	TP18-0.10	QAQC01	QAQC03
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EP2516926-058	EP2516926-062	EP2516926-064	EP2516926-067	EP2516926-068
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP16-0.10	TP17-0.50	TP18-0.10	QAQC01	QAQC03
				Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00
Compound	CAS Number	LOR	Unit		EP2516926-058	EP2516926-062	EP2516926-064	EP2516926-067	EP2516926-068
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**84.3**	**81.5**	**93.4**	**101**	**85.0**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**134**	**108**	**104**	**98.7**	**95.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP04-0.8	----	----	----	----
				Sampling date / time	10-Oct-2025 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2516926-069	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**4.3**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**15**	----	----	----	----
Copper	7440-50-8	5	mg/kg		<5	----	----	----	----
Lead	7439-92-1	5	mg/kg		<5	----	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg		<5	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	53	152
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	28	152

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2516926**	Page	: 1 of 7
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assessment	Date Samples Received	: 13-Oct-2025
Site	:	Issue Date	: 23-Oct-2025
Sampler	: Alex Massey	No. of samples received	: 72
Order number	: EP25-108(4)	No. of samples analysed	: 36

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP068A: Organochlorine Pesticides (OC)	QC-6936972-002	----	**Heptachlor**	76-44-8	121 %	40.0-118%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	QC-6937112-002	----	**Heptachlor**	76-44-8	119 %	40.0-118%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	QC-6937112-002	----	**Heptachlor epoxide**	1024-57-3	126 %	41.0-119%	**Recovery greater than upper control limit**
EP068A: Organochlorine Pesticides (OC)	QC-6937112-002	----	**trans-Chlordane**	5103-74-2	124 %	43.0-119%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6936972-002	----	**Monocrotophos**	6923-22-4	164 %	4.10-154%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6937112-002	----	**Monocrotophos**	6923-22-4	177 %	4.10-154%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6936972-002	----	**Chlorfenvinphos**	470-90-6	154 %	53.0-133%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6937112-002	----	**Chlorfenvinphos**	470-90-6	173 %	53.0-133%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6937112-002	----	**Bromophos-ethyl**	4824-78-6	138 %	49.0-133%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6936972-002	----	**Fenamiphos**	22224-92-6	190 %	39.0-137%	**Recovery greater than upper control limit**
EP068B: Organophosphorus Pesticides (OP)	QC-6937112-002	----	**Fenamiphos**	22224-92-6	211 %	39.0-137%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EP068B: Organophosphorus Pesticides (OP)	EP2516926--058	TP16-0.10	**Bromophos-ethyl**	4824-78-6	130 %	60.7-128%	**Recovery greater than upper data quality objective**
EP068B: Organophosphorus Pesticides (OP)	EP2516926--058	TP16-0.10	**Prothiofos**	34643-46-4	132 %	60.0-129%	**Recovery greater than upper data quality objective**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / *Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
TP01-0.10,	TP02-0.10,	**10-Oct-2025**	**----**	----	----	**21-Oct-2025**	24-Oct-2025	✓
TP03-0.10,	TP04-0.40,							
TP05-0.50,	TP06-0.10,							
TP06-1.00,	TP07-0.10,							
TP08-0.10,	TP09-0.50,							
TP10-0.50,	TP11-0.50,							
TP12-0.10,	TP12-0.50,							
TP12-1.00,	TP12-1.60,							
TP13-0.10,	TP13-0.50,							
TP13-1.00,	TP13-1.50,							
TP13-2.00,	TP14-0.10,							
TP14-0.50,	TP14-1.00,							
TP14-1.50,	TP14-2.00,							
TP15-0.10,	TP15-0.50,							
TP15-1.00,	TP15-1.50,							
TP16-0.10,	TP17-0.50,							
TP18-0.10,	QAQC01,							
QAQC03,	TP04-0.8							
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
TP13-2.00,	TP14-0.10,	**10-Oct-2025**	**17-Oct-2025**	08-Apr-2026	✓	**23-Oct-2025**	08-Apr-2026	✓
TP14-0.50,	TP14-1.00,							
TP14-1.50,	TP14-2.00,							
TP15-0.10,	TP15-0.50,							
TP15-1.00,	TP15-1.50,							
TP16-0.10,	TP17-0.50,							
TP18-0.10,	QAQC01,							
QAQC03,	TP04-0.8							
Soil Glass Jar - Unpreserved (EG005T)								
TP01-0.10,	TP02-0.10,	**10-Oct-2025**	**18-Oct-2025**	08-Apr-2026	✓	**21-Oct-2025**	08-Apr-2026	✓
TP03-0.10,	TP04-0.40,							
TP05-0.50,	TP06-0.10,							
TP06-1.00,	TP07-0.10,							
TP08-0.10,	TP09-0.50,							
TP10-0.50,	TP11-0.50,							
TP12-0.10,	TP12-0.50,							
TP12-1.00,	TP12-1.60,							
TP13-0.10,	TP13-0.50,							
TP13-1.00,	TP13-1.50							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
TP13-2.00,	TP14-0.10,	**10-Oct-2025**	**17-Oct-2025**	07-Nov-2025	✓	**20-Oct-2025**	07-Nov-2025	✓
TP14-0.50,	TP14-1.00,							
TP14-1.50,	TP14-2.00,							
TP15-0.10,	TP15-0.50,							
TP15-1.00,	TP15-1.50,							
TP16-0.10,	TP17-0.50,							
TP18-0.10,	QAQC01,							
QAQC03,	TP04-0.8							
Soil Glass Jar - Unpreserved (EG035T)								
TP01-0.10,	TP02-0.10,	**10-Oct-2025**	**18-Oct-2025**	07-Nov-2025	✓	**20-Oct-2025**	07-Nov-2025	✓
TP03-0.10,	TP04-0.40,							
TP05-0.50,	TP06-0.10,							
TP06-1.00,	TP07-0.10,							
TP08-0.10,	TP09-0.50,							
TP10-0.50,	TP11-0.50,							
TP12-0.10,	TP12-0.50,							
TP12-1.00,	TP12-1.60,							
TP13-0.10,	TP13-0.50,							
TP13-1.00,	TP13-1.50							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
TP01-0.10,	TP02-0.10,	**10-Oct-2025**	**20-Oct-2025**	24-Oct-2025	✓	**21-Oct-2025**	29-Nov-2025	✓
TP03-0.10,	TP04-0.40,							
TP05-0.50,	TP06-0.10,							
TP06-1.00,	TP07-0.10,							
TP08-0.10,	TP09-0.50,							
TP10-0.50,	TP11-0.50,							
TP12-0.10,	TP12-1.00							
Soil Glass Jar - Unpreserved (EP068)								
TP13-0.10,	TP13-1.00,	**10-Oct-2025**	**20-Oct-2025**	24-Oct-2025	✓	**22-Oct-2025**	29-Nov-2025	✓
TP14-0.10,	TP14-1.00,							
TP15-0.10,	TP15-1.00							
Soil Glass Jar - Unpreserved (EP068)								
TP16-0.10,	TP17-0.50,	**10-Oct-2025**	**21-Oct-2025**	24-Oct-2025	✓	**21-Oct-2025**	30-Nov-2025	✓
TP18-0.10,	QAQC01,							
QAQC03								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
TP01-0.10, TP02-0.10, TP03-0.10, TP04-0.40, TP05-0.50, TP06-0.10, TP06-1.00, TP07-0.10, TP08-0.10, TP09-0.50, TP10-0.50, TP11-0.50, TP12-0.10, TP12-1.00	**10-Oct-2025**	**20-Oct-2025**	24-Oct-2025	✓	**21-Oct-2025**	29-Nov-2025	✓
Soil Glass Jar - Unpreserved (EP068)							
TP13-0.10, TP13-1.00, TP14-0.10, TP14-1.00, TP15-0.10, TP15-1.00	**10-Oct-2025**	**20-Oct-2025**	24-Oct-2025	✓	**22-Oct-2025**	29-Nov-2025	✓
Soil Glass Jar - Unpreserved (EP068)							
TP16-0.10, TP17-0.50, TP18-0.10, QAQC01, QAQC03	**10-Oct-2025**	**21-Oct-2025**	24-Oct-2025	✓	**21-Oct-2025**	30-Nov-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Pesticides by GCMS	EP068	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Pesticides by GCMS	EP068	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Pesticides by GCMS	EP068	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM Schedule B(3).

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2516926**

Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: matt.james@emergeassociates.com.au	E-mail	: angel.tam@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: EP25-108(4) Hilton Park - Soil Contamination Assessment	Page	: 1 of 4
Order number	: EP25-108(4)	Quote number	: EP2017EMEASS0008 (EPBQ/009/21)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: Alex Massey		

Dates

Date Samples Received	: 13-Oct-2025 16:15	Issue Date	: 15-Oct-2025
Client Requested Due Date	: 23-Oct-2025	Scheduled Reporting Date	: **23-Oct-2025**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 9.2/24.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 72 / 36

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Perth, NATA accreditation no. 825, site no. 15847.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **If Scheduled Reporting Date shown above is earlier than Client Requested Due Date, this reflects the date that a preliminary report is scheduled to be issued. Client Requested Due Date reflects the date that the final report is to be issued.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-12 OC/OP Pesticides
EP2516926-001	10-Oct-2025 00:00	TP01-0.10		✓	✓	✓
EP2516926-002	10-Oct-2025 00:00	TP01-0.50	✓			
EP2516926-003	10-Oct-2025 00:00	TP01-1.00	✓			
EP2516926-004	10-Oct-2025 00:00	TP01-1.30	✓			
EP2516926-005	10-Oct-2025 00:00	TP02-0.10		✓	✓	✓
EP2516926-006	10-Oct-2025 00:00	TP02-0.50	✓			
EP2516926-007	10-Oct-2025 00:00	TP02-1.00	✓			
EP2516926-008	10-Oct-2025 00:00	TP03-0.10		✓	✓	✓
EP2516926-009	10-Oct-2025 00:00	TP03-0.50	✓			
EP2516926-010	10-Oct-2025 00:00	TP03-1.00	✓			
EP2516926-011	10-Oct-2025 00:00	TP03-1.20	✓			
EP2516926-012	10-Oct-2025 00:00	TP04-0.10	✓			
EP2516926-013	10-Oct-2025 00:00	TP04-0.40		✓	✓	✓
EP2516926-015	10-Oct-2025 00:00	TP04-1.20	✓			
EP2516926-016	10-Oct-2025 00:00	TP05-0.10	✓			
EP2516926-017	10-Oct-2025 00:00	TP05-0.30	✓			
EP2516926-018	10-Oct-2025 00:00	TP05-0.50		✓	✓	✓
EP2516926-019	10-Oct-2025 00:00	TP05-1.00	✓			
EP2516926-020	10-Oct-2025 00:00	TP06-0.10		✓	✓	✓
EP2516926-021	10-Oct-2025 00:00	TP06-0.50	✓			
EP2516926-022	10-Oct-2025 00:00	TP06-0.70	✓			
EP2516926-023	10-Oct-2025 00:00	TP06-1.00		✓	✓	✓
EP2516926-024	10-Oct-2025 00:00	TP07-0.10		✓	✓	✓
EP2516926-025	10-Oct-2025 00:00	TP07-0.50	✓			
EP2516926-026	10-Oct-2025 00:00	TP07-0.80	✓			
EP2516926-027	10-Oct-2025 00:00	TP08-0.10		✓	✓	✓
EP2516926-028	10-Oct-2025 00:00	TP08-0.50	✓			
EP2516926-029	10-Oct-2025 00:00	TP08-1.00	✓			
EP2516926-030	10-Oct-2025 00:00	TP09-0.10	✓			
EP2516926-031	10-Oct-2025 00:00	TP09-0.50		✓	✓	✓
EP2516926-032	10-Oct-2025 00:00	TP09-1.00	✓			
EP2516926-033	10-Oct-2025 00:00	TP10-0.10	✓			
EP2516926-034	10-Oct-2025 00:00	TP10-0.50		✓	✓	✓
EP2516926-035	10-Oct-2025 00:00	TP10-1.00	✓			
EP2516926-036	10-Oct-2025 00:00	TP10-1.70	✓			

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-12 OC/OP Pesticides
EP2516926-037	10-Oct-2025 00:00	TP11-0.10	✓			
EP2516926-038	10-Oct-2025 00:00	TP11-0.50		✓	✓	✓
EP2516926-039	10-Oct-2025 00:00	TP11-1.00	✓			
EP2516926-040	10-Oct-2025 00:00	TP12-0.10		✓	✓	✓
EP2516926-041	10-Oct-2025 00:00	TP12-0.50		✓	✓	
EP2516926-042	10-Oct-2025 00:00	TP12-1.00		✓	✓	✓
EP2516926-043	10-Oct-2025 00:00	TP12-1.60		✓	✓	
EP2516926-044	10-Oct-2025 00:00	TP13-0.10		✓	✓	✓
EP2516926-045	10-Oct-2025 00:00	TP13-0.50		✓	✓	
EP2516926-046	10-Oct-2025 00:00	TP13-1.00		✓	✓	✓
EP2516926-047	10-Oct-2025 00:00	TP13-1.50		✓	✓	
EP2516926-048	10-Oct-2025 00:00	TP13-2.00		✓	✓	
EP2516926-049	10-Oct-2025 00:00	TP14-0.10		✓	✓	✓
EP2516926-050	10-Oct-2025 00:00	TP14-0.50		✓	✓	
EP2516926-051	10-Oct-2025 00:00	TP14-1.00		✓	✓	✓
EP2516926-052	10-Oct-2025 00:00	TP14-1.50		✓	✓	
EP2516926-053	10-Oct-2025 00:00	TP14-2.00		✓	✓	
EP2516926-054	10-Oct-2025 00:00	TP15-0.10		✓	✓	✓
EP2516926-055	10-Oct-2025 00:00	TP15-0.50		✓	✓	
EP2516926-056	10-Oct-2025 00:00	TP15-1.00		✓	✓	✓
EP2516926-057	10-Oct-2025 00:00	TP15-1.50		✓	✓	
EP2516926-058	10-Oct-2025 00:00	TP16-0.10		✓	✓	✓
EP2516926-059	10-Oct-2025 00:00	TP16-0.50	✓			
EP2516926-060	10-Oct-2025 00:00	TP16-1.00	✓			
EP2516926-061	10-Oct-2025 00:00	TP17-0.10	✓			
EP2516926-062	10-Oct-2025 00:00	TP17-0.50		✓	✓	✓
EP2516926-063	10-Oct-2025 00:00	TP17-1.00	✓			
EP2516926-064	10-Oct-2025 00:00	TP18-0.10		✓	✓	✓
EP2516926-065	10-Oct-2025 00:00	TP18-0.50	✓			
EP2516926-066	10-Oct-2025 00:00	TP18-1.00	✓			
EP2516926-067	10-Oct-2025 00:00	QAQC01		✓	✓	✓
EP2516926-068	10-Oct-2025 00:00	QAQC03		✓	✓	✓
EP2516926-069	10-Oct-2025 00:00	TP04-0.8		✓	✓	
EP2516926-070	10-Oct-2025 00:00	QAQC02	✓			
EP2516926-071	10-Oct-2025 00:00	QAQC04	✓			
EP2516926-072	10-Oct-2025 00:00	QAQC05	✓			
EP2516926-073	10-Oct-2025 00:00	QAQC06	✓			

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS (INVOICES)

- A4 - AU Tax Invoice (INV)	Email	accounts@emergeassociates.com.au

Alex Mazzeyrubio

- *AU Certificate of Analysis - NATA (COA)	Email	alex.mazzey@emergeassociates.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.mazzey@emergeassociates.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.mazzey@emergeassociates.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.mazzey@emergeassociates.com.au
- Chain of Custody (CoC) (COC)	Email	alex.mazzey@emergeassociates.com.au
- EDI Format - ESDAT (ESDAT)	Email	alex.mazzey@emergeassociates.com.au

ESdat

- *AU Certificate of Analysis - NATA (COA)	Email	ESdat_AU+emerge@ESdatLabSync.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ESdat_AU+emerge@ESdatLabSync.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ESdat_AU+emerge@ESdatLabSync.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ESdat_AU+emerge@ESdatLabSync.net
- Chain of Custody (CoC) (COC)	Email	ESdat_AU+emerge@ESdatLabSync.net
- EDI Format - ESDAT (ESDAT)	Email	ESdat_AU+emerge@ESdatLabSync.net

Matt James

- *AU Certificate of Analysis - NATA (COA)	Email	matt.james@emergeassociates.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	matt.james@emergeassociates.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	matt.james@emergeassociates.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	matt.james@emergeassociates.com.au
- Chain of Custody (CoC) (COC)	Email	matt.james@emergeassociates.com.au
- EDI Format - ESDAT (ESDAT)	Email	matt.james@emergeassociates.com.au

SIMON GREGG

- *AU Certificate of Analysis - NATA (COA)	Email	simon.gregg@emergeassociates.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	simon.gregg@emergeassociates.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	simon.gregg@emergeassociates.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	simon.gregg@emergeassociates.com.au
- Chain of Custody (CoC) (COC)	Email	simon.gregg@emergeassociates.com.au
- EDI Format - ESDAT (ESDAT)	Email	simon.gregg@emergeassociates.com.au

QUALITY CONTROL REPORT

Work Order	: **EP2516926**	Page	: 1 of 12
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assessment	Date Samples Received	: 13-Oct-2025
Order number	: EP25-108(4)	Date Analysis Commenced	: 17-Oct-2025
C-O-C number	: ----	Issue Date	: 23-Oct-2025
Sampler	: Alex Massey		
Site	:		
Quote number	: EPBQ/009/21		
No. of samples received	: 72		
No. of samples analysed	: 36		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Efua Wilson	Metals Chemist	Perth Inorganics, Wangara, WA
John Horwood	Organic Supervisor	Perth Organics, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6938346)									
EP2516926-001	TP01-0.10	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	10	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	14	10	24.9	No Limit
EP2516926-034	TP10-0.50	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	4	58.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	28	29	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	34	3.8	No Limit
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6938353)									
EP2516926-048	TP13-2.00	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	8	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	6	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	21	22	4.8	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 6938353) - continued									
EP2516926-048	TP13-2.00	EG005T: Zinc	7440-66-6	5	mg/kg	14	13	9.9	No Limit
EP2516926-058	TP16-0.10	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	12	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6942381)									
EP2516926-024	TP07-0.10	EA055: Moisture Content	----	0.1 (1.0)*	%	5.6	5.7	2.6	No Limit
EP2516926-045	TP13-0.50	EA055: Moisture Content	----	0.1 (1.0)*	%	3.5	3.7	6.6	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6942382)									
EP2516926-055	TP15-0.50	EA055: Moisture Content	----	0.1 (1.0)*	%	2.4	2.4	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 6942384)									
EP2516926-001	TP01-0.10	EA055: Moisture Content	----	0.1 (1.0)*	%	20.4	18.4	10.3	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6938347)									
EP2516926-001	TP01-0.10	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP2516926-034	TP10-0.50	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 6938354)									
EP2516926-048	TP13-2.00	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP2516926-058	TP16-0.10	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6936972)									
EP2516926-001	TP01-0.10	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6936972) - continued									
EP2516926-001	TP01-0.10	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP2516926-034	TP10-0.50	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	0.27	0.24	9.9	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	0.27	0.24	11.8	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6936972) - continued									
EP2516926-034	TP10-0.50	EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 6937112)									
EP2516926-058	TP16-0.10	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6936972)									
EP2516926-001	TP01-0.10	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6936972) - continued									
EP2516926-001	TP01-0.10	EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP2516926-034	TP10-0.50	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6937112)									
EP2516926-058	TP16-0.10	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 6937112) - continued									
EP2516926-058	TP16-0.10	EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6938346)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	77.39 mg/kg	95.6	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
EG005T: Chromium	7440-47-3	2	mg/kg	<2	18.67 mg/kg	94.3	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	46.13 mg/kg	97.6	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	58.42 mg/kg	98.8	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	14.48 mg/kg	97.0	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	190.4 mg/kg	94.7	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6938353)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	77.39 mg/kg	97.9	70.0	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
EG005T: Chromium	7440-47-3	2	mg/kg	<2	18.67 mg/kg	92.7	70.0	130
EG005T: Copper	7440-50-8	5	mg/kg	<5	46.13 mg/kg	98.7	70.0	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	58.42 mg/kg	88.7	70.0	130
EG005T: Nickel	7440-02-0	2	mg/kg	<2	14.48 mg/kg	90.1	70.0	130
EG005T: Zinc	7440-66-6	5	mg/kg	<5	190.4 mg/kg	87.3	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6938347)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.115 mg/kg	79.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6938354)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.115 mg/kg	74.3	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 6936972)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	93.6	46.0	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	53.0	133
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	96.7	45.0	117
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	46.0	122
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.8	47.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	# 121	40.0	118
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	47.0	123
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	112	41.0	119
EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	110	43.0	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 6936972) - continued								
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	115	41.0	131
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	109	41.0	119
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	41.0	127
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	44.0	122
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	37.0	129
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	41.0	127
EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.3	42.0	122
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	31.2	117
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	38.0	120
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	99.4	31.4	125
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	81.8	31.2	123
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	92.0	24.7	125
EP068: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068: Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 6937112)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	105	46.0	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	107	53.0	133
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	105	45.0	117
EP068: gamma-BHC - (Lindane)	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	110	46.0	122
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	109	47.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	# 119	40.0	118
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	47.0	123
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	# 126	41.0	119
EP068: Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	# 124	43.0	119
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	110	41.0	131
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	115	41.0	119
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	102	41.0	127
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	44.0	122
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	116	37.0	129
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	41.0	127
EP068: Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 6937112) - continued								
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	111	42.0	122
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	112	31.2	117
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	38.0	120
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	110	31.4	125
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	31.2	123
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	115	24.7	125
EP068: Sum of DDD + DDE + DDT	72-54-8/72-5 5-9/50-2	0.05	mg/kg	<0.05	----	----	----	----
EP068: Sum of Aldrin + Dieldrin	309-00-2/60- 57-1	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6936972)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	112	61.0	141
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	116	39.0	147
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	# 164	4.10	154
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	78.6	40.0	136
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	113	59.0	133
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	114	57.0	135
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	131	39.0	133
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	127	53.0	131
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	108	53.0	133
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	109	57.0	135
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	119	45.0	131
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	128	53.0	137
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	# 154	53.0	133
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	124	49.0	133
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	# 190	39.0	137
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	122	57.0	137
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	109	53.0	135
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	105	52.0	134
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	26.5	20.4	154
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6937112)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	124	61.0	141
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	124	39.0	147
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	# 177	4.10	154
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	40.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6937112) - continued								
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	121	59.0	133
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	115	57.0	135
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	126	39.0	133
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	131	53.0	131
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	103	53.0	133
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	107	57.0	135
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	112	45.0	131
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	120	53.0	137
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	# 173	53.0	133
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	# 138	49.0	133
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	# 211	39.0	137
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	123	57.0	137
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	128	53.0	135
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	132	52.0	134
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	38.5	20.4	154

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6938346)							
EP2516926-001	TP01-0.10	EG005T: Arsenic	7440-38-2	50 mg/kg	97.7	70.0	130
		EG005T: Cadmium	7440-43-9	12.5 mg/kg	98.0	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.1	70.0	130
		EG005T: Copper	7440-50-8	50 mg/kg	97.8	70.0	130
		EG005T: Lead	7439-92-1	50 mg/kg	98.6	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.2	70.0	130
		EG005T: Zinc	7440-66-6	50 mg/kg	93.8	70.0	130
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6938353)							
EP2516926-048	TP13-2.00	EG005T: Arsenic	7440-38-2	50 mg/kg	98.7	70.0	130
		EG005T: Cadmium	7440-43-9	12.5 mg/kg	92.4	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.6	70.0	130
		EG005T: Copper	7440-50-8	50 mg/kg	105	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 6938353) - continued							
EP2516926-048	TP13-2.00	EG005T: Lead	7439-92-1	50 mg/kg	105	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.5	70.0	130
		EG005T: Zinc	7440-66-6	50 mg/kg	92.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6938347)							
EP2516926-001	TP01-0.10	EG035T: Mercury	7439-97-6	1 mg/kg	89.4	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 6938354)							
EP2516926-048	TP13-2.00	EG035T: Mercury	7439-97-6	1 mg/kg	89.4	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 6936972)							
EP2516926-005	TP02-0.10	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	96.2	57.9	124
		EP068: Heptachlor	76-44-8	0.5 mg/kg	88.4	57.4	135
		EP068: Aldrin	309-00-2	0.5 mg/kg	99.5	59.6	125
		EP068: Dieldrin	60-57-1	0.5 mg/kg	94.5	62.2	131
		EP068: Endrin	72-20-8	0.5 mg/kg	91.3	55.8	138
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	88.4	50.5	145
EP068A: Organochlorine Pesticides (OC) (QCLot: 6937112)							
EP2516926-058	TP16-0.10	EP068: gamma-BHC - (Lindane)	58-89-9	0.5 mg/kg	108	57.9	124
		EP068: Heptachlor	76-44-8	0.5 mg/kg	88.0	57.4	135
		EP068: Aldrin	309-00-2	0.5 mg/kg	93.8	59.6	125
		EP068: Dieldrin	60-57-1	0.5 mg/kg	101	62.2	131
		EP068: Endrin	72-20-8	0.5 mg/kg	56.3	55.8	138
		EP068: 4.4`-DDT	50-29-3	0.5 mg/kg	64.4	50.5	145
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6936972)							
EP2516926-005	TP02-0.10	EP068: Diazinon	333-41-5	0.5 mg/kg	107	59.5	128
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	102	60.3	128
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	123	58.8	127
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	108	60.7	128
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	123	60.0	129
EP068B: Organophosphorus Pesticides (OP) (QCLot: 6937112)							
EP2516926-058	TP16-0.10	EP068: Diazinon	333-41-5	0.5 mg/kg	119	59.5	128
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	95.1	60.3	128
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	96.0	58.8	127
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	# 130	60.7	128
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	# 132	60.0	129

CHAIN OF CUSTODY

emerge ASSOCIATES
Integrated Science & Design

CLIENT: Emerge Associates	POSTAL ADDRESS: Suite 4, 26 Railway Road, Subiaco WA 6008	Page 1 of 1
PROJECT MANAGER: Matt James	CONTACT PHONE: 0412 368 365	**ALS LABORATORY: Perth**
PROJECT ID.: EP25-108(4)	PROJECT NAME: Hilton Park – Soil Contamination Assessment	TURNAROUND REQUIREMENTS
SAMPLER(S): Alex Mazzey	SAMPLERS PHONE: 0488791576	☒ Standard (5-7 days) ☐ Non-standard (72H)
QUOTE NO.: ORDER NO.:		Email report to: ESdat_AU+emerge@ESdatLabSync.net alex.mazzeyrubio@emergeassociates.com.au matt.james@emergeassociates.com.au
Laboratory Batch No:	Comments/special handling/storage or disposal	Email invoice to: accounts@emergeassociates.com.au

Laboratory Use	Yes	No	N/a
Custody seal intact:	☐	☐	☐
Free ice/frozen ice bricks present:	☐	☐	☐
Random sample temp on receipt:			°C

SAMPLE DETAILS				CONTAINER INFORMATION		ANALYSIS REQUIRED										
Lab ID	Sample ID	Matrix	Date	Type & Preservative	Total No.	Presence/Absence ACM										Additional information (likely contaminants, dilutions or specific QC analysis)
1	ACM1		10/10/25	1 X B	1	X										
2	ACM2		10/10/25	1 X B	1	X										
3	ACM3		10/10/25	1 X B	1	X										
TOTAL																

Environmental Division
Perth
Work Order Reference
EP2516979

Telephone : + 61-8-9406 1301

RELINQUISHED BY:		RECEIVED BY		CoC emailed to ALS?
NAME: Alex Mazzey	DATE: 13/10/2025	NAME:	DATE: 14/10	☒ Yes ☐ No
OF: Emerge Associates	TIME:	OF:	TIME: 1736	
NAME:	DATE:	NAME:	DATE:	
OF:	TIME:	OF:	TIME:	

Water Container Codes: **P** = Unpreserved Plastic; **N** = Nitric Preserved Plastic; **ORC** = Nitric Preserved ORC; **SH** = Sodium Hydroxide/Cd Preserved; **S** = Sodium Hydroxide Preserved Plastic; **AG** = Amber Glass Unpreserved; **AP** = Airfreight Unpreserved Plastic; **V** = VOA Vial HCl Preserved; **VB** = VOA Vial Sodium Bisulphate Preserved; **VS** = VOA Vial Sulfuric Preserved; **AV** = Airfreight Unpreserved Vial; **SG** = Sulfuric Preserved Amber Glass; **H** = HCl preserved Plastic; **HS** = HCl Preserved Speciation bottle; **SP** = Sulfuric Preserved Plastic; **F** = Formaldehyde Preserved Glass; **Z** = Zinc Acetate Preserved Bottle; **E** = EDTA Preserved Bottles; **ST** = Sterile Bottle; **LI** = Lugols Iodine Preserved Bottles; **STT** = Sterile Sodium Thiosulfate Preserved Bottles. **Soil Container Codes**: **J** = Jar; **ASS** = Plastic Bag for Acid Sulfate Soils; **B** = Unpreserved Bag;

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2516979**

Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: matt.james@emergeassociates.com.au	E-mail	: angel.tam@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: EP25-108(4) Hilton Park - Soil Contamination Assesment	Page	: 1 of 3
Order number	: EP25-108(4)	Quote number	: EP2017EMEASS0008 (EPBQ/009/21)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: Alex Mazzey		

Dates

Date Samples Received	: 14-Oct-2025 17:36	Issue Date	: 15-Oct-2025
Client Requested Due Date	: 22-Oct-2025	Scheduled Reporting Date	: **22-Oct-2025**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 9.2/24.3 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Perth, NATA accreditation no. 825, site no. 15847.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **If Scheduled Reporting Date shown above is earlier than Client Requested Due Date, this reflects the date that a preliminary report is scheduled to be issued. Client Requested Due Date reflects the date that the final report is to be issued.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOLID**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOLID - EA200B Asbestos Identification in Bulk Solids (Excluding
EP2516979-001	10-Oct-2025 00:00	ACM1	✓
EP2516979-002	10-Oct-2025 00:00	ACM2	✓
EP2516979-003	10-Oct-2025 00:00	ACM3	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS (INVOICES)

- A4 - AU Tax Invoice (INV)	Email	accounts@emergeassociates.com.au

ALEX MAZZEYRUBIO

- *AU Certificate of Analysis - NATA (COA)	Email	alex.mazzeyrubio@emergeassociates.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.mazzeyrubio@emergeassociates.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.mazzeyrubio@emergeassociates.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.mazzeyrubio@emergeassociates.com.au
- Chain of Custody (CoC) (COC)	Email	alex.mazzeyrubio@emergeassociates.com.au
- EDI Format - ESDAT (ESDAT)	Email	alex.mazzeyrubio@emergeassociates.com.au

ESdat

- *AU Certificate of Analysis - NATA (COA)	Email	ESdat_AU+emerge@ESdatLabSync.net
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ESdat_AU+emerge@ESdatLabSync.net
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ESdat_AU+emerge@ESdatLabSync.net
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ESdat_AU+emerge@ESdatLabSync.net
- Chain of Custody (CoC) (COC)	Email	ESdat_AU+emerge@ESdatLabSync.net
- EDI Format - ESDAT (ESDAT)	Email	ESdat_AU+emerge@ESdatLabSync.net

Matt James

- *AU Certificate of Analysis - NATA (COA)	Email	matt.james@emergeassociates.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	matt.james@emergeassociates.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	matt.james@emergeassociates.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	matt.james@emergeassociates.com.au
- Chain of Custody (CoC) (COC)	Email	matt.james@emergeassociates.com.au
- EDI Format - ESDAT (ESDAT)	Email	matt.james@emergeassociates.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

CERTIFICATE OF ANALYSIS

Work Order	: **EP2516979**	Page	: 1 of 3
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assesment	Date Samples Received	: 14-Oct-2025 17:36
Order number	: EP25-108(4)	Date Analysis Commenced	: 17-Oct-2025
C-O-C number	: ----	Issue Date	: 22-Oct-2025 15:03
Sampler	: Alex Mazzey		
Site	:		
Quote number	: EPBQ/009/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- **EA200 Legend**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Analysis of asbestos from swabs and tapes is not covered under the current scope of NATA accreditation.
- EA200: N/A - Not Applicable

Analytical Results

Sub-Matrix: SOLID (Matrix: SOLID)			Sample ID	ACM1	ACM2	ACM3	----	----
			Sampling date / time	10-Oct-2025 00:00	10-Oct-2025 00:00	10-Oct-2025 00:00	----	----
Compound	CAS Number	LOR	Unit	EP2516979-001	EP2516979-002	EP2516979-003	--------	--------
				Result	Result	Result	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	**Yes**	**Yes**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**Ch + Am + Cr**	**Ch + Am**	**Ch + Am + Cr**	**----**	**----**
Asbestos (Trace)	1332-21-4	-	-	**N/A**	**N/A**	**N/A**	**----**	**----**
Sample weight (dry)	----	0.01	g	**19.7**	**4.46**	**3.52**	**----**	**----**
Synthetic Mineral Fibre	----	-	-	**No**	**No**	**No**	**----**	**----**
Organic Fibre	----	-	-	**No**	**No**	**No**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**T.MANIKATALIA**	**T.MANIKATALIA**	**T.MANIKATALIA**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOLID**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	ACM1 - 10-Oct-2025 00:00	Asbestos sheeting fragment approx 60 x 30 x 5mm.
EA200: Description	ACM2 - 10-Oct-2025 00:00	Asbestos sheeting fragment approx 30 x 25 x 4mm.
EA200: Description	ACM3 - 10-Oct-2025 00:00	Asbestos sheeting fragment approx 30 x 15 x 4mm.

Inter-Laboratory Testing

Analysis conducted by ALS Melbourne, NATA accreditation no. 825, site no. 13778 (Chemistry).

(SOLID) EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples

QUALITY CONTROL REPORT

Work Order	: **EP2516979**	Page	: 1 of 3
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Contact	: Angel Tam
Address	: SUITE 4, 26 RAILWAY ROAD SUBIACO WESTERN AUSTRALIA 6008	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assesment	Date Samples Received	: 14-Oct-2025
Order number	: EP25-108(4)	Date Analysis Commenced	: 17-Oct-2025
C-O-C number	: ----	Issue Date	: 22-Oct-2025
Sampler	: Alex Mazzey		
Site	:		
Quote number	: EPBQ/009/21		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
MINNIE TRAN	Approved Asbestos Identifier	Melbourne Asbestos, Springvale, VIC

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2516979**	Page	: 1 of 4
Client	: **EMERGE ASSOCIATES**	Laboratory	: Environmental Division Perth
Contact	: Matt James	Telephone	: +61-8-9406 1301
Project	: EP25-108(4) Hilton Park - Soil Contamination Assesment	Date Samples Received	: 14-Oct-2025
Site	:	Issue Date	: 22-Oct-2025
Sampler	: Alex Mazzey	No. of samples received	: 3
Order number	: EP25-108(4)	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOLID**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag (EA200)							
ACM1, ACM2, ACM3	**10-Oct-2025**	**----**	----	----	**17-Oct-2025**	08-Apr-2026	✓

Quality Control Parameter Frequency Compliance

- **No Quality Control data available for this section.**

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Asbestos Identification in Bulk Solids	EA200	SOLID	In house: Referenced to AS 4964 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

Attachment 4

ACM Assessment Results

Sample ID	Date	Sample			No. ACM fragments	Mass of ACM	Assumed asbestos	Asbestos conc.	Person
		Volume	Mass	Density					
		L	*kg*	*kg/L*	-	*g*	*%*	*% w/w asbestos in soil*	
TP01-0.25	25/10/2025	10	11.06	1.106	0	0	15	0.0000	AM/LJ
TP01-0.50	25/10/2025	10	12.04	1.204	0	0	15	0.0000	AM/LJ
TP01-0.75	25/10/2025	10	11.91	1.191	0	0	15	0.0000	AM/LJ
TP01-1.00	25/10/2025	10	12.62	1.262	0	0	15	0.0000	AM/LJ
TP02-0.25	25/10/2025	10	9.85	0.985	0	0	15	0.0000	AM/LJ
TP02-0.50	25/10/2025	10	11.92	1.192	0	0	15	0.0000	AM/LJ
TP02-0.75	25/10/2025	10	11.82	1.182	0	0	15	0.0000	AM/LJ
TP02-1.00	25/10/2025	10	11.30	1.13	0	0	15	0.0000	AM/LJ
TP03-0.25	25/10/2025	10	10.75	1.075	0	0	15	0.0000	AM/LJ
TP03-0.50	25/10/2025	10	12.19	1.219	0	0	15	0.0000	AM/LJ
TP03-0.75	25/10/2025	10	11.31	1.131	0	0	15	0.0000	AM/LJ
TP03-1.00	25/10/2025	10	11.77	1.177	0	0	15	0.0000	AM/LJ
TP04-0.25	25/10/2025	10	9.73	0.973	0	0	15	0.0000	AM/LJ
TP04-0.50	25/10/2025	10	11.98	1.198	0	0	15	0.0000	AM/LJ
TP04-0.75	25/10/2025	10	12.68	1.268	0	0	15	0.0000	AM/LJ
TP04-1.00	25/10/2025	10	13.28	1.328	0	0	15	0.0000	AM/LJ
TP04-1.25	25/10/2025	10	10.40	1.04	0	0	15	0.0000	AM/LJ
TP05-0.25	25/10/2025	10	11.27	1.127	0	0	15	0.0000	AM/LJ
TP05-0.50	25/10/2025	10	11.74	1.174	0	0	15	0.0000	AM/LJ
TP05-0.75	25/10/2025	10	12.21	1.221	0	0	15	0.0000	AM/LJ
TP05-1.00	25/10/2025	10	11.88	1.188	0	0	15	0.0000	AM/LJ
TP06-0.25	25/10/2025	10	11.24	1.124	0	0	15	0.0000	AM/LJ
TP06-0.50	25/10/2025	10	13.14	1.314	0	0	15	0.0000	AM/LJ
TP06-0.75	25/10/2025	10	12.01	1.201	0	0	15	0.0000	AM/LJ
TP06-1.00	25/10/2025	10	10.62	1.062	0	0	15	0.0000	AM/LJ
TP07-0.25	25/10/2025	10	11.95	1.195	0	0	15	0.0000	AM/LJ
TP07-0.50	25/10/2025	10	11.45	1.145	0	0	15	0.0000	AM/LJ
TP07-0.75	25/10/2025	10	12.12	1.212	0	0	15	0.0000	AM/LJ
TP07-1.00	25/10/2025	10	11.68	1.168	0	0	15	0.0000	AM/LJ
TP08-0.25	25/10/2025	10	11.72	1.172	0	0	15	0.0000	AM/LJ
TP08-0.50	25/10/2025	10	12.35	1.235	0	0	15	0.0000	AM/LJ
TP08-0.75	25/10/2025	10	11.99	1.199	0	0	15	0.0000	AM/LJ
TP08-1.00	25/10/2025	10	11.72	1.172	0	0	15	0.0000	AM/LJ
TP09-0.25	25/10/2025	10	11.27	1.127	0	0	15	0.0000	AM/LJ
TP09-0.50	25/10/2025	10	10.70	1.07	0	0	15	0.0000	AM/LJ
TP09-0.75	25/10/2025	10	12.11	1.211	0	0	15	0.0000	AM/LJ
TP09-1.00	25/10/2025	10	11.99	1.199	0	0	15	0.0000	AM/LJ
TP10-0.25	25/10/2025	10	12.21	1.221	0	0	15	0.0000	AM/LJ
TP10-0.50	25/10/2025	10	12.26	1.226	0	0	15	0.0000	AM/LJ
TP10-0.75	25/10/2025	10	12.21	1.221	0	0	15	0.0000	AM/LJ
TP10-1.00	25/10/2025	10	11.78	1.178	0	0	15	0.0000	AM/LJ
TP10-1.25	25/10/2025	10	11.81	1.181	0	0	15	0.0000	AM/LJ
TP10-1.50	25/10/2025	10	11.73	1.173	0	0	15	0.0000	AM/LJ
TP10-1.80	25/10/2025	10	10.21	1.021	0	0	15	0.0000	AM/LJ
TP11-0.25	25/10/2025	10	12.93	1.293	0	0	15	0.0000	AM/LJ
TP11-0.50	25/10/2025	10	12.63	1.263	0	0	15	0.0000	AM/LJ
TP11-0.75	25/10/2025	10	12.63	1.263	0	0	15	0.0000	AM/LJ
TP11-1.00	25/10/2025	10	11.69	1.169	0	0	15	0.0000	AM/LJ
TP12-0.25	25/10/2025	10	11.01	1.101	0	0	15	0.0000	AM/LJ
TP12-0.50	25/10/2025	10	11.35	1.135	0	0	15	0.0000	AM/LJ
TP12-0.75	25/10/2025	10	12.32	1.232	0	0	15	0.0000	AM/LJ
TP12-1.00	25/10/2025	10	12.91	1.291	0	0	15	0.0000	AM/LJ
TP12-1.50	25/10/2025	10	10.11	1.011	0	0	15	0.0000	AM/LJ
TP13-0.25	25/10/2025	10	12.74	1.274	0	0	15	0.0000	AM/LJ
TP13-0.50	25/10/2025	10	12.31	1.231	0	0	15	0.0000	AM/LJ
TP13-0.75	25/10/2025	10	13.19	1.319	0	0	15	0.0000	AM/LJ
TP13-1.00	25/10/2025	10	14.31	1.431	0	0	15	0.0000	AM/LJ
TP13-1.25	25/10/2025	10	11.53	1.153	0	0	15	0.0000	AM/LJ
TP13-1.50	25/10/2025	10	11.86	1.186	0	0	15	0.0000	AM/LJ
TP13-1.75	25/10/2025	10	13.63	1.363	0	0	15	0.0000	AM/LJ
TP13-2.00	25/10/2025	10	12.98	1.298	0	0	15	0.0000	AM/LJ
TP14-0.25	25/10/2025	10	13.01	1.301	0	0	15	0.0000	AM/LJ
TP14-0.50	25/10/2025	10	11.56	1.156	0	0	15	0.0000	AM/LJ
TP14-0.75	25/10/2025	10	12.55	1.255	0	0	15	0.0000	AM/LJ

Sample ID	Date	Sample			No. ACM fragments	Mass of ACM	Assumed asbestos	Asbestos conc.	Person
		Volume	Mass	Density				% w/w asbestos in soil	
		L	*kg*	*kg/L*	-	*g*	*%*		
TP14-1.00	25/10/2025	10	12.98	1.298	1	19.7	15	0.0228	AM/LJ
TP14-1.25	25/10/2025	10	13.60	1.36	0	0	15	0.0000	AM/LJ
TP14-1.50	25/10/2025	10	11.74	1.174	0	0	15	0.0000	AM/LJ
TP14-1.75	25/10/2025	10	12.28	1.228	0	0	15	0.0000	AM/LJ
TP14-2.00	25/10/2025	10	11.82	1.182	0	0	15	0.0000	AM/LJ
TP15-0.25	25/10/2025	10	11.82	1.182	1	4.46	15	0.0057	AM/LJ
TP15-0.50	25/10/2025	10	13.27	1.327	0	0	15	0.0000	AM/LJ
TP15-0.75	25/10/2025	10	12.50	1.25	0	0	15	0.0000	AM/LJ
TP15-1.00	25/10/2025	10	11.84	1.184	0	0	15	0.0000	AM/LJ
TP15-1.25	25/10/2025	10	11.26	1.126	0	0	15	0.0000	AM/LJ
TP15-1.50	25/10/2025	10	12.75	1.275	1	3.52	15	0.0041	AM/LJ
TP16-0.25	25/10/2025	10	12.53	1.253	0	0	15	0.0000	AM/LJ
TP16-0.50	25/10/2025	10	11.47	1.147	0	0	15	0.0000	AM/LJ
TP16-0.75	25/10/2025	10	12.56	1.256	0	0	15	0.0000	AM/LJ
TP16-1.00	25/10/2025	10	12.93	1.293	0	0	15	0.0000	AM/LJ
TP17-0.25	25/10/2025	10	13.03	1.303	0	0	15	0.0000	AM/LJ
TP17-0.50	25/10/2025	10	12.78	1.278	0	0	15	0.0000	AM/LJ
TP17-0.75	25/10/2025	10	13.65	1.365	0	0	15	0.0000	AM/LJ
TP17-1.00	25/10/2025	10	12.62	1.262	0	0	15	0.0000	AM/LJ
TP18-0.25	25/10/2025	10	10.37	1.037	0	0	15	0.0000	AM/LJ
TP18-0.50	25/10/2025	10	11.67	1.167	0	0	15	0.0000	AM/LJ
TP18-0.75	25/10/2025	10	12.18	1.218	0	0	15	0.0000	AM/LJ
TP18-1.00	25/10/2025	10	11.21	1.121	0	0	15	0.0000	AM/LJ
Total		870	1044.09	1.200	0	0	15	0.00037	

Appendix C

Hydrology Report

TECHNICAL MEMORANDUM

Hydrological Assessment – Hilton Reserve Redevelopment

PROJECT NUMBER	EP25-108	**DOC. NUMBER**	EP25-108(07)—008 JSD
PROJECT	Hilton Park Development Support	**CLIENT**	City of Fremantle
AUTHOR	JSD	**REVIEWER**	CJO
VERSION	001	**DATE**	December 2025

1 INTRODUCTION

Emerge Environmental Services Pty Ltd (Emerge Associates) was engaged to undertake a hydrological assessment to inform the Hilton Park Precinct Plan associated with the redevelopment of Hilton Park North, Beaconsfield.

2 BACKGROUND

Hilton Park North is located within the City of Fremantle (CoF). The park is bounded by Carrington Street to the east, Lefroy Road to the north, Shepherd Street to the west and Walton Way to the south (herein referred to as 'the site'). The location of the site is shown in **Figure 1**.

The CoF intends to redevelop the site to increase participation in a diverse range of sports and to address key priorities in the CoF Strategic Community Plan 2024-2034. The Hilton Park precinct plan (UDLA 2025) is provided in **Appendix A** and the main works proposed in the site include:

- Realignment of the main oval (i.e. Dick Lawrance Oval)
- Cut/fill balance and grading of the southeastern corner of the site to convert space to junior sporting oval
- Creating a main oval running track loop
- Bleachers (seating, including limestone retaining walls) to provide a stepped interface between the main and junior ovals.
- Sporting activity spaces including cricket nets, bicycle pump track and 18-hole frisbee golf course
- Perimeter paths and car parking around the site.

The purpose of this document is to review and summarise information relevant to water management within the site and to provide advice on stormwater management opportunities and their indicative volumes and requirements that will inform the future detailed design.

3 PRE-DEVELOPMENT ENVIRONMENT

3.1 Rainfall

Rainfall data provided from the nearest Bureau of Meteorology (BoM) station (Fremantle - Site No. 9192) indicates a long term average annual rainfall of 702.4 mm (BoM 2025) with the majority of the rain being received between May and September.

3.2 Local geology and soils

As part of the soil assessment undertaken by Emerge Associates in 2025, 18 test pits were excavated across the site to depths ranging from 1 m below ground level (m BGL) to 2.4 m BGL. The lithology encountered was generally sandy topsoil overlying sandy soils with varying amounts of silt up to 1.5 m BGL.

3.3 Groundwater

The *Perth Groundwater Map* (DWER 2025) indicates that groundwater in the superficial aquifer flows to the west and that depth to maximum groundwater level (MGL) across the site ranges from 30 m to 37 m. Groundwater is therefore unlikely to be an impediment to the site infiltration capacity.

4 ASSESSMENT OF SITE HYDROLOGY

This section provides a summary of the existing landscape features and stormwater infrastructure dictating the hydrology of the site; it also presents the set of assumptions used to determine the pre and post development catchment areas, land use cover, water pathways, and the stormwater volumes that need to be managed for the post development scenario. The XPSWMM hydrologic and hydraulic modelling software (2021.3) was used to calculate the surface water runoff peak flows and volumes from the site within the existing and proposed development layout.

4.1 Pre-development

4.1.1 Catchments

The catchment (Ct) areas within the site and those contributing to the site were derived using topographic contours and drainage information provided by CoF, the feature and contour survey (RM Surveys 2025) and publicly available topographic contours (i.e. 1 m intervals - Australian height datum (AHD)). A summary of pre-development catchment information is provided in **Table 1** with catchment locations and topographic contours shown in **Figure 2**.

Based on the available drainage and topographic information, five catchments surrounding the site were identified as discharging into the site (totalling 3.19 ha of road reserve). The north-west corner of the site is the only portion of the site that potentially contributes surface runoff (i.e. overland flow) towards Lefroy Road.

Table 1: Pre-development catchment areas and land use description

Sub-catchment	Land use description	Catchment area (ha)
Ct 1	• Brad Hardie Clubrooms • Carpark • Path • Playground	0.767
Ct 2.1	• Lefroy Road and Carrington Street	0.336
Ct 2.2	• Main Oval • Portion of Walton Way	2.499
Ct 2.3	• Carr Street, Shepherd Street and Gibson Street	0.672
Ct 2.4	• Public open space (POS) • Portion of Walton Way	0.256
Ct 2.5	• POS • Basketball court • Toilet building • Portion of Walton Way	1.840
Ct 2.6	• Portion of Carrington Street	0.357
Ct 3.1	• POS • Basketball court	1.837
Ct 3.2	• Portion of Carrington Street, Farrell Street, Rennie Crescent and Lynn Street	1.346
Ct 3.3	• Portion of Lennie Crescent north and Paget Street	0.478

4.1.2 Existing stormwater infrastructure

Two detention/infiltration structures exist within the site. A 200 m^2 area in the north east corner of the site accommodates runoff from the upstream piped drainage network to the east and south of the site (see Ct 3.2 and Ct 3.3 in **Table 1**). A second smaller detention area is located in the south west corner of the site and accommodates runoff from a piped drainage network to the south to the site (see Ct 2.3 in **Table 1**). The north east drainage basin (Ct 3.1 – Bio-retention area (BRA)) and the basin in the south west (Ct 2.4 – BRA) are shown in **Figure 2**.

A recent topographic survey indicated that Ct 3.1 – BRA could overtop at 35.00 m AHD while Ct 2.4 – BRA could overtop at 33.30 m AHD. Overflow from both storage areas would discharge towards the oval (Ct 2.2 – Oval area in **Figure 2**). Given the high anticipated infiltration capacity of the soils, runoff directed to the oval is expected to temporarily pond before rapidly infiltrating within the existing turf.

The site also receives runoff from two localised road reserves areas, one via a bubble up pit from Ct 2.1 adjacent to Smith Street and the other from Ct 2.6 via a small rock pitched spillway in the south east corner of the site; both structures discharge and contribute runoff to Ct 2.2 (see locations in **Figure 2**).

4.1.3 Pre-development model assumptions

An initial loss-continuing loss model was adopted to account for pre-development catchment losses. The loss values were based on typical infiltration rates for the soils which occur onsite based on project team experience and the soil investigation recently conducted (in 2025 by Emerge Associates). **Table 2** summarises the loss parameters and roughness coefficients for different land uses adopted within the pre-development model.

Table 2: Pre-development model parameters

Land Type	Initial loss (mm)	Continuing loss (mm)	Roughness
Road pavement	1	0.1	0.02
Road verge	9	1.5	0.05
Impervious surfaces – concrete paths and basketball courts	1	0.1	0.02
Roof	1	0.1	0.02
POS	22.5	*50%	0.05

**POS areas have adopted a proportional continuing loss value which better represents the losses associated with this land type*

The following assumptions were incorporated into the model:

- Land uses
  - All roof areas associated with the clubrooms are fully infiltrated in soakwells or adjacent permeable soils. Therefore the contributing runoff is not included in the model.
  - The playground area is assumed to retain all runoff up to the 1% AEP.
  - Road pavement, concrete paths and basketball court areas are 100% impervious.
  - POS areas are 100% permeable.
- Infiltration
  - Based on the lithology encountered it has been assumed that the site has a high infiltration capacity and permeability has been assumed to be 4 m/day.
  - Infiltration rate within Ct 2.4 – BRA and Ct 3.1 – BRA was assumed to be 4 m/day with a 0.5 clogging factor (effective hydraulic conductivity of 2 m/day). This is consistent with the soil investigation undertaken as part of this study.
  - Infiltration rate for the oval area (Ct 2.2 – Oval) was assumed to be 4 m/day with no clogging.

4.1.4 Results

The small (first 15 mm) and major (1% AEP) rainfall event depths were obtained from the BoM *Design Rainfall Data System* (BoM 2016) for critical durations between one and three hours. Rainfall depths and model results for localised maximum inundation depth and extent, and model results are provided in **Table 3**.

Table 3: Small (first 15 mm) and major (1% AEP) rainfall event modelling results

Stormwater infrastructure	Ct 2.4 – BRA	Ct 3.1 – BRA	Ct 2.2 – Oval
Basin details			
Base invert (mAHD)	32.66	34.52	33.00
Spillway/overflow invert (mAHD)	33.30	35.00	-
63.2% AEP			
Critical duration (hours)	1	1	1
Rainfall (mm)	15	15	15
Maximum inundation depth (m)	0.50	0.43	0.01
Inundation area (m^2)	218	673	1,490
Storage volume (m^3)	55	129	9
1% AEP			
Critical duration (hours)	3	3	3
Rainfall (mm)	68.5	68.5	68.5
Maximum inundation depth (m)	0.69	0.60	0.13
Inundation area (m^2)	286	742	4,765
Storage volume (m^3)	106	253	374

The pre-development results indicate that at the peak of the storm event the low-lying part of Ct 2.2 – Oval will experience temporary soil saturation. This will occur over a 0.15 ha area in the small event (to 10 mm) and over a 0.48 ha area in response to a 1% AEP storm event (with a localised maximum inundation depth of 0.13 m).

Runoff from the Ct 1 area is of interest for water management due to its contribution offsite. Modelling for Ct 1 identified a critical event duration of two hours for this catchment in the 1% AEP event, and that in this event a volume of 35 m^3 would discharge onto Shepherd Street and Lefroy Road in the 1% AEP event.

4.2 Post development

4.2.1 Catchments

The post development catchments were derived using the concept plan provided in **Appendix A**. The key changes associated with the proposed development are:

- The levelling of the southeastern corner of the site to accommodate the junior football oval.
- The addition of 0.42 ha of impermeable surfaces across the site including concrete paths (Pavement 1 – concrete and Pavement 2 – exposed aggregate concrete), roofs, cricket nets and a shelter.

- The addition of 0.087 ha of bicycle pump track, although it is assumed this structure will retain all runoff up to the 1% AEP event within the internal permeable surfaces.
- The addition of 0.37 ha of permeable surfaces including paths and carparks (Pavement 3 – bitumen stabilised limestone and Pavement 4 – compacted limestone) which have a reduced infiltration capacity as compared to turfed/mulched areas.

A summary of post development catchment boundaries and land use types are shown in **Figure 3**.

4.2.2 Post development model assumptions

The loss values adopted are consistent with the pre-development values provided in **Table 2** with the only addition being Pavement 3 and Pavement 4 which have been assumed to have an initial loss of 2 mm and a continuing loss of 0.1 mm/hr.

The post development scenario also introduced additional stormwater infrastructure for water management of the site. The assumptions associated with the existing and new proposed stormwater infrastructure are:

- The pathway surrounding the junior oval (i.e. Ct 3.3 in **Figure 3**) can been designed to provide a physical barrier to prevent runoff from leaving this catchment. Therefore this area runoff will be retained within the junior oval area.
- Partitioning of Ct 1 catchment into two areas Ct 1.1. and Ct 1.2 to allow better water management from the new impervious carparks/footpaths.
- The inclusion of roadside swales (Ct 1.2 – Swale) to intercept and treat runoff from the adjacent pavement areas will provide additional storage. It is assumed that sufficient storage will be provided to ensure runoff from Ct 1.2 does not discharge north to Ct 1.1.
- The inclusion of a BRA and flood storage area (FSA) (Ct 4.1 – BRA/FSA) to treat runoff from the adjacent road reserve (i.e. Ct 4.2 discharge via the existing rock pitching) and provide sufficient storage to retain up to the 1% AEP event. This intends to mitigate current erosion issues experienced at the southern boundary of the site along Walton Way.
- The inclusion of two roadside swales (Ct 2.5 – Swale and Ct 2.6 – Swale) to intercept and to treat runoff from the adjacent pavement and provide additional storage. This intends to mitigate current erosion issues experienced at the southern boundary of the site along Walton Way.
- The inclusion of bunding along the western outflow of Ct 3.1 – BRA to increase the spillway invert from 35 mAHD to 35.4 mAHD. This will considerably increase the storage capacity of this basin.
- The inclusion of an additional flood storage area (Ct 3 – FSA) located to the west of Ct 3.1 – BRA and designed to retain all runoff up to the 1% AEP that discharges from Ct 3.1 – BRA (noting that the inundation of the Ct 3 – FSA area already occurs under the pre-development scenario).

4.2.3 Results

A comparison of the major 1% AEP rainfall events depths, top water levels (TWLs) and storage volumes relevant to the pre and post development environments are provided in **Table 4**. The inundation area associated with the post development scenario is shown in **Figure 3**.

Table 4: Major (1% AEP) rainfall event modelling results comparison

Stormwater infrastructure	Modelling	Modelled depth (m)	Modelled TWL area (m^2)	Modelled volume (m^3)
Ct 2.2 – Oval	Pre-development	0.13	4,765	374
	Post development	0.10	2,471	141
	Variance	**-0.03**	**-2,294**	**-233**
Ct 2.4 – BRA	Pre-development	0.67	286	100
	Post development	0.67	286	100
	Variance	**-**	**-**	**-**
Ct 2.5 – Swale	Pre-development	-	-	-
	Post development	0.31	63	16
	Variance	**+0.31**	**+63**	**+16**
Ct 2.6 – Swale	Pre-development	-	-	-
	Post development	0.31	82	**21**
	Variance	**+0.31**	**+82**	**+21**
Ct 3 – FSA	Pre-development	0.10	*1,100	*73
	Post development	0.71	542	261
	Variance	**+0.61**	**-558**	**+188**
Ct 3.1 – BRA	Pre-development	0.45	742	211
	Post development	0.92	1,213	598
	Variance	**+0.47**	**471**	**+387**
Ct 4.1 – BRA/FSA	Pre-development	**-**	**-**	**-**
	Post development	0.47	368	150
	Variance	**+0.47**	**+368**	**+150**

**Volume and area for Ct 3 – FSA pre-development determined based on topography*

The post development volumes provided in **Table 4** indicates that the existing and proposed stormwater infrastructure within the site has the capacity to manage the stormwater runoff up to the 1% AEP event.

Although there is an increase in impervious areas in the post development (mainly from carpark areas and footpaths), the major improvements are observed for the extent of saturated and temporarily water ponding areas within the main oval (i.e. Ct 2.2 – Oval) that were reduced by 48% in comparison to pre-development conditions. This was achieved by the BRAs and swales in the eastern and southern sides of the site. These have resulted in:

- The increase in existing storage capacity for Ct 3.1 – BRA; by constructing bunding to raise the spillway invert from 35 mAHD to 35.4 mAHD.

- The increase in storage capacity by resizing an existing low-lying area (Ct 3 – FSA) located downstream of Ct 3.1 – BRA. This could be achieved and potentially further augmented by raising the footpath around the oval slightly.
- The promotion of infiltration at source and elimination of surface runoff contribution directly into the main oval by the levelling of the junior oval (Ct 3.3).
- The interception at source of runoff from Ct 4.2 by creating a BRA/FSA with a capacity of 150 m^3.
- The reduction of surface runoff into Ct 2.2 – Oval at the southern side by adding a total of 37 m^3 of storage capacity via swales along Walton Way (Ct 2.5 – Swale and Ct 2.6 – Swale).

The stormwater management strategy for the Ct 1.1 and Ct 1.2 catchments requires further consideration in relation to their potential impact to the downstream areas.

The post development modelling for Ct 1.1 calculated a contributing volume of 46 m^3 during the 1% AEP event discharging onto Shepherd Street and Lefroy Road (an increase of 11 m^3). The Hilton Park precinct plan for this area considers the implementation of a perimeter path (Pavement 1) that can potentially be modified to manage runoff from Ct 1.1; this can be achieved by raising the path 100 mm above the adjacent POS and creating a physical barrier to allow 12 m^3 of runoff to infiltrate at source. This can reduce the post development outflow volume to 34 m^3 which is lower than the pre-development outflow volume.

The stormwater management strategy for Ct 1.2 will require no runoff contribution to Ct 1.1 for the 1% AEP event. The post development modelling for Ct 1.2 calculated a contributing volume of 27 m^3 during the 1% AEP event discharging into Ct 1.1. The approach to managing this runoff is with a combination of treatment swales intercepting carpark runoff. A swale with a top width of 3 m, 1:3 side slopes and a depth of 0.3 m will provide 0.6 m^3/m capacity and therefore requiring approximately 45 m of swale to intercept all runoff up to the 1% AEP event. The indicative location of the swales is shown in **Figure 3**. The provision of this storage capacity will ensure that runoff from Ct 1.2 is retained within its catchment.

The implementation of the proposed changes to existing stormwater infrastructure and the addition of BRAs and treatment swales result in retention of runoff up to 1% AEP storm event. The adoption of treatment swales will substantially contribute to reduction of soil erosion and will improve water quality when compared with the current conditions.

5 SUMMARY AND RECOMENDATIONS

The characteristics of the site and surrounding drainage infrastructure have been assessed concurrent with the proposed precinct plan to inform the most appropriate water management approach for the site. The design criteria were adopted to mimic pre-development hydrology, achieve positive water quality outcomes and to minimise flooding during major storm events. The overall design assessment has been undertaken and detailed in **Section 4**, and demonstrates how an appropriate outcome can be achieved within the site. A summary of the recommendations includes:

- Adopt an at source storage approach within Ct 1.1. This could be achieved by raising the perimeter path (Pavement 1) 100 mm above the adjacent POS, creating a physical barrier which will approximately store 12 m^3 of runoff from the internal turfed area and reduce the post development outflow to 34 m^3 - lower than the pre-development outflow volume.

- Adopt and design swales to intercept runoff at source within Ct 1.2 to provide a minimum of 27 m^3 of storage. This will ensure that runoff from Ct 1.2 is fully retained and contributes no runoff to Ct 1.1 and the downstream environment.
- Adopt and design a BRA/FSA structure within Ct 4.1 to accommodate approximately 150 m^3 of runoff from Carrington Road (Ct 4.2) and Ct 4.1. A storage area of this size will ensure that runoff up to the 1% AEP will be retained and therefore mitigate erosion issues along the eastern part of Walton Way.
- Adopt treatment swales along Walton Way carparks to mitigate erosion and provide more at source treatment from Ct 2.5 and Ct 2.6 catchments runoff. A total volume of 37 m^3 will be required to manage up to the 1% AEP event.
- Design bunding within the existing Ct 3.1 – BRA to increase its storage capacity. If bunding can be constructed at the existing western outlet to increase the spillway invert from 35 mAHD to 35.4 mAHD this will increase storage capacity by 387 m^3. Increasing this storage area also reduces the downstream Ct 3 – FSA basin size and allows this basin to be sized to retain all runoff up to the 1% AEP event.
- The proposed stormwater strategy achieved a 48% reduction in the extent of saturated/ponding areas within the Ct 2.2 – Oval (compared to the pre-development condition). The resulting runoff volume on Ct 2.2 – Oval in the 1% AEP event is still approximately 141 m^3 spreading over an area of approximately 0.25 ha. It is expected that up to 0.13 m water depth can locally and temporarily occur around the low point in Ct 2.2 – Oval in a 1% AEP event. Accommodating this volume outside the main oval into a smaller footprint storage would require an additional FSA. However, given the temporary and infrequent expectation for inundation of the oval, the predicted outcome may be considered acceptable.

6 REFERENCES

6.1 General references

Bureau of Meteorology (BoM) 2016, *Design Rainfall Data System (2016)*, <http://www.bom.gov.au/water/designRainfalls/revised-ifd/>.

Bureau of Meteorology (BoM) 2025, *Climate Data Online*, <http://www.bom.gov.au/climate/data/>.

Department of Water and Environmental Regulation (DWER) 2025, *Perth Groundwater Map*, <https://maps.water.wa.gov.au/Groundwater/>.

RM Surveys 2025, *Feature and Contours Survey - Hilton Reserve*,

UDLA 2025, *Hilton Park Precinct Plan - North Zone Concept*, Version B.

Figures

Figure 1: Site location

Figure 2: Pre-development hydrology

Figure 3: Post development hydrology



Figure 1: Site Location

Project:	Hydrological Assessment City of Fremantle Hilton Park Development Support
Client:	City of Fremantle

Plan Number:
EP25-108(07)--F04

Drawn:	CTH
Date:	26/11/2025
Checked:	JSD
Approved:	CJO
Date:	12/12/2025

N

0 50 100
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used
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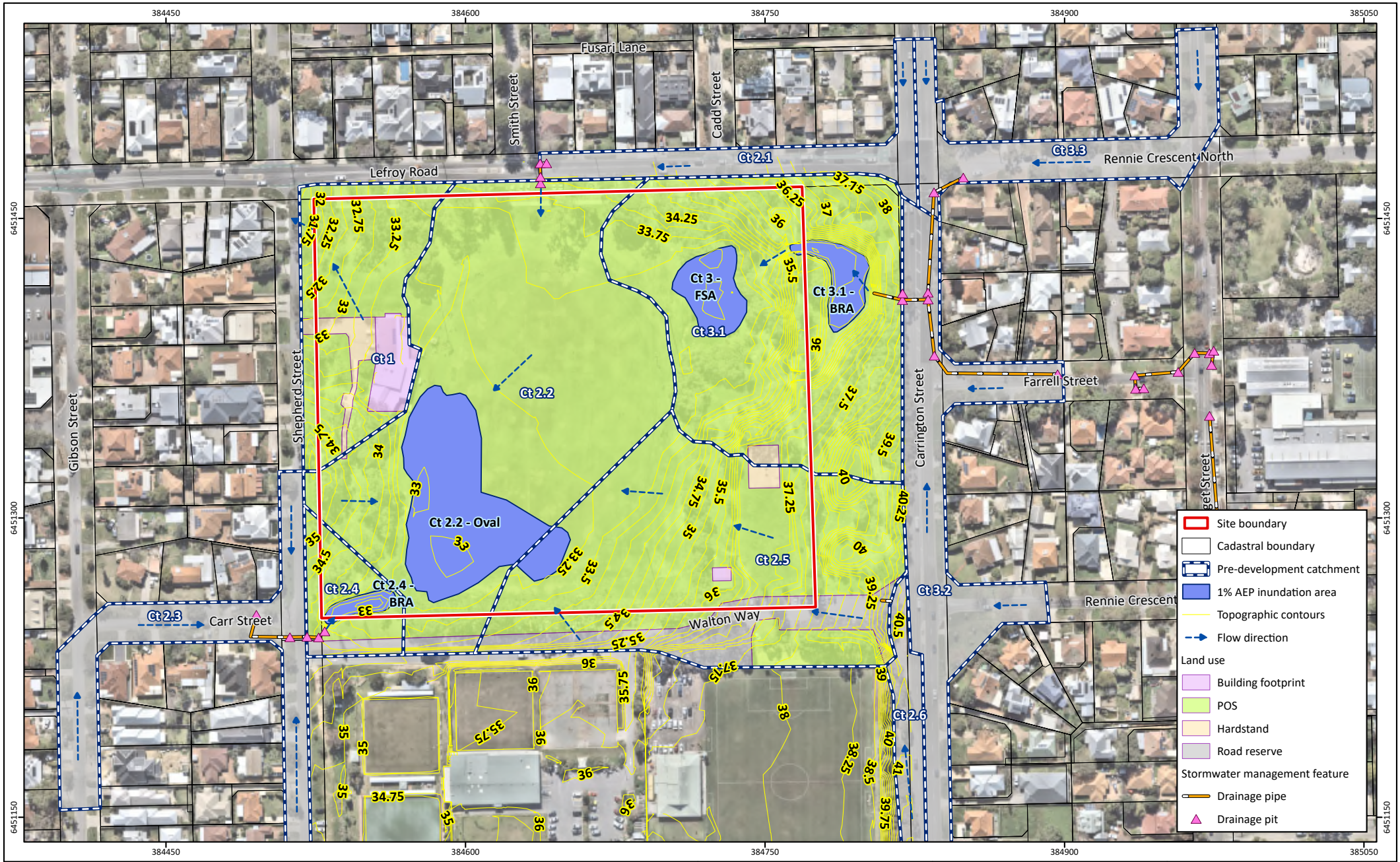


Figure 2: Pre-development Hydrology

Project:	Hydrological Assessment City of Fremantle Hilton Park Development Support
Client:	City of Fremantle

Plan Number:
EP25-108(07)--F05

Drawn:	CTH
Date:	26/11/2025
Checked:	JSD
Approved:	CJO
Date:	12/12/2025

N

0 50 100
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

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Figure 3: Post-development Hydrology

Project:	Hydrological Assessment City of Fremantle Hilton Park Development Support
Client:	City of Fremantle

Plan Number:
EP25-108(07)--F06

Drawn:	CTH
Date:	26/11/2025
Checked:	JSD
Approved:	CJO
Date:	12/12/2025

N

0 50 100
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

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Appendix D

Ecological Assessment

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Document Reference: EP25-108(05)—010 SED

Emerge contact: Rachel Weber

3 March 2026

Attention: Mike Welsh
Senior Building Officer
City of Fremantle
151 High Street
Fremantle WA 6959

Delivered by email to: mikew@fremantle.wa.gov.au

Dear Mike

FLORA, VEGETATION, FAUNA, BLACK COCKATOO AND TREE RETENTION ASSESSMENT – HILTON PARK NORTH

1 INTRODUCTION AND SCOPE OF WORK

Emerge Associates (Emerge) were engaged by the City of Fremantle to undertake a flora, vegetation, fauna, black cockatoo and tree retention assessment to inform the Project Definition Plan (PDP) for Hilton Park North (referred to herein as the 'site').

The site comprises Lot 551 Lefroy Road and part Lot 839 Carrington Street in Beaconsfield and extends over approximately 6.16 hectares (ha). It is bounded by Lefroy Road to the north, Shepherd Street to the west, Walton Way to the south and Carrington Street to the east. The location and extent of the site is shown in **Figure 1**.

This assessment provides information on threatened and priority flora, ecological communities and fauna species, habitat for threatened species of black cockatoo and tree retention values.

As part of this scope of work, the following tasks were undertaken:

- Desktop study to provide contextual information and determine the likelihood of occurrence of threatened and priority flora, ecological communities and fauna.
- Field surveys to record flora, vegetation units, vegetation condition, fauna and black cockatoo habitat values and tree retention values.
- Analysis and mapping of threatened and priority flora, ecological communities and fauna, vegetation units, vegetation condition, black cockatoo habitat and tree retention values.
- Documentation of the desktop study, methods, results, discussion and conclusions.

2 DESKTOP STUDY

2.1 Threatened and priority flora

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) has compiled various datasets relating to 'matters of national environmental significance' (MNES) (DCCEEW 2026). The *Protected Matters Search Tool* provides general guidance on threatened flora

listed under the EPBC Act that may occur within a location based on validated records and less reliable unvalidated habitat distribution modelling (DCCEEW 2026).

DBCA's *Threatened and Priority Flora Database* and *WA Herbarium Database* contain records of threatened and priority flora in Western Australia (DBCA 2025b). Searches of these databases provide point data for threatened and priority flora within a location, comprising validated and historical unvalidated records.

The *Protected Matters Search Tool* (DCCEEW 2026) and DBCA's threatened and priority flora databases (reference no. 41-1125FL (DBCA 2025a)) identified 15 threatened and 16 priority flora occurring or potentially occurring within a 10 km radius of the site (refer **Appendix A**).

2.1.1 Flora likelihood of occurrence

The distribution and habitat preferences of the threatened and priority flora species listed in **Appendix A** was reviewed against site context information. Likelihood of occurrence of threatened and priority flora species within the site was classified as 'high', 'moderate', 'low' or 'negligible' as outlined in **Table 1**.

Table 1: Decision matrix for likelihood of occurrence of threatened and priority flora and ecological communities

		Distribution[1]	
		Reliable record within search area	**No reliable record within search area**
Habitat	**Suitable**	High	Negligible
	Potentially suitable	Moderate	
	Unsuitable	Low	

[1] Reliable record defined as validated, recent (within the last ~40 years) and spatially accurate (refer DBCA search metadata) in order to exclude unverified range or habitat projections.

All species were classified as having a 'low' likelihood of occurrence given the high level of habitat disturbance throughout the site.

2.2 Threatened and priority ecological communities

The *Protected Matters Search Tool* provides general guidance on threatened ecological communities (TECs) listed under the EPBC Act that may occur within a location based on reliable records and less reliable habitat distribution modelling (DCCEEW 2026).

DBCA's *Threatened and Priority Ecological Community buffers and boundaries in WA* dataset contains validated records of TECs and priority ecological communities (PECs) as buffered polygons.

Searches of the Protected Matters Search Tool (DCCEEW 2026) and DBCA's TEC and PEC database (reference no. 54-1025EC (DBCA 2025a)) indicate there are records for eight TECs and one PEC within a 10 km radius of the site (refer **Appendix B**). The distribution and habitat preferences of a single TEC/PEC, the 'tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain' (herein referred to as the 'tuart woodland TEC/PEC') align most closely to the location, geomorphology, topography and hydrology of the site. This community is listed as critically endangered pursuant to the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* and is listed as a priority 3 PEC in Western Australia.

2.3 Threatened, specially protected and priority fauna

The *Protected Matters Search Tool* also provides guidance on threatened and specially protected fauna listed under the EPBC Act that may occur within a location based on validated records and less reliable unvalidated habitat distribution modelling (DCCEEW 2026).

DBCA's *Threatened and Priority Fauna* database as well as the spatial portal of the *Atlas of Living Australia* (ALA) contain records of threatened specially protected and priority fauna in Western Australia (ALA 2026; DBCA 2025c). Searches of these databases provide point data for threatened,

specially protected and priority fauna within a location, comprising validated and historical unvalidated records.

A search was conducted for fauna species that have been recorded within a 10 km radius of the site using the *Protected Matters Search Tool* (DCCEEW 2026), *Dandjoo* (DBCA 2026), DBCA's conservation significant fauna database (reference no. 37-1125FA (DBCA 2025a)), *Atlas of Living Australia* (ALA 2026) and literature references.

2.3.1 Fauna likelihood of occurrence

The distribution and habitat preferences of the threatened and priority fauna species identified within 10 km of the site (refer **Appendix C**) was reviewed against site context information described. Likelihood of occurrence of threatened, specially protected and priority fauna species within the site was classified as 'high', 'moderate', 'low', 'very low, 'negligible' or 'nil' as outlined in **Table 2**.

Table 2: Likelihood of occurrence assessment categories and definitions

		Reliable record[1]		**Unreliable record[2]**
		Access to site not impeded	**Access to site impeded**	
Habitat	**Suitable**	High	Very low	Negligible
	Potentially suitable	Moderate		
	Unsuitable	Low		
	Absent	Nil		

[1]Reliable record defined as DBCA or validated ALA record from the last ~20 years, [2]Unreliable record defined as record >20 years old or PMST prediction.

Two threatened and one specially protected species were classified as having a 'high' or 'moderate' likelihood of occurrence. The legislative or policy status and habitat preferences of these species are shown in **Table 3**.

The remainder of the conservation significant fauna species identified in the desktop assessment (106 species) were considered as having a 'low', very low', negligible' or 'nil' likelihood of occurrence. Refer to **Table 3** and **Appendix C** for detail on individual species likelihood of occurrence.

Table 3: Summary of conservation significant fauna species with a high or moderate likelihood of occurrence in the site

Species name	**Common name**	**Status**		**Habitat description**	**Likelihood**
		WA	**EPBC Act**		
Birds					
Apus pacificus	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Pizzey & Knight 2012).	Moderate
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	*Eucalypt* and *Corymbia* forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding *Corymbia calophylla*, *Eucalyptus marginata*, introduced *Melia azedarach* and *Eucalyptus* spp. trees.	High
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of *Pinus* spp. Attracted to seeding *Banksia* spp., *Dryandra* spp., *Hakea* spp., *Eucalyptus* spp., *Corymbia calophylla*, *Grevillea* spp., and *Allocasuarina* spp.	High

2.3.2 Black cockatoos

Three threatened species of black cockatoo occur in the south-west of WA (referred to herein collectively as 'black cockatoos'):

- *Zanda*[1] *latirostris* (Carnaby's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Zanda*[1] *baudinii* (Baudin's black cockatoo) which is listed as 'endangered' under the EPBC Act and the BC Act.
- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) which is listed as 'vulnerable' under the EPBC Act and the BC Act.

Black cockatoo habitat is conventionally separated into breeding, roosting and foraging categories. **Breeding habitat** refers to 'habitat trees' which consist of native trees of a suitable species that either contain nesting hollows or have a large enough diameter at breast height[2] (DBH) to develop a nesting hollow over time(DAWE 2022). Black cockatoos typically utilise breeding habitat within their defined breeding season: August to March for Baudin's black cockatoo, July to December for Carnaby's black cockatoo breed and throughout the year for forest red-tailed black cockatoo, with peaks in April – June and August – October (DAWE 2022). **Roosting habitat** consists of a stand of tall trees (>8 m) within 6 km of water and food resources and 12 km of additional foraging resources where black cockatoos rest overnight (DAWE 2022; Glossop *et al.* 2011; Le Roux 2017; Shah 2006). **Foraging habitat** is vegetation that black cockatoos are known to feed on, which varies between black cockatoo species (DAWE 2022; Groom 2011; Johnstone *et al.* 2011). A full range of foraging plants and their foraging category assigned by Emerge Associates is available in **Appendix D**.

A review of black cockatoo datasets was undertaken as outlined in **Table 4** and shown in **Figure 2**. Counts for all known black cockatoo roosts within 10 km are available in **Appendix E**.

Table 4: Summary of black cockatoo background review

Category	Black cockatoo site context			Source
	Carnaby's	Baudin's	Forest red-tailed	
Site located within species distribution	Yes	No	Yes	(DAWE 2022)
Site in known breeding distribution	No	No	Yes*	(DAWE 2022)
Confirmed or possible breeding hollows within 10 kmˇ	20	N/A	0	(DBCA 2025a; Glossop *et al.* 2011)
Site located in important bird area	No	N/A	N/A	(BirdLife International 2024; DPaW 2013)
Known roosts occur within site^	0		0	(BirdLife International 2024)
Known roosts occur within 10 km of site^	23		20	
Potential foraging habitat within site	Yes	N/A	Yes	(Emerge Associates 2021; Forest Products Commission 2020)
Potential foraging habitat in local area (including pine plantations)	Yes	N/A	Yes	

*Whilst no datasets of breeding distributions are available for forest red-tailed black cockatoos, they are known to breed across the Swan Coastal Plain (Johnstone *et al.* 2013b).

ˇResults from DBCA database search.

^'White-tailed black cockatoo roosts can be Carnaby's black cockatoo and/or Baudin's black cockatoo.

[1] Previously *Calyptorhynchus*

[2] ≥50 cm or ≥30 cm for wandoo or salmon gum

3 METHODS

3.1 Field survey

Two ecologists from Emerge visited the site on 3 and 5 November 2025.

3.1.1 Flora and vegetation

During each survey the site was traversed on foot and the composition and condition of vegetation was recorded. Photographic images and notes were recorded as required.

3.1.1.1 Vegetation units

No formal sampling of vegetation was undertaken as part of the current survey. The vegetation units determined based on notes taken during the field survey.

3.1.1.2 Vegetation condition

The condition of the vegetation was assessed using the EPA (2016) scale as adapted from Keighery (1994) (**Table 5**).

Table 5: Vegetation condition scale applied during the field survey

Category	Definition (EPA 2016)
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.

^relative to the expected natural diversity for that vegetation.

3.1.2 Fauna habitat

The site was traversed on foot during the day to evaluate the fauna habitat present.

3.1.3 Black cockatoos

The presence of potential black cockatoo breeding, night roosting and foraging habitat was recorded. If observed, the presence of black cockatoos within or near the site was noted.

3.1.3.1 Breeding habitat

All native eucalypts within the site with a DBH ≥50 cm were recorded. Occasionally, native eucalypts were encountered that met DBH requirements but did not contain a trunk/branch of a sufficient size to support a hollow suitable for use by black cockatoos. For example, the tree may have been less than 3 m tall or had a trunk that forked between 1.3 m and 3 m in height and after the fork no limbs had a diameter of ≥50 cm. These trees were not recorded as habitat trees as the likelihood they would form a suitable hollow was low.

Hollows that appeared potentially suitable for use by a black cockatoo from the ground were further inspected using a drone and/or a pole-mounted camera. During the hollow inspection the internal dimensions of the hollow were confirmed if possible and an assessment was made for signs of use such as chew marks around the hollow entrance, nesting material, eggs, feathers or the presence of birds within the hollow.

To be suitable for use as breeding habitat by black cockatoos it was considered a hollow must:

- have an entrance opening of at least 10 cm but preferably 20-30 cm (Groom 2010; Johnstone *et al.* 2013a; Saunders *et al.* 1982)
- be located at least 3 m from the ground (Groom 2010; Johnstone and Storr 1998; Saunders 1979b, 2014)
- be located in a trunk or branch that is generally large enough to contain a hollow that has a floor diameter of at least 40 cm and depth of 50-200 cm such that it could house an adult black cockatoo and nestlings (DPaW 2015; Johnstone and Storr 1998; Saunders 1979a; Saunders 2014)
- have vertical or near vertical orientation (Johnstone *et al.* 2013a; Johnstone and Kirkby 2008).

Each habitat tree was assigned to a category listed in **Table 6** based on current black cockatoo guidelines (DAWE 2022).

Table 6: Habitat tree categories (DAWE 2022)

Category	Specifications
Known nesting tree	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting tree	Trees with suitable nesting hollows present^, although no evidence of use. Note that any species of tree may develop suitable hollows for breeding.
Potential nesting tree	Trees that have a suitable DBH to develop a nest hollow, but do not currently have suitable nesting hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH. Note that many species of eucalypt may develop suitable hollows for breeding.

^Hollow determined to be suitable for use as breeding habitat by black cockatoos as listed above in Section **3.1.3.1**

3.1.3.2 Roosting habitat

If present, groups of tall native and non-native trees were assumed to provide roosting habitat. The presence of active or historical roosts in these trees was determined through evidence of roosting activity, such as branch clippings, droppings or moulted feathers.

3.1.3.3 Foraging habitat

Foraging habitat was identified by assessing vegetation in the site for plant species known to provide food for black cockatoos (Davies 1966; DAWE 2022; Groom 2011; Johnstone *et al.* 2011; Johnstone and Kirkby 1999; Johnstone and Storr 1998; Saunders 1980).

Foraging habitat was classified as either 'native' or 'non-native' based on the predominant vegetation's naturalised status and in accordance with DAWE (2022).

It was also classified as either 'primary' or 'secondary' based on black cockatoo foraging preferences. Primary food plants were defined as those with historical and contemporary records of regular consumption by a black cockatoo species. Secondary food plants were defined as plants that black cockatoo species have been recorded consuming occasionally or that, based on their limited extent or agricultural origin, should not be considered a sustaining resource. A list of plant species classified as primary or secondary food plants is provided as **Appendix D**.

Each patch of foraging habitat was assigned a foraging value for each species of black cockatoo likely to occur within the site. As it is not always possible to separate out food plants from non-food plants,

mapped foraging habitat may also include vegetation comprising non-food plants. The proportion of non-food plants in mapped foraging habitat was minimised as far as practicable.

Evidence of black cockatoo foraging, such as chewed fruits, was searched for within the site and allocated to a black cockatoo species where possible.

3.1.4 Tree assessment

During each survey the site was traversed on foot and all trees with a DBH ≥10 centimetres (cm) were assessed.

3.1.4.1 Attributes

The attributes outlined in **Table 7** were recorded for each tree.

Table 7: Attributes recorded for each tree

Attribute	Description
Tag number	An individually numbered aluminium tags was attached to each tree
GPS location	The location was recorded using a handheld GPS unit
Tree species	Species and common name were identified
Diameter at breast height (DBH) (cm)	DBH was measured at breast height (1.3 m) using a diameter tape
Hollows present	The presence of any hollows was recorded.
Health	Health rating (excellent, good, average, poor or dead)
Structure	Appearance rating based on structure (good, acceptable or poor)
General notes	Any additional observations

3.1.4.2 Identification tags

Trees were tagged with a unique number tag as shown in **Plate 1**.



Plate 1: Example id tag affixed to trees within the site

3.1.4.3 Health score

Tree health was scored as outlined in **Table 8.**

Table 8: Tree health score

Score	Description
3 – Excellent/Good	Tree condition and growth typical in seasonal context. Signs of disease or stress absent. Impacts from herbivory absent or minor.
2 - Average	Tree growth limited in seasonal context or in comparison to other individuals of same species *in situ*. Minor signs of disease, stress and / or moderate impacts from herbivory.
1 - Poor	Tree in decline. Growth severely limited. Severe impacts from disease, stress or herbivory.
0 - Dead	Tree is dead.

3.1.4.4 Structure score

Tree structure score was scored as outlined in **Table 9**.

Table 9: Tree structure score

Score	Description
3 - Good	Tree structure is regular (typical for species) and defects are absent or minor.
2 - Acceptable	Tree structure is irregular, such as leaning trunk or due to damage, but defects are absent or minor.
1 - Poor	Tree structure is irregular, such as leaning trunk or due to damage, and major defects are present.

3.2 Analysis and data preparation

3.2.1 Mapping

Vegetation units, vegetation condition, threatened or priority flora or ecological communities, fauna and black cockatoo habitat and tree retention values/inventory were mapped on aerial photography using notes and data collected in the field.

3.2.1 Tuart woodland TEC/PEC

In order to determine whether the tuart woodland TEC/PEC is present, vegetation units were assessed against the diagnostic characteristics and size and vegetation condition thresholds outlined in DoEE (2019).

3.2.2 Black cockatoo foraging habitat value

Foraging habitat was described according to the dominant flora species or vegetation type present and mapped using boundaries interpreted from aerial photography and notes taken in the field. The foraging value of each patch of foraging habitat was attributed separately for each species of black cockatoo likely to occur in the site. Foraging value was assigned as outlined in **Section 3.1.3.3**.

3.2.3 Tree retention values

Tree retention values were calculated using the data received from the tree assessment within the site. These values include useful life expectancy, significance, retention value, tree protection zone and structural root zone.

3.2.3.1 Useful life expectancy

Useful life expectancy (ULE) was classified as 'greater than 40 years', '15 – 40 years', '5 – 15 years' and 'less than 5 years' by considering the typical lifespan of a species and the health and structural score of each tree as outlined in **Table 10**.

Table 10: Useful life expectancy value matrix

Sum Health and Structure Score	Typical lifespan of species		
	100-400 years	**40-100 years**	**<40 years**
≥5	Greater than 40 years	Greater than 40 years	15 – 40 years
4	Greater than 40 years	15 – 40 years	5 – 15 years
3	5 – 15 years	5 – 15 years	Less than 5 years
≤2	Less than 5 years	Less than 5 years	Less than 5 years

3.2.3.2 Significance

Significance was classified by considering the ecological, cultural and amenity values outlined in **Table 11.**

Table 11: Ecological or cultural significance score

Significance	Ecological	Cultural	Amenity
3 - Special	Tree provides specific, verified, critical habitat for conservation significant fauna	Tree has specific, verified cultural / heritage significance	Tree makes a special contribution to local amenity
2 - General	Tree provides ecosystem services that are of general benefit native fauna	Tree has general cultural / heritage significance	Tree contributes to local amenity as part of the urban forest
1 - Nominal	Tree provides ecosystem services of nominal benefit to native fauna	Tree has nominal cultural / heritage significance	Tree makes a nominal contribution to local amenity or urban forest

3.2.3.3 Retention value

Retention value was classified as 'high', 'moderate' and 'low' by considering the useful life expectancy and ecological or cultural significance of each tree as outlined in **Table 12.**

Table 12: Tree retention value matrix

Useful life expectancy (ULE)	Ecological, cultural or amenity significance		
	3	**2**	**1**
40+ years	High		
15 to 40 years	Moderate		
5 to 15 years			Low
Less than 5 years			

3.2.3.4 Tree protection zone (TPZ)

AS 4970-2025 Protection of Trees on Development Sites requires application of notional root zone (NRZ) and tree protection zones (TPZ) to protect trees during development (Standards Australia 2025). A NRZ represents thetheoretical area required to sustain a tree's health and long-term viability. The TPZ refers to the physical area on a development site that is protected during development.

The radius of a NRZ was calculated for each tree by multiplying its DBH by 12, up to a maximum of 15 m (Standards Australia 2025).

3.2.3.5 Structural root zone (SRZ)

AS 4970-2025 Protection of Trees on Development Sites defines the structural root zone (SRZ) as the minimum volume of roots required by a tree to remain stable in the ground (Standards Australia 2025). An indicative SRZ for an individual tree was calculated as $SRZ = (D \times 50)^{0.42} \times 0.64$, *where D is the trunk diameter in metres (m), measured above the root buttress* (Standards Australia 2025).

3.3 Survey limitations

No significant limitations that may have affected the results of the survey were identified.

4 RESULTS

4.1 Flora and vegetation

4.1.1 Threatened and priority flora

No threatened or priority flora species were recorded and none are considered likely to occur given the high level of disturbance and human impact throughout the site.

4.1.2 Vegetation units

One vegetation unit (**planted/non-native**) was identified within the site and comprises scattered planted and non-native trees over non-native grasses/herbs and cleared areas. The vegetation unit extends over the whole site, as shown in **Figure 3.**

4.1.3 Vegetation condition

The extent of vegetation by condition category is detailed in **Table 13** and shown in **Figure 4**.

Table 13: Extent of vegetation condition categories within the site

Condition category (Keighery 1994)	Total area (ha)	Proportion of site (%)
Pristine	0	0
Excellent	0	0
Very good	0	0
Good	0	0
Degraded	0	0
Completely degraded	6.16	100

4.1.4 Tuart woodland TEC

As outlined in **Table 14**, the **planted/non-native** vegetation does not satisfy the criteria to be considered a patch of the tuart woodland TEC as it does not meet the minimum size and condition thresholds.

Table 14: Criteria for determining presence of tuart woodlands and forests of the Swan Coastal Plain ecological community TEC adapted from (DoEE 2019)

Criteria	Requirements for meeting criteria	Site implications
Must meet key diagnostic characteristics	A variety of factors relating to: ▪ Location ▪ Soils ▪ Structure ▪ Composition	The site meets location and soils criteria. The **planted/non-native** vegetation includes the key diagnostic feature of having at least two living established tuart trees. The **planted/non-native** vegetation within the site also meets structure and composition criterion.

Table 14: Criteria for determining presence of tuart woodlands and forests of the Swan Coastal Plain ecological community TEC adapted from (DoEE 2019) (continued)

Criteria	Requirements for meeting criteria	Site implications
Defining a patch of the ecological community	A variety of criteria: ▪ A continuous area of vegetation meeting key diagnostic characteristics ▪ Patch boundary is 30 m beyond outer canopy of established tuart trees ▪ Existing buildings and other human-made structures and gardens do not form part of TEC	The p**lanted/non-native** vegetation contains managed turf areas that will prevent the continuity of vegetation meeting key diagnostic features.
Must meet minimum patch size	Minimum size of patch: ▪ Must be more than 0.5 ha ▪ If between 0.5 ha to 5 ha, condition thresholds apply ▪ If greater than 5 ha, it is considered part of TEC	The **planted/non native** vegetation contains a tuart patch of less than 5 ha and therefore condition thresholds apply.
Must meet condition thresholds	Patches between 2 ha and 5 ha: ▪ Must have more than 50% native understory or 4 native understory species per 0.1 ha Patches between 0.5 ha to 2 ha: ▪ Must have more than 60% native understory or at least 8 native understory species per 0.01 ha.	The **planted/non-native** vegetation is present in 'completely degraded' condition, which does not meet this criterion.
Result	The vegetation in the site does not represent the tuart woodland TEC as it does not meet the minimum size and condition threshold.	

4.1.5 Native vegetation under the *Environmental Protection (EP) Act 1986*

No vegetation which meets the definition of 'native vegetation' under the EP Act occurs within the site. Observations made during site visits and through aerial imagery suggests trees within the site have been planted and are not remnant native vegetation.

4.2 Fauna habitat

Two fauna habitats were identified within the site, as described below and shown in **Figure 5**:

- **Scattered trees** (1.65 ha): patches of planted native and non-native trees with no understory around the edges of the site.
- **Turf, bare ground and grassland** (4.51 ha): heavily disturbed areas with non-native grasses and bare ground.

4.3 Black cockatoos

4.3.1 Breeding habitat

Eighteen black cockatoo habitat trees were recorded within the site as shown in **Figure 6.**

The habitat trees comprised one *Corymbia calophylla* (marri), one *Eucalyptus rudis* and 16 tuart trees.

No trees contained suitable hollows for breeding by black cockatoos. A summary of the habitat trees recorded within the site is provided in **Table 15**.

Table 15: Habitat trees within the site

Category	No. trees
Known nesting trees	0
Suitable nesting trees	0
Potential nesting trees	18
Total nesting trees	18

4.3.2 Roosting habitat

No roosts or evidence of roosting were observed within the site during the survey.

4.3.3 Foraging habitat

A total of 0.93 ha of foraging habitat for Carnaby's black cockatoo and 0.50 ha for forest red-tailed black cockatoo were recorded in the site as shown in **Figure 7** to **Figure 8**.

The extent of foraging habitat by value category is detailed in Table **16**.

Table 16: Foraging habitat recorded within the site

Foraging habitat	Black cockatoo species and area of foraging habitat (ha)	
	Carnaby's	Forest red-tailed
Native primary	0.04	0.04
Non-native primary	0.10	0.00
Native secondary	0.57	0.35
Non-native secondary	0.22	0.11
Total	0.93	0.50

4.4 Tree retention assessment

4.4.1 Tree assessment

A total of 271 trees were recorded within the site. Of the 271 trees, 133 trees are native to the Swan Coastal Plain and 138 non-native. All native trees within the site have been planted and are not classified as native under the EP act. The locations of the trees are shown in **Figure 9** and a complete inventory of trees recorded in the site is provided in **Appendix F**.

4.4.2 Retention value

Out of the 271 trees recorded, 23 were classified as having high retention value due to ecological (native eucalypts which qualify as habitat trees for black cockatoos) or amenity significance. Most of the remaining trees were classified as having moderate retention value, and <10% were classified as having low retention value. A summary of the tree retention values is provided in **Table 17** and shown in **Figure 10.**

Table 17: Summary of tree retention values recorded within the site

Retention value	No. of trees
High	23 (8.49%)
Moderate	230 (84.87%)
Low	18 (6.64%)

4.4.3 TPZ and SRZ

The NRZ and SRZ for each tree is provided in **Appendix F** and spatial data is attached.

5 DISCUSSION

5.1 Threatened and priority flora

No occurrences of threatened or priority flora species were recorded within the site and none are considered likely to occur given the completely degraded condition of the site.

5.2 Vegetation condition

The vegetation within the site shows evidence of historical disturbance, with all understory vegetation cleared and weeds throughout. The remaining trees have been identified as either planted natives or non-native species. The entire site has therefore been mapped as 'completely degraded' to reflect these conditions.

5.3 Tuart woodland TEC

Multiple tuart trees occur within the site, particularly in the eastern portion. However, when the canopy of these trees is mapped and appropriate buffer applied, the patches do not meet minimum size and condition thresholds specified in DoEE (2019).

5.4 Conservation significant fauna

No threatened, specially protected or priority species were recorded in the site.

Three conservation significant species were considered to have a high or moderate likelihood of occurring in the site, as described below.

- Pacific swift (MI) are highly mobile species that may opportunistically fly over or forage in the site for short periods of time as part of a much larger home range. The species would not breed within the site. Any occurrence of pacific swift in the site would likely be in the air space and largely independent from terrestrial habitat.
- While Carnaby's black cockatoos (EN) and forest red-tailed black cockatoos (VU) were not directly recorded, both species are considered likely to occur given their widespread distribution across the Swan Coastal Plain and the presence of foraging habitat within the site.

5.5 Fauna habitat

The majority of the site comprises of **turf, bare ground and grassland** habitat which provides limited habitat to fauna given the high level of disturbance and lack of microhabitats. In addition, the site is bounded by roads/urban areas, acting as a significant barrier for ground dwelling species dispersing from nearby vegetation or reserves. The **scattered trees** habitat would mostly provide habitat for birds due to the lack of understorey vegetation for refuge.

5.6 Black cockatoos

As outlined in **Table 4**, the site lies within the modelled distribution range and non-breeding range of Carnaby's black cockatoo, within the distribution range and breeding range of forest red-tailed black cockatoo, and outside of the modelled distribution of Baudin's black cockatoo. As such, breeding habitat only applies to forest red-tailed black cockatoo and foraging habitat applies to both Carnaby's black cockatoo and forest red-tailed black cockatoo.

5.6.1 Breeding habitat

As none of the habitat trees contain hollows suitable for use by black cockatoos for breeding, the site does not currently provide nesting habitat for black cockatoos. The habitat trees within the site have the potential to form suitable hollows in the future. However, it will likely take many decades for hollows to form that are large enough to be suitable for use by black cockatoos for breeding.

5.6.2 Roosting habitat

No secondary evidence of roosting such as branch clippings, droppings or feathers were observed within the site. Therefore, there is no reason to suspect that roosting by black cockatoos has recently occurred in the site. Nevertheless, the site contains a small number of tall trees and groups of tall trees that have the potential to provide roosting habitat for black cockatoos.

5.6.3 Foraging habitat

The site contains native foraging habitat for both Carnaby's black cockatoo and forest red-tailed black cockatoo. The highest value foraging resource in the site for both black cockatoos is associated with the planted marri trees scattered throughout the site and the *Pinus pinea* trees which are favoured by Carnaby's black cockatoo.

The secondary foraging habitat for both Carnaby's black cockatoo and forest red-tailed black cockatoo is predominantly associated with scattered tuart, *Corymbia citriodora* and non-native eucalypt trees. The scattered *Agonis flexuosa* and *Araucaria heterophylla* also provide secondary foraging habitat for Carnaby's black cockatoo. While there are records of Carnaby's black cockatoo and forest red-tailed black cockatoo consuming the fruit of these plants (DoEE 2017; Groom 2011), they are likely to be secondary options that are opportunistically consumed rather than relied upon.

6 CONCLUSIONS

Outcomes of the assessment include the following:

- No threatened or priority flora species were recorded or are considered likely to occur.
- One vegetation unit was identified across the site, **planted/non-native,** which occurs in 'completely degraded' condition.
- No TECs or PECs were recorded or are considered likely to occur.
- Two broad fauna habitats were identified: **scattered trees and turf** and **bare ground and grassland**.
- No conservation significant fauna species were recorded within the site.
- Three conservation significant fauna species were considered to have a high or moderate likelihood of occurrence:
    - Carnaby's black cockatoo (EN)
    - forest red-tailed black cockatoo (VU)
    - Pacific swift (MI).
- The site contains black cockatoo breeding habitat, with 18 'potential nesting trees'.
- No roosting evidence was recorded. Some tall trees in the site may provide roosting habitat for black cockatoos.
- A total of 0.93 ha of foraging habitat for Carnaby's black cockatoo was recorded, comprising 0.04 ha of native primary plants, 0.57 ha of native secondary plants, 0.10 ha of non-native primary plants and 0.22 ha of non-native secondary plants.
- A total of 0.50 ha of foraging habitat for forest red-tailed black cockatoo was recorded, comprising 0.04 ha of native primary plants, 0.35 ha of native secondary plants and 0.11 ha of non-native secondary plants. No non-native primary foraging habitat was recorded.
- A total of 271 trees were recorded within the site, comprising 133 native species to the Swan Coastal Plain and 138 non-native. All native trees within the site have been planted and are not classified as native under the EP act.
- Out of the 271 trees recorded, 23 were classified as having high retention value due to ecological or amenity significance. Most of the remaining trees were classified as having moderate retention value, and <10% were classified as having low retention value.

7 SUMMARY AND CLOSING

We trust that this letter provides sufficient details on the flora, vegetation, fauna, black cockatoo values and tree retention values within the site. Should you have any questions regarding the content of this letter, please do not hesitate to contact the undersigned.

Yours sincerely

Emerge Associates



Rachel Weber
PRINCIPAL ENVIRONMENTAL CONSULTANT, TEAM LEADER – ECOLOGY

cc: nil

Encl:
Figure 1: Site Location
Figure 2: Black Cockatoo Habitat Context
Figure 3: Vegetation Units
Figure 4: Vegetation Condition
Figure 5: Fauna Habitat
Figure 6: Black Cockatoo Habitat Trees
Figure 7: Carnaby's Black Cockatoo Foraging Habitat
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Appendix A: Conservation Significant Flora
Appendix B: Conservation Significant Communities
Appendix C: Conservation Significant Fauna
Appendix D: Black Cockatoo Foraging Plants
Appendix E: Black Cockatoo Roost Counts
Appendix F: Tree Inventory

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Figures

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Figure 2: Black Cockatoo Habitat Context

Figure 3: Vegetation Units

Figure 4: Vegetation Condition

Figure 5: Fauna Habitat

Figure 6: Black Cockatoo Habitat Trees

Figure 7: Carnaby's Black Cockatoo Foraging Habitat

Figure 8: Forest Red-tailed Black Cockatoo Foraging Habitat

Figure 9: Tree Inventory

Figure 10: Tree Retention Values



Figure 1: Site Location

Project: Targeted Flora, Vegetation, Fauna, Black Cockatoo and Tree Retention Assessment
Hilton Park North
Client: City of Fremantle

Plan Number:
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Drawn: CTH
Date: 28/01/2026
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Date: 04/02/2026

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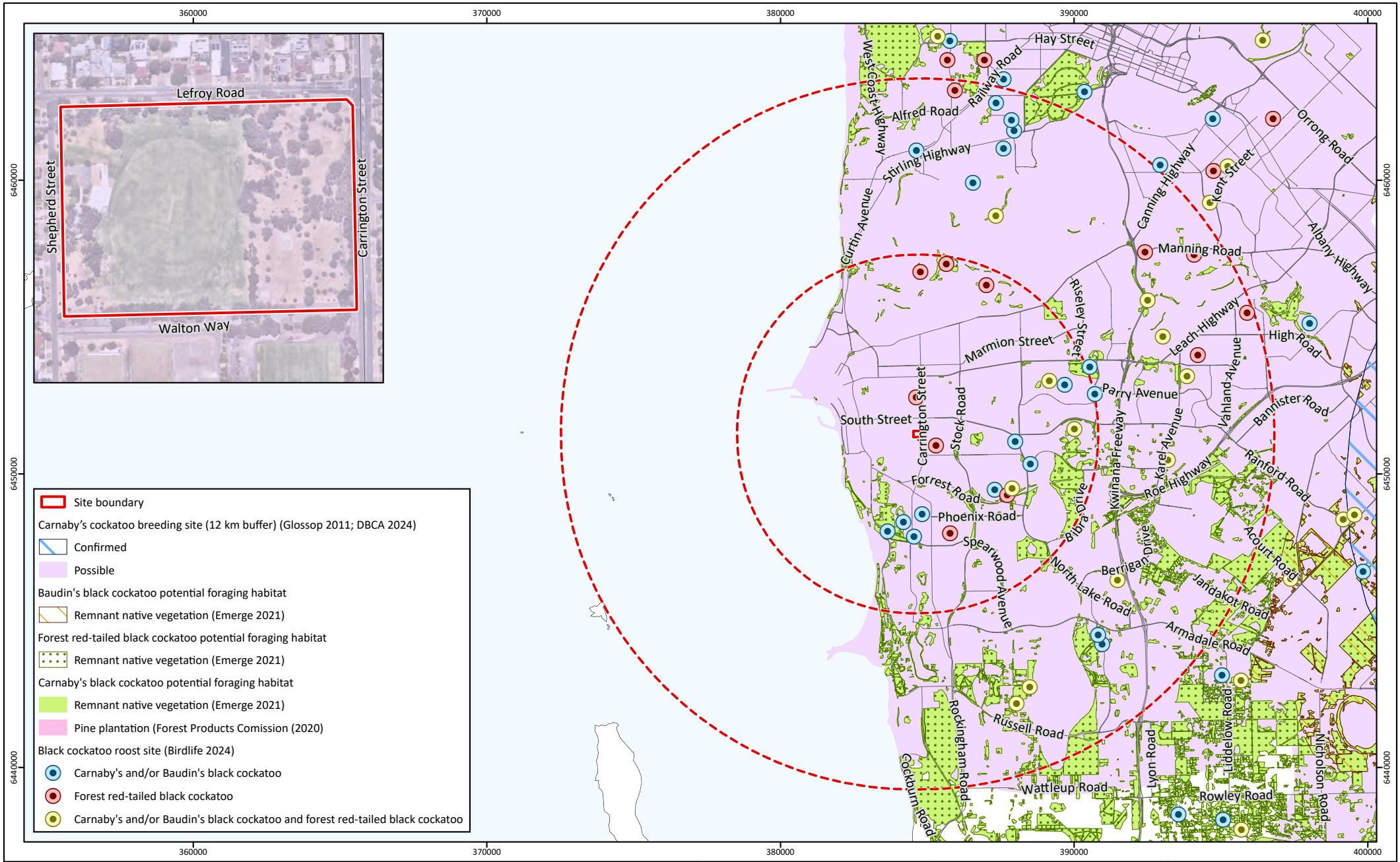


Figure 2: Black Cockatoo Habitat Context

Project: Targeted Flora, Vegetation, Fauna, Black Cockatoo and Tree Retention Assessment
Hilton Park North

Client: City of Fremantle

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Figure 3: Vegetation Unit

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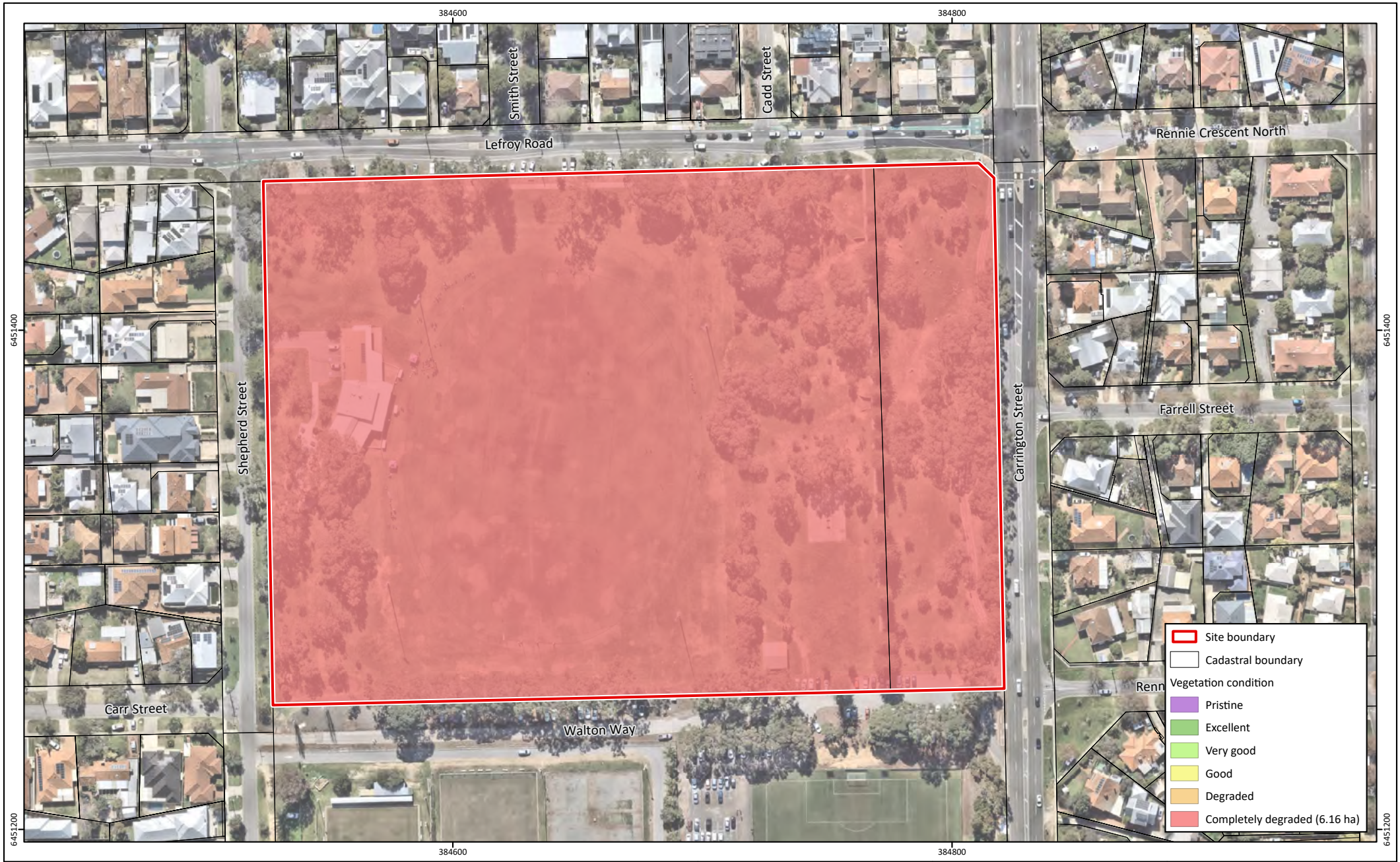


Figure 4: Vegetation Condition

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Figure 5: Fauna Habitat

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Figure 6: Black Cockatoo Habitat Trees

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Figure 7: Carnaby's Black Cockatoo Foraging Habitat

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Figure 8: Forest Red-tailed Black Cockatoo Foraging Habitat

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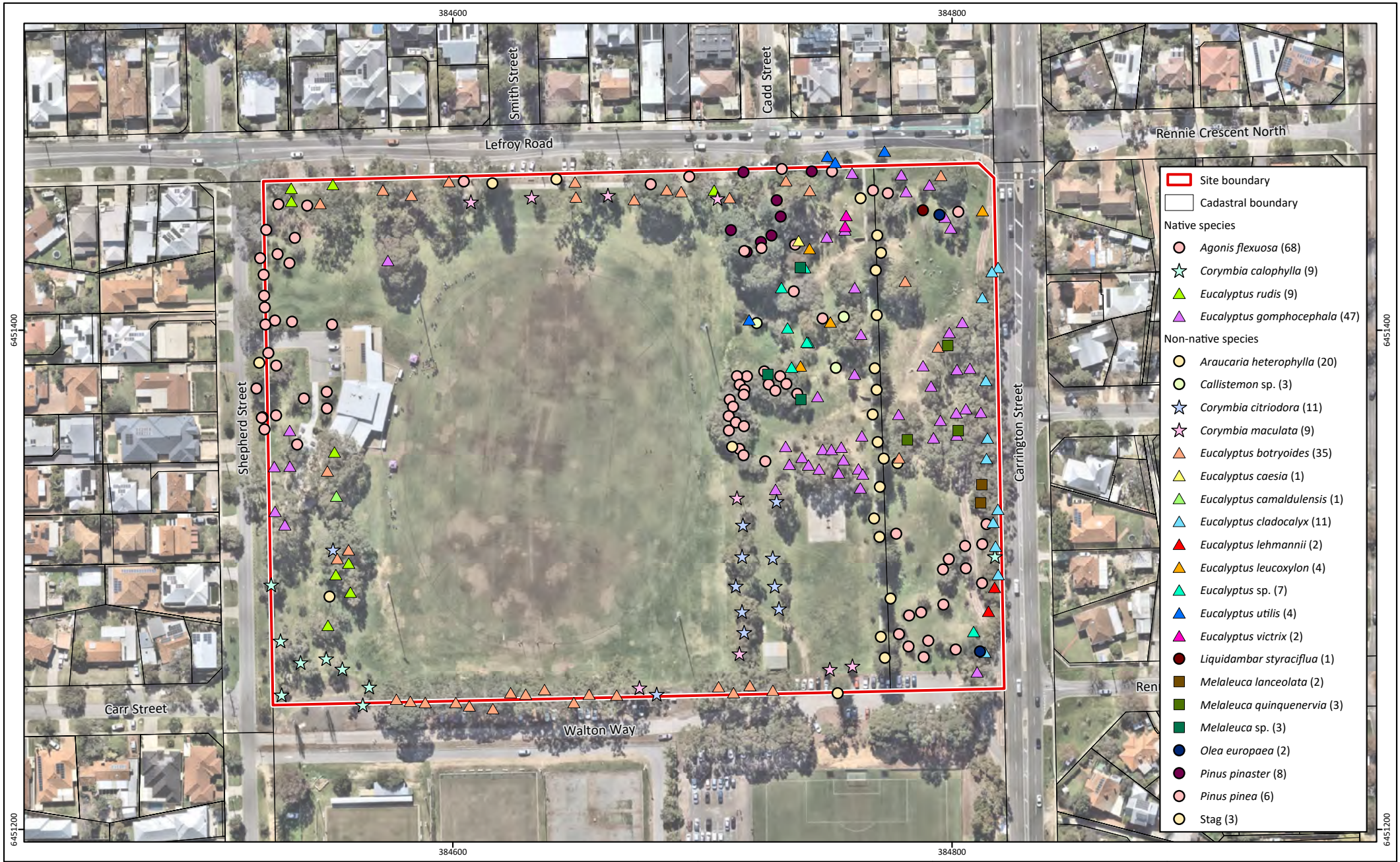


Figure 9: Tree Inventory

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Client: City of Fremantle

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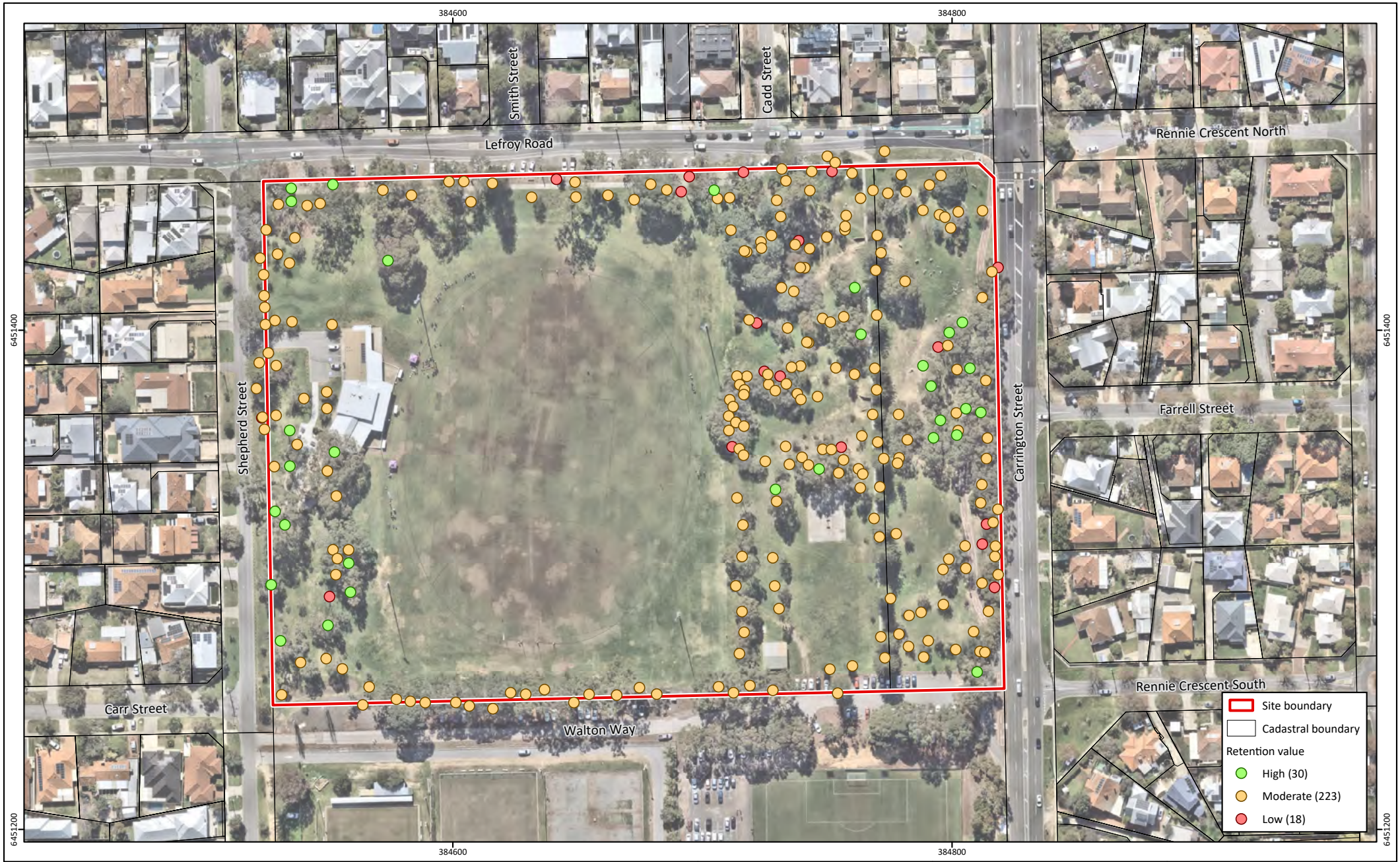


Figure 10: Tree Retention Values

Project:	Targeted Flora, Vegetation, Fauna, Black Cockatoo and Tree Retention Assessment Hilton Park North
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Appendix A

Conservation Significant Flora Species and Likelihood of Occurrence Assessment

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Grevillea thelemanniana	CR	CR	P	Sand, sandy clay. Winter-wet low-lying flats.	May-Nov	Low
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	CR	CR	P	Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.	Oct	Negligible
Caladenia huegelii	CR	EN	PG	Banksia spp., Eucalyptus marginata and Corymbia calophylla woodlands, usually within 20km of the coast. Grows amongst dense low shrubs in well-drained, deep sandy soils in lush undergrowth in a variety of moisture levels. Soils usually deep grey-white sand associated with the Bassendean sand dune system but may also extend into Spearwood dune system.	Sep-Nov	Negligible
Drakaea elastica	CR	EN	PG	Bare patches of sand within otherwise dense vegetation in low-lying areas alongside winter-wet swamps. Typically in banksia woodland or thickets of Kunzea glabrescens.	Sep-Nov	Negligible
Eucalyptus x balanites	CR	EN	P	Light coloured sandy soils over laterite. Habitat consists of gently sloping heathlands; open mallee woodland over shrubland (Population 2) or heathland with emergent mallees (population 1).	Oct-Feb	Negligible
Diuris purdiei	EN	EN	PG	Sand to sandy clay soils in areas subject to winter inundation.	Sep-Oct	Negligible
Macarthuria keigheryi	EN	EN	P	Low-lying winter-wet damp grey/white sands in open patches.	Sep-Dec, Feb-Mar	Negligible
Thelymitra stellata	EN	EN	PG	Sandy loam, clay or gravel over laterite or gravel.	Sep-Nov	Negligible

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Andersonia gracilis	VU	EN	P	Seasonally damp, black sandy clay flats near or on the margins of swamps.	Sep-Nov	Negligible
Banksia mimica	VU	EN	P	White or grey sand over laterite, sandy loam in open woodlands.	Dec-Jan	Negligible
Drakaea micrantha	EN	VU	PG	Open sandy patches often adjacent to winter-wet swamps.	Sep-Oct	Negligible
Conospermum undulatum	VU	VU	P	Sand and sandy clay soils, on flat or gently sloping sites between the Swan and Canning Rivers.	May-Oct	Negligible
Diuris drummondii	VU	VU	PG	In low-lying depressions in peaty and sandy clay swamps.	Nov-Jan	Negligible
Diuris micrantha	VU	VU	PG	Dark grey-black sandy clay-loam in winter wet depressions or swamps. Often in shallow standing water.	Aug-Oct	Negligible
Eleocharis keigheryi	VU	VU	P	Clay or sandy loam in freshwater creeks and transient waterbodies such as seasonally wet clay pans.	Aug-Dec	Negligible
Adiantum capillus-veneris	P2	-	P	Moist, sheltered sites in gorges and on cliff walls.	N/A	Low
Netrostylis sp. Chandala (G.J. Keighery 17055)	P2	-	P	Peaty soils on edges of swamps.	Feb, July	Low
Angianthus micropodioides	P3	-	A	Saline sandy soils on edge of rivers, depressions and clay pans.	Nov-Dec, Jan-Feb	Low
Beyeria cinerea subsp. cinerea	P3	-	P	Sand, limestone.	May-Oct	Low
Cyathochaeta teretifolia	P3	-	P	Grey sand, sandy clay in swamps and creek edges.	Oct-Jan	Low
Dampiera triloba	P3	-	P	Damp peat/loam soil.	Aug-Dec	Low
Jacksonia gracillima	P3	-	P	Sand, often adjacent to winter wet areas.	Sep-Dec	Low
Pimelea calcicola	P3	-	P	Sand, limestone on coastal ridges.	Sep-Nov	Low

Species name	Level of significance		Life strategy	Habitat	Flowering period	Likelihood of occurrence
	WA	EPBC Act				
Stylidium paludicola	P3	-	P	Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.	Oct-Dec	Low
Styphelia filifolia	P3	-	P	Brown over pale yellow sand.	Feb-Apr	Low
Dodonaea hackettiana	P4	-	P	Sand, outcropping limestone.	Jul-Oct	Low
Eucalyptus foecunda subsp. foecunda	P4	-	P	Sand over limestone. Outcropping limestone.	Jan-Mar	Low
Grevillea olivacea	P4	-	P	White or grey sand. Coastal dunes, limestone rocks.	Jun-Sep	Low
Hydrocotyle lemnoides	P4	-	A	Floating in swamps.	Aug-Oct	Negligible
Jacksonia sericea	P4	-	P	Calcareous and sandy soils on Swan Coastal Plain.	Dec-Feb	Low
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4	-	P	Winter-wet areas on grey sand.	Oct-Feb	Negligible

Note: CR=critically endangered, EN=endangered, VU=vulnerable, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4, P=perennial, PG=perennial geophyte, A=annual.

Appendix B

Conservation Significant Communities and Likelihood of Occurrence Assessment

Code	Community name	TEC/ PEC	Level of significance		Likelihood of occurrence
			State	EPBC Act	
BW SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	TEC/ PEC	P3	EN	Low
SCP30a	Callitris preissii (or Melaleuca lanceolata) forests and woodlands of the Swan Coastal Plain (floristic community type 30a as originally described in Gibson et al. 1994)	TEC	CR	-	Low
Empodisma Peatlands	Empodisma peatlands of southwestern Australia	TEC	-	EN	Low
Honeymyrtle Shrublands	Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion				Low
SCP26a	Melaleuca huegelii - M. systena shrublands of limestone ridges (floristic community type 26a as originally described in Gibson et al. 1994)	TEC	CR	-	Low
FCT 24	Northern Spearwood shrublands and woodlands	PEC	P3	-	Low
Coastal Saltmarsh	Subtropical and Temperate Coastal Saltmarsh	TEC/ PEC	P3	VU	Low
Tuart Woodlands	Tuart (Eucalyptus gomphocephala) woodlands and forests of the Swan Coastal Plain	PEC	P3	-	Moderate
Wooded Waterbird Wetlands	Wooded wetlands which support colonial waterbird nesting areas	PEC	P2	-	Low

Note: TEC=threatened ecological community, PEC=priority ecological community, CR=critically endangered, EN=endangered, VU=vulnerable, P3=priority 3. Communities considered to potentially occur within the site are shaded green.

Appendix C

Conservation Significant Fauna Species and Likelihood of Occurrence Assessment

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Birds					
Actitis hypoleucos	Common sandpiper	MI	MI	Edge of sheltered waters salt or fresh, e.g. estuaries, mangrove creeks, rocky coasts, near-coastal saltlakes (including saltwork ponds), river pools, lagoons, claypans, drying swamps, flood waters, dams and sewage ponds. Preferring situations where low perches are available (Johnstone & Storr 1998).	Low
Anous stolidus	Common noddy	MI	MI	Tropical and subtropical seas, cayes, reefs, buoys and piles (Pizzey & Knight 2012).	Negligible
Anous tenuirostris melanops	Australian lesser noddy	EN	VU	Very common in blue-water seas around the Abrolhos (endemic to this area, accidental occurrences on lower west coast of Australia) (Johnstone and Storr 1998).	Negligible
Apus pacificus	Pacific swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities (Pizzey & Knight 2012).	Moderate
Ardenna carneipes	Flesh-footed shearwater	VU	MI	Marine species that breeds on islands off south coast from near Cape Leeuwin (Johnstone and Storr 1998).	Low
Ardenna grisea	Sooty shearwater	MI	MI	Marine, migratory species that may visit south-western Australian waters from June to October (Pizzey & Knight 2012).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Ardenna pacifica	Wedge-tailed Shearwater	MI	MI	Pelagic species that inhabits tropical and subtropical seas. Common in western and eastern Australian seas. In western Australia breeds on offshore islands from Montebello to Rottnest/Carnac (Morcombe & Stewart 2021; Pizzey & Knight 2012).	Low
Arenaria interpres	Ruddy turnstone	VU (MI)	VU (MI)	Tidal mud and reef flats, sheltered rocky coasts, stony and seaweedy beaches and sandpits, dry coral ridges (Abrolhos) and pebbly shores of near-coastal saltlakes (including saltwork ponds) (Johnstone and Storr 1998).	Low
Botaurus dubius	Australian little bittern	P4	-	Dense vegetation surrounding/within freshwater pools, swamps and lagoons, well screened with trees. Shelters in dense beds of Typha spp., Baumea spp. and tall rushes in freshwater swamps around lakes and along rivers (Johnstone and Storr 1998).	Low
Botaurus poiciloptilus	Australasian bittern	EN	EN	In or over water, in tall reedbeds, sedges, rushes, cumbungi, lignum. Also occurs in ricefields, drains in tussocky paddocks and occasionally in saltmarshes and brackish wetlands (TSSC 2019).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Calidris acuminata	Sharp-tailed sandpiper	VU (MI)	VU (MI)	Occurs in tidal mudflats, saltmarshes and mangroves, as well as, shallow fresh, brackish or saline inland wetlands. It is also known from floodwaters, irrigated pastures and crops, sewage ponds, saltfields (Pizzey & Knight 2012).	Low
Calidris alba	Sanderling	MI	MI	Mainly steeply shelving sandy beaches exposed to ocean swell. Also sandy inlets, estuarine sandbanks and near-coastal saltlakes (including saltwork ponds) (Johnstone & Storr 1998).	Negligible
Calidris canutus	Red knot	EN	EN (MI)	Mud and sand flats in estuaries and on sheltered coasts. Also near-coastal saltlakes, including saltwork ponds (Pizzey & Knight 2012).	Low
Calidris ferruginea	Curlew sandpiper	CR	CR (MI)	Mainly shallows of estuaries and near-coastal saltlakes (including saltwork ponds) and drying near-coastal freshwater lakes and swamps. Also beaches and near-coastal sewage ponds (Johnstone & Storr 1988).	Low
Calidris melanotos	Pectoral sandpiper	MI	MI	Mainly fresh waters (swamps, lagoons, river pools, irrigation channels and sewage ponds); also samphire flats around estuaries and saltlakes (Johnstone & Storr 1998).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Calidris pugnax	Ruff	MI	MI	Fresh, brackish and saline wetlands; tidal mudflats, saltfields, sewage ponds (Pizzey & Knight 2012).	Negligible
Calidris ruficollis	Red-necked stint	MI	MI	Tidal mudflats, saltmarshes, sandy or shelly beaches, saline and freshwater wetlands (coastal and inland), saltfields, sewage ponds (Pizzey and Knight 2012).	Low
Calidris subminuta	Long-toed stint	MI	MI	Mainly freshwater swamps (especially when drying and where vegetation is short), river pools, lagoons and claypans; also brackish pools, sewage ponds and samphire flats around estuaries and saltlakes (Johnstone & Storr 1988).	Low
Calidris tenuirostris	Great knot	CR	CR (MI)	Mud or sand flats in estuaries and on sheltered coasts. Also near-coastal saltlakes, including saltwork ponds (Johnstone & Storr 1988).	Low
Calonectris leucomelas	Streaked shearwater	MI	MI	Regular non-breeding visitor to western Australian north of Geraldton (Pizzey & Knight 2012).	Negligible
Calyptorhynchus banksii naso	Forest red-tailed black cockatoo	VU	VU	Eucalypt and Corymbia forests, often in hilly interior. More recently also observed in more open agricultural and suburban areas including Perth metropolitan area. Attracted to seeding Corymbia calophylla, Eucalyptus marginata, introduced Melia azedarach and Eucalyptus spp. trees (Johnstone et al. 2013).	High

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Charadrius cucullatus	Hooded plover	P4	MA	Margins and shallows of saltlakes, sandy and seaweedy beaches and estuaries; also dams (Johnstone and Storr 1998).	Low
Charadrius dubius	Little ringed plover	MI	MI	Open, muddy or sandy shores of lakes, swamps, tidal areas, sewage ponds or farm dams. Rare but regular summer migrant to Australia (Pizzey & Knight 2012).	Negligible
Charadrius leschenaultii	Great sand plover	VU	VU (MI)	Wide sandy or shelly beaches, sandpits, tidal mudflats, reefs, sand cays, mangroves, saltmarsh, dune wilderness, bare paddocks, seldom far inland (Pizzey & Knight 2012).	Negligible
Charadrius mongolus	Lesser sand plover	EN	EN (MI)	Sandy beaches and tidal estuarine flats. Also near-coastal saltlakes, including saltwork ponds (Johnstone & Storr 1998).	Negligible
Chlidonias leucopterus	White-winged black tern	MI	MI	Vegetated and open wetlands, brackish and saline lakes, saltfields, irrigated lands, sewage ponds and occasionally offshore (Pizzey & Knight 2012).	Low
Diomedea amsterdamensis	Amsterdam Island albatross	CR	EN (MI)	The Amsterdam albatross is a marine, pelagic seabird. It nests in open patchy vegetation (among tussocks, ferns or shrubs) near exposed ridges or hillocks (Weimerskirch et al. 1985). It sleeps and rests on ocean waters when not breeding (Marchant and Higgins 1990)	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Diomedea dabbenena	Tristan albatross	CR	EN (MI)	The Tristan albatross is a marine, pelagic seabird. It forages in open water in the Atlantic Ocean near the Cape of Good Hope, South Africa. It sleeps and rests on ocean waters when not breeding (Marchant and Higgins 1990).	Negligible
Diomedea epomophora	Southern royal albatross	VU	VU (MI)	Rare visitor to Western Australian seas; it breeds on subantarctic islands south of New Zealand (Johnstone and Storr 1998).	Negligible
Diomedea exulans	Wandering albatross	VU	VU (MI)	Marine, pelagic and aerial species. It breeds on Macquarie Island and feeds in Australian portions of the Southern Ocean (DCCEEW 2022).	Negligible
Diomedea sanfordi	Northern royal albatross	EN	EN	Species is marine, pelagic and aerial. Habitat includes subantarctic, subtropical, and occasionally Antarctic waters (Marchant & Higgins 1990). Rare visitors to south-western Australian waters.	Negligible
Falco hypoleucos	Grey falcon	VU	VU	Species occurs in arid and semi-arid Australia, where it inhabits timbered lowland plains. In particular Acacia shrublands and that are crossed by tree-lined water courses. Species has also been observed hunting in treeless areas and frequenting tussock grassland and open woodlands (TSSC 2020).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Falco peregrinus	Peregrine falcon	OS	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes (Johnstone and Storr 1998).	Low
Falco peregrinus macropus	Australian peregrine falcon	S	-	Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes (Johnstone & Storr 1988).	Negligible
Gallinago stenura	Pin-tailed snipe	MI	MI	Boggy edges of vegetated wetlands; sewage and other ponds; stubbles, grasslands with shrubs, pastures (Pizzey & Knight 2012).	Negligible
Halobaena caerulea	Blue petrel	MI	VU (MI)	Marine species that breeds on southern subantarctic and northern artic islands. Only an accidental or uncommon visitor to Western Australian waters (Johnstone & Storr 1998).	Negligible
Hydroprogne caspia	Caspian tern	MI	MI	Mainly sheltered areas, estuaries (when not laden with silt) and tidal creeks; occasionally near-coastal saltlakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh waters (DCCEEW 2023).	Low
Leipoa ocellata	Malleefowl	VU	VU	Scrubs and thickets of Eucalyptus spp., Melaleuca lanceolata and Acacia linophylla; also other dense litter-forming shrublands. Attracted to fallen wheat in stubbles and along roads (Johnstone and Storr 1998).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Limosa lapponica	Bar-tailed godwit	MI	MI	Estuarine sand and mudflats and sandy beaches with loads of seaweed; also reef flats and near-coastal saltlakes (including saltwork and sewage ponds) (Johnstone and Storr 1998).	Low
Limosa lapponica menzbieri	Bar-tailed godwit	CR (MI)	CR (MI)	Mainly coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats (Higgins and Davies 1996).	Negligible
Limosa limosa	Black-tailed godwit	EN MI	EN (MI)	Tidal mudflats, estuaries, sewage ponds, shallow river margins, brackish or saline inland lakes, flooded pastures, airfields (Pizzey & Knight 2012).	Low
Macronectes giganteus	Southern giant-petrel	MI	EN (MI)	Breeds on southern subantarctic and antarctic islands. May visit Western Australian waters from February to December (mostly June to September) (Johnstone and Storr 1998).	Negligible
Macronectes halli	Northern giant petrel	MI	VU (MI)	Breeds on subantarctic islands. May visit Western Australian water from February to September (Johnstone and Storr 1998).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Neophema petrophila	Rock parrot	P4	-	Low vegetation on islands and mainland beaches and dunes. Attracted to seeding composites.	Low
Ninox connivens connivens	Barking owl (southwest subpop.)	P3	-	Open forests, woodlands, dense scrubs, foothills, river red gums, and other large trees near watercourses penetrating otherwise open country. Also Melaleuca woodlands, mangroves, rainforests and deciduous vine scrubs (Johnstone and Storr 1998; Pizzey & Knight 2012).	Low
Numenius madagascariensis	Eastern curlew	CR	CR (MI)	Mainly tidal mudflats; also reef flats, sandy beaches and rarely near-coastal lakes (including saltwork ponds) (Johnstone and Storr 1998).	Low
Numenius phaeopus	Whimbrel	MI	MI	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, bare grasslands, sportsgrounds and lawns (Pizzey & Knight 2012).	Low
Oceanites oceanicus	Wilson's storm petrel	MI	MI	Marine, migratory species that may visit south-western Australian waters and shores in late autumn to winter (Pizzey & Knight 2012).	Negligible
Onychoprion anaethetus	Bridled tern	MI	MI	Tropical and subtropical seas, offshore islands, rarely coasts (Pizzey & Knight 2012).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Oxyura australis	Blue-billed duck	P4	-	Mainly deeper freshwater swamps and lakes; occasionally saltlakes and estuaries freshened by flood waters (Johnstone and Storr 1998).	Low
Pachyptila turtur subantarctica	Fairy prion	-	VU	Breeds on subantarctic islands and is presumed to frequent subtropical waters during non-breeding period (TSSC 2015).	Negligible
Pandion haliaetus	Osprey	MI	MI	Coasts, estuaries, bays, inlets, islands, and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks (Pizzey & Knight 2012).	Low
Phaethon rubricauda	red-tailed tropicbird	P4 (MI)	MI	Breeding occurs seasonally in loose colonies on small, remote oceanic islands mostly on inaccessible cliffs. No regular migrations are known; adults can be found in the vicinity of colonies all year round (Schreiber & Schreiber 2020).	Low
Phaethon rubricauda westralis	Red-tailed tropicbird	P4 (MI)	EN (MI)	Spend most of their lives at sea and rarely venture near land. This bird is normally found in tropical and subtropical seas around northern Australia. Though rarely seen in colder areas, a few pairs breed on Sugarloaf Rock, south of Cape Naturaliste (DPAW 2017b). Are known to breed on Rottnest Island (DCCEEW 2023).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Phoebetria fusca	Sooty albatross	EN	VU (MI)	Marine, pelagic species that tolerates a wide range of sea surface temperatures and salinities. breeds on subtropical and subantarctic islands in the Indian and Atlantic Oceans, on vegetated cliffs and steep slopes that are sheltered from prevailing winds, often amongst tussock grass (Pizzey & Knight 2012).	Negligible
Plegadis falcinellus	Glossy Ibis	MI	MI	Well-vegetated wetlands, wet pasture, ricefields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats and occasionally dry grassland (Pizzey & Knight 2012).	Low
Pluvialis fulva	Pacific golden plover	MI	MI	Estuaries, mudflats, saltmarshes, mangroves; rocky reefs and stranded seaweed on ocean shores; margins of shallow open inland swamps; sewage ponds, short-grass paddocks, sportsgrounds, airfields, ploughed land (Pizzey & Knight 2012).	Low
Pluvialis squatarola	Grey Plover	VU (MI)	VU (MI)	Mudflats, saltmarsh, tidal reefs and estuaries, rarely inland (Pizzey and Knight 2012).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Pterodroma mollis	Soft-plumaged petrel	MI	VU (MI)	Marine species that breeds on temperate and subantarctic islands in south Atlantic and south Indian Ocean. Visitor to West Australian waters from March to September. Rarely observed inshore (Johnstone & Storr 1998).	Negligible
Puffinus huttoni	Hutton's shearwater	EN	MI	Marine species that breeds in New Zealand and disperses mainly to seas off northern Australia (Johnstone & Storr 1998).	Negligible
Rostratula australis	Australian painted snipe	EN	EN	Mainly shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (Marchant and Higgins 1993).	Low
Stercorarius antarcticus	Brown skua	MI	MI	Mostly beyond shelf break; occasionally on beaches foraging on dead seals or whales (Pizzey & Knight 2012).	Negligible
Stercorarius parasiticus	Arctic skua	MI	MI	Offshore waters, bays and harbours, seldom ashore. Also follows ships (Pizzey & Knight 2012).	Negligible
Stercorarius pomarinus	Pomarine Skua (Pomarine Jaeger)	MI	MI	Oceans, offshore waters, entrances of harbours, bays (Pizzey & Knight 2012).	Negligible
Sterna dougallii	Roseate tern	MI	MI	Offshore waters, islands, coral reefs, sand cays, beaches, tidal inlets (Pizzey & Knight 2012).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Sterna hirundo	Common tern	MI	MI	Offshore waters, beaches, reefs, bays, estuaries, sandflats, saltfields, sewage ponds, freshwater wetlands (Pizzey & Knight 2012).	Negligible
Sterna paradisaea	Arctic tern	MI	MI	Sheltered coasts, estauries and near-coastal lakes. Scarce passage migrant and accidental visitor (Johnston and Storr 1998).	Negligible
Sternula albifrons	Little tern	MI	MI	Species is mainly coastal, being found on beaches, sheltered inlets, estuaries, lakes, sewage farms, lagoons, river mouths and deltas (Pizzey & Knight 2012).	Negligible
Sternula nereis nereis	Australian fairy tern	VU	VU	Sheltered blue-water seas close to land, estuaries (when free of silt) and near-coastal lakes (Johnstone and Storr 1998).	Low
Thalassarche carteri	Indian yellow-nosed albatross	EN	VU (MI)	Marine species that inhabits seas of south and west coast of Western Australia and breeds on islands in the south Indian Ocean and in the south Atlantic (Johnstone & Storr 1998).	Negligible
Thalassarche cauta	Shy albatross	VU	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	Negligible
Thalassarche chlororhynchos	Atlantic yellow-nosed albatross	VU	MI	Marine migratory species that breeds on the Tristan da Cunha group and on Gough Island. Sparse visitor to Australian waters/shores (DCCEEW 2022).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Thalassarche chrysostoma	Grey-headed albatross	VU	EN (MI)	Marine migratory species that remains at sea for most of its life. Breeding habitat on subantarctic and Antarctic islands of the Indian and Atlantic Oceans and seas south of New Zealand (Marchant and Higgins 1993).	Nil
Thalassarche impavida	Campbell albatross	VU	VU (MI)	Scarce visitor to south-western and western Australian seas. Breeds on Campbell Island (Pizzey & Knight 2012).	Negligible
Thalassarche melanophris	Black-browed albatross	EN	VU (MI)	Seas of south and west coasts. Visitor to Western Australian mainland from January to early November (mostly May to September). Breeds on southern subantarctic and Antarctic islands (Johnstone and Storr 1998).	Low
Thalassarche steadi	White-capped albatross	VU	VU (MI)	Scarce visitor (late May to mid-October) to southwestern and western seas. Breeds on islands off Tasmania and south New Zealand (Johnstone and Storr 1998).	Negligible
Thalasseus bergii	Crested tern	MI	MI	Mainly blue-water seas (especially within 3 km of land), including southern estuaries in summer and autumn (when free of silt); also tidal creeks in north, but not penetrating far into larger estuaries (DCCEEW 2023).	Nil

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Tringa brevipes	Grey-tailed tattler	P4 (MI)	MI	Tidal mud and reef flats, sheltered rocky coasts, stony and seaweedy beaches and sandpits, dry coral ridges (Abrolhos) and pebbly shores of near-coastal saltlakes (including saltwork ponds) (Johnstone and Storr 1998).	Low
Tringa glareola	Wood sandpiper	MI	MI	Mainly shallow fresh waters (lagoons, swamps, claypans, river pools, dams, bore overflows and sewage ponds); occasionally brackish swamps, rarely saltlakes and estuaries (Pizzey & Knight 2012).	Low
Tringa nebularia	Common greenshank	EN (MI)	EN (MI)	Mudflats, estuaries, saltmarshes, margins of lakes, wetlands, claypans (fresh and saline), commercial saltfields, sewage ponds (Pizzey & Knight 2012).	Low
Tringa stagnatilis	Marsh sandpiper	MI	MI	Mainly shallow fresh or brackish waters: swamps, lakes, river pools, soaks, sewage ponds and bore overflows. Occasionally estuaries and salt ponds, and rarely coasts (DCCEEW 2023).	Low
Tyto novaehollandiae novaehollandiae	Australian masked owl	P3	-	Forests, open woodlands, farmlands with large trees. E.g. river red gums, adjacent cleared country, timbered watercourses, paperbark woodlands and caves (Pizzey & Knight 2012).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Xenus cinereus	Terek sandpiper	VU (MI)	VU (MI)	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields (Pizzey & Knight 2012).	Negligible
Zanda baudinii	Baudin's black cockatoo	EN	EN	Mainly eucalypt forests. Attracted to seeding Corymbia calophylla, Banksia spp., Hakea spp., and to fruiting apples and pears (Johnstone and Storr 1998).	Nil
Zanda latirostris	Carnaby's black cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of Pinus spp. Attracted to seeding Banksia spp., Hakea spp., Eucalyptus spp., Corymbia calophylla, Grevillea spp., and Allocasuarina spp. (Johnstone and Storr 1998).	High
Invertebrates					
Euoplos inornatus	Inornate trapdoor spider	P3	-	Has previously been recorded in jarrah and marri forest on lateritic soils. Most records are from the Darling scarp/Jarrah Forest Region, with limited records from the Swan Coastal Plain (Rainbow & Pulleine 1918).	Low
Hesperocolletes douglasi	Douglas's broad-headed bee	CR	CR	Banksia woodland vegetation (Pille Arnold 2019).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Idiosoma sigillatum	Swan Coastal Plain shield-backed trapdoor spider	P3	-	Widely distributed in sandy areas on the Swan Coastal Plain and on Rottnest Island (Prince 2003). Species predominantly recorded from remnant banksia woodland vegetation and heath on sandy soils (Rix et. al 2018).	Low
Leioproctus contrarius	a short-tongued bee	P3	-	Life history and habits are poorly documented/ unknown.	Negligible
Synemon gratiosa	Graceful sun-moth	P4	-	Coastal heathland on Quindalup dunes where it is restricted to secondary sand dunes due to the abundance of the preferred host plant Lomandra maritima. Banksia woodland on Spearwood and Bassendean dunes, where the second known host plant L. hermaphrodita is widespread (DEC 2011).	Low
Throscodectes xiphos	Stylet bush cricket	P1	-	Species poorly understood and documented. Known from Jandakot area, where it was originally collected in the axial leaf bases of grass trees (Xanthorrhoea preissii) (Invertebrate Solutions 2019).	Negligible

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Westralunio carteri	Carter's freshwater mussel	VU	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots. Also occupies lentic systems including large water supply dams and even on-stream farm dams. Salinity tolerance quite low (Morgan et al. 2011).	Negligible
Mammals					
Dasyurus geoffroii	Chuditch	VU	VU	Wide range of habitats from woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. Appears to utilise native vegetation along roadsides in the wheatbelt (DEC 2012).	Low
Falsistrellus mackenziei	Western false pipistrelle	P4	-	High rainfall forests dominated by jarrah, karri, marri, and tuart. Occupies hollow logs for breeding and resting (Van Dyck and Strahan 2008). Also known to utilise Banksia woodland on the Swan Coastal Plain (Hosken and O'Shea 1995).	Negligible
Hydromys chrysogaster	Rakali	P4	-	Areas with permanent water, fresh, brackish or marine. Likely to occur in all major rivers and most of the larger streams as well as bodies of permanent water in the lower south-west (Christensen et al. 1984). Intact riparian vegetation and associated bank stability is critical to their survival (DWER 2023).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Isoodon fusciventer	Quenda	P4	-	Dense scrubby, often swampy, vegetation with dense cover up to one metre high (DEC 2012)	Low
Myrmecobius fasciatus	Numbat	EN	EN	Generally dominated by Eucalyptus spp. that provide hollow logs and branches for shelter and termites for food (van Dyck & Strahan 2008).	Negligible
Notamacropus eugenii derbianus	Tammar wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	Negligible
Notamacropus irma	Western brush wallaby	P4	-	Dry sclerophyll forest, Banksia spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover (Christensen and Strahan 1983).	Negligible
Parantechinus apicalis	Dibbler	EN	EN	Old-growth mallee heath in coastal southwest and Escape Island off Jurien Bay (Menkhorst and Knight 2011).	Negligible
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale	CD	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover (Triggs 2003).	Low
Pseudocheirus occidentalis	Western ringtail possum	CR	CR	On the Swan Coastal Plain in Agonis flexuosa woodlands and Agonis flexuosa/ Eucalyptus gomphocephala forests. Also Eucalyptus marginata forests (DBCA 2017).	Low

Species name	Common name	Level of significance		Habitat	Likelihood of occurrence
		WA	EPBC Act		
Setonix brachyurus	Quokka	VU	VU	On the mainland mostly dense streamside vegetation or shrubland and heath areas, particularly around swamps (Cronin 2007).	Low
Reptiles					
Lerista lineata	Perth slider	P3	-	Sandy coastal heath and low scrubland. Banksia spp. woodland, Eucalyptus gomphocephala open woodland over deep sands, and coastal dunes immediately adjacent to the beach (Wilson and Swan 2021).	Low
Neelaps calonotos	Black-striped snake	P3	-	Coastal and near-coastal dunes, sandplains supporting heathlands and Banksia spp. woodlands (Bush et al. 2010).	Negligible
Pseudemydura umbrina	*Western swamp tortoise*	CR	CR	Clay based ephemeral swamps (Bush et al. 2010).	Negligible
Note: CR=critically endangered, EN=endangered, VU=vulnerable, CD=conservation dependent, MI=migratory, OS=other specially protected, P1=Priority 1, P2=Priority 2, P3=Priority 3, P4=Priority 4. Species with a high or moderate likelihood to occur within the site are shaded green.					

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Appendix D

Black Cockatoo Foraging Plants

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Acacia baileyana	Cootamundra wattle	Secondary	-	-	Groom 2011
Acacia pentadenia	Karri wattle	Secondary	-	-	Groom 2011
Acacia saligna	Orange wattle	Secondary	-	-	Groom 2011
Agonis flexuosa	Peppermint tree	Secondary	-	-	Groom 2011
Allocasuarina fraseriana	Sheoak	Secondary	Secondary	Secondary	Johnstone & Storr 1998; Johnstone *et al.* 2010; Johnstone 2017; DoEE 2017
Allocasuarina spp.		Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Anigozanthos flavidus	Tall kangaroo paw	-	Secondary	-	Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Araucaria heterophylla	Norfolk island pine	Secondary	-	-	Groom 2011; DoEE 2017
Banksia ashbyi	Ashby's banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia attenuata	Slender banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia baxteri	Baxter's banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia carlinoides	Pink dryandra	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia coccinea	Scarlet banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia dallanneyi	Couch honeypot dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia ericifolia	Heath-leaved banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia fraseri		Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia gardneri	Prostrate banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia grandis	Bull banksia	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia hookeriana	Hooker's banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia ilicifolia	Holly banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; Johnstone & Storr 1998; DoEE 2017
Banksia kippistiana		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia leptophylla		Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia lindleyana	Porcupine banksia	Primary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Banksia littoralis	Swamp banksia	Primary	Secondary	-	Saunders 1980; Groom 2011Johnstone & Storr 1998; Johnstone *et al.* 2010; DoEE 2017
Banksia menziesii	Firewood banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia mucronulata	Swordfish dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia nivea	Honeypot dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia nobilis	Golden dryandra	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Banksia praemorsa	Cut-leaf banksia	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia prionotes	Acorn banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia prolata		Primary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Banksia quercifolia	Oak-leaved banksia	Primary	Secondary	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia sessilis	Parrot bush	Primary	Secondary	-	Saunders 1980; Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia speciosa	Showy banksia	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Banksia squarrosa	Pingle	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Banksia tricuspis	Pine banksia	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia undata	Urchin dryandra	Primary	Secondary	-	Groom 2011; DoEE 2017
Banksia verticillata	Granite banksia	Primary	Secondary	-	Saunders 1980; Groom 2011; DoEE 2017
Brassica campestris	Canola	Secondary	-	-	Groom 2011; DoEE 2017
Callistemon spp.		Secondary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Callistemon viminalis	Captain cook bottlebrush	Secondary	-	-	Groom 2011
Callitris sp.		Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Carya illnoinensis	Pecan	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; Groom 2014; DoEE 2017
Casuarina cunninghamiana	River sheoak	Secondary	-	-	Groom 2011
Citrullus lanatus	Pie or afghan melon	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Corymbia calophylla	Marri	Primary	Primary	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Saunders 1979; Johnstone & Kirkby 2008
Corymbia citriodora	Lemon scented gum	Secondary	Secondary	Secondary	Johnstone *et al.* 2010; DSEWPaC 2012; Groom 2011; Johnstone 2017
Corymbia ficifolia	Red flowering gum	Secondary	-	-	Groom 2011
Corymbia haematoxylon	Mountain marri	Secondary	-	Secondary	Groom 2011; DoEE 2012; DoEE 2017
Corymbia maculata	Spotted gum	-	-	-	-
Darwinia citriodora	Lemon-scented darwinia	Secondary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Diospryros sp.	Sweet persimmon	Secondary	Secondary	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eremophila glabra	Tarbush	Secondary	-	-	Groom 2011
Erodium aureum		Secondary	-	-	Groom 2011
Erodium botrys	Long storksbill	Secondary	Secondary	-	Groom 2011; Johnstone & Storr 1998; Johnstone *et al.* 2010
Erodium spp.		Secondary	Secondary	-	Johnstone *et al.* 2010; DoEE 2017
Eucalyptus caesia	Silver princess	Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone 2017
Eucalyptus camaldulensis	River red gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus decipiens	Red heart/moit	-	-	Secondary	Johnstone 2017
Eucalyptus diversicolor	Karri	-	-	Primary	Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998
Eucalyptus erythrocorys	Illyarrie	Secondary	-	Secondary	DSEWPaC 2012; DoEE 2017; Johnstone 2017, Johnstone *et al.* 2010
Eucalyptus gomphocephala	Tuart	Secondary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus grandis	Flooded gum, rose gum	-	-	Secondary	DoEE 2012; DoEE 2017
Eucalyptus lehmannii	Bushy yate	-	-	Secondary	Johnstone 2017
Eucalyptus leucoxylon	Yellow gum	Secondary	-	-	Groom 2014

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Eucalyptus loxophleba	York gum	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Eucalyptus marginata	Jarrah	Primary	Secondary	Primary	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DoEE 2017; Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone 2017
Eucalyptus patens	Blackbutt	Primary	-	Primary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017; Johnstone 2017; Groom 2011
Eucalyptus pleurocarpa	Tallerack	Secondary	-	-	Groom 2011
Eucalyptus preissiana	Bell-fruited mallee	Secondary	-	-	Groom 2011
Eucalyptus robusta	Swamp mahogany	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Eucalyptus salmonophloia	Salmon gum	Primary	-	-	Johnstone *et al.* 2010; Groom 2011; DSEWPaC 2012; DSEWPaC 2012; DoEE 2017
Eucalyptus staeri	Albany blackbutt	-	-	Secondary	Johnstone & Storr 1998
Eucalyptus todtiana	Coastal blackbutt	Secondary	-	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011; Johnstone & Kirkby 2008
Eucalyptus wandoo	Wandoo	Primary	Secondary	Primary	Saunders 1980; Johnstone *et al* . 2010; Groom 2011; DSEWPaC 2012; DoEE 2017
Ficus sp.	Fig	Secondary	-	-	Groom 2011
Grevillea armigera	Prickly toothbrushes	Primary	-	-	Groom 2011
Grevillea bipinnatifida	Fuschia grevillea	Primary	-	-	Groom 2011
Grevillea hookeriana	Red toothbrushes	Primary	-	-	Groom 2011
Grevillea hookeriana subsp. api	Black toothbrushes	Primary	-	-	Groom 2011
Grevillea paniculata	Kerosene bush	Primary	-	-	Groom 2011
Grevillea paradoxa	Bottlebrush grevillea	Primary	-	-	Groom 2011
Grevillea petrophiloides	Pink poker	Primary	-	-	Groom 2011
Grevillea robusta	Silky oak	Primary	-	-	Johnstone *et al.* 2010; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Grevillea spp.		Primary	-	-	Saunders 1979; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Grevillea wilsonii	Native fuchsia	-	Secondary	-	Johnstone *et al.* 2010
Hakea auriculata		Primary	-	-	Saunders 1980; Groom 2011
Hakea candolleana		Primary	-	-	Groom 2011
Hakea circumalata	Coastal hakea	Primary	-	-	Groom 2011
Hakea commutata		Primary	-	-	Groom 2011
Hakea conchifolia	Shell-leaved hakea	Primary	-	-	Groom 2011
Hakea costata	Ribbed hakea	Primary	-	-	Groom 2011
Hakea cristata	Snail hakea	Primary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Hakea cucullata	Snail hakea	Primary	-	-	Groom 2011
Hakea cyclocarpa	Ramshorn	Primary	-	-	Saunders 1980; Groom 2011
Hakea eneabba		Primary	-	-	Groom 2011
Hakea erinacea	Hedgehog hakea	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Hakea falcata	Sickle hakea	Primary	-	-	Groom 2011
Hakea flabellifolia	Fan-leaved hakea	Primary	-	-	Groom 2011
Hakea gilbertii		Primary	-	-	Saunders 1980; Groom 2011
Hakea incrassata	Golfball or marble hakea	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Hakea lasiantha	Woolly flowered hakea	Primary	-	-	Johnstone *et al* . 2010; Groom 2011
Hakea lasianthoides		Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Hakea laurina	Pin-cushion hakea	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Hakea lissocarpha	Honeybush	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea marginata		-	Secondary	-	Johnstone *et al.* 2010
Hakea megalosperma	Lesueur hakea	Primary	-	-	Groom 2011
Hakea multilineata	Grass leaf hakea	Primary	-	-	Groom 2011
Hakea neospathulata		Primary	-	-	Groom 2011
Hakea obliqua	Needles and corks	Primary	-	-	Saunders 1980; Groom 2011
Hakea oleifolia	Dungyn	Primary	-	-	Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Hakea pandanicarpa subsp. crassifolia	Thick-leaved hakea	Primary	-	-	Groom 2011
Hakea petiolaris	Sea urchin hakea	Primary	-	-	Groom 2011
Hakea polyanthema		Primary	-	-	Groom 2011
Hakea preissii	Needle tree	Primary	-	-	Groom 2011
Hakea prostrata	Harsh hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea psilorrhyncha		Primary	-	-	Groom 2011
Hakea ruscifolia	Candle hakea	Primary	Secondary	-	Saunders 1980; Groom 2011; Johnstone *et al.* 2010
Hakea scoparia	Kangaroo bush	Primary	-	-	Groom 2011
Hakea smilacifolia		Primary	-	-	Groom 2011
Hakea spp.		Primary	Secondary	-	Saunders 1979; DSEWPaC 2012; DoEE 2017
Hakea stenocarpa	Narrow-fruited hakea	Primary	Secondary	-	Johnstone et al. 2010; Groom 2011
Hakea sulcata	Furrowed hakea	Primary	-	-	Groom 2011
Hakea trifurcata	Two-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea undulata	Wavy-leaved hakea	Primary	Secondary	-	Saunders 1980; Johnstone *et al.* 2010; Groom 2011
Hakea varia	Variable-leaved hakea	Primary	Secondary	-	Saunders 1980; Groom 2011
Harpephyllum caffrum	Kaffir plum	-	-	Secondary	Johnstone 2017
Helianthus annuus	Sunflower	Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Hibiscus sp.	Hibiscus	Secondary	-	-	Groom 2011
Isopogon scabriusculus		Secondary	-	-	Groom 2011
Jacaranda mimosifolia	Jacaranda	Secondary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Jacksonia furcellata	Grey stinkwood	Secondary	-	-	Groom 2011
Kingia australis	Kingia	-	Secondary	-	Johnstone *et al.* 2010
Lambertia inermis	Chittick	Secondary	-	-	Johnstone & Storr 1998; Groom 2011
Lambertia multiflora	Many-flowered honeysuckle	Secondary	-	-	Saunders 1980; Groom 2011

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Liquidamber styraciflua	Liquid amber	Primary	-	Secondary	Johnstone *et al.* 2010; Groom 2011; Groom 2014; Personal observation
Lupinus sp.	Lupin	Secondary	-	-	Saunders 1980; Groom 2011
Macadamia integrifolia	Macadamia	Primary	Secondary	-	Johnstone *et al.* 2010; Grooms 2011; Groom 2014
Malus domestica	Apple	Secondary	Secondary	-	Johnstone *et al* . 2010; Johnstone & Storr 1998; DSEWPaC 2012; DoEE 2017; Groom 2011
Melaleuca leuropoma		Secondary	-	-	Saunders 1980; Groom 2011
Melia azedarach	Cape lilac or white cedar	Secondary	-	Primary	Johnstone *et al.* 2010; Groom 2011
Mesomeleana spp.		Secondary	-	-	Johnstone *et al.* 2010; Groom 2011
Olea europea	Olive	-	-	Secondary	Johnstone 2017
Persoonia longifolia	Snottygobble	-	-	Secondary	Johnstone & Storr 1998; Johnstone & Kirkby 1999; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Pinus canariensis	Canary island pine	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Pinus caribea	Caribbean pine	Primary	-	-	Johnstone *et al.* 2010; Groom 2011
Pinus pinaster	Pinaster or maritime pine	Primary	-	-	Groom 2011
Pinus radiata	Radiata pine	Primary	Secondary	-	Johnstone *et al.* 2010; Groom 2011
Pinus spp.		Primary	Secondary	-	Johnstone & Storr 1998; Saunders 1979; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Protea 'Pink Ice'		Secondary	-	-	Groom 2011
Protea repens		Secondary	-	-	Groom 2011
Protea spp.		Secondary	-	-	Johnstone *et al.* 2010
Prunus amygdalus	Almond tree	Secondary	-	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; Groom 2011; DoEE 2017
Pyrus communis	European pear	-	Secondary	-	Johnstone & Storr 1998; Johnstone *et al.* 2010; DSEWPaC 2012; DoEE 2017
Quercus spp.	Oak	-	Secondary	-	Johnstone *et al.* 2010

Species name	Common name	Foraging category as assigned by Emerge			Literature references
		CBC	BBC	FRTBC	
Raphanus raphanistrum	Wild radish	Secondary	-	-	Groom 2011; DoEE 2017
Reedia spathacea		-	Secondary	-	Johnstone *et al.* 2010
Rumex hypogaeus	Doublegee	Secondary	-	-	Saunders 1980
Stenocarpus sinuatus		Secondary	-	-	Johnstone *et al.* 2010
Syzygium smithii	Lilly pilly	Secondary	-	-	Groom 2014
Tipuana tipu	Tipu or rosewood tree	Primary	-	-	Groom 2011, Groom 2014
Xanthorrhoea preissii	Grass tree	Secondary	Secondary	-	Groom 2011; Johnstone *et al.* 2010
Xylomelum occidentale	Woody pear	Secondary	-	-	Groom 2014

CBC=Carnaby's black cockatoo, BBC=Baudin's black cockatoo and FRTBC=Forest red-tailed black cockatoo

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Appendix E

Black Cockatoo Roost Counts

Table 1: White-tailed black cockatoo recorded in roosts within 10 km of the site

Roost ID	Year and number of individuals									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CANROSR001	NS	0	0	0	0	NS	0	0	0	5
CANWILR001	0	0	0	0	0	NS	0	0	0	2
CLASWAR001	0	0	0	0	0	NS	7	NS	0	NS
COCCOCR001	NS	NS	NS	0	0	NS	7	0	23	0
COCCOOR003	NS	0	0	0	0	NS	0	0	0	15
COCCOOR005	NS	NS	38	0	0	NS	0	NS	0	0
COCHAMR001	68	101	0	0	0	NS	109	0	0	0
COCHAMR002	263	194	0	369	506	NS	0	194	315	109
COCMUNR001	NS	0	0	0	0	NS	0	0	0	6
COCMUNR003	NS	0	0	0	3	NS	0	0	0	72
COCNORR001	NS	NS	NS	NS	NS	NS	NS	NS	125	0
COCSPER001	0	0	40	0	NS	NS	257	0	143	192
COCSPER002	0	24	0	NS	NS	NS	0	NS	NS	NS
MELBATR001	0	0	0	0	0	NS	NS	NS	NS	NS
MELKARR002	55	0	0	0	0	NS	NS	NS	NS	NS
MELLEER001	0	0	0	15	2	NS	0	0	0	0
MELMURR001	24	78	0	227	249	NS	245	222	55	131
MELWINR001	0	21	0	0	12	NS	9	12	90	177
MELWINR003	0	7	54	64	108	NS	155	127	31	0
MELWINR004	0	0	0	0	NS	NS	0	NS	NS	NS
NEDDALR002	NS	0	0	12	0	NS	0	0	NS	0
NEDDALR003	0	0	0	0	0	NS	0	NS	NS	NS
SOUSALR001	0	20	0	2	0	NS	10	50	19	16

NS = not surveyed

Table 2: Forest red-tailed black cockatoo recorded in roosts within 10 km of the site

Roost ID	Year and number of individuals									
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CANROSR001	NS	0	0	0	0	NS	0	0	0	5
CANWILR001	0	0	0	0	0	NS	0	0	0	2
CANWILR004	NS	NS	NS	NS	NS	NS	0	0	0	0
COCCOCR001	NS	NS	NS	0	0	NS	7	0	23	0
COCCOOR001	0	0	0	0	0	NS	0	0	0	NS
COCCOOR003	NS	0	0	0	0	NS	0	0	0	15
COCMUNR001	NS	0	0	0	0	NS	0	0	0	6
COCMUNR003	NS	0	0	0	3	NS	0	0	0	72
COCSPER003	NS	NS	0	0	0	NS	0	0	0	0
FREHILR002	NS	NS	NS	NS	NS	NS	NS	NS	NS	0
FREWHIR001	NS	0	0	0	0	NS	0	0	0	0
MELATTR002	NS	NS	NS	NS	NS	NS	NS	0	0	0
MELBICR001	0	0	0	NS	NS	NS	NS	NS	NS	0
MELLEER001	0	0	0	15	2	NS	0	0	0	0
MELMURR001	24	78	0	227	249	NS	245	222	55	131
MELWINR003	0	7	54	64	108	NS	155	127	31	0
MOSMOSR001	0	0	0	0	0	NS	0	0	NS	NS
NEDDALR002	NS	0	0	12	0	NS	0	0	NS	0
SOUCOMR003	NS	NS	NS	NS	NS	NS	NS	0	NS	NS
SOUSALR001	0	20	0	2	0	NS	10	50	19	16

NS = not surveyed

Appendix F

Tree Inventory

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384530.09	6451450.49	12	2998	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.44	1.36
384525.20	6451440.23	14	2997	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.68	1.45
384536.66	6451437.04	30	2996	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	3.60	2.00
384534.51	6451426.92	13	2995	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.56	1.40
384529.75	6451430.53	17	2994	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.04	1.57
384522.78	6451428.90	11	2993	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.32	1.31
384524.18	6451422.26	20	2992	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.40	1.68
384524.37	6451413.84	13	2991	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.56	1.40
384524.88	6451402.31	19	2989	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.28	1.65
384528.73	6451403.91	13	2988	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.56	1.40
384535.53	6451403.43	13	2987	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.56	1.40
384551.60	6451402.28	16	2986	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.92	1.53
384549.45	6451375.32	24	2985	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.88	1.82
384549.52	6451368.66	18	2984	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.16	1.61
384540.32	6451372.66	77	2981	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	9.24	2.97
384529.22	6451385.84	85	2980	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	10.20	3.09
384526.05	6451390.90	16	2979	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.92	1.53
384521.30	6451376.66	77	2977	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	9.24	2.97
384523.69	6451365.16	15	2976	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	1.80	1.49
384523.41	6451364.93	13	2975	*Agonis flexuosa*	1	2	5-15	2	Ecological	Low	1.56	1.40
384529.16	6451365.88	11	2974	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.32	1.31
384524.50	6451360.29	11	2972	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.32	1.31
384537.60	6451354.23	49	2971	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	5.88	2.45
384788.65	6451269.04	22	2929	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	2.64	1.75
384790.46	6451275.60	25	2928	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	3.00	1.85
384801.45	6451272.07	20	2927	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	2.40	1.68
384787.60	6451286.99	30	2922	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	3.60	2.00
384796.53	6451290.08	34	2921	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	4.08	2.10
384796.37	6451304.16	50	2920	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	6.00	2.47
384805.52	6451304.60	39	2919	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	4.68	2.23
384798.68	6451308.29	57	2918	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	6.84	2.61
384805.23	6451313.58	40	2917	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	4.80	2.25
384812.01	6451298.68	18	2914	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	2.16	1.61
384812.12	6451314.32	22	2910	*Agonis flexuosa*	0	2	<5	2	Ecological	Low	2.64	1.75
384813.82	6451322.32	22	2908	*Agonis flexuosa*	0	2	<5	2	Ecological	Low	2.64	1.75
384782.56	6451273.30	15	2900	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	1.80	1.49
384778.73	6451278.24	21	2899	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	2.52	1.72

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384782.80	6451285.72	11	2898	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	1.32	1.31
384777.61	6451318.47	17	2895	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	2.04	1.57
384802.49	6451447.47	40	2855	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	4.80	2.25
384774.27	6451454.92	37	2851	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	4.44	2.18
384768.31	6451456.07	90	2850	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	10.80	3.17
384737.99	6451374.57	37	2811	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	4.44	2.18
384733.60	6451378.51	27	2803	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	3.24	1.91
384729.19	6451375.80	52	2802	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	6.24	2.51
384725.17	6451347.48	23	2790	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	2.76	1.79
384716.46	6451349.93	32	2789	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	3.84	2.05
384714.73	6451352.46	27	2788	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	3.24	1.91
384716.61	6451361.58	35	2786	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	4.20	2.13
384713.38	6451363.09	54	2785	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	6.48	2.55
384710.59	6451359.85	66	2784	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	7.92	2.78
384710.52	6451365.61	43	2783	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	5.16	2.32
384712.27	6451369.40	53	2782	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	6.36	2.53
384716.56	6451374.22	60	2781	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	7.20	2.67
384710.92	6451372.16	16	2780	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	1.92	1.53
384716.82	6451376.10	52	2779	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	6.24	2.51
384714.91	6451378.19	24	2778	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	2.88	1.82
384713.83	6451381.61	46	2777	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	5.52	2.39
384717.80	6451381.55	58	2776	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	6.96	2.63
384724.76	6451383.51	16	2775	*Agonis flexuosa*	1	2	5-15	2	Ecological	Low	1.92	1.53
384726.52	6451378.32	34	2774	*Agonis flexuosa*	2	2	15-40	2	Ecological	Moderate	4.08	2.10
384731.11	6451381.59	26	2772	*Agonis flexuosa*	1	2	5-15	2	Ecological	Low	3.12	1.88
384736.58	6451415.57	31	2762	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	3.72	2.02
384748.12	6451404.73	30	2757	*Agonis flexuosa*	3	2	>40	2	Ecological	Moderate	3.60	2.00
384737.12	6451434.32	11	2748	*Agonis flexuosa*	3	1	15-40	2	Ecological	Moderate	1.32	1.31
384751.89	6451463.64	92	2732	*Agonis flexuosa*	1	2	5-15	2	Ecological	Low	11.04	3.20
384694.71	6451461.55	36	2722	*Agonis flexuosa*	1	2	5-15	2	Ecological	Low	4.32	2.15
384541.61	6451449.95	12	2703	*Agonis flexuosa*	3	3	>40	2	Ecological	Moderate	1.44	1.36
384522.41	6451386.98	71	2978	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.52	2.87
384754.17	6451254.57	69	2932	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.28	2.83
384773.08	6451268.75	74	2902	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.88	2.92
384771.47	6451277.16	73	2901	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.76	2.90
384775.36	6451292.50	84	2897	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	10.08	3.08
384770.92	6451317.18	76	2896	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	9.12	2.95

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384768.76	6451324.58	98	2894	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	11.76	3.28
384771.07	6451337.25	50	2893	Araucaria heterophylla	3	3	>40	2	Amenity	Moderate	6.00	2.47
384778.14	6451346.75	33	2892	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	3.96	2.08
384772.64	6451348.57	67	2891	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.04	2.80
384770.21	6451355.20	52	2890	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	6.24	2.51
384768.20	6451366.26	49	2889	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	5.88	2.45
384766.65	6451385.98	57	2865	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	6.84	2.61
384760.73	6451392.01	55	2864	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	6.60	2.57
384769.82	6451406.08	49	2863	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	5.88	2.45
384769.43	6451424.04	44	2861	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	5.28	2.34
384771.52	6451431.05	85	2860	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	10.20	3.09
384770.03	6451438.02	68	2859	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	8.16	2.81
384763.34	6451452.91	49	2849	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	5.88	2.45
384615.81	6451458.89	97	2712	*Araucaria heterophylla*	3	3	>40	2	Amenity	Moderate	11.64	3.27
384753.45	6451384.94	12	2768	*Callistemon sp.*	3	3	>40	2	Amenity	Moderate	1.44	1.36
384721.71	6451402.88	12	2764	*Callistemon sp.*	1	2	5-15	1	Ecological	Low	1.44	1.36
384756.61	6451405.38	11	2756	*Callistemon sp.*	3	1	>40	1	Ecological	Moderate	1.32	1.31
384531.37	6451253.93	12	2999	*Corymbia calophylla*	3	2	>40	2	Ecological	Moderate	1.44	1.36
384527.19	6451298.01	64	2960	*Corymbia calophylla*	3	2	>40	3	Ecological	High	7.68	2.74
384530.94	6451275.55	103	2956	*Corymbia calophylla*	3	2	>40	3	Ecological	High	12.36	3.35
384538.97	6451266.88	32	2955	*Corymbia calophylla*	3	2	>40	2	Ecological	Moderate	3.84	2.05
384549.24	6451268.44	31	2954	*Corymbia calophylla*	3	2	>40	2	Ecological	Moderate	3.72	2.02
384555.71	6451264.30	16	2953	*Corymbia calophylla*	3	2	>40	2	Ecological	Moderate	1.92	1.53
384566.46	6451257.10	15	2952	*Corymbia calophylla*	3	2	>40	2	Ecological	Moderate	1.80	1.49
384563.90	6451249.86	18	2951	Corymbia calophylla	3	2	>40	2	Ecological	Moderate	2.16	1.61
384817.18	6451309.39	24	2912	*Corymbia calophylla*	3	3	>40	2	Ecological	Moderate	2.88	1.82
384551.96	6451312.04	35	2964	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	4.20	2.13
384681.67	6451254.19	23	2937	*Corymbia citriodora*	3	3	>40	2	Amenity	Moderate	2.76	1.79
384716.69	6451278.98	30	2847	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	3.60	2.00
384715.84	6451287.29	39	2846	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	4.68	2.23
384713.37	6451297.57	20	2845	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	2.40	1.68
384730.65	6451288.45	20	2844	*Corymbia citriodora*	2	3	>40	2	Amenity	Moderate	2.40	1.68
384728.95	6451297.52	18	2843	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	2.16	1.61
384728.16	6451308.82	21	2842	*Corymbia citriodora*	3	3	>40	2	Amenity	Moderate	2.52	1.72
384715.88	6451309.35	58	2841	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	6.96	2.63
384716.21	6451321.99	20	2840	*Corymbia citriodora*	3	2	>40	2	Amenity	Moderate	2.40	1.68
384729.69	6451331.46	17	2838	*Corymbia citriodora*	2	3	>40	2	Amenity	Moderate	2.04	1.57

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384674.75	6451256.77	23	2938	*Corymbia maculata*	3	3	>40	2	Amenity	Moderate	2.76	1.79
384751.04	6451264.18	14	2931	*Corymbia maculata*	3	3	>40	2	Amenity	Moderate	1.68	1.45
384760.08	6451265.50	14	2930	*Corymbia maculata*	3	3	>40	2	Amenity	Moderate	1.68	1.45
384714.81	6451270.42	31	2848	*Corymbia maculata*	3	2	>40	2	Amenity	Moderate	3.72	2.02
384713.82	6451332.83	27	2839	*Corymbia maculata*	3	2	>40	2	Amenity	Moderate	3.24	1.91
384706.04	6451452.81	16	2724	*Corymbia maculata*	3	3	>40	2	Amenity	Moderate	1.92	1.53
384662.13	6451454.09	20	2717	Corymbia maculata	3	2	>40	2	Amenity	Moderate	2.40	1.68
384631.55	6451453.30	23	2713	*Corymbia maculata*	2	3	>40	2	Amenity	Moderate	2.76	1.79
384607.21	6451451.47	22	2711	*Corymbia maculata*	3	3	>40	2	Amenity	Moderate	2.64	1.75
384549.71	6451343.61	45	2982	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	5.40	2.37
384558.19	6451312.00	63	2965	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	7.56	2.73
384553.70	6451308.51	58	2963	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.96	2.63
384577.37	6451252.12	56	2950	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.72	2.59
384582.95	6451251.30	29	2949	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	3.48	1.97
384588.90	6451250.81	56	2948	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.72	2.59
384601.18	6451250.84	57	2947	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.84	2.61
384606.57	6451249.46	66	2946	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	7.92	2.78
384616.03	6451248.35	56	2945	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.72	2.59
384623.13	6451254.75	37	2944	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	4.44	2.18
384629.18	6451254.15	36	2943	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	4.32	2.15
384636.71	6451256.01	99	2942	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	11.88	3.30
384648.47	6451250.82	89	2941	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	10.68	3.15
384654.57	6451254.11	82	2940	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	9.84	3.04
384665.62	6451253.79	85	2939	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	10.20	3.09
384706.46	6451257.13	96	2936	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	11.52	3.25
384712.44	6451254.76	76	2935	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	9.12	2.95
384719.01	6451257.61	135	2934	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	16.20	3.75
384728.19	6451255.72	113	2933	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	13.56	3.48
384778.78	6451348.86	47	2888	Eucalyptus botryoides	3	2	>40	2	Amenity	Moderate	5.64	2.41
384794.42	6451393.28	52	2873	Eucalyptus botryoides	2	1	5-15	1	Ecological	Low	6.24	2.51
384781.19	6451419.63	64	2862	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	7.68	2.74
384743.01	6451456.00	36	2738	*Eucalyptus botryoides*	3	1	>40	1	Ecological	Moderate	4.32	2.15
384795.53	6451462.03	51	2737	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	6.12	2.49
384733.43	6451459.89	110	2728	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	13.20	3.44
384710.85	6451453.09	73	2725	Eucalyptus botryoides	2	2	>40	2	Amenity	Moderate	8.76	2.90
384691.47	6451455.53	53	2721	*Eucalyptus botryoides*	1	2	5-15	1	Ecological	Low	6.36	2.53
384685.70	6451456.24	82	2720	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	9.84	3.04

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384672.63	6451452.32	43	2718	*Eucalyptus botryoides*	2	2	>40	2	Amenity	Moderate	5.16	2.32
384648.94	6451459.37	89	2716	*Eucalyptus botryoides*	2	2	>40	2	Amenity	Moderate	10.68	3.15
384649.29	6451453.39	108	2715	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	12.96	3.42
384598.43	6451459.58	101	2709	*Eucalyptus botryoides*	3	3	>40	2	Amenity	Moderate	12.12	3.32
384583.39	6451454.08	114	2708	*Eucalyptus botryoides*	2	2	>40	2	Amenity	Moderate	13.68	3.50
384571.94	6451456.17	100	2706	*Eucalyptus botryoides*	3	3	>40	2	Amenity	Moderate	12.00	3.31
384546.80	6451450.79	99	2704	*Eucalyptus botryoides*	3	2	>40	2	Amenity	Moderate	11.88	3.30
384738.52	6451435.88	16	2747	*Eucalyptus caesia*	2	1	5-15	2	Ecological	Low	1.92	1.53
384553.32	6451333.56	56	2966	*Eucalyptus camaldulensis*	3	2	>40	2	Amenity	Moderate	6.72	2.59
384813.17	6451270.98	40	2924	*Eucalyptus cladocalyx*	2	2	>40	2	Amenity	Moderate	4.80	2.25
384818.49	6451302.08	38	2913	Eucalyptus cladocalyx	3	2	>40	2	Amenity	Moderate	4.56	2.20
384817.41	6451313.49	52	2911	*Eucalyptus cladocalyx*	2	2	>40	2	Amenity	Moderate	6.24	2.51
384816.45	6451323.02	32	2909	*Eucalyptus cladocalyx*	3	2	>40	2	Amenity	Moderate	3.84	2.05
384818.38	6451328.25	45	2907	*Eucalyptus cladocalyx*	2	2	>40	2	Amenity	Moderate	5.40	2.37
384813.81	6451348.60	69	2904	*Eucalyptus cladocalyx*	3	3	>40	2	Amenity	Moderate	8.28	2.83
384814.18	6451356.80	57	2903	Eucalyptus cladocalyx	3	3	>40	2	Amenity	Moderate	6.84	2.61
384813.55	6451379.86	43	2878	*Eucalyptus cladocalyx*	3	2	>40	2	Amenity	Moderate	5.16	2.32
384812.13	6451413.10	58	2868	*Eucalyptus cladocalyx*	3	2	>40	2	Amenity	Moderate	6.96	2.63
384815.98	6451423.46	54	2867	*Eucalyptus cladocalyx*	3	2	>40	2	Amenity	Moderate	6.48	2.55
384818.42	6451425.15	37	2866	*Eucalyptus cladocalyx*	1	2	5-15	1	Ecological	Low	4.44	2.18
384534.61	6451359.85	50	2973	*Eucalyptus gomphocephala*	2	2	>40	3	Ecological	High	6.00	2.47
384534.68	6451345.55	67	2970	*Eucalyptus gomphocephala*	2	2	>40	3	Ecological	High	8.04	2.80
384528.45	6451345.36	42	2969	*Eucalyptus gomphocephala*	2	2	>40	2	Ecological	Moderate	5.04	2.30
384528.75	6451327.41	75	2968	Eucalyptus gomphocephala	3	2	>40	3	Ecological	High	9.00	2.93
384532.68	6451322.02	90	2967	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	10.80	3.17
384810.05	6451263.07	75	2926	*Eucalyptus gomphocephala*	3	3	>40	3	Ecological	High	9.00	2.93
384778.58	6451366.27	37	2886	*Eucalyptus gomphocephala*	3	3	>40	2	Ecological	Moderate	4.44	2.18
384792.56	6451356.89	80	2885	Eucalyptus gomphocephala	3	3	>40	3	Ecological	High	9.60	3.01
384801.90	6451358.00	83	2884	*Eucalyptus gomphocephala*	3	3	>40	3	Ecological	High	9.96	3.06
384795.32	6451363.91	59	2883	*Eucalyptus gomphocephala*	3	3	>40	3	Ecological	High	7.08	2.65
384801.70	6451366.86	39	2881	*Eucalyptus gomphocephala*	3	1	>40	2	Ecological	Moderate	4.68	2.23
384811.52	6451367.09	90	2880	*Eucalyptus gomphocephala*	3	3	>40	3	Ecological	High	10.80	3.17
384805.55	6451368.57	57	2879	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	6.84	2.61
384807.17	6451384.77	110	2877	*Eucalyptus gomphocephala*	3	3	>40	3	Ecological	High	13.20	3.44
384791.57	6451377.61	56	2876	*Eucalyptus gomphocephala*	3	1	>40	3	Ecological	High	6.72	2.59
384788.37	6451385.78	57	2874	Eucalyptus gomphocephala	2	3	>40	3	Ecological	High	6.84	2.61
384798.88	6451399.09	83	2870	Eucalyptus gomphocephala	3	2	>40	3	Ecological	High	9.96	3.06

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384804.13	6451403.14	118	2869	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	14.16	3.55
384797.13	6451445.31	14	2858	*Eucalyptus gomphocephala*	2	2	>40	2	Ecological	Moderate	1.68	1.45
384799.45	6451441.01	14	2857	Eucalyptus gomphocephala	3	2	>40	2	Ecological	Moderate	1.68	1.45
384781.54	6451455.55	19	2852	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	2.28	1.65
384801.98	6451384.27	14	2845	*Eucalyptus gomphocephala*	2	3	>40	2	Ecological	Moderate	1.68	1.45
384729.26	6451336.22	63	2837	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	7.56	2.73
384763.24	6451336.83	21	2836	*Eucalyptus gomphocephala*	2	2	>40	2	Ecological	Moderate	2.52	1.72
384764.22	6451342.38	41	2835	*Eucalyptus gomphocephala*	2	2	>40	2	Ecological	Moderate	4.92	2.28
384762.49	6451344.47	11	2834	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	1.32	1.31
384756.51	6451348.06	45	2833	Eucalyptus gomphocephala	3	2	>40	2	Ecological	Moderate	5.40	2.37
384755.60	6451353.15	13	2832	*Eucalyptus gomphocephala*	1	2	5-15	2	Ecological	Low	1.56	1.40
384763.86	6451357.68	14	2831	*Eucalyptus gomphocephala*	2	2	>40	2	Ecological	Moderate	1.68	1.45
384754.58	6451342.83	32	2830	*Eucalyptus gomphocephala*	2	3	>40	2	Ecological	Moderate	3.84	2.05
384751.64	6451352.22	49	2829	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	5.88	2.45
384748.15	6451352.29	15	2828	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	1.80	1.49
384746.73	6451344.40	65	2827	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	7.80	2.76
384742.46	6451346.01	18	2826	*Eucalyptus gomphocephala*	2	3	>40	2	Ecological	Moderate	2.16	1.61
384739.88	6451349.09	35	2825	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	4.20	2.13
384734.81	6451346.26	26	2824	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	3.12	1.88
384733.32	6451353.45	13	2823	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	1.56	1.40
384746.12	6451373.44	21	2822	*Eucalyptus gomphocephala*	3	3	>40	2	Ecological	Moderate	2.52	1.72
384760.93	6451382.37	20	2769	*Eucalyptus gomphocephala*	3	3	>40	2	Ecological	Moderate	2.40	1.68
384763.49	6451398.36	63	2755	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	7.56	2.73
384761.01	6451417.07	58	2754	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	6.96	2.63
384757.07	6451440.20	12	2751	*Eucalyptus gomphocephala*	3	3	>40	2	Ecological	Moderate	1.44	1.36
384749.83	6451437.34	12	2750	*Eucalyptus gomphocephala*	3	3	>40	2	Ecological	Moderate	1.44	1.36
384790.95	6451458.21	17	2736	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	2.04	1.57
384779.67	6451462.29	16	2735	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	1.92	1.53
384759.93	6451462.96	19	2733	*Eucalyptus gomphocephala*	3	2	>40	2	Ecological	Moderate	2.28	1.65
384573.96	6451427.92	115	2707	*Eucalyptus gomphocephala*	3	2	>40	3	Ecological	High	13.80	3.51
384817.03	6451296.97	55	2915	*Eucalyptus lehmannii*	1	2	5-15	2	Ecological	Low	6.60	2.57
384812.21	6451447.92	12	2856	*Eucalyptus leucoxylon*	3	2	>40	2	Amenity	Moderate	1.44	1.36
384739.28	6451385.67	19	2770	*Eucalyptus leucoxylon*	3	1	>40	1	Ecological	Moderate	2.28	1.65
384746.22	6451405.93	25	2758	*Eucalyptus leucoxylon*	3	1	>40	1	Ecological	Moderate	3.00	1.85
384742.90	6451432.72	21	2749	*Eucalyptus leucoxylon*	3	1	>40	1	Ecological	Moderate	2.52	1.72
384552.55	6451351.18	99	2983	*Eucalyptus rudis*	3	2	>40	3	Ecological	High	11.88	3.30
384558.25	6451306.68	56	2962	*Eucalyptus rudis*	3	2	>40	3	Ecological	High	6.72	2.59

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384553.11	6451302.07	26	2961	*Eucalyptus rudis*	3	2	>40	2	Ecological	Moderate	3.12	1.88
384558.95	6451295.04	60	2958	*Eucalyptus rudis*	2	2	>40	3	Ecological	High	7.20	2.67
384549.94	6451281.75	84	2957	*Eucalyptus rudis*	3	2	>40	3	Ecological	High	10.08	3.08
384704.68	6451456.12	92	2723	*Eucalyptus rudis*	3	2	>40	3	Ecological	High	11.04	3.20
384551.90	6451458.38	54	2705	*Eucalyptus rudis*	3	2	>40	3	Ecological	High	6.48	2.55
384535.27	6451451.65	77	2702	*Eucalyptus rudis*	2	2	>40	3	Ecological	High	9.24	2.97
384535.21	6451456.86	108	2701	*Eucalyptus rudis*	2	2	>40	3	Ecological	High	12.96	3.42
384808.64	6451279.24	10	2923	*Eucalyptus sp.*	3	3	>40	2	Amenity	Moderate	1.20	1.26
384735.69	6451385.19	16	2771	*Eucalyptus sp.*	3	2	>40	2	Amenity	Moderate	1.92	1.53
384741.81	6451395.23	18	2767	*Eucalyptus sp.*	3	2	>40	2	Amenity	Moderate	2.16	1.61
384742.47	6451395.02	30	2766	*Eucalyptus sp.*	2	2	>40	2	Amenity	Moderate	3.60	2.00
384734.10	6451400.91	43	2765	*Eucalyptus sp.*	3	1	>40	1	Ecological	Moderate	5.16	2.32
384731.65	6451417.07	34	2761	*Eucalyptus sp.*	3	2	>40	2	Amenity	Moderate	4.08	2.10
384741.00	6451425.05	26	2759	*Eucalyptus sp.*	3	1	>40	1	Ecological	Moderate	3.12	1.88
384718.68	6451404.17	11	2763	*Eucalyptus utilis*	2	2	>40	2	Amenity	Moderate	1.32	1.31
384772.95	6451471.75	11	2734	Eucalyptus utilis	3	2	>40	2	Amenity	Moderate	1.32	1.31
384753.18	6451467.20	10	2731	*Eucalyptus utilis*	3	2	>40	2	Amenity	Moderate	1.20	1.26
384750.03	6451469.72	11	2730	*Eucalyptus utilis*	3	2	>40	2	Amenity	Moderate	1.32	1.31
384757.15	6451441.64	13	2753	*Eucalyptus victrix*	3	2	>40	2	Amenity	Moderate	1.56	1.40
384757.57	6451445.97	12	2752	*Eucalyptus victrix*	3	2	>40	2	Amenity	Moderate	1.44	1.36
384788.32	6451448.09	18	2853	*Liquidambar styraciflua*	3	3	>40	2	Amenity	Moderate	2.16	1.61
384814.59	6451287.41	63	2916	*Melaleuca lanceolata*	3	2	>40	2	Amenity	Moderate	7.56	2.73
384811.46	6451330.83	25	2906	*Melaleuca lanceolata*	3	2	>40	2	Amenity	Moderate	3.00	1.85
384811.94	6451338.15	15	2905	*Melaleuca lanceolata*	3	2	>40	2	Amenity	Moderate	1.80	1.49
384782.09	6451356.11	23	2887	*Melaleuca quinquenervia*	3	2	>40	2	Amenity	Moderate	2.76	1.79
384802.44	6451359.78	23	2882	*Melaleuca quinquenervia*	3	3	>40	2	Amenity	Moderate	2.76	1.79
384798.28	6451393.88	18	2871	*Melaleuca quinquenervia*	2	2	15-40	2	Amenity	Moderate	2.16	1.61
384739.43	6451372.26	12	2812	*Melaleuca sp.*	3	2	>40	2	Amenity	Moderate	1.44	1.36
384726.19	6451382.31	13	2773	*Melaleuca sp.*	3	2	>40	2	Amenity	Moderate	1.56	1.40
384739.21	6451425.14	13	2760	*Melaleuca sp.*	2	2	15-40	2	Amenity	Moderate	1.56	1.40
384811.19	6451271.29	39	2925	*Olea europaea*	3	2	>40	2	Amenity	Moderate	4.68	2.23
384794.95	6451446.28	16	2854	*Olea europaea*	3	2	>40	2	Amenity	Moderate	1.92	1.53
384723.42	6451435.38	50	2745	*Pinus pinaster*	2	2	15-40	2	Amenity	Moderate	6.00	2.47
384727.64	6451437.98	62	2744	*Pinus pinaster*	2	3	>40	2	Amenity	Moderate	7.44	2.71
384717.71	6451431.44	45	2742	*Pinus pinaster*	3	2	>40	2	Amenity	Moderate	5.40	2.37
384711.38	6451440.12	69	2741	*Pinus pinaster*	3	3	>40	2	Amenity	Moderate	8.28	2.83
384731.33	6451445.56	42	2740	*Pinus pinaster*	2	3	>40	2	Amenity	Moderate	5.04	2.30

Easting	Northing	DBH	Tag No.	Species	Health	Structure	ULE	Significance	Significant Value	RetentionValue	TPZ	SRZ
384729.74	6451452.08	44	2739	*Pinus pinaster*	2	3	>40	2	Amenity	Moderate	5.28	2.34
384716.40	6451463.35	74	2726	*Pinus pinaster*	1	2	5-15	1	Ecological	Low	8.88	2.92
384524.61	6451409.18	108	2990	*Pinus pinea*	2	2	15-40	2	Amenity	Moderate	12.96	3.42
384723.64	6451432.94	95	2746	*Pinus pinea*	2	2	15-40	2	Amenity	Moderate	11.40	3.24
384716.76	6451431.76	64	2743	*Pinus pinea*	3	2	>40	2	Amenity	Moderate	7.68	2.74
384731.77	6451464.63	84	2727	*Pinus pinea*	3	2	>40	2	Amenity	Moderate	10.08	3.08
384679.26	6451458.50	103	2719	*Pinus pinea*	3	2	>40	2	Amenity	Moderate	12.36	3.35
384604.38	6451459.64	73	2710	*Pinus pinea*	3	2	>40	2	Amenity	Moderate	8.76	2.90
384743.78	6451463.66	63	2729	*Pinus radiata*	3	2	>40	2	Amenity	Moderate	7.56	2.73
384550.57	6451293.29	57	2959	*Stag*	0	2	<5	1	Ecological	Low	6.84	2.61
384711.89	6451353.32	16	2787	*Stag*	0	2	<5	1	Ecological	Low	1.92	1.53
384641.47	6451460.51	89	2714	*Stag*	1	3	5-15	1	Ecological	Low	10.68	3.15