



Aliro Trusco 1 Pty Ltd
care of
Aliro Management Pty Ltd

Masterplan Remedial Action Plan
13 Endeavour Road, Caringbah, NSW

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64957/153694 Rev 2

JBS&G Australia Pty Ltd

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Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AHD	Australian Height Datum
AMP	Asbestos Management Plan
ASC NEPM	National Environmental Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
AST	Above Ground Storage Tank
Bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CEC	Cation Exchange Capacity
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DO	Dissolved Oxygen
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EC	Electrical Conductivity
Eh	Redox Potential
EIL	Ecological Investigation Levels
EMP	Environmental Management Plan
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environment Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GME	Groundwater Monitoring Event
ha	Hectare
HGG	Hazardous Ground Gas
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LEP	Local Environmental Plan
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council
OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
PFAS	Per- and poly- fluoroalkyl substances
pH	Potential of Hydrogen
PID	Photo-ionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
SAQP	Sampling, Analysis and Quality Plan
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UPSS	Underground Petroleum Storage Systems
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Aliro Trusco 1 Pty Ltd (Aliro Trusco, the client) care of Aliro Management Pty Ltd (Aliro Management) to prepare a remedial action plan (RAP) for a property located at 13 Endeavour Road, Caringbah, NSW (the site). The site is legally identified as Lot 2 in Deposited Plan (DP) 714965 and occupies an area of 12.5 hectares (ha). The site location and site layout are shown in **Figures 1 and 2**, respectively.

The site is undergoing staged redevelopment for mixed land uses (commercial/industrial and community uses including construction of a child care facility). Redevelopment activities are proposed for Stage of the development, herein referred to as the Masterplan Area, which occur within a portion of the site (**Figure 2**), and will include the demolition / augmentation of existing buildings and construction of seven new warehouse buildings and augmentation to existing peripheral driveways/carparks, hardstand pavements and landscaped areas. Based on review of concept cut to fill design plans (**Appendix A**), development activities will generally involve filling to raise site surfaces across the majority of the Masterplan Area, with minor shallow detailed excavation in limited areas.

Previous environmental investigations were conducted across the broader site (JBS&G 2020a¹) with a Detailed Site Investigation (DSI, JBS&G 2023a²) prepared for the Masterplan area (to support development application), which reported the majority of the site had been extensively filled with approximately 2 m of gravelly sand/clay/sandstone between 1961 to 1965 as part of regional reclamation of low-lying land adjacent to Woollooware Bay. Natural/reworked natural material underlying fill was identified to comprise a combination of organic rich estuarine sediments (former reclaimed tidal mangroves) and alluvial silty clays which were identified to be potential and actual acid sulphate soils (P/ASS).

Recent remediation works within the Warehouse E1 Developable Area were conducted under DA21/0777 and a subsequent Validation Report was prepared for this portion of the site (JBS&G 2023b⁴) documenting remediation works including the removal of an historically abandoned underground petroleum storage system (UPSS).

Previous investigations identified localised subsurface asbestos contamination adjoining the centre of the site's eastern boundary and in the southeastern portion of the Masterplan Area. This is subject to management in accordance with the site Environmental Management Plan (EMP, JBS&G 2021a⁵) for the interim period prior to remediation. Following remediation and validation of subsurface asbestos contaminated soils, the site is not anticipated to require ongoing management under an EMP. Elevated levels of ground gases (methane and carbon dioxide) were identified on the site, however, through a detailed assessment of the gas concentrations, flow rates and the conceptual site model (CSM), the site JBS&G (2020a) including Masterplan Area (JBS&G 2023a) was reported to pose a 'very low risk' and not requiring specific ground gas remediation/management.

This document presents a RAP that outlines the principles of remediation and validation works required for the developable area, that when completed, will make and demonstrate the site as suitable for the proposed land use.

¹ Aliro Trusco 1 Pty Ltd c/- Aliro Management Pty Ltd – Detailed Site Investigation, Toyota Caringbah 13 Endeavour Road, Caringbah, NSW. Prepared by JBS&G Australia Pty Ltd ref. 58037/132083 Revision A dated 9 September 2020 (JBS&G 2020a)

² Detailed Site Investigation, Masterplan Area, 13 Endeavour Road, Caringbah NSW. Prepared by JBS&G doc ref 64957/153895 Rev 0 dated 1 September 2022 (JBS&G 2023a)

⁴ E1 Warehouse DA21/0777 Validation Report. Prepared by JBS&G Australia Pty Ltd doc ref 62048/151490 (Rev A) date 8 June 2023 (JBS&G 2023b)

⁵ 13 Endeavour Road, Caringbah NSW Environmental Management Plan. Prepared by JBS&G Australia Pty Ltd ref. 58037/142514 Rev A, dated 3 December 2021a (JBS&G 2021a)

This RAP has been prepared with reference to relevant guidelines made or endorsed by the NSW Environment Protection Authority (EPA) inclusive of NEPC (2013⁶) and the requirements of Chapter 4 Remediation of Land of *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP).

⁶ *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013*. National Environment Protection Council (NEPC 2013)

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Aliro Trusco 1 Pty Ltd (Aliro Trusco, the client) care of Aliro Management Pty Ltd (Aliro Management) to prepare a remedial action plan (RAP) for a property located at 13 Endeavour Road, Caringbah, NSW (the site). The site is legally identified as Lot 2 in Deposited Plan (DP) 714965 and occupies an area of 12.5 hectares (ha). The site location and site layout are shown in **Figures 1 and 2**, respectively.

The site is undergoing staged redevelopment for mixed land uses (commercial/industrial and community uses including construction of a child care facility). Redevelopment activities are proposed for Stage of the development, herein referred to as the Masterplan Area, which occur within a portion of the site (**Figure 2**), and include the demolition / augmentation of existing buildings and construction of eight new warehouse buildings and augmentation to existing peripheral driveways/carparks, hardstand pavements and landscaped areas. Based on review of concept cut to fill design plans (**Appendix A**), development activities will generally involve filling to raise site surfaces across the majority of the Masterplan Area, with minor shallow detailed excavation in limited areas.

Previous environmental investigations were conducted across the broader site (JBS&G 2020a⁷) with a Detailed Site Investigation (DSI, JBS&G 2023a⁸) prepared for the Masterplan area (to support development application), which reported the majority of the site had been extensively filled with approximately 2 m of gravelly sand/clay/sandstone between 1961 to 1965 as part of regional reclamation of low-lying land adjacent to Woolloomooloo Bay. Natural/reworked natural material underlying fill was identified to comprise a combination of organic rich estuarine sediments (former reclaimed tidal mangroves) and alluvial silty clays which were identified to be potential and actual acid sulphate soils (P/ASS).

Recent remediation works within the Warehouse E1 Developable Area were conducted under DA21/0777 and a subsequent Validation Report was prepared for this portion of the site (JBS&G 2023b⁹) documenting remediation works including the removal of an historically abandoned underground petroleum storage system (UPSS).

Previous investigations identified localised subsurface asbestos contamination adjoining the centre of the site's eastern boundary and in the southeastern portion of the Masterplan Area. This is subject to management in accordance with the site Environmental Management Plan (EMP, JBS&G 2021a¹¹) for the interim period prior to remediation. Following remediation and validation of subsurface asbestos contaminated soils, it is anticipated that the site will not require ongoing management under an EMP. Elevated levels of ground gases (methane and carbon dioxide) were identified on the site, however, through a detailed assessment of the gas concentrations, flow rates and the conceptual site model (CSM), the site JBS&G (2020a) including Masterplan area (JBS&G 2023a) was reported to pose a 'very low risk' and not requiring specific ground gas remediation/management.

⁷ Aliro Trusco 1 Pty Ltd c/- Aliro Management Pty Ltd – Detailed Site Investigation, Toyota Caringbah 13 Endeavour Road, Caringbah, NSW. Prepared by JBS&G Australia Pty Ltd ref. 58037/132083 Revision A dated 9 September 2020 (JBS&G 2020a)

⁸ Detailed Site Investigation, Masterplan Area, 13 Endeavour Road, Caringbah NSW. Prepared by JBS&G doc ref 64957/153895 Rev 0 dated 1 September 2022 (JBS&G 2023a)

⁹ E1 Warehouse DA21/0777 Validation Report. Prepared by JBS&G Australia Pty Ltd doc ref 62048/151490 (Rev A) date 8 June 2023 (JBS&G 2023b)

¹¹ 13 Endeavour Road, Caringbah NSW Environmental Management Plan. Prepared by JBS&G Australia Pty Ltd ref. 58037/142514 Rev A, dated 3 December 2021a (JBS&G 2021a)

This document presents a RAP that outlines the principles of remediation and validation works required for the developable area, that when completed, will make and demonstrate the site as suitable for the proposed land use.

This RAP has been prepared with reference to relevant guidelines made or endorsed by the NSW Environment Protection Authority (EPA) inclusive of NEPC (2013¹²) and also the requirements of Chapter 4 Remediation of Land of *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP).

1.2 Objective

objectives of this RAP are to:

- Characterise and document the known extent of environmental impact within the Masterplan Area via presentation of a CSM;
- Identify the remedial strategy(ies)/framework to be adopted by an assessment of remedial options and development objectives; and
- Document the procedures and standards to be followed in order to remove the risks posed by contaminated soils/infrastructure to make the site suitable for suitable for the proposed development, while ensuring the protection of human health and the surrounding environment.

1.3 Proposed Development

As discussed in **Section 1.1** a multi-use development is proposed, detailed design plans are provided in **Appendix A**

Under the current development scenario, seven new warehouse buildings will be constructed along with new internal road networks, carparks, loading docks and minor landscaped areas. A child care centre is proposed to be established as part of the precinct, with development plans indicating this facility will be located in the southwest of the site. The works are anticipated to generally involve filling to raise the site surfaces across the Masterplan Area, with minor shallow detailed excavation in limited areas. Asbestos impacted soil identified at the site is proposed to be retained on-site under a cap cover remediation strategy and the management of the identified impact will be subject to requirements under this RAP.

¹² *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013*. National Environment Protection Council (NEPC 2013)

2. Site Condition, History & Surrounding Environment

2.1 Site Identification

The location of the site is shown in **Figure 1**. The current layout is shown in **Figure 2** and the proposed site development is detailed in design plans provided as **Appendix A**. Site details are summarised in **Table 2.1** and discussed in detail in the following section.

Table 2.1: Summary of Site Details

Site Legal Identifier (as shown on Figure 2)	Lot 2 DP 714965
Site Address	13 Endeavour Road, Caringbah, NSW
Site Area (approximate)	Approximately 12.5 ha
Local Government Authority	Sutherland Shire Council
Site Geographic Coordinates (MGA 56)	Easting: 340210.89 Northing: 1510802.86
Current Zoning	SP4 Enterprise – Sutherland Shire Council Local Environmental Plan (LEP) 2015
Current Land Use	Commercial/Industrial
Proposed Land Use	Commercial/Industrial with a Child Care facility.

2.2 Current Site Condition

A detailed site inspection was completed on 15 June 2023 by JBS&G which identified the condition of the Masterplan Area to be generally consistent with that previously reported. The following key features, as shown on **Figure 2**, were reported:

- The Warehouse E1 Developable area was located to the north / northwest of the Masterplan Area, which had been subject to recent development activities including a new fit out of the main warehouse and augmentation to peripheral driveways. At the time of inspection, the warehouse was occupied by Woolworths Group, Australia Post, Dutton One, Bowerbird Interiors and Carlile Swimming;
- The Masterplan Area was generally consistent with that observed previously, with several buildings which were previously used for commercial / educational purposes associated with Toyota's former operations observed in the south and northern extents.
- The balance of the Masterplan Area comprised paved extents (driveways and car parking), landscaped areas (garden beds and lawn areas) and a small putting green (golf course), consistent with previous observations; and
- Of note, the former Toyota office building to the south of the warehouse had been demolished and several site sheds were present in the southwest of the site associated with E1 Warehouse Developable activities.

2.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roadways are summarised below.

- North – Woollooware Bay and associated mangroves, and to northwest there are commercial/industrial premises including automotive workshops, welding workshops, packaging and air conditioning companies;
- East – The site is bound to the east by the Solander Playing Fields and Cronulla RSL Youth Soccer Club. Further afield is Dune Walk, across which are residential apartments then Shark/Toyota Park and leagues club;

- South – The site is bound to the south and southwest by Captain Cook Drive, across which are low density residential lands, with playing fields and Woollooware Golf Club to the southeast; and
- West – The site is bound to the west and northwest by Endeavour Road with commercial facilities and Captain Cook Drive beyond. Further afield are some commercial/industrial premises and low-density residential lands.

2.4 Natural Site Setting

The environmental setting of the site is presented in **Table 2.2**.

Table 2.1: Summary of Environmental Characteristics

Environmental Aspect	Characteristics
Topography	A review of topographical information available on SIX Maps¹³ indicates that the site is generally flat with an elevation of approximately 3 m Australian Height Datum (AHD) and gently falls towards the northeast/Woollooware Bay. An area (comprising the putt putt golf course) close to the northeast boundary was elevated above the surrounding site area by approximately 2-3 m. Land to the west of the site, across Captain Cook Drive, was reported to be elevated approximately 2 m above the site levels.
Hydrology	The nearest surface water receptor is Woollooware Bay located directly to the north of the site (marine ecosystem). Existing pavements occupy the majority of the site. As such, rainfall within the site is anticipated to generally be controlled by the current stormwater network, draining towards municipality's stormwater infrastructure before being discharged to Woollooware Bay. In unsealed sections of the site, rainfall is expected to infiltrate the relatively permeable sandy fill soils, with the overflow surface water (following soil saturation) anticipated to enter the regional stormwater system.
Geology	A review of the 1:100 000 scale Wollongong – Port Hacking Geological Map (DMR 1985¹⁴) identifies the site is underlain by man-made fill and organic-rich muddy, mostly “marine” sand. Man-made fill typically but not always comprises dredged estuarine sand and mud, coal washing, inclusions of industrial and household mixed waste whereas the organic-rich muddy “marine” sand typically overlaid clean to muddy, shelly “marine” sand, sometimes with low dunes, then medium to fine-grained “marine” sand with podzols and shelly layers. Reference to the online ESPADE 2.0 tool hosted by OEH (OEH 2019¹⁵) indicated the site is underlain by disturbed terrain. The disturbed terrain landscape group characterises areas having been subject to removal of natural soils or greatly disturbed or buried natural soils often associated with quarries, tips, land reclamation and large cut-to-fill features. Soils within this group typically comprise imported or reclaimed soils, rock, building and waste materials. This may result in soils with characteristics including high variability, engineering hazards, unconsolidated low bearing strength materials, permeability, poor drainage, very low fertility, toxic materials and wind erosion hazard. Soils within this landscape group may also be sources of sediment and groundwater contamination. Previous investigations (Section 2.6) confirmed the presence of fill (sand/sandstone) at an average thickness of 2 m across the site associated with former land reclamation activities. Underlying materials were noted to comprise organic rich sandy clays (peaty muds) and estuarine sands associated with former mangrove swamps/coastal saltmarsh. Alluvial/marine silty sands were unidentified underlying organic rich sediments with sandstone bedrock identified at relatively shallow depths toward the southern portion of the site, increasing in depth toward the north east (Woollooware Bay).

¹³ <http://maps.six.nsw.gov.au/>, *Six Maps*. Accessed by JBS&G on 21 July 2020

¹⁴ *Wollongong – Port Hacking Geological Series Sheet 9029-9129 (Edition 1) 1983*. Department of Mineral Resource, Geological Survey of NSW (DMR 1983)

¹⁵ *ESPADE 2.0*. NSW Office of Environment and heritage, Accessed 11 August 2020 (OEH 2019)

Environmental Aspect	Characteristics
Acid Sulfate Soils (ASS)	Review of the Port Hacking Acid Sulfate Soil Risk Map ¹⁶ indicates that the site is located within an area classed as 'disturbed terrain'. Areas having this classification may include filled areas which often occur following reclamation of low-lying swamps for urban development. Other areas with this classification may include areas which have been mined, dredged, or have undergone heavy ground disturbance through general urban development. Review of the Sutherland Local Environmental Plan (LEP) 2015 online portal¹⁷ indicates that the site falls within a category classified as Class 3 ASS. According to the LEP, development consent is required for any works in a Class 3 ASS area that extend beyond 1 metre below the natural ground surface and which are likely to lower the water table more than 1 m below ground surface (bgs). Such works would trigger the requirement for assessment and may require ASS management unless preliminary assessment indicates management is not required. It is noted that land within a category classified as Class 1 and 2 are located directly adjacent the site (mangroves associated with Woolloomare Bay). JBS&G's (2020a) assessment of natural/reworked/reclaimed soils across the site indicated that the majority of reworked/natural soils comprise silty sands and organic rich sandy clays characterised as P/ASS. Field screening and laboratory results identified materials at depth of between 2 -3 m bgs (silty sands/organic rich sandy clays) contain P/ASS properties with moderate drops in pH_f values reported in organic rich sediments and underlying silty sands which exhibited a moderate to strong organic odour. Soil samples submitted for suspension peroxide oxidation combined acidity and sulfur (SPOCAS) analysis reported acid trails ranging between 98 mol H⁺/T and 280 mol H⁺/T and sulfur trails ranging between 0.01 %S and 0.71 %S. PASS was identified to the maximum depth of previous investigation (6.8 m bgs). An Acid Sulfate Soil Management Plan (ASSMP) has been prepared for the Masterplan Development (JBS&G 2023c¹⁸) to manage the presence of P/ASS (if disturbed).
Hydrogeology	Previous investigations reported groundwater at depths of approximately 1.0 to 4.5 m bgs. A review of the Water NSW groundwater mapping portal (Water NSW 2020¹⁹) indicates 20 registered groundwater bores are situated within a 1.5 km radius of the site. The bores were noted to be used for monitoring purposes with groundwater ranging in depths from 0.5 m bgs to >5 m. Based on previous investigations, groundwater within the fill/alluvial sediments is expected to flow to the northeast towards Woolloomare Bay and encountered at depths between 0.5 and 5 m AHD.

2.5 Summary Site History

A review of aerial photos, discussions with representatives of the former site operators, heritage records and records held by government agencies has been previously undertaken in JBS&G (2020a). On the basis of these reviews it has been found that the site was generally vacant comprising mangroves and vegetated areas until 1965, when reclamation activities were observed along the coastline associated with the surrounding urban development. The whole site area to the northern boundary had been filled by 1965, as had the land immediately northwest and southeast. The site was purchased by Toyota in 1982 as a storage and training facility. Toyota commenced construction of the first portion of the warehouse in approximately 1986 and extended in 1989 to the current size.

- Whilst a search of SafeWork NSW's (formerly WorkCover NSW) dangerous goods database was not completed for the site, based on previous investigation works a single diesel UST was formerly located at the western boundary of the site, and was indicated to have been decommissioned/abandoned by AECOM (2019) and subsequently removed and validated by JBS&G (2023a).

¹⁶ Port Hacking Acid Sulfate Soil Risk Map (Edition 2), Department of Land and Water Conservation, December 1997 (DLWC 1997)

¹⁷ <https://maps.ssc.nsw.gov.au/LEP/>. Sutherland Shire Council LEP 2015 Online Portal. Accessed on 11 August 2020

¹⁸ Masterplan Area Acid Sulfate Soil Management Plan. Prepared by JBS&G Australia Pty Ltd ref.64957/153701 Revision A dated 2 August 2023 (JBS&G 2023b)

¹⁹ Groundwater Monitoring Overview Map. <https://realtimedata.waternsw.com.au/>. Accessed 11 August 2020. Water NSW, 2020.

2.6 Previous Investigations

A number of assessment reports, prepared by others, have been summarised in third party reports or made available for review by JBS&G. The following sections provide a summary of the information and site characterisation data presented within key assessment reports. These reports include both historical and information relating to investigations conducted at that time.

Comments in relation to contaminants of potential concern (COPC) are provided in the following text in relation to assessment criteria adopted by the author at the time of report preparation. This comprises the range of health investigation levels presented in NEPC (1999²⁰) and EPA (1994²¹) for investigation results generally up to and including the end of 2012; ANZECC (2000²²) for groundwater thresholds until 2018; and NEPC (2013) and ANZG (2018²³) for results from 2012 and 2019, respectively.

Historical analytical summary tables are included in **Appendix B**. Historical field logs are provided in **Appendix C**.

2.6.1 Geotechnical and Environmental Assessment Report (Golder 1998²⁴)

This report was not cited by JBS&G. The following is a summary of information presented in AECOM (2019²⁵).

Golder Associates Pty Ltd (Golder 1998²⁶) were engaged by Toyota to prepare a geotechnical and environmental assessment report of the site to identify the ground conditions in preparation for proposed extensions including new offices warehouse buildings and car park facilities comprising the current Toyota House, Links House and the Hub.

The scope of works included review of historical information, a site inspection, advancement of fifteen test pits (GA1 to GA15, as shown in **Figure 3**), soil sampling and analysis for heavy metals, total petroleum hydrocarbon (TPH), organochlorine pesticides (OCPs), soil pH and net acid generation.

Golder (1998) reported the following with regard to the environmental status of the site:

- All test pits were excavated to a depth of 3 m bgs;
- The lithology was noted to comprise 100 mm of topsoil followed by graded mixture of sand with fines, clay and crushed sandstone (depth unknown);
- Golder indicated that fill had been placed over natural sand, organic material (former mangroves) and/or vegetated surfaces;
- Soil pH was measured to range from 7.2 to 8.0 representing a slightly basic environment (assumed to be imported material rather than natural material at depth); and

²⁰ *National Environment Protection (Assessment of Site Contamination) Measure, 1999*. National Environment Protection Council, 1999 (NEPC 1999)

²¹ *Contaminated Sites: Guidelines for Assessing Service Station Sites*. NSW EPA December 1994 (EPA 1994)

²² *Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1*. Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand, October 2000 (ANZECC 2000)

²³ *Australia and New Zealand Guidelines for Fresh & Marine Water Quality 2018 (ANZG 2018)*

²⁴ *Geotechnical and Preliminary Contamination Investigation. Proposed development areas of Toyota Facility Captain Cook Drive Woollooware Bay*. Golder Associates Pty Ltd dated August 1998 (Golder 1998)

²⁵ *Toyota Caringbah, Phase 1 & 2 Environmental Site Assessment 2019 – 13 Endeavour Road, Caringbah, NSW*. AECOM Australia Pty Ltd dated 28 October 2019 (AECOM 2019)

²⁶ *Geotechnical and Preliminary Contamination Investigation. Proposed development areas of Toyota Facility Captain Cook Drive Woollooware Bay*. Golder Associates Pty Ltd dated August 1998 (Golder 1998)

- All samples analysed reported concentrations below the adopted commercial/industrial land use criteria (NEPC 1999 and EPA 1994). It was also reported there was a low likelihood of P/ASS.

Golder (1998) presented a detailed geotechnical assessment of underlying sediments (based on core samples collected across the site) which identified the following stratigraphy/lithologies:

- Sandy fill to between 4 and 0 m AHD – contains some building rubble (non-putrescible);
- Peat (peaty sand/clay) from 1 to 2 m AHD – estuarine and marine deposits with some grey sand (shell inclusions) above and below;
- Sand and silty/sandy clays between 0 to 10 m AHD – dune sands with some lenses of peat;
- Sands and sandy clays between -6 to -23 m AHD – generally inorganic with some shells;
- Clayey sands/sandy clays (residual Hawkesbury Sandstone); and
- Quartz rich sandstone bedrock.

The data presented indicates sandy fill material overlies natural peat (organic rich clay/sand) which reported an average thickness of 1 m. Deeper sediments comprised alluvial/estuarine and marine sands/clays which extend to termination on underlying Hawkesbury Sandstone. The reported lithology is considered consistent with the review of the site history and natural setting provided above.

2.6.2 Soil Quality Assessment (CES 2005²⁷)

This report was not cited by JBS&G. The following is a summary of information presented in AECOM (2019).

Consulting Earth Sciences Pty Ltd (CES 2005) were engaged by Toyota to undertake soil characterisation activities in proximity to a proposed 10 m x 60 m x 2 m in depth underground water holding tank along the western boundary of the site adjacent Endeavour Road. Based on review of AECOM (2019) it is unclear if this was installed, and JBS&G did not observe clear evidence of such a feature during inspection of the site.

The scope of works included drilling of eight boreholes (BH1 to BH8, shown in **Figure 3**) to a maximum of 2.4 m bgs, soil sampling and analysis for heavy metals, TPH, benzene, toluene ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), OCP, organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCB) and potential for ASS. Additional Toxicity Characteristic Leachate Procedures (TCLP) were also scheduled for heavy metals and PAHs to provide a waste classification in accordance with NSW waste classification guidelines (EPA 1999²⁸) in force at the time.

CES (2005) noted the site soil comprised sandy silt topsoil overlying sandy fill material with gravel in the upper 1 m underlain at 1.8 m bgs by sandy clay and silty clay estuarine sediments. No asbestos was identified. All samples reported concentrations within the “inert waste” classification in accordance with the EPA (1999) waste classification guidelines and low likelihood of P/ASS.

2.6.3 Targeted Soil Contamination Assessment (NA 2012²⁹)

This report was not cited by JBS&G. The following is a summary of information presented in AECOM (2019).

²⁷ *Soil Quality Assessment – Proposed Water Holding Tank Construction Area, Toyota Headquarters Caringbah NSW*. Consulting Earth Sciences dated 7 December 2005 (CES 2005)

²⁸ *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*. NSW EPA (1999)

²⁹ *Targeted Soil Contamination Assessment, Toyota Motor Corporation Australia Ltd, Corner Captain Cook Drive and Gannons Road Caringbah NSW*. Noel Arnold and Associates dated February 2012 (NA 2012)

Noel Arnold and Associates (NA 2012) were engaged by Toyota to prepare a targeted soil contamination assessment to identify if significant contamination was present in soils immediately surrounding the previously removed UST, formerly located along the western boundary of the site (as shown in **Figure 2**).

The scope of works included drilling of four boreholes (SB01 to SB04, **Figure 3**) to a maximum of 4 m bgs on each side of the former UST location, soil sampling and analysis for lead, TPH, BTEX and PAH, and submission of a dangerous good search from Workcover NSW (now SafeWork NSW).

NA (2012) noted soil comprised sandy silt topsoil from 0.1 to 0.4 m bgs, overlying sandy fill material with clay and gravel to the depth of 1.7 m bgs and underlain by grey silty sand (estuarine sediments) containing strong sulfuric odour. All samples reported concentration below the adopted EPA (1994) criteria in force at the time.

Dangerous Goods Search documentation provided by Workcover NSW on 16 February 2012 did not identify the presence of any petroleum infrastructure at the site. AECOM (2019) noted that previous records indicated the UST was decommissioned in 2003 as confirmed by a UPSS removal certificate, however the certificate was not made available to JBS&G for review. Notwithstanding, NA (2012) indicated that a visual inspection of the tank found white foam protruding from the fill point, consistent with the reported methodology for decommissioning.

NA (2012) included a tank integrity report which was prepared by OPEC Systems Pty Ltd (OPE 2003) presumably prior to decommissioning of the tank. The integrity assessment report identified serious ruptures in the UST lining and evidence of ingress.

NA (2012) recommended that should the tank be removed, it be done so in accordance with relevant EPA made or endorsed regulations/Australian standards and should areas of potential soil or groundwater contamination be identified, a suitably qualified environmental consultant be contacted, and appropriate investigations undertaken.

2.6.4 Hazardous Building Materials Survey (BV 2018³⁰)

Bureau Veritas HSE Pty Ltd (BV) was engaged by Toyota to conduct a hazardous materials survey report (BV 2018) for the site in September 2018.

Non-friable asbestos containing material (ACM) was reported at a number of locations. Synthetic mineral fibres (SMF) were presumed or identified in various materials. BV noted that it was considered unlikely lead-based paints or PCB containing capacitors in fluorescent lights fittings to be present on site given the age of the warehouses, whereas Ni-Cd batteries can be present in uninterrupted power supplies on site.

BV recommended identified and suspected ACM and SMF should be left undisturbed as far as practical, should disturbance be required, appropriate control measures and protocols should be followed in accordance with the *Work Health and Safety Regulations 2017* and National Occupational Health and Safety Commission (NOHSC) *National Code of Practice for the Safe Use of Synthetic Mineral Fibre Products 1990*, respectively.

2.6.5 Stage 1 and 2 Environmental Site Assessment (AECOM 2019)

AECOM Australia Pty Ltd (AECOM) were engaged by Toyota to prepare a combined Stage 1 and 2 Environmental Site Assessment (ESA, AECOM 2019) of the site. The objectives of the combined ESA were to obtain and review available historical and current site information, identify and address data gaps and uncertainties for potential contamination of the site.

The combined ESA report comprised a desktop assessment including review of previous environmental reports supplied by Toyota. Based on the review of historical information for the

³⁰ Hazardous Building Materials Survey – Toyota Australia Woollooware Bay. Bureau Veritas HSE dated September 2018 (BV 2018)

site, it appeared that the site was historically vacant land, potentially used by locals to access Woollooware Bay and/or for dumping household waste, lawn clippings etc. The site was then extensively filled with generally clayey, gravelly coarse sand and crushed sandstone to close to current site levels and developed by Toyota as automotive workshops (commercial/industrial use) since 1982.

Site investigation works were then undertaken from 5 May to 13 September 2019. The field program comprised a detailed site inspection, advancement of twenty-four boreholes (BH1 to BH24, **Figure 3**), conversion of five boreholes into groundwater monitoring wells (MW1 to MW5, **Figure 3**) and soil and groundwater sampling. Selected soil samples were analysed for heavy metals, TRH, BTEX, PAH, PCB, OCP, OPP, volatile organic compounds (VOCs) and asbestos, whereas groundwater samples were analysed for heavy metals, TRH, BTEX, PAH and phenols.

Fill materials were encountered across the site to depths ranging from 1.6 (BH14/MW4) to 3.5 m bgs (BH6/MW3), comprising topsoil, fine to coarse grained sand/gravelly sand with some anthropogenic inclusions of tile fragments, brick fragments, concrete fragments and sandstone cobbles observed at location BH3/MW2, BH5, BH14/MW4, BH18, BH19 and BH24, underlain by dark grey or black medium plasticity sandy silt/silt (estuarine sediments) with inclusions of high organic content to a maximum depth of 5.5 m bgs (BH14/MW4) at most locations. Natural light brown/grey sand were encountered at 1.25 m bgs (BH10) according to the logs. Sulfuric odour was generally identified within the underlying dark grey/black estuarine sediments layer. No staining was observed in any locations. ACM fragments were identified at sample location BH24 to a depth of 2.4 m bgs. High photo-ionisation detector (PID) readings were obtained at BH20/MW5 at 3 m bgs (83.6 ppm) and BH17 at 2.5 m bgs (271.4 ppm) which was located adjacent to the wash bay and interceptor, however no elevated TRH or VOCs were reported in BH17 samples or BH20/MW5 shallower soil samples.

Groundwater was encountered between 1.58 (MW2) to 4.1 m bgs (MW4) during intrusive works, while the standing water level (SWL) were reported between 0.589 (MW2) and 0.834 m AHD (MW5) during groundwater sampling event. No hydrocarbon odour or sheen were observed in any groundwater samples, however, sulfur odour was noted at sample locations MW1 and MW2.

All soil and groundwater concentrations were reported within the human health and ecological site criteria for commercial/industrial land (NEPC 2013). ACM fragments observed at location BH24 were reported to contain the presence of chrysotile, amosite and crocidolite asbestos. However, laboratory certificates were not included in AECOM (2019) to verify their discussion and summary tables of analytical data.

JBS&G note that AECOM (2019) adopted ANZG (2018³¹) 95% Protection of Species Trigger Values for Freshwater Aquatic Ecosystems for arsenic, 0.024 mg/L. Based on recent guidance from the NSW EPA, JBS&G consider adoption of ANZG (2018) low reliability values of 0.0023 mg/L for arsenic in marine waters to be more appropriate. With consideration of the revised criterion, arsenic concentrations in all groundwater samples are noted to exceed the adopted criterion.

AECOM (2019) concluded that the presence of ACM fragments in BH24 below 1.3 m bgs did not preclude the site suitability for commercial/industrial land use under the existing development scenario.

2.6.6 Review of Land Contamination (JBS&G 2019a³²)

JBS&G (2019a) conducted a due diligence assessment of land contamination in December 2019. The letter comprised a desktop assessment including review of previous environmental reports (as made

³¹ Australia and New Zealand Guidelines for Fresh & Marine Water Quality 2018 (ANZG 2018)

³² Review of Land Contamination Information, Toyota Caringbah Rev 0. JBS&G Australia Pty Ltd document reference 58037-126401, dated 16 December 2019 (JBS&G 2019a)

available at the site) and a review of publicly available historical and environmental information. The review identified a number of data gaps that required further consideration to evaluate the potential for contamination and what implications the site contamination status has for the proposed acquisition and development of the site.

2.6.7 Due Diligence Assessment (JBS&G 2020c³³)

Based on the findings of previous investigations, JBS&G conducted a due diligence contamination assessment to address identified data gaps to evaluate the potential for contamination at the site.

The investigation comprised a review of site environmental information, a detailed site inspection and a program of sampling/analysis which included:

- Advancement of eight soil bore locations (BH25-BH30, MW6-MW7, **Figure 3**) and soil sampling and analysis targeting AECs and to provide broad site coverage;
- Field screening of excavated material for indicators of P/ASS and subsequent laboratory analysis to assess for P/ASS in underlying soils at the site;
- Conversion of two soil bores to groundwater monitoring wells (MW6 and MW7, **Figure 3**) and groundwater sampling and analysis of groundwater from the two new and five existing (MW1 to MW5, **Figure 3**) monitoring wells;
- Soil vapour screening from twenty-one sub-slab locations (VP01 to VP21, **Figure 3**) and sampling and analysis of soil vapour from nine of the locations; and
- Field screening for high ground gas (HGG) from seven dual-purpose groundwater monitoring wells fitted with gas well caps (two rounds of sampling) and from twenty-one sub-slab points.

Based on the implementation of the investigation, the following was reported:

- Sand and sandstone fill were reported overlying reworked organic rich sandy clays and natural grey alluvial silty sands at the majority of locations, consistent with previous investigations (AECOM 2019);
- Concentrations of copper at three locations (BH25, BH29 and MW07, **Figure 3**) in sub-grade blue metal road base, exceeding the adopted ecological criteria for the most sensitive land uses (HIL A, NEPC (2013));
- P/ASS were identified within soils at depths of between 2-3 m bgs to the maximum depth of the investigation (6.8 m bgs);
- Concentrations of COPC in groundwater were generally reported below the adopted criteria with the exception of ammonia which was reported at three locations (MW3, MW4 and MW7, **Figure 3**), above the site-specific ecological criteria (ANZG 2018) for 95 % species protection for marine environments;
- Exceedances of the adopted site criteria in soil and groundwater were considered not to pose an unacceptable risk to ecological receptors at the site under the current or proposed land uses (pursuant to NEPC (2013));
- PFAS was considered not to be present at significant concentrations in site groundwater, nor at a level that would indicate the presence of gross or widespread contamination requiring further investigation, management or remediation.

³³ Toyota Caringbah Due Diligence Assessment. JBS&G Australia Pty Ltd. Document reference 58037/127800 (Revision 1). Dated 25 February 2020 (JBS&G 2020c)

- Soil vapour assessment reported concentrations of volatile COPC below the adopted site assessment criteria;
- Ground gas assessment identified the presence of potentially HGG underlying the site likely associated with the anerobic microbial decay of organic materials present within the sites underlying lithologies (both uncontrolled fill and/or naturally occurring material). The investigation identified;
 - Concentrations and low flow rates are considered generally consistent with concentrations and low gas generation rates to be expected in reclaimed coastal or estuarine swamps and mangrove flats (EPA 2020a³⁴);
 - Elevated carbon dioxide and methane were reported within the north eastern portion of the site at sub slab sample locations VP20, VP21 (**Figure 3**) and at ground gas monitoring well locations MW3 and MW4 (**Figure 3**), with a characteristic gas situation of CS2 ('low risk');
 - As methane was reported above 20% v/v as such, a CS value of 3 was applied to the northern portion of the site;
 - The balance of the site (south western) was reported to fall within a characteristic gas situation of CS1 ('very low risk'); and
 - A CS value of 3 requires a value for gas protection of 2 for land uses inclusive of large open plan warehouses and commercial buildings.

JBS&G (2020c) recommended further assessment of ground gases be undertaken (including continuous monitoring) to develop a detailed understanding of the nature and temporal variation in ground gases at the site through CSM development, and to better draw conclusions on the requirement for potential future management and/or implications to the redevelopment of the site.

Further, JBS&G (2020c) recommended additional investigation be conducted within vicinity of BH24 (AECOM 2019) to delineate and quantify bonded ACM impacted fill material in accordance with NEPC (2013) and Western Australia Department of Health (WA DOH 2018³⁵) guidance.

JBS&G (2020c) concluded management of P/ASS is required as part of future redevelopment works (i.e. piling and/or deep excavations) and a site-specific management plan (ASSMP) will be required to be developed.

2.6.8 Acid Sulfate Soil Management Plan (JBS&G 2020b)

JBS&G (2020b) prepared an ASSMP to document procedures to be implemented to manage the potential environmental risk associated with disturbance of P/ASS materials identified by JBS&G (2020c) and to provide a framework for ongoing management of P/ASS at the site. The management plan presented the following:

- Based on previous investigations, P/ASS materials are typically associated with natural/reworked natural estuarine silty clays and alluvial sands;
- Construction activities which have the potential to generate P/ASS include (but not limited to); building foundations, service installations, piling, dewatering, and/or general site excavations;
- The collection of additional environmental data prior to proposed excavations would facilitate the efficient and effective management of P/ASS at the site;

³⁴ Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases, NSW EPA, May 2020 (EPA 2020a)

³⁵ Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, WA Department of Health 2009, updated 2018 (WA DOH 2018).

- The addition of neutralising chemicals is recommended as the preferred P/ASS treatment approach; and
- Existing data presents liming rates varying between 9 kg and 25 kg lime/tonne of PASS for appropriate treatment. Notwithstanding, the revising of liming rates will be required based on the placement (i.e. stockpiled) or extents (i.e. batters/exposed faces) of P/ASS materials.

2.6.9 Detailed Site Investigation (JBS&G 2020a)

JBS&G prepared a detailed site investigation (DSI) report for the site. The scope of works included a review of previous investigations and a targeted program of soil and ground gas sampling/monitoring and analysis as follows:

- Additional soil sampling and analysis via advancements of twelve 200 mm boreholes (BH24A to BH24L, **Figure 3**) in proximity to an area of previously identified asbestos impact (BH24). Field quantification was conducted in accordance with WA DOH (2018). Bonded ACM fragments were identified at one sample location (BH24C), in addition to BH24, in a 10L field quantification sample, with a reported concentration of 0.057 % w/w, in exceedance of the adopted site criterion for the most sensitive land use (HIL-A, NEPC (2013)) and less sensitive commercial/industrial land use (0.05% w/w (HIL-D, NEPC (2013))).
- Installation and monitoring of two ground gas wells (LGF01 and LGF02, **Figure 3**) for a period of 23 days, including continuous monitoring. Elevated levels of methane, carbon dioxide and low flows of ground gases were reported as part of the current assessment. Through a detailed assessment of the gas concentrations, flow rates and the conceptual site model, the site was reported to pose a 'very low risk' (when considered with relevant NSW EPA endorsed guidelines) and a characteristic gas situation of '1' was reported as generally applicable to the site.

Based on the scope of the work completed the following conclusions and recommendations were made.

- The soil, groundwater and soil vapour investigations did not identify gross or widespread contamination at concentrations that would preclude the use of the site for its proposed mixed uses (commercial retail spaces and industrial warehouses).
- Isolated copper and TRH concentrations exceeding the adopted ecological criteria in soil were not considered to represent an unacceptable risk to current/future site receptors under the current/proposed development scenarios.
- Heavy metal and ammonia in groundwater were reported to exceed the adopted ecological criteria. Heavy metals were considered reflective of background concentrations to be expected in urban environments and considered not to pose an unacceptable risk at the site. Ammonia was considered to be present in groundwater as a result of the anerobic decay of organic rich sediment underlying the site and in the absence of nitrate/nitrite was not considered to pose an unacceptable risk to current/future ecological receptors under the current/proposed land uses.
- The asbestos impact at the east of the site (BH24 and BH24C, **Figure 4**) was confirmed to be bonded in nature and was restricted/isolated to an area of approximately 505 m² by 2.4 m in depth requiring remediation/management (approximately 1,200 m³).
- P/ASS was identified in underlying soils at the site and requires to be managed in accordance with the ASSMP (JBS&G 2020b).
- Indoor ambient air assessment did not identify the presence of HGG within site structures.

- Based on the gas risk assessment and detailed CSM, giving appropriate consideration to the gas screening value (GSV) and CSM as part of the multiple lines of evidence approach, a 'very low risk' characteristic situation CS1 was considered the most appropriate for the site, and where current/future development of the site includes/will involve engineered concrete slabs associated with the built form, mitigating potential ground gas migration.
- With consideration to requirements of the UPSS Regulation and the NSW EPA's preference that abandoned USTs be removed, JBS&G recommended that the UST/s be appropriately decommissioned (removed), and the resulting excavation/s validated.
- JBS&G recommended a RAP be prepared to describe the required management strategy including any necessary remediation and validation works to ensure the site is suitable for the proposed mixed uses (commercial retail spaces and industrial warehouses).

JBS&G note that a revised DSI (JBS&G 2023c) has been prepared for submission with the Masterplan Area development application which acknowledges that UPSS have been removed from the site and validated as part of Warehouse E1 works, as discussed in **Section 2.6.12**.

2.6.10 UST Environmental Assessment, 13 Endeavour Road, Caringbah NSW (JBS&G 2021b)

JBS&G were engaged to undertake a detailed review and environmental assessment of historic UPSS at the site, which included the review of relevant plans detailing the location and configuration of a single UST and associated infrastructure in the northwest of the site. A copy of the detailed assessment letter has been provided in **Appendix D**. As noted, the UST has since been removed as validated by JBS&G (2023b).

The investigation included an inspection of the UPSS area, which identified the UST remained *in-situ* at the time, with evidence of white foam filling, consistent with observations made by previous investigations and the reported method of decommissioning. At the time of inspection, a UST fill point was observed encased in concrete and the tank area was noted within a mulched garden bed.

The investigation concluded that:

- Review of previous investigations and visual observations made during the investigation outlined herein indicate the UST was decommissioned and foam filled (abandoned *in-situ*) in 2003;
- Subsequent targeted soil and groundwater investigations in proximity of the UST did not identify the presence of gross or widespread contamination to soil/fill or groundwater;
- The UST should be excavated and removed to facilitate the redevelopment of the site;
- Any isolated petroleum hydrocarbon impact to soil/fill identified during the excavation/removal of the UST is anticipated to be localised and limited in extent;
- A remedial plan (i.e. this RAP, an earlier version of which was in preparation at the time of reporting) has been prepared to validate the excavation and removal of the UST in accordance with relevant regulatory requirements and Australian Standards to ensure the site can be made suitable for its proposed land use(s) (pursuant to NEPC 2013); and
- Based on the assessment, the UPSS infrastructure at the site was not considered to pose an immediate contamination risk at the site.

2.6.11 New Park Contamination Assessment (JBS&G 2022)

JBS&G (2022³⁶) was engaged to conduct a contamination assessment in the southeast portion of the site to evaluate if any further environmental constraints that may influence a new park proposed to be constructed under a previous development scenario.

The investigation included advancement of nine test pits (TP01 to TP09) and collection of three surface samples (SS01 to SS03) via hand auger across the area. Bonded ACM was identified to be commingled with building rubble at location TP104 to a depth of approximately 1 m bgs. All other COPC were reported to be below the adopted site assessment criteria.

The report noted subsurface ACM could be managed under the existing EMP, however recommended development of an Asbestos Management Plan (AMP) to manage potential future exposure risks from asbestos for soil disturbance works within the New Park area to satisfy requirements under the *Work, Health and Safety Regulation 2017* (WHS Regulation) and SafeWork NSW Codes of Practice relating to asbestos.

2.6.12 Validation Report E1 Warehouse (JBS&G 2023b)

A validation report was prepared following remediation works which occurred as part of the E1 Warehouse development (the northern portion of the site). The works included the removal of an historically abandoned UST and validation of residual soils. During the works, one ACM unexpected find was excavated and disposed of offsite. On the completion of the remediation works, it was concluded that the E1 Warehouse developable area was suitable for the proposed commercial / industrial land use.

2.6.13 Masterplan Development ASSMP (JBS&G 2023c)

A revised ASSMP (JBS&G 2023c) was prepared (following preparation of the original site ASSMP (JBS&G 2020b)) to guide development activities including the management of PASS materials should they be uncovered. The management plan includes additional data collected to assess the occurrence of PASS as part of the Masterplan Area Development Activities, which are considered representative of site wide conditions. The management plan presented the following:

- Based on previous investigations, P/PASS materials are typically associated with natural/reworked natural estuarine silty clays and alluvial sands;
- Construction activities which have the potential to generate P/PASS include (but not limited to); deep excavation if required;
- The addition of neutralising chemicals is recommended as the preferred P/PASS treatment approach;
- Existing data presents liming rates varying between 9 kg and 25 kg lime/tonne of PASS for appropriate treatment. Notwithstanding, the revising of liming rates will be required based on the placement (i.e. stockpiled) or extents (i.e. batters/exposed faces) of P/PASS materials; and
- Should any PASS be excavated / disturbed, then appropriate confirmation of neutralisation will be required.

³⁶ New Park Contamination Assessment, 13 Endeavour Road Caringbah NSW. Prepared by JBS&G Australia Pty Ltd doc ref 63523/147218 date 8 October 2022 (JBS&G 2022)

3. Conceptual Site Model

A conceptual site model has been presented following as:

- The extent of contamination;
- Potential fate and transport of contaminants;
- Potential receptors to site contamination; and
- Potentially complete exposure pathways.

This is detailed in the following sections.

3.1 Extent of Contamination

A range of previous assessments have been completed on the site as detailed in **Section 2.6**. On the basis of these investigations and recent remediation and validation activities as documented in JBS&G (2023a) for the E1 Warehouse portion of the site, the extent of contamination within the Masterplan Area is limited to isolated areas of bonded ACM impacted fill material in subsurface soil considered to pose a potential human health risk. Asbestos impacted subsurface soil is currently subject to management in accordance with the interim EMP (JBS&G 2021a).

Notwithstanding, remediation / management of the identified asbestos impacts will be required during development activities to document the onsite treatment of ACM impacted soils through the implementation of mechanical or manual picking of ACM. It is noted most of the Masterplan Area will be subject to filling to establish site levels, and minor asbestos disturbance activities are only anticipated in localised portion(s) of the site where ACM has historically been identified.

3.2 Potential Fate and Transport of Contaminants

Contaminants generally migrate from a site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The potential contaminants identified as part of the site history review and previous investigation are generally in either a solid form (e.g. heavy metals) or liquid form (e.g. hydrocarbons, acid leachates from ASS, oxidation of PASS).

As the site is covered by a combination of concrete/asphaltic pavement and vegetation (landscaped garden beds with minor areas of grass cover), the potential for windblown dust migration of contamination from the site is generally low. The potential for contamination migration via surface water movement and infiltration of water and subsequent migration through the soil profile is further considered generally to be low noting impermeable pavements and the physical forms of contaminants identified.

Potential acidic leachates from P/ASS will not occur in lieu of the disturbance of these materials. Where these materials are disturbed and liquid leachates are caused to migrate from the soils, then they can migrate as surface water/overland flows, or otherwise through infiltration through groundwater and via groundwater flows. The acidic nature of these leachates can alter the oxidation states of otherwise naturally occurring heavy metals as present in soils, causing reduction

and occurrence as dissolved forms. This can also lead to elevated levels of some heavy metals migrating as dissolved forms in the leachate.

3.3 Potential Receptors

Potential human populations who may be exposed to site impacts in the future (if they are not remediated or appropriate management is not implemented prior to or during development) include:

- Current and future site occupants/workers/visitors (including infants who may attend the childcare facility) who may potentially be exposed to contaminants of concern through direct contact with impacted soils, groundwater and/or inhalation of dusts/fibres associated with impacted soils; and/or
- Excavation/construction/maintenance workers conducting activities at the site, who may potentially be exposed to contaminants of concern through direct contact with impacted soils present within excavations and/or inhalation of dusts/fibres associated with impacted soil.

Potential ecological receptors identified on and in proximity of the site include flora species established on the site; and downgradient ecological receptors including the marine waters of Woollooware Bay.

3.4 Potential Exposure Pathways

Based on the contaminants of concern as discussed above, the potential exposure pathways for the site include:

- Inhalation of potential COPC including airborne fibres which may be released from asbestos impacted; and
- Potential contaminant uptake by vegetation within landscaped areas.

3.5 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gases.

Man-made preferential pathways are present throughout the assessment area, generally associated with fill materials, and at near surface depths over the remainder of the assessment area. Fill materials are anticipated to have a high permeability.

Sub-surface services are also present, or will be present as part of site redevelopment, throughout the assessment area. Preferential pathways can be created by the generally higher permeability backfill used to re-instate these trenches.

Preferential pathways are also important in the assessment of potential off-site sources of COPC. Preferential pathways are potentially present in the adjoining road network, as associated with service easements.

4. Remedial Options

4.1 Remedial Goal

The goal for the remediation and/or management of environmental impact is to remove unacceptable risks to human populations who will potentially use the multi-use redeveloped site in the future; and to undertake remedial works in a manner that best complies with the principles of ecologically sustainable development (ESD).

4.2 Extent of Remediation

Remediation / management is required to address known areas of contamination within the Masterplan Area associated with the presence of localised bonded ACM impacted fill material (**Figure 5**).

It is noted that P/ASS have also been identified as a potential environmental if any deep excavations are required. However, the management of these materials will be undertaken through the JBS&G (2023c) ASSMP.

Previously unidentified contamination if encountered will be addressed as a contingency through the unexpected find protocol in **Section 7**.

4.3 Assessment of Remedial Options

The approach adopted in this RAP is consistent with the preferred hierarchy of options for site clean-up and/or management provided in NEPC (2013), which are listed as follows:

- on-site treatment so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
- off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site; or

if the above are not practicable,

- consolidation and isolation of the soil on-site by containment within a properly designed barrier; and
- removal of contaminated soil to an approved site or facility, followed where necessary, by replacement with appropriate material;

or

- where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

In addition, it is also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed. And, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017³⁷).

Remedial options have been assessed for the site as detailed in **Table 4.1** following. Remedial options have been considered specific to the site contamination issues identified as requiring to be addressed by this RAP.

³⁷ Contaminated land Management – Guidelines for the NSW Site Auditor Scheme (3rd Edition). NSW EPA 2017 (EPA 2017)

Table 4.1: Assessment of Remedial Options

Remedial Option	Applicability	Assessment
1. On-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.	<u>Bonded ACM Impacted Fill</u> Mechanic or manual picking of ACM within fill material is labour intensive, however, it is more in keeping with the principles of ESD, reducing the need to dispose of material to landfill and import material to reinstate excavations. Should the material be particularly high in ACM content, clay or anthropogenic materials, or prove difficult to achieve validation, consideration should be given to off-site disposal.	The preferred option. Where practicable, this is the preferred option as this reduces material requiring disposal to landfill, the physical resources that would be required to remediate the material are minor and is considered consistent with ESD objectives for the project.
2. Off-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level, after which the soil is returned to the site.	<u>Bonded ACM Impacted Fill</u> This option includes increased truck movements and the potential for exposure to emissions over a wider area. It is also noted that there are licensing issues, associated costs and limited licensed off-site treatment facilities in the surrounding area	Not a suitable option. The resources that would be required to remediate the material and available facilities precludes consideration of this option.
3. On-site in situ management of the soil by physical separation	<u>Bonded ACM Impacted Fill</u> Bonded asbestos impacted material may be relocated at depth or placed in a location(s) not readily accessible (i.e. below an engineered concrete slab associated with the built form) such that they do not represent a potential health risk (i.e. not exposed at the site surface).	Not the preferred option. Where ACM is amenable to picking (Option 1), capping and containing is likely more costly and involves greater emissions to relocate and cap rather than pick. Although feasible, this option is not being considered given the objective of the remediation to allow for commercial/industrial land use without the requirement for ongoing management. This option may be considered should greater volumes of impact be identified or if materials are identified as not amenable to picking.
4. Excavation and off-site removal of the impacted material.	<u>Bonded ACM Impacted Fill</u> There are currently suitably licensed waste facilities in the Sydney region capable of accepting the identified contaminants within fill materials. These are generally located within proximity of the site. Given the potential substantial volume impacted material, consideration to Option 1 is more in line in keeping with the principles of ESD. This option would be implemented as excavation of impacted soils and off-site disposal to a waste facility licensed to receive them.	A suitable option for all contaminant types. Not preferred for Bonded ACM impacted fill, but available as the most preferred contingency if required (due to development constraints or if ACM is difficult to remove as per Option 1).

4.4 Preferred Remedial Approach

Based on the assessment in **Table 4.1**, the preferred remedial approach is to excavate fill identified to contain bonded ACM above the health criterion and undertake picking/removal of ACM fragments from the fill soil profile for on-site reuse of fill following validation and off-site disposal of ACM fragments.

5. Remedial Plan

5.1 Regulatory and Planning Requirements

This RAP has been prepared with reference to the following guidelines and legislation.

5.1.1 Environment Planning and Assessment Act 1979/Resilience and Hazards SEPP

The proposed remedial works discussed herein are considered to be Category 1 remediation work as defined in the Resilience and Hazards SEPP, due to several planning instruments (Urbis 2019³⁹) that apply to the land, and will require specific development consent under the *Environmental Planning and Assessment Act 1997*.

It is understood the remediation works are proposed to be undertaken ancillary to other development that requires consent.

5.1.2 Environment Planning and Assessment Regulation 2000 – Schedule 3 Designated Development

The proposed remediation works is not proposed to involve onsite treatment of soil (refer to **Section 4.4**) and does not require specific development consent.

5.1.3 Protection of the Environment Operations Act 1997

The proposed remediation/validation activities are required to be licensed under the *Protection of the Environment Operation Act 1997 (POEO Act)*. The remedial area is not greater than 3 aggregated ha and does not propose handling of greater than 30,000 m³ of contaminated fill, hence does not trigger the licensing requirements.

5.1.4 Water Management Act 2000

Dewatering is not anticipated for remedial works.

Should groundwater dewatering be required, a dewatering licence will be obtained from the NSW Department of Primary Industry – Water (DPI). The approval will require to be obtained prior to the undertaking of any groundwater dewatering and treatment.

If rainwater accumulates at the site and requires removal from the site, any discharge is required to be in accordance with the *POEA Act*.

If any water is required to be discharged from site to sewer as part of the remedial works scope, approval from the asset owner (Sydney Water) will be required. Sydney Water's approval conditions will require to be upheld by the Principal/Remediation Contractor and demonstration thereof included as part of the validation report.

5.1.5 Protection of the Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site will not require to be licensed. Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It is also stipulated that vehicles used to transport waste must be appropriately licensed and covered when loaded with impacted materials. For transport activities this regulation also details additional tracking requirements for vehicles carrying Special (asbestos) waste if material is identified to contain asbestos following waste classification activities.

Provision is provided in the Regulation and EPA (2014) guidelines for the NSW EPA to approve the immobilisation of contaminants in waste (if required with unexpected finds).

³⁹ Toyota Woollooware Bay Planning Report. Urbis Pty Ltd, dated May 2019 (Urbis 2019)

5.1.6 Waste Classification Guidelines

All wastes generated and proposed to be disposed off-site shall be assessed, classified and managed in accordance with EPA (2014). Where wastes require immobilisation prior to off-site disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of the guideline. Immobilisation is not anticipated.

Should treated P/ASS require off-site disposal then this is required to be undertaken in accordance with the ASSMP (JBS&G 2023c) prepared for the site.

5.1.7 Work Health and Safety Act 2011 and Work Health and Safety Regulation 2017

The information and data provided in this RAP should be considered by the Principal/Remediation Contractor in preparation of their health and safety plans for the remedial works (refer to **Section 8.2**). If asbestos in soil is identified that requires removal, the removal and disposal of asbestos will be managed in accordance with the *Work Health and Safety Act 2011* (WHS Act) and *Work Health and Safety Regulation 2017* (WHS Regulation) and relevant Australian standards, regulations and codes of practice.

5.1.8 Sutherland Shire Council Development Control Plan

The site is subject to development controls as specified in the Sutherland Shire Development Control Plan (DCP). Stockpiling, materials tracking, materials control procedures have been incorporated into this RAP.

5.1.9 Asbestos Removal and Management

The removal and disposal of asbestos will be managed in accordance with the *WHS Act* and *WHS Regulation* and relevant Australian standards, regulations and codes of practice.

A licensed asbestos removalist and SafeWork notification regarding the scope of the removal works is required. It will be the requirement of the appointed remedial contractor to obtain the appropriate approvals and prepare an AMP.

5.2 Site Establishment

The extent of remediation is summarised in **Section 4.2** and shown on **Figure 5**. The Principal/Remediation Contractor shall secure the site to ensure that all safety and environmental controls are implemented. These controls will include, but not be limited to:

- Locate and isolate all required utilities in the proximity of the works;
- Assess need for and implement of any necessary traffic controls;
- Work area security fencing;
- Site signage and contact numbers;
- Stabilised site entry gate;
- Appropriate decontamination areas for personnel and plant, if required;
- Sediment fencing (attached to security fencing); and
- Stormwater runoff and sediment controls (e.g. silt fences and hay bales).

5.3 Remedial Works

The remedial works are required to be undertaken by the Principal/Remediation Contractor with appropriately qualifications, licenses and experience, under the supervision of JBS&G.

5.4 Asbestos Remediation

The extent of remediation is summarised in **Section 4.2** and shown on **Figure 5**. The remedial contractor shall undertake the following to remove ACM:

- Fill identified to contain bonded ACM is to be progressively excavated and stockpiled in approximately 70m³ batches,
- The lateral and vertical extent of the excavation and associated stockpiled soils are to be surveyed for material volume reconciliation;
- The bonded ACM impacted fill is to be spread by the remedial contractor to form pad/s not more than 0.1 m thick, within the designated pad sorting area (more than one pad may be used);
- The dimensions of each pad are to be documented such that the volume of material can be verified and meet the validation sampling density required;
- ACM fragments are to be collected by raking (teeth >10 cm long and not more than 7 mm spacing) and picking of the spread material by the remedial contractor or their appointed contractor and collected ACM fragments disposed of off-site to an appropriately licensed waste facility. A minimum of two passes of picking and raking will be made with a 90° direction change between each;
 - Note: other methodologies may be deployed based on a cost/benefit evaluation by remedial contractor such as use of a Table Screen (or similar) in the case that variable anthropogenic inclusions⁴² may make it difficult to sort/treat manually;
- Following the initial screening process, the remedial contractor or their appointed contractor shall complete a second walkover of the pads to confirm there is no visible ACM;
- Pads will be validated by JBS&G as per **Section 6**. Should validation fail the pad will be subjected to an additional rake, walk/pick by the remedial contractor or their appointed contractor and re-validated by JBS&G until such time as validation is achieved;
- At completion of validation of a prepared pad, it will be excavated and placed in a holding stockpile and the process restarted with the placement of a new pad;
- The footprint of all stockpiles/pads and material underlying impacted fill (following excavation) are to be validated by JBS&G as per **Section 7**. Should validation fail, the failed base of the excavation/pad/stockpile will be excavated a further 0.2 m in the direction of the failure and the validation process repeated until validation is achieved; and
- Materials will be tracked from source, through required remedial activities to final placement/disposal, noting remediation undertaken and validation outcome.

5.5 Asbestos Management Requirements

Based on the available characterisation information, distinct fill materials within the site are impacted with asbestos and are provisionally classified as asbestos contaminated soils until deemed otherwise by further assessment. Asbestos contaminated soil necessitating management for potential asbestos exposure is defined in *How to Manage and Control Asbestos in the Workplace Code of Practice* (SWA 2022) as:

⁴² Previous investigations identified inert anthropogenic inclusions including brick and concrete not considered to pose an aesthetic issue under the proposed commercial industrial land use scenario. Should any inclusions be identified which may pose an aesthetic concern under the proposed land use then these would require to be removed by the contractor during the works. Geotechnical considerations are beyond JBS&G's advice.

- Soil that contains visible asbestos as determined by a competent person; or
- Soil that contains asbestos fibres at quantities exceeding trace levels (considered to be the analytical detection limit in lieu of alternate guidance) as reported by analysis undertaken in accordance with AS4964:2004 *Method for the qualitative identification of asbestos in bulk samples*.

Environmental, health and safety management requirements for the handling of these materials will be documented in an AMP to be prepared by the remedial contractor and based on the requirements provided for asbestos-related works in SWA (2022). This will include preparation of an asbestos register and associated asbestos removal control/management plan as outlined in SWA (2022). Appropriate signage specific to asbestos removal works will be provided.

Where sampling and analysis of specific fill materials is completed in conjunction with inspection by an appropriately qualified person, and the results indicate the material does not fall within the “asbestos contaminated soil” definition, the requirements for management of “asbestos contaminated soils” will not be required to be implemented. For the purposes of remediation works within the site, a competent person shall be considered to be a person who holds a tertiary degree in a science or engineering discipline, has experience in contaminated site assessment and has completed a WorkSafe approved Asbestos Removal Supervisor course.

Additional requirements for asbestos remediation works will be documented within the AMP, which shall make specific reference to the requirement for:

- Decontamination procedures;
- Air monitoring;
- Exclusion zones;
- Fencing and signage; and
- Other relevant controls identified stipulated within SWA (2019).

5.5.1 Asbestos Air Monitoring

During works which have the potential to disturb ACM inclusive of the excavation of ACM impacted soils for on-site treatment or off-site disposal, perimeter air monitoring will be conducted on each of the site boundaries. Additional downwind monitoring locations will be included in the air monitoring program as required.

Air monitoring will be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the *Guidance note for the estimation of airborne asbestos dust* [NOHSC 3002:2005].

5.6 Off-site Disposal

Where waste is required to be removed, waste materials shall be classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

The waste facility must be lawfully licensed to receive the material sent to it for disposal.

The Principal/Remediation Contractor must be aware of and conduct all waste disposal in accordance with all relevant regulations. All waste tracking documentation including disposal dockets must be maintained by the Principal/Remediation Contractor and must be provided to JBS&G/the client for inclusion in the validation report.

Where P/ASS is encountered, consideration should also be given to JBS&G (2023) and the waste treatment and disposal requirements.

5.7 On-site Reuse

Following remediation and successful validation, fill materials are proposed to be re-used on site.

5.8 Materials Importation

A requirement to import material is unlikely. It is envisaged soil piling spoil or similar will be used to reinstate remedial excavations

If material is to be imported to the site, e.g. for the reinstatement of excavations, then it shall be validated as per **Section 6.1.7**.

5.9 Surveying

A qualified surveyor will conduct surveying of excavations, stockpiles and remedial extents (as required for volume reconciliation).

5.10 Validation

Validation of the remedial works will be conducted by JBS&G to demonstrate that the remediation objectives have been achieved. Details of the validation program are provided in **Section 6**.

5.11 Site Disestablishment

On completion of the remediation works all plant/equipment and safety/environmental controls shall be removed from the site by the appointed Principal/Remediation Contractor. All equipment used during remediation works will need to be appropriately decontaminated or disposed of as waste in accordance with relevant waste regulations.

6. Validation Plan

6.1 Overview

Validation data is required to be collected to verify the effectiveness of the remedial works and document the final site conditions as being suitable for the proposed future use(s).

The following sections establish the data quality objectives (DQOs) to be adopted during validation of the site remediation works.

6.1.1 State the Problem

The site, which has historically been used for commercial/industrial land uses is proposed to be redeveloped for mixed uses (refer to **Section 1**). Past assessment activities, as summarised in **Section 2** have identified subsurface bonded ACM impacted fill materials which require remediation and / or management during redevelopment activities proposed within the Masterplan Area.

During redevelopment / remediation activities, sufficient validation of the site activities is required to demonstrate that the identified environmental and health-based risks to future site user(s) have been adequately managed to render the site suitable for the proposed land use/development without the requirement for ongoing environmental management.

6.1.2 Identify the Decision

The decisions which are required to be made for validation of the site are:

- Has all treated fill material and remedial excavation extents been validated as per the adopted site remediation criteria, such that they do not pose a potential risk to future site users?
- Has the extent of remediated asbestos impacted fill materials been sufficiently documented?
- Have any unexpected finds or additional areas of impacted soil been addressed, and residual fill/soils considered environmentally suitable?
- Are imported soils (where required) environmentally suitable for their proposed use?
- Is the site suitable for the proposed use without the requirement for ongoing management?

6.1.3 Identify Inputs to the Decision?

Inputs to the decisions are:

- Field observations in relation to inspection of all excavation bases, walls, pads and stockpiles for indicators of potential contamination;
- Soil validation analysis data collected from, pads, the exposed ground surface and from the base and walls of the remedial excavations;
- Waste classification and/or material characterisation data obtained during assessment of fill materials/soils;
- Materials tracking records;
- Importation assessment criteria;
- Survey data;
- Management plan documentation (where required);

- Disposal dockets and relevant documents in relation to appropriate disposal of material to be removed from site as part of the remediation works (landfill dockets, beneficial reuse/recycling dockets); and
- Data quality indicators as assessed by quality assurance/quality control (QA/QC).

Specifically, sufficient data needs to be collected from each of the identified potentially impacted media (e.g. fill material and natural soils) across the site for associated COPC.

6.1.4 Define the Study Boundaries

The site boundaries are defined in **Section 2.1** and presented on **Figures 1** and **2**. The surrounding land uses are outlined in **Section 2.3**. The vertical extent of the works will be the maximum depth of remedial excavations.

Validation works will be completed within development timelines to be informed by Aliro.

6.1.5 Develop a Decision Rule

Decision rules are provided following for each of the decisions:

- Has all treated fill material and remedial excavation extents been validated as per the adopted site remediation criteria, such that they do not pose a potential risk to future site users?
 - If all asbestos impacted soil and remedial excavation extents has been treated and validated on-site, and all remedial excavation extents have been validated in accordance with the requirements of this RAP then the decision will be **Yes**. Otherwise the decision will be **No** and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved.
- Has the extent of remediated asbestos impacted fill materials been sufficiently documented?
 - If assessment of field observations and survey data indicates remedial works have sufficiently documents the extent of remediated asbestos impacted fill material, then the decision will be **Yes**. Otherwise the decision will be **No**, and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved.
- Have any unexpected finds or additional areas of impacted soil been addressed, and residual fill/soils considered environmentally suitable?
 - If assessment of field observations and analytical results for unexpected finds or additional areas of impacted soil satisfies the site validation criteria (human health and ecological) the decision will be **Yes**. Otherwise, the decision will be **No** and additional remedial works or ongoing management are required.
- Are imported soils (where required) suitable for their proposed use?
 - If imported soils are comprised of virgin excavated natural material (VENM) or excavated natural material (ENM) and they are used in accordance with the relevant exemptions, and analyte levels within the soils meet all the adopted validation criteria (**Section 6.3**) then the decision will be **Yes**. Otherwise the decision will be **No**.
- Have the objectives of the RAP been achieved such that the site upon completion of remedial works is considered appropriate/suitable for permissible land uses without the requirement for ongoing management?
 - If all answers to the above decisions are **Yes**, then the site is suitable for the proposed use. Otherwise the decision is **No**, and additional assessment and/or remediation is

required to demonstrate the objectives of the RAP have been achieved and/or long term environmental management will be required.

6.1.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), ANZG (2018), appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for completeness, comparability, representativeness, precision and accuracy.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in **Table 6.1**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted criteria.

If any of the DQIs are not met, further assessment of the data set will be required in order to determine whether the non-conformance has significant effects on the usefulness of the data. Corrective action to correct an adverse impact on the reliability of the dataset may include, but is not limited to, the request of further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Table 6.1: Summary of Quality Assurance/Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory) ²	1 / 20 samples	<30% RPD ² , asbestos in agreement
Blind duplicates (inter laboratory) ²	1 / 20 samples	<30% RPD ² , asbestos in agreement
Laboratory duplicates	1 / 20 samples	<30% RPD ² , asbestos in agreement
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes		.. ³
Samples extracted and analysed within holding times.	-	Soil: organics (14 days), inorganics (6 months) Groundwater: metals (6 months, other than mercury - 28 days), sVOCs (>C ₁₀ - 7 days), volatiles (<C ₁₀ - 14 days) Soil vapour: sorbent tubes VOCs/TRH (28 days)
Trip spike (soil and ground water only) ¹	1 per sampling event	70-130% recovery
Storage blank (soil and groundwater only) ¹	1 per sampling event	<LOR
Rinsate blank (soil and groundwater only) ¹	1 per sampling data where reusable equipment is used	<LOR
Method blank (soil vapour only) ¹	1 per lab batch	<LOR
Equipment blank (soil vapour only) ¹	1 per lab batch	<LOR
Laboratory blanks	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples ¹
Standard analytical methods used for all analyses	All Samples	All samples ¹
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples ¹
Limits of reporting appropriate and consistent	All Samples	All samples ¹
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples ²
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	.. ¹
Data from critical samples is considered valid	-	Critical samples valid ³
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All Samples	All samples

¹ If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

² A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

6.1.7 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field validation sampling design that generates data that are expected to satisfy the decision performance criteria, as specified in the preceding steps of the DQO process. The output of this step is the sampling design that will guide development of the field sampling and analysis plan. This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

The remediation validation and subsequent laboratory analysis program as outlined in the following sections will need to be implemented during site remediation activities to demonstrate the successful completion of works in compliance with the RAP goals. The validation/characterisation sampling and analytical program for the site is outlined in **Table 6.2** below.

Table 6.2: Characterisation/Remediation Validation Program

Item		RAP Sampling Frequency		Analytical Suite
Export of Materials				
Classified in accordance with EPA (2014) Waste Guidelines		Soils requiring additional classification for off-site disposal will be sampled by JBS&G as per the sampling density for stockpiled materials in EPA (2022)		TRH/BTEX PAH Heavy Metals OCP/PCBs Asbestos (absent/present)
Validation of Asbestos Impacted Fill Remediation/Removal				
		Excavation Floors	Excavation Walls	
Treated ACM impacted fill	N/A	N/A		Visual Inspection by JBS&G + Asbestos (NEPM protocol: 500 mL)
	Stockpiled Material ACM (and anthropogenic) impacted fill is to be placed as pads no thicker than 0.1 m. Following remedial activities by remedial contractor each pad will be subject to visual inspection as per the methodology outlined in Section 5.4 . If no ACM (and aesthetic impacts) is apparent, a 500 mL validation sample is required to be collected at a density of 1 sample per 70m ³ with a minimum of 1 sample per pad (if less than 70m ³).			
ACM remedial excavation		1 sample per 25 m ² , with a minimum of one sample per base	5 m of excavation wall, with a minimum of 1 sample per wall	Asbestos (NEPM protocol: 500 mL)
Exposed ground surface (following stockpiling, sorting and excavation of ACM impacted fill)		Visual, and 1 per 100m ² (10 m grid) or minimum 1x sample per base	1 per 10m lineal (from each distinct horizon/material type/1 m vertical soil profile). Minimum 1 x sample per wall. If excavation is shallow, i.e. wall height ≤ 0.2 m, then wall samples are not required.	Visual Inspection by JBS&G + Asbestos (NEPM protocol: 500 mL)
Materials Importation				
Imported VENM		Minimum of 5 samples per source site/material type up to 10,000 m ³ then 1 sample per 1000 m ³ thereafter, or at a reduced frequency subject to a 95% UCL calculated for all applicable analytes		TRH/BTEX PAH Heavy Metals OCP/PCBs Asbestos (NEPM protocol: 500 mL) plus source site inspection
Quarry VENM Materials (e.g. blue metal, sandstone, shale)		Confirmation that the material is quarried rock (VENM) prior to importation, and visual confirmation.		Source site inspection required
Recycle materials including ‘quarry’ products that are recycled.		Letter showing compliance with the EPL from the source facility and supplemented with analytical data at a density of 3 samples per material type/batch up to 2000 m ³ then one sample per 500 m ³ thereafter		TRH/BTEX PAH Heavy Metals Asbestos (NEPM protocol: 500 mL) plus a source site inspection
Imported ENM		As per the exemption		As per the exemption + asbestos (500 mL) plus a source site inspection
Unexpected Finds				
		Excavation Floors	Excavation Walls	
Unexpected Find		1 per 25 m ²	1 per 5 m lineal	As appropriate, depending on the location and characteristics of the unexpected find

The nominated sampling densities and analytical program have considered sample density guidance provided in EPA made and endorsed guidelines, in particular EPA (2022) *Contaminated Land Guidelines, Sampling design part 1 -application*.

6.2 Soil Sampling Methodology

6.2.1 Sampling for Asbestos Assessment

Bulk soil samples (minimum 10L) will be collected and weighed in the field. Collected bulk sample will be sieved in the field ($\leq 7\text{mm}$ passing) and separated fragments retained and weighed in the field, or spread out on contrasting plastic. The asbestos concentration as ACM in soil will be calculated in accordance with NEPC (2013) and WA DOH (2021) and based on the weight of collected fragment/s (assuming 15% asbestos content) divided by the weight of the collected 10L soil sample, providing a w/w %. Validation criteria will be adopted in accordance with NEPC (2013) for the permissible land use. A requirement of 'no visible ACM' and a 0.0 w/w% will be required to achieve the validation objectives such that the site can be considered suitable without the requirement for ongoing management.

A separate 500mL soil sample will be collected from the same location as a bulk sample, labelled and sent to the laboratory for asbestos analysis according to NEPM (2013) protocol.

6.2.2 Validation of Excavation(s)

Samples will need to be collected by an appropriately trained and experienced environmental scientist/engineer using a hand trowel or from the bucket of mechanical excavation equipment, at the required densities to meet the project DQOs.

If a potential for volatile contamination is identified, samples will be screened using a photoionization detector (PID) to assess the potential for volatile organics. Soil samples obtained for PID screening will be placed in a sealed plastic bag for approximately 5 minutes to equilibrate, prior to a PID being attached to the bag. Readings will then be monitored for a period of approximately 30 seconds or until values stabilise and the stabilise/highest reading will be recorded on the field sample forms.

The PID will be calibrated prior to the commencement of field works and then check readings will be completed on a daily basis during the field program using suitable calibration standards. If required, the PID will be re-calibrated during the field program in accordance with manufacturer's instructions.

Prior to collection of each sample, hand tools will need to be thoroughly decontaminated using phosphate free detergent and distilled water as per **Section 6.2.6**.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination will need to be noted on the field documentation.

6.2.3 Stockpile Sampling

For stockpile sampling, material will be obtained from a minimum depth of 0.3 m into the surface of the stockpile at the time of sampling. Appropriate decontamination activities shall be followed following the collection of each sample.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination will be noted on the field documentation.

6.2.4 Sample Handling

Collected samples will be immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis, plastic bags for asbestos). Sample labels recorded: job number; sample identification number; and date of sampling.

Sample containers will be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

6.2.5 Soil Duplicate and Triplicate Sample Preparation and QA/QC Requirements

Field duplicate and triplicate samples for the characterisation/validation assessment will be obtained during sampling using the procedures outlined at a frequency outlined in **Table 6.1**. The primary sample will be divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and / or plastic bags. All jars will be filled completely with no headspace to reduce the potential for loss of volatiles and separately labelled as the primary, duplicate and triplicate samples before being placed in the same chilled esky for laboratory transport.

Trip spike, storage blank and rinsate samples will be collected as per **Table 6.1**.

6.2.6 Soil Sampling Equipment Decontamination

The following procedure will be used to clean non-disposable equipment, including the trowel, pick etc., prior to the collection of each sample:

- Scrubbing with a wire brush to remove gross contamination;
- Pressure spray with Decon 90 detergent and potable water mix;
- Pressure spray rinse with potable water; and
- Air drying.

Where re-usable equipment is utilised for sample collection, rinsate samples will be obtained during the field decontamination procedures at regular intervals during characterisation/validation sampling activities. Each rinsate sample will be obtained by rinsing the trowel with laboratory grade demineralised water following the decontamination procedure. The water sample will be appropriately preserved and stored with the site samples prior to transport to the laboratory for chemical analysis.

6.3 Validation Criteria

Based on the proposed development details and in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017), the most conservative land use criteria will be applied for the Masterplan Area (noting the development scenario includes construction of a childcare facility), sourced from the following:

- Health based Investigation Levels (HILs) for residential use with accessible soil (2013) - HIL-A;
- Health Screening Levels (HSLs) for petroleum hydrocarbons considering potential for vapour intrusion, fine grained soil for low density residential (HSL A) land use at 0.0-1.0 m depth (NEPC 2013);
- Site specific ecological investigation levels (EILs) derived through the added contaminant limits for commercial/industrial land use;
- Management Limits for TRH, fine grained soils for commercial/industrial land use – NEPC (2013);
- Ecological Screening Levels (ESLs) for TRH fractions, BTEX and benzo(a)pyrene in fine grained soil for commercial/industrial land use (NEPC 2013); and
- Where there are no NSW EPA endorsed thresholds the laboratory LOR has been adopted as an initial screening value for the purposes of this validation assessment.

It is noted, whilst the most conservative scenario will be applied in the first instance, applicable criteria for commercial / industrial use as per NEPC (2013) will be considered for portion(s) of the Masterplan Area which will be utilised for commercial uses (such as roadways and warehouse facilities).

6.3.1.1 Application of Soil Assessment Criteria

For soils to be considered as meeting the health/ecological based assessment criteria (i.e., not posing an unacceptable risk), the following criteria will be adopted:

Either:

- All contaminant concentrations were less than the adopted site assessment criteria,

Or:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) was below the adopted criterion;
- No single analyte concentration exceeded 250% of the adopted criterion; and
- The standard deviation of the results was less than 50% of the criterion.
 - Analytical results for asbestos in soils will be directly compared to the site criteria. No statistical assessment for asbestos in soils will be undertaken.

In addition to the numerical criteria, consideration will be given to odorous or discoloured soils (caused by contamination) to supplement the assessment process:

6.3.2 Material Characterisation for Off-site Disposal

Where contaminated fill/soil is not suitable for on-site retention or is surplus to site requirements, materials are proposed to be remediated by off-site removal and disposal. Materials shall be sampled consistent with EPA (2022) sampling guidelines and classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

Material will require to be removed to a facility lawfully able to receive it.

Should treated P/ASS require off-site disposal then this is required to be undertaken in accordance with the ASSMP (JBS&G 2023) prepared for the site.

6.3.3 Imported Materials

In accordance with current EPA policy, only material that does not represent an environmental or human health risk at the receiving site may be considered for resource recovery. Imported materials will only be accepted to the site if they meet the restrictions placed on these materials and meet the definition of:

- VENM as defined in the *Protection of the Environment Operations Act* (1997) Schedule 1;
- Excavated Natural Material (ENM) as defined in EPA (2014a); or
- Recycle materials as per an EPA exemption.

All material imported onto the site are required to be accompanied by appropriate documentation that has been verified by the appointed site contamination (environmental) consultant.

Sampling of materials as per an EPA exemption (recycled products) is required to be undertaken by the facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by JBS&G for land use suitability (refer to **Section 6.1.7**).

6.4 Reporting

6.4.1 Validation Report

The validation report shall be prepared by the environmental consultant written in general accordance with EPA reporting guidelines (EPA 2020b⁴³). The validation report will be submitted to the client at the completion of remedial works at the site.

The validation report should contain information including:

- Results of previous investigations conducted at the site;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP have been achieved;
- Information demonstrating compliance with appropriate regulations and guidelines;
- All material tracking data;
- Any variations to the strategy undertaken during the implementation of the remedial works; and
- Details of any environmental incidents occurring during the remedial works and the actions undertaken in response to these incidents; and
- Other information as appropriate.

⁴³ *Consultants Reporting on Contaminated Land. Contaminated land Guideline. NSW EPA 2020 (EPA 2020b)*

7. Contingency Plan

A review of the proposed contamination-related aspects of the works associated with development of the site has been undertaken and has identified a number of potential risks, outlined in the following sections that required the development of contingencies to ensure that the objectives of this RAP are met.

The Contingency Plan is required to be part of the REMP, as described in **Section 8.1**, below, and part of the Work Health and Safety Plan (WHSP), as described in **Section 8.2**.

7.1 Unexpected Finds

The possibility exists for hazards that have not been identified to date to be present within fill materials or underlying pavements/building on the site. The nature of hazards which may be present, and which may be discovered at the site are generally detectable through visual or olfactory means, for example:

- Presence of visible non-friable ACM following removal of any hardstand or excavations; and/or
- The presence of significant aggregates of friable asbestos materials (visible) as opposed to minor occurrences of fragments or fibre bundles in soil; and/or
- Excessive quantities of Construction/Demolition Waste (visible); and/or
- Hydrocarbon impacted materials beyond that reported to date (visible/odorous); and/or
- Drums, waste pits (visible); and/or
- Oily Ash and/or oily slag contaminated soils/fill materials (visible/odorous); and/or
- Tarry like impacted soil/fill material (visible/odorous); and/or
- Potential chlorinated hydrocarbon impact (sweet odour soils).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances (or any other unexpected potentially hazardous substance) be identified, the procedure summarised in **Flow Chart 7.1** is to be followed.

An enlarged version of the Unexpected Finds Protocol, suitable for use on the site, should be posted in the Site Office and referred to during the site-specific induction by the Principal Contractor.

The sampling strategy for each “unexpected find” shall be designed by a suitably qualified environmental consultant. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The sampling frequency of the identified substance/materials shall meet the minimum requirements outlined in EPA (2022⁴⁴) in addition to those outlined in **Section 6**.

7.1.1 Identification of Underground Storage Tanks

There is the potential that additional USTs may be encountered during demolition of the pavements or subsequent earthworks. In the event of such an occurrence, the Unexpected Finds Protocol (**Flow Chart 7.1**) will be implemented and remedial actions defined with consideration to the requirements for known USTs as documented in **Section 6**.

⁴⁴ Contaminated Land Guidelines, Sampling Design part 1 - application. NSW EPA 2022 (EPA 2022)

7.1.2 Previously Unidentified Asbestos Impacts

Should asbestos impacts be identified (either in unsealed garden beds or as may be exposed following removal of hardstand pavements), the material will be subject to additional characterisation activities and required to be managed as per the requirements of this RAP for other site based asbestos contamination.

7.1.3 Identification of Oily or Tarry Materials

In the event that oily/tarry materials are encountered, the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Section 7.1**).

Any suspected oily/tarry materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their appropriate management. In the event that the oily/tarry materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

7.1.4 Identification of Petroleum Hydrocarbon Impact

In the event that petroleum hydrocarbon impacted materials are encountered, the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Section 7.1**).

Any suspected petroleum hydrocarbon impacted materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their appropriate management. In the event that the materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

7.1.5 Material Storage Breach

In the event that any materials storage containment controls are breached and stockpiled materials classified as asbestos contaminated soil or otherwise have escaped (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented. The REMP (**Section 8**) shall include a documented process for identifying and responding to such incidents.

7.1.6 Emissions Complaints

Due to the nature of the activities and type of contaminants identified within the site, there is a potential for complaints to be received from members of the public and/or occupants of surrounding properties relating to environmental emissions including:

- Odour emissions arising from handling of malodorous soil;
- Noise and vibration arising from excavation, piling and other works;
- Dust emissions arising from excavation, material handling and placement; and
- Visibly impacted water quality in surface water discharge from the site.

Monitoring of all environmental emissions shall be undertaken during the works as detailed in the REMP (discussed in **Section 8**) and appropriate actions taken to further control emissions following receipt of a complaint. The REMP shall contain provision for contingency actions where excessive emissions occur, however it is anticipated that one or more of the following actions will be considered:

- Increased application of odour screening/masking chemicals on odorous materials;
- Disturbance of soils during meteorologically favourable periods only; and/or
- Covering of impacted soils.

8. Other Remediation Documents

8.1 Environmental Management

8.1.1 Preparation of a Remediation Environmental Management Plan

Prior to commencement of remediation works, a REMP shall be prepared by the Principal/Remedial Contractor which documents the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with the construction of the site.

The REMP shall address each of the nominated items in **Section 8.1.2** and shall include the Contingency Plan, referred to in **Section 7**, above. Additional environmental management requirements may be required as part of development consent.

8.1.2 Required Elements/Procedures

An assessment of the proposed activities and the associated elements required to be incorporated into the REMP is provided in **Table 8.1**. The REMP is required to address each of the required elements and procedures in full detail and to include detailed monitoring processes and procedures, corrective actions and reporting requirements.

Table 8.1 Required Elements of the REMP

Element	Specific Minimum Requirements to be included in REMP
1. Dust and Airborne Hazard Control	Dust and asbestos air monitoring. Provisions for dust control based on monitoring results.
2. Flora and Fauna	As appropriate.
3. Heritage/Archaeological	In accordance with relevant heritage/archaeological studies.
4. Visual Impacts	Visual monitoring at site boundary Specific colour requirements for various controls/measures, including PPE (e.g., masks/coveralls).
5. Emergency Response	As appropriate. Procedures required for spill incident response including material storage breach.
6. Noise Control	Hours of operation, consistent with the consent conditions.
7. Traffic	Controls on vehicle movements on public roads. Controls on transport of impacted materials.
8. Protection of Adjoining Structures	As appropriate.
9. Odour Control	Management of all potential odour generating activities (i.e., excavation of petroleum hydrocarbon contaminated soils) with appropriate odour controls incorporating safeguards and monitoring. Daily monitoring of odour levels at site boundary during handling of malodorous materials. Procedures for addressing elevated odour monitoring results, including, but not limited to reduction in earthworks activities within odorous material areas during adverse meteorological conditions; application of odour masking solutions at the odour source or between identified source(s) and receptor(s).
10. Handling of Contaminated Soil and Groundwater	Soil and water management (stockpiling, site access, excavation pump out, reinstatement).
11. Soil Storage/Placement Areas	Soil and water management (stockpiling, site access, excavation pump out, reinstatement). Bunding. Heavy vehicle/personnel decontamination. Site drainage requirements, incorporating clean/dirty areas and modifications to existing surface water and drainage controls beneath retained pavements. Monitoring as required.
12. Sediment Control	Bunding. Collection/treatment/handling impacted sediments.
13. Operation of Site Office	As appropriate.

Element	Specific Minimum Requirements to be included in REMP
14. Decontamination of Heavy Equipment	As appropriate.
15. Environmental Monitoring	Monitoring of dusts, noise, odour and fibres. Monitoring as required for vibration and water releases. Inspection checklists and field forms.
16. Environmental Criteria	Soil and water criteria as presented in this RAP
17. Material Classification	As detailed in this RAP.
18. Community Relations Plan	Specific communication protocols, incorporating nomination of specific contact persons & details and requirements for communications/response register.
19. Incident Reporting	As appropriate, including standard form/checklist.
20. Security and Signage	Secure site perimeter. Site boundary signage.
21. Training	As appropriate.
22. Contact Details	Company/personnel details, including names/phone numbers for: - Principal Contractor - Remediation Consultant - Remediation Contractor - OH&S Compliance - Environmental Compliance
23. Stockpiling	No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained. All stockpiles of soil or other materials shall be placed away from drainage lines gutters or stormwater pits or inlets. All stockpiles of soil or other materials likely to generate dust or odours shall be covered. All stockpiles of chemically contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours. All stockpiles of asbestos contaminated soils shall be kept damp and covered to minimise potential fibre release, and if left for more than 24 hours, be stored in a secure area.
24. P/ASS	All works are required to be undertaken in accordance with the ASSMP (JBS&G 2023) prepared for the site.

8.1.3 Certification

Prior to commencement of remediation works, the Principal/Remediation Contractor is required to have the REMP endorsed as acceptable by the Environmental Consultant or the client.

A copy of the REMP and the endorsement to the satisfaction of Environmental Consultant/client are required to be provided by the Principal/Remedial Contractor prior to commencement of remediation works.

8.1.4 Hours of Site Operation/Duration of Works

Remediation works shall be completed in accordance with the permissible hours of work and noise as nominated in of the Development Consent.

The appointed remediation contractor will be required to include a proposed schedule of remediation works within the REMP submitted for endorsement as discussed above.

8.2 Health and Safety

8.2.1 Work Health and Safety Management Plan

A WHSP shall be prepared by the Principal/Remediation Contractor prior to commencement of remediation works. The plan shall contain procedures and requirements that are to be implemented as a minimum during the works, in addition to the Contingency Plan, referred to in **Section 7**.

The objectives of the WHSP are:

- To apply standard procedures that minimises risks resulting from the works;

- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while operations are being conducted at the site.

8.2.2 Additional Site-Specific Elements/Procedures

In addition to the normal construction-related matters, the WHSP shall address the following site-specific hazards associated with the works relating to the management of contaminated soil and groundwater:

- Under/aboveground services, specifically former petroleum infrastructure;
- Use of plant and machinery within confined spaces (i.e. tank pit excavations);
- Contact to asbestos contaminated soils;
- Contact with contaminated soil (lead, TRH) other than asbestos; and
- Heat/cold stress.

8.2.3 Asbestos

Should any asbestos-related remedial works occur, perimeter asbestos in air monitoring will be conducted at each applicable remedial works area boundary when soil with asbestos are being disturbed. Air monitoring will be conducted on a daily basis at relevant locations whilst disturbance of asbestos contaminated areas takes place.

Air monitoring will be conducted during any ground disturbance activities associated with asbestos remedial works to verify that implementation of appropriate control measures have been successful at managing the risk of air borne fibre generation. Air monitoring will be undertaken in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the *Guidance note for the estimation of airborne asbestos dust* [NOHSC 3002:2005].

9. Conclusions and Recommendations

9.1 Conclusions

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3rd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and the recommendations below, it is concluded that the site can be made suitable for the intended uses and that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment.

9.2 Recommendations

It is recommended that the processes outlined in this RAP be implemented and that the following documentation be developed and implemented to ensure the risks and impacts during remediation works are controlled in an appropriate manner:

- A REMP, to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed; and
- A WHSP to document the procedures to be followed to manage the risks posed to the health of the remediation workforce.

10. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

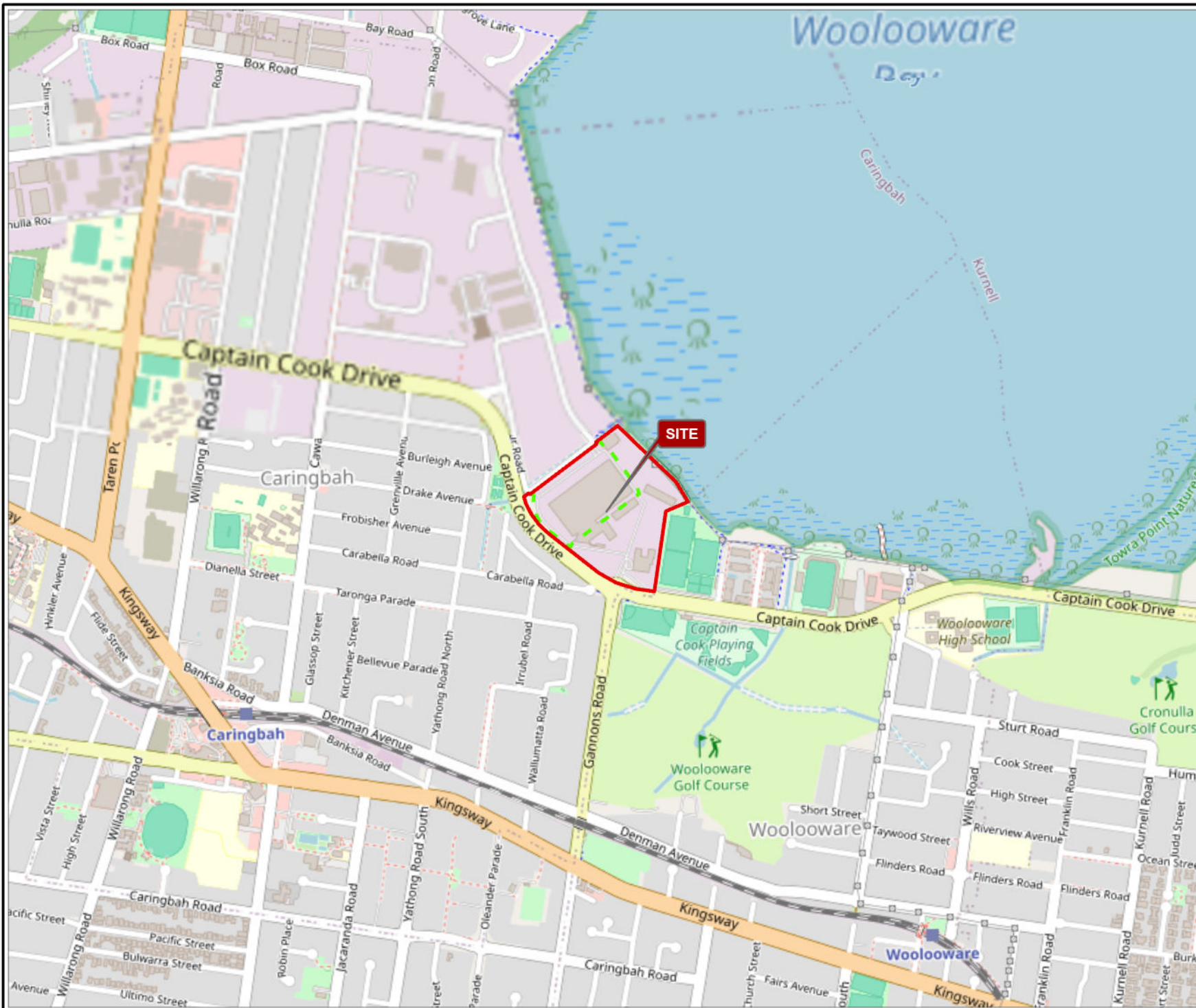
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



- Legend
- SITE Approximate Site Boundary
 - SITE Stage 2 TripleTwoNine Masterplan Development



Job No: 58037

Client: Aliro

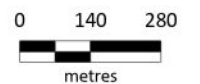
Version: R01 Rev A

Date 11/10/2024

Drawn By: IA

Checked By: RC

Scale 1:15,000

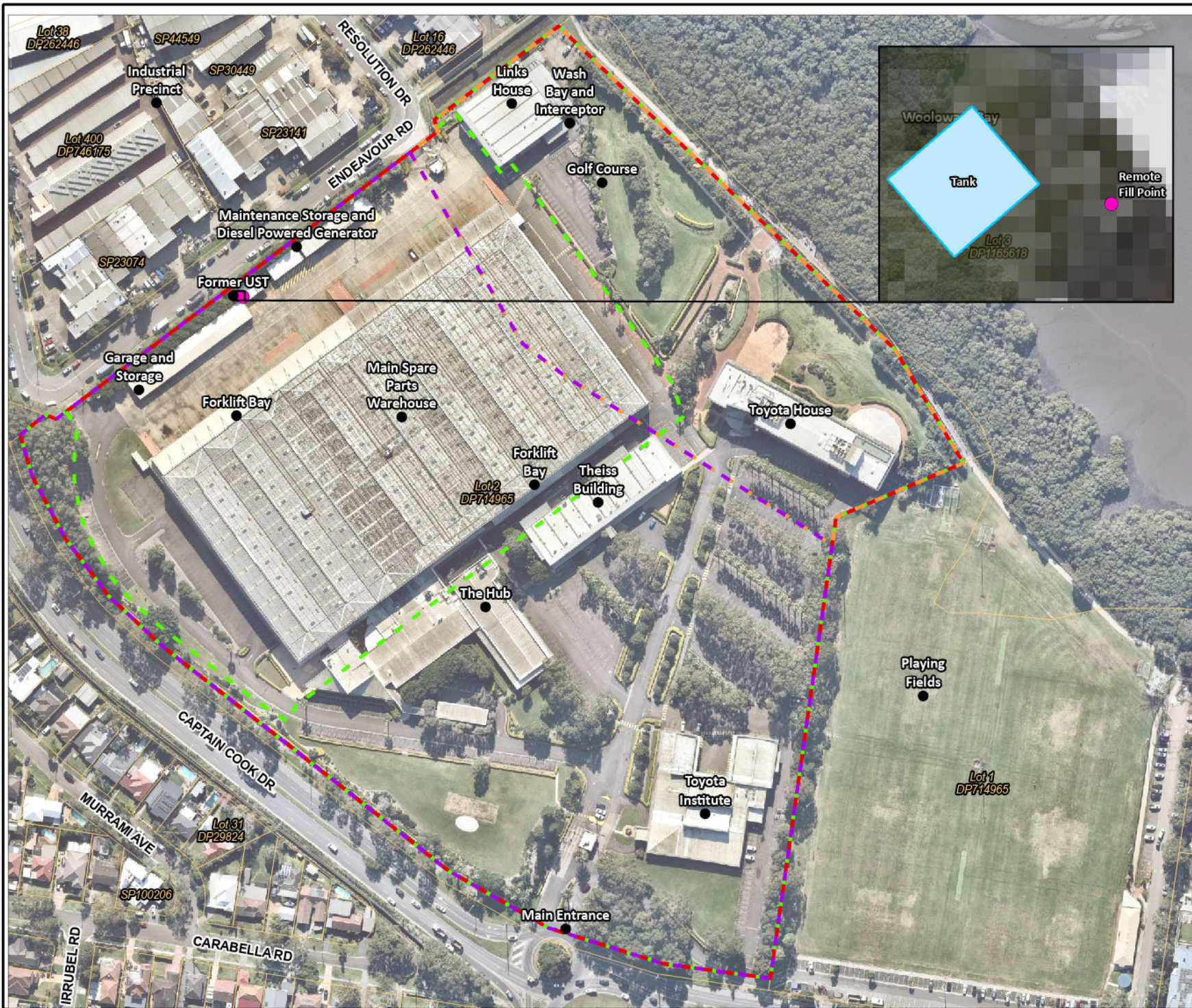


Coord. Sys. GDA 1994 MGA Zone 56

**13 Endeavour Road
Caringbah NSW**

SITE LOCATION

FIGURE 1



- Legend
- Approximate Site Boundary
 - NSW Cadastre
 - Stage 2 TripleTwoNine Masterplan Development
 - Northern Portion of the Site: Reclaimed Tidal Mangrove Swamp
 - Southern Portion of the Site: Reclaimed Tidal Mangrove Swamp
 - UST
 - Site Features
 - Remote Fill Point



Job No: 64957

Client: Aliro

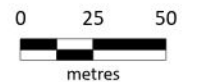
Version: R01 Rev 2

Date 11/10/2024

Drawn By: IA/RF

Checked By: RC/AH

Scale 1:2,600



Coord. Sys. GDA 1994 MGA Zone 56

**13 Endeavour Road
Caringbah, NSW**

SITE LAYOUT

FIGURE 2



Legend

- Approximate Site Boundary
- NSW Cadastre

Job No: 64957

Client: Aliro

Version: R01 Rev 2	Date 11/10/2024
Drawn By: IA/RF	Checked By: RC/AH

Scale 1:2,600

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road
Caringbah, NSW

PROPOSED SITE LAYOUT

FIGURE 2



- Legend**
- Approximate Site Boundary
 - Stage 2 TripleTwoNine Masterplan Development
 - Northern Portion of the Site: Reclaimed Tidal Mangrove Swamp
 - Southern Portion of the Site: Reclaimed Tidal Mangrove Swamp
- Historical Sample Locations**
- Borehole Location, AECOM 2019
 - Borehole Location, CES 2005
 - Borehole/Groundwater Monitoring Well Location, AECOM 2019
 - Sample Location, Noel Arnold & Ass. 2012
 - Test Pit Location, Golder 1998
- Sample Locations - JBS&G 2019**
- Borehole Location, JBS&G 2019
 - Groundwater Monitoring Location, JBS&G 2019
 - Soil Vapour Sample Location, JBS&G 2019
- Sample Locations (2020)**
- Borehole Location
 - Ground Gas Monitoring Wells
- Sample Locations (2022)**
- Soil Sample
 - Testpit



Job No: 64957

Client: Aliro

Version: R01 Rev 2 Date 11/10/2024

Drawn By: IA/RF Checked By: RC/AH

Scale 1:2,800

0 25 50
metres

Coord. Sys. GDA 1994 MGA Zone 56

**13 Endeavour Road
Caringbah, NSW**

HISTORICAL SAMPLE LOCATIONS

FIGURE 4



Legend

- Approximate Site Boundary
- NSW Cadastre
- Bonded ACM Impact Area
- ACM Impact Area
- Stage 2 TripleTwoNine Masterplan Development
- Northern Portion of the Site: Reclaimed Tidal Mangrove Swamp
- Southern Portion of the Site: Reclaimed Tidal Mangrove Swamp

Historical Sample Locations

- Borehole Location, AECOM 2019
- Borehole Location, CES 2005
- Borehole/Groundwater Monitoring Well Location, AECOM 2019
- Sample Location, Noel Arnold & Ass. 2012
- Test Pit Location, Golder 1998

Sample Locations - JBS&G 2019

- Borehole Location, JBS&G 2019
- Groundwater Monitoring Location, JBS&G 2019
- Soil Vapour Sample Location, JBS&G 2019

Sample Locations (2020)

- Borehole Location
- Ground Gas Monitoring Wells

Sample Locations (2022)

- Soil Sample
- Testpit

Job No: 64957

Client: Aliro

Version: R01 Rev 2	Date 11/10/2024
Drawn By: IA/RF	Checked By: RC/AH

Scale 1:2,800

Coord. Sys. GDA 1994 MGA Zone 56

**13 Endeavour Road
Caringbah, NSW**

REMEDIAL AREAS

FIGURE 5

Appendix A Design Plans



NOTES

ALL NEW CROSSEOVERS IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS

ALL DISABLED PARKING SPACES IN ACCORDANCE WITH AUSTRALIAN STANDARD AS2890 (5.4m x 2.4m)

SITE STORMWATER DRAINAGE IN ACCORDANCE WITH LOCAL AUTHORITY & COUNCIL REQUIREMENTS

ALL RELATIVE LEVELS ARE SHOWN TO A H.D. (Australian Height Datum) LEVELS SHOWN ARE INDICATIVE ONLY AND SUBJECT TO FURTHER CIVIL DETAIL DESIGN. THESE MIGHT VARY +/- 1000 mm

EXTENT OF RETAINING WALLS SHOWN AS INDICATIVE ONLY SUBJECT TO CIVIL REVIEW

GROSS LETTABLE AREA (GLA) IS THE TOTAL FLOOR AREA OF A BUILDING, MEASURED FROM THE OUTSIDE OF EXTERNAL WALLS OR THE CENTRE OF PARTY WALLS AND INCLUDES ALL ROOFED AREAS

5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS CAR SHARING BAYS

5% OF CARPARKING SPACES PROVIDED TO BE DEDICATED AS ELECTRICAL VEHICLE BAYS

DEVELOPMENT ANALYSIS

USE	GFA
BUILDING 3	
WAREHOUSE 3A	649 m ²
WAREHOUSE 3B	676 m ²
WAREHOUSE 3C	677 m ²
WAREHOUSE 3D	677 m ²
WAREHOUSE 3E	698 m ²
WAREHOUSE 3F	763 m ²
OFFICE 3A	126 m ²
OFFICE 3B	127 m ²
OFFICE 3C	127 m ²
OFFICE 3D	127 m ²
OFFICE 3E	127 m ²
OFFICE 3F	126 m ²
TOTAL AREA	4,900 m ²

BUILDING 4		
WAREHOUSE	GROUND LEVEL	4,249 m²
WAREHOUSE	LEVEL 1	2,972 m²
OFFICE	GROUND LEVEL	884 m²
MEZZANINE		
OFFICE	LEVEL 1	937 m²
MEZZANINE		
TOTAL AREA		9,042 m²

BUILDING 5 BLOCK 1	
WAREHOUSE 5A	1,071 m ²
WAREHOUSE 5B	3,048 m ²
WAREHOUSE 5C	2,163 m ²
OFFICE 5A	333 m ²
OFFICE 5B	431 m ²
OFFICE 5C	403 m ²
TOTAL AREA	7,449 m ²

BUILDING 5 BLOCK 2	
WAREHOUSE 5D	2,732 m ²
WAREHOUSE 5E	2,023 m ²
OFFICE 5D	424 m ²
OFFICE 5E	391 m ²
TOTAL AREA	5,570 m ²

BUILDING 5 COMMERCIAL	
CAFE	112 m ²
CHILDCARE	648 m ²
CHILDCARE OUTDOOR	571 m ²
COMMERCIAL	554 m ²
TOTAL AREA	1,885 m ²

BUILDING 6	
WAREHOUSE 6A	892 m ²
WAREHOUSE 6B	1,688 m ²
OFFICE 6A	154 m ²
OFFICE 6B	181 m ²
ESTATE MANAGER OFFICE	27 m ²
TOTAL AREA	2,942 m ²

BUILDING 7	
WAREHOUSE 7A	698 m ²
WAREHOUSE 7B	647 m ²
WAREHOUSE 7C	644 m ²
WAREHOUSE 7D	696 m ²
WAREHOUSE 7E	647 m ²
WAREHOUSE 7F	644 m ²
OFFICE 7A	117 m ²
OFFICE 7B	118 m ²
OFFICE 7C	117 m ²
OFFICE 7D	110 m ²
OFFICE 7E	118 m ²
OFFICE 7F	117 m ²
TOTAL AREA	4,673 m ²

BUILDING 8	
WAREHOUSE 8A	744 m ²
WAREHOUSE 8B	633 m ²
OFFICE 8A	139 m ²
OFFICE 8B	130 m ²
TOTAL AREA	1,646 m ²

GRAND TOTAL GFA 38,107 m²

SITE COVERAGE

TOTAL SITE AREA	123,898 m ²
BUILDING 3 - 8 FOOTPRINT	32,119 m ²
BUILDING 1 & 2 FOOTPRINT APPROX.	27,878 m ²
SITE COVERAGE APPROX.	48.42%
LANDSCAPING	13.69%

LEGEND

- ESTATE BOUNDARY
- FORESHORE LINE BOUNDARY
- TRANSMISSION EASEMENT
- LANDSCAPE SETBACK
- BUILDING SETBACK
- COUNCIL LAND DEDICATION
- 2.5 m BICYCLE & PEDESTRIAN SHARED PATH
- PEDESTRIAN CONCRETE FOOTPATH
- MAINTENANCE ACCESS TRACK & PEDESTRIAN PATH
- BIORETENTION BASIN / RAIN GARDEN
- EXISTING TREE PROTECTION ZONE
- PROPOSED TREE
- PYLON SIGN
- RW RETAINING WALL
- OA OUTDOOR AREA
- RWT RAIN WATER TANK
- W WASTE AREA
- MSB MAIN SWITCH BOARD
| PL | PARCEL LOCKERS |
| BG | BOOM GATE |
| RPC | RAISED PEDESTRAIN CROSSING |
| DP | DELIVERY PARKING BAY |
| SP | SHARED PARKING BAY (5%) |
| EV | ELECTRICAL VEHICLE BAY (5%) |
| EMO | ESTATE MANAGER OFFICE |

PARKING PROVISION

PARKING ALLOCATION SHOWN AS INDICATIVE ONLY

	CARS	BICYCLES
Building 1A	51	-
Building 1B	81	-
Building 1C	12	-
Building 1D	35	-
Building 1E	10	-
Building 2	12	-
Building 3	19	12
Building 4	131	64
Building 5 Block 1	48	12
Building 5 Block 2	19	8
Building 5 Childcare	17	4
Building 5 Commercial	15	8
Building 6	28	8
Building 7	62	12
Building 8	22	4
TOTAL	562	132

MOTORBIKES

No.	DATE:	REVISION:	BY:	CHK:
P17	15.08.2024	BUILDING 4 & 6 UPDATE	AS	JF
P18	03.09.2024	BUILDING 3 UPDATE	AS	JF
P19	16.09.2024	BUILDING 4 & 6 UPDATE	AS	JF
P20	24.09.2024	BUILDING 4 & 6, LANDSCAPE UPDATE	AS	JF
D	04.10.2024	FOR LODGEMENT	AS	JF

All areas indicated are indicative for design and planning purposes only and should not be used for any contractual reasons without verification by a licensed surveyor or further design development being completed.

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PROJECT:
CARINGBAH MASTERPLAN
13 ENDEAVOUR ROAD, CARINGBAH NSW 2229

TITLE:
ESTATE MASTERPLAN



CLIENT:
Aliro

DATE: SEPTEMBER, 2023
DRAWN BY: AS
SCALE: 1:1000 @ A1
SCALE: 1:2000 @ A3

JOB NO:	22366
DRAWING NO:	005
REVISION:	D

watson young

Appendix B Analytical Summary Tables

Table A: Soil Analytical Results
Project Number: 58037
Project Name: Carrington Toyota



	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)					BTEXN																	Polycyclic Aromatic Hydrocarbons																
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	G6-G9 Fraction	C10-C14 Fraction	C15-C18 fraction	G20-C26 fraction	C10-C16 fraction (Total)	<C10-C16 Fraction	<C16-C24 Fraction	<C24-C40 Fraction	<C10-C40 Fraction (Total)	<C10-C16 less Naphthalene (F2)	G6-C10 Fraction	G6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzofluoranthene	Benzofluoranthene	Benzofluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-c,d]pyrene	PAHs (Total)	Phenanthrene	Pyrene										
EOL	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	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	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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg							
NEPM 2013 EIL - Commercial/Industrial (specific)	160	0.4	5	280 ¹²	1800	290 ¹³	620 ¹⁴		20	20	50	50	50	50	100	100	100	50		20	20	0.1	0.1	0.1	0.1	0.2	0.3		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5							
NEPM 2013 EIL - Urban/Residential (specific)	100		310 ¹⁵	190 ¹⁶	1100	170 ¹⁷	400 ¹⁸																					370																								
NEPM 2013 ESL Commercial and Industrial, Coarse Soil															1700 ¹⁹	3300 ²⁰		170 ²¹		215 ²²	75 ²³	165 ²⁴	135 ²⁵			180 ²⁶							1.4 ²⁷																			
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil															300 ²⁸	2800 ²⁹		120 ³⁰		180 ³¹	50 ³²	70 ³³	85 ³⁴			105 ³⁵						0.7 ³⁶																				
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Commercial/Industrial - HSL D																																																				
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL A																																																				
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																																				
NEPM 2013 Mgmt Limits - Commercial and Industrial, Coarse														1000 ³⁷	3500	10000				700 ³⁸																																
NEPM 2013 Mgmt Limits - Residential, Parkland and Public Open Space, Coarse														1000 ³⁹	2500	10000				700 ⁴⁰																																
NEPM 2013 Soil HIL A	100 ⁴¹	20	100 ⁴²	6000	300 ⁴⁴	40 ⁴⁵	400	7400															160 ⁴⁶																													
NEPM 2013 Soil HIL D	3000 ⁴⁷	900	3600 ⁴⁸	240000	1500 ⁴⁴	730 ⁴⁵	6000	400000																																												
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																		110 ⁴⁹	45 ⁵⁰	0.5	55	160				40	3																									
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																		999999 ⁵¹	260 ⁵²	3	999999	999999																														

[illegible][illegible]

Table A: Soil Analytical Results
Project Number: 58037
Project Name: Carringbah Toyota

[illegible][illegible][illegible]

[illegible]



	TPHs (NEPC 1999)					TRHs (NEPC 2013)					BTEXN					VOC	Chlorinated Alkanes																					
	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	THM (total)*	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane		
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MG/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
EQL	0.02	0.05	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.05	0.02	0.02	0.001	0.001	0.001	0.001	0.002	0.003	0.01	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
ANZG (2018) Marine water 95% toxicant DGVs													0.7 ^{#1}						0.07 ^{#1}					1.9 ^{#2}														
NEMP 2018 PFAS Tier 1 Screening Values - Interim Marine 95% species protection																																						
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion										1 ^{#11}	1 ^{#12}	0.8 ^{#13}	NL ^{#13}	NL ^{#13}				NL ^{#13}	NL ^{#13}																			
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Sand 2 to <4m										1 ^{#14}	1 ^{#15}	0.8	NL	NL				NL	NL																			
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m										NL ^{#14}	6 ^{#15}	5	NL	NL				NL	NL																			
Indiana Department of Environmental Management																																						

Field_ID	Sampled_Date-Time	Lab_Report_Number																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
MW1	22/01/2020	698107	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	&

Statistical Summary			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
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Env Stds Comments

#1:Moderate reliability. DGV may not protect key test species from chronic toxicity (this refers to experimental chronic values or geometric mean for species). Check toxicant DGV technical brief for spread of data and its significance.

#2:Very Low reliability

#3:Moderate reliability. Ammonia as total ammonia, measured as [NH3-N] adjusted using pH 7.

#4:TV based on NH3 as NH3 (needs to be calculated based on in situ pH and temperature).

#5:Adopted from WHO Petroleum Products in Drinking Water 2008

#6:Adopted from WHO Drinking Water Guideline 2011

#7:Adopted from US EPA RSL - Tapwater (November 2015) - THQ = 0.1

#8:These values may be used to screen for direct toxicity to aquatic organisms. OEH can provide advice on which value to use. Data sourced from DoEE 2016

#9:TV adopted from the ADWG (2011) Updated March 2015.

#10:TV May not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

#11:Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. To obtain F2 subtract naphthalene from >C10-C16. NL - Not Limiting.

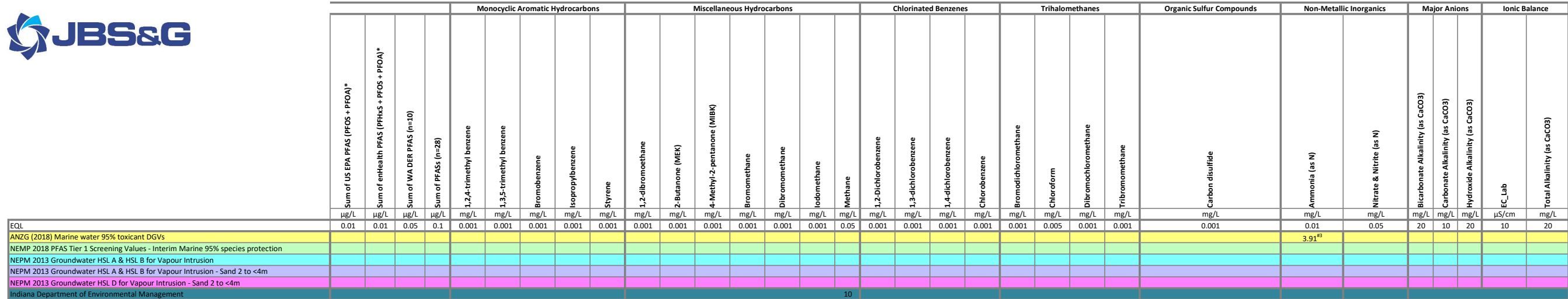
#12:Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. To obtain F1 subtract the sum of BTEX from C6-C10.

#13:Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. NL - Not Limiting.

#14:To obtain F2 subtract naphthalene from >C10-C16.

#15:To obtain F1 subtract the sum of BTEX from C6-C10.

Project Number: 58037
Project Name: Carringbah Toyota



Field_ID	Sampled_Date-Time	Lab_Report_Number
MW1	22/01/2020	698107
MW2	22/01/2020	698107
MW3	22/01/2020	698107
MW4	22/01/2020	698107
MW5	22/01/2020	698107
MW6	22/01/2020	698107
MW7	22/01/2020	698107

[illegible]

- #1: Moderate reliability. DGV may not protect key test species from chronic toxicity (this refers to...)
- #2: Very Low reliability
- #3: Moderate reliability. Ammonia as total ammonia, measured as [NH3-N] adjusted using pH 7.
- #4: TV based on NH3 as NH3 (needs to be calculated based on in situ pH and temperature).
- #5: Adopted from WHO Petroleum Products in Drinking Water 2008
- #6: Adopted from WHO Drinking Water Guideline 2011
- #7: Adopted from US EPA RSL - Tapwater (November 2015) - THQ = 0.1
- #8: These values may be used to screen for direct toxicity to aquatic organisms. OEH can provide...
- #9: TV adopted from the ADWG (2011) Updated March 2015.
- #10: TV may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) f...
- #11: Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. To obtain F2 subtract naotha...
- #12: Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. To obtain F1 subtract the sum...
- #13: Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. NL - Not Limiting.
- #14: To obtain F2 subtract naohthalene from >C10-C16.
- #15: To obtain F1 subtract the sum of BTEX from C6-C10.

Table C: Soil Vapour Analytical Results
Project Number: 58037
Project Name: Caringbah Toyota





TRHs (NEPC 2013)		BTEXN						Chlorinated Alkanes													
>C10-C16 Fraction (F2)	C6-C10 Fraction (F1)	Benzene	Ethylbenzene	Toluene	Xylene (Total)	Naphthalene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Trichlorofluoromethane	
mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	
EQL	3.33333334	3.33333334	0.083333334	0.083333334	0.083333334	0.250000001	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	
NEPM 2013 Soil Vapour HSL A & HSL B - Sand 0 to <1m	110	45	1	330	1300	220	0.8														
NEPM 2013 Soil Vapour HSL D - Sand 0 to <1m	NL	260	4	1300	4800	840	3														

Field_ID	Sampled_Date-Time	Lab_Report_Number	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP01	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP04	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP07	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP09	28/01/2020	698996	<3.333	82.003	<0.08333	2	<0.08333	2.667	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP11	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP14	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP16	28/01/2020	698996	<3.333	<3.333	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
VP19	28/01/2020	698996	2.458	10.458	<0.02083	0.875	<0.02083	1.167	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083
VP21	28/01/2020	698996	<3.333	28.33	<0.08333	<0.08333	<0.08333	<0.25	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333

Statistical Summary																					
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects	1	3	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	2.458	<3.333	<0.02083	<0.08333	<0.02083	<0.25	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083
Minimum Detect	2.458	10.458	ND	0.875	ND	1.167	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<3.333	82.003	<0.08333	2	<0.08333	2.667	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333
Maximum Detect	2.458	82.003	ND	2	ND	2.667	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	1.8	15	0.038	0.35	0.038	0.52	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
Median Concentration	1.6665	1.6665	0.041665	0.041665	0.041665	0.125	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665
Standard Deviation	0.26	27	0.01	0.68	0.01	0.87	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Number of Guideline Exceedances	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C: Soil Vapour Analytical Results

Project Number: 58037
Project Name: Caringbah Toyota



	Chlorinated Alkenes										Monocyclic Aromatic Hydrocarbons										Miscellaneous Hydrocarbons	
	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Isopropyl benzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	1,2-dibromoethane	Dibromomethane	
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.833333335	0.083333334	0.083333334	0.083333334	
NEPM 2013 Soil Vapour HSL A & HSL B - Sand 0 to <1m																						
NEPM 2013 Soil Vapour HSL D - Sand 0 to <1m																						
Field_ID	Sampled_Date-Time	Lab_Report_Number																				
VP01	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP04	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP07	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP09	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	0.8	0.3	<0.08333	0.4	<0.08333	0.3333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP11	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP14	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP16	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
VP19	28/01/2020	698996	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	0.3958	0.1417	<0.02083	0.2	<0.02083	0.1667	0.02917	<0.2083	<0.02083	<0.02083	<0.02083	
VP21	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
Statistical Summary																						
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	
Number of Detects	0	0	0	0	0	0	0	0	0	0	2	2	0	2	0	2	1	0	0	0	0	
Minimum Concentration	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.08333	<0.08333	<0.02083	<0.08333	<0.02083	<0.08333	0.02917	<0.2083	<0.02083	<0.02083	<0.02083	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3958	0.1417	ND	0.2	ND	0.1667	0.02917	ND	ND	ND	ND	
Maximum Concentration	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	0.8	0.3	<0.08333	0.4	<0.08333	0.3333	<0.08333	<0.8333	<0.08333	<0.08333	<0.08333	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8	0.3	ND	0.4	ND	0.3333	0.02917	ND	ND	ND	ND	
Average Concentration	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.17	0.081	0.038	0.099	0.038	0.088	0.04	0.38	0.038	0.038	0.038	
Median Concentration	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.41665	0.041665	0.041665	0.041665	
Standard Deviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.27	0.088	0.01	0.12	0.01	0.1	0.0042	0.1	0.01	0.01	0.01	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Table C: Soil Vapour Analytical Results
Project Number: 58037
Project Name: Caringbah Toyota



	Chlorinated Benzenes						Trihalomethanes				Miscellaneous Industrial Chemicals	Organic Alcohols
	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Hexachlorobutadiene	Isopropyl alcohol
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	0.083333334	1.66666667
NEPM 2013 Soil Vapour HSL A & HSL B - Sand 0 to <1m												
NEPM 2013 Soil Vapour HSL D - Sand 0 to <1m												

Field_ID	Sampled_Date-Time	Lab_Report_Number											
VP01	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP04	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP07	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP09	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP11	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP14	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP16	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
VP19	28/01/2020	698996	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.4167
VP21	28/01/2020	698996	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667

Statistical Summary													
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.4167
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<0.08333	<1.667
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.76
Median Concentration	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.8335
Standard Deviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.21
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

LFG01 Continous Gas Monitoring Data (GasFlux Unit)																	
	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Gust (km/h)	Barometric Pressure (hPa)	Precipitation (mm)	Precipitation Today (mm)	Well Barometric Pressue (hPa)	Relative Humidity (%)	Steady State Flow Rate (L/hr)	CH4 (% v/v)	C02 (%v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	(CH4) GSV	(CO2) GSV
Date / Time	Meterological Data							Monitoring Well Data									Continious GSV
4/9/2020 16:20	20	77	14.8	14.8	1024	0	1	1024.36	77	0	0.01	2.07	15.82	0	0.01	0	0
4/9/2020 17:23	20	82	11.1	11.1	1024	0	1	1024.36	82	0	0.01	2.09	15.8	0	0	0	0
4/9/2020 18:25	18.9	82	9.3	9.3	1024	0	2.4	1024.83	82	-0.03	0.01	2.11	15.75	0	0	0	0
4/9/2020 19:28	18.9	82	0	0	1024	0	2.7	1025.31	82	-0.04	0.02	2.04	15.78	0	0.01	0	0
4/9/2020 20:30	18.9	88	0	0	1025	0	2.7	1024.83	88	-0.01	0.01	2.1	15.64	0	0	0	0
4/9/2020 21:33	17.8	87	3.7	3.7	1024	0	2.4	1024.83	87	0.01	0.02	2.2	15.58	0	0.01	0	0
4/9/2020 22:35	17.2	93	0	0	1024	0	1.7	1024.36	93	-0.03	0.02	2.18	15.47	0	0.01	0	0
4/9/2020 23:38	17.2	93	0	0	1024	0	2.1	1023.88	93	0	0.03	2.2	15.4	0	0.01	0	0
4/10/2020 0:40	17.8	87	5.6	5.6	1023	0.3	2.3	1023.88	87	0.01	0.01	2.21	15.37	0	0.01	0	0
4/10/2020 1:43	17.8	87	0	0	1022	0	2.3	1022.93	87	0	0.01	2.3	15.34	0	0.01	0	0
4/10/2020 2:45	17.8	87	0	0	1022	0.3	2.5	1021.5	87	0	0.02	2.33	15.32	0	0.03	0	0
4/10/2020 3:48	17.8	87	9.3	9.3	1021	0.3	1.9	1021.5	87	0.01	0.01	2.33	15.3	0	0	0	0
4/10/2020 4:50	17.8	87	7.4	7.4	1021	0.3	1.7	1021.02	87	0.01	0.03	2.32	15.3	0	0.01	0	0
4/10/2020 5:53	17.8	87	7.4	7.4	1020	0.3	3.5	1020.55	87	-0.01	0.02	2.32	15.36	0	0.01	0	0
4/10/2020 6:55	17.8	93	7.4	7.4	1020	0.5	3.8	1021.02	93	-0.01	0.02	2.21	15.37	0	0	0	0
4/10/2020 7:57	18.9	88	9.3	9.3	1020	0.5	3.8	1020.55	88	-0.01	0.02	2.2	15.38	0	0.04	0	0
4/10/2020 9:00	18.9	88	14.8	14.8	1020	0.5	4.5	1020.07	88	0	0.01	2.32	15.35	0	0.01	0	0
4/10/2020 10:02	18.9	88	20.4	20.4	1019	0.5	0.5	1019.12	88	-0.01	0.02	2.33	15.35	0	0.01	0	0
4/10/2020 11:05	20	82	24.1	24.1	1018	0.5	3.8	1018.17	82	0.04	0.02	2.31	15.33	0	0	0	0
4/10/2020 12:07	20	82	20.4	20.4	1016	0.5	4	1016.74	82	0	0.02	2.23	15.37	0	0.01	0	0
4/10/2020 13:09	20	82	14.8	14.8	1014	0	4.3	1014.83	82	0.06	0.01	2.23	15.43	NaN	0.03	0	0
4/10/2020 14:12	22.8	68	18.5	18.5	1013	0	4.5	1012.93	68	0.02	0.01	2.26	15.41	NaN	0.02	0	0
4/10/2020 15:14	22.8	60	20.4	20.4	1012	0	4.2	1011.98	60	0.02	0.01	2.21	15.44	NaN	0.02	0	0
4/10/2020 16:17	22.8	60	22.2	22.2	1011	0	2.7	1011.5	60	-0.02	0.01	2.16	15.56	NaN	0.03	0	0
4/10/2020 17:19	20	63	42.6	42.6	1012	0	2.7	1012.45	63	0.14	0.01	2.06	15.72	NaN	0.01	0	0
4/10/2020 18:22	16.1	87	13	13	1012	0.3	11.7	1012.45	87	0.1	0.01	2.17	15.55	0	0	0	0
4/10/2020 19:24	17.2	87	9.3	9.3	1012	0	13.4	1011.98	87	-0.05	0.02	2.13	15.42	0	0.01	0	0
4/10/2020 20:27	16.1	87	14.8	14.8	1011	0	13.4	1011.98	87	0	0.02	2.24	15.36	0	0.03	0	0
4/10/2020 21:29	16.1	87	13	13	1011	0	18.2	1011.02	87	0.01	0.01	2.26	15.27	0	0.01	0	0
4/10/2020 22:32	16.1	87	20.4	20.4	1011	0	8.6	1010.55	87	0.02	0.02	2.26	15.19	0	0.05	0	0
4/10/2020 23:34	16.1	82	13	13	1009	0	13.4	1009.6	82	-0.02	0.02	2.34	15.15	0	0.01	0	0
4/11/2020 0:37	16.1	82	22.2	22.2	1009	0	13.4	1009.12	82	0.01	0.02	2.35	15.1	0	0.03	0	0
4/11/2020 1:39	15	87	25.9	25.9	1008	0	12.6	1008.17	87	0.03	0.04	2.36	15.09	0	0.01	0	0
4/11/2020 2:42	15	82	22.2	22.2	1007	0	11.8	1006.74	82	0	0.01	2.37	15.03	0	0.02	0	0
4/11/2020 3:44	15	82	18.5	18.5	1007	0	11.8	1006.74	82	-0.04	0.01	2.32	15.08	0	0.04	0	0
4/11/2020 4:47	15	82	16.7	16.7	1006	0	11.8	1006.74	82	0.01	0.01	2.36	15.1	0	0.03	0	0
4/11/2020 5:49	13.9	82	14.8	14.8	1006	0	11.8	1006.74	82	-0.07	0.02	2.33	15.07	0	0.02	0	0
4/11/2020 6:52	15.5	81	28.2	33.7	1010	0	11.8	1006.74	81	-0.05	0.01	2.37	15.05	0	0.01	0	0
4/11/2020 7:54	16.2	81	30.7	35	1010.9	0	11.1	1005.79	81	0	0.03	2.36	15.01	0	0.03	0	0
4/11/2020 8:56	17.7	73	33.5	38.6	1010.9	0	11.1	1005.31	73	0.04	0.02	2.37	15.12	0	0.05	0	0
4/11/2020 9:59	21.1	52	25.9	25.9	1005	0	11.1	1003.88	52	0.07	0.01	2.27	15.27	NaN	0.17	0	0
4/11/2020 11:01	22.8	40	33.3	33.3	1004	0	11.1	1002.45	40	-0.03	0.02	2.19	15.55	NaN	0.22	0	0
4/11/2020 12:03	25	38	33.3	33.3	1000	0	10.3	1000.55	38	0.13	0.07	2.09	15.79	NaN	0.21	0	0
4/11/2020 13:06	27.2	25	40.8	59.3	999	0	9.6	1000.07	25	0.07	0.07	1.99	15.89	NaN	0.1	0	0
4/11/2020 14:08	24.8	28	40.8	59.3	999	0	9.6	1000.55	28	-0.05	0.05	2	15.98	NaN	0.05	0	0
4/11/2020 15:11	25	27	53.7	72.2	1000	0	9.6	1000.55	27	0.19	0.06	2	15.97	NaN	0.01	0	0
4/11/2020 16:13	23.1	31	53.7	72.2	1002	0	7.2	1001.98	31	-0.03	0.06	2	15.94	NaN	0.04	0	0
4/11/2020 17:16	21.9	33	46.3	46.3	1001	0	4.8	1002.93	33	-0.05	0.03	2.12	15.85	NaN	0.06	0	0
4/11/2020 18:19	20	34	44.5	63	1004	0.3	2.4	1004.83	34	0.06	0.02	2.03	15.78	NaN	0.06	0	0

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/14/2020 22:22	17.8	87	7.4	7.4	1023	0	0	1023.88	87	-0.02	0.03	2.07	15.8	0	0.07	0	0
4/14/2020 23:25	17.8	87	9.3	9.3	1023	0	0	1023.88	87	-0.02	0.02	2.13	15.7	0	0.07	0	0
4/15/2020 0:27	17.2	93	3.7	3.7	1023	0	0	1023.4	93	-0.02	0.03	2.14	15.66	0	0.05	0	0
4/15/2020 1:30	17.2	93	0	0	1023	0	0	1022.93	93	-0.04	0.03	2.18	15.63	0	0.07	0	0
4/15/2020 2:32	17.2	87	9.3	9.3	1023	0	0	1022.93	87	0.01	0.02	2.23	15.55	0	0.05	0	0
4/15/2020 3:35	16.1	87	9.3	9.3	1023	0	0	1022.45	87	0	0.04	2.22	15.56	0	0.06	0	0
4/15/2020 4:37	16.1	87	11.1	11.1	1022	0	0	1022.93	87	-0.04	0.03	2.24	15.6	0	0.1	0	0
4/15/2020 5:40	16.1	87	11.1	11.1	1022	0	0	1022.45	87	-0.01	0.04	2.26	15.53	0	0.04	0	0
4/15/2020 6:42	16.1	87	11.1	11.1	1023	0	0	1022.93	87	-0.03	0.04	2.23	15.62	0	0.08	0	0
4/15/2020 7:44	17.8	77	11.1	11.1	1023	0	0	1023.88	77	-0.02	0.03	2.24	15.61	0	0.07	0	0
4/15/2020 8:46	18.9	72	14.8	14.8	1023	0	0	1022.93	72	0	0.04	2.24	15.62	0	0.18	0	0
4/15/2020 9:49	22.2	60	13	13	1023	0	0	1022.93	60	0	0.07	2.14	15.83	NaN	0.29	0	0
4/15/2020 10:51	23.9	53	13	13	1022	0	0	1021.98	53	0.02	0.07	2.06	16.04	NaN	0.35	0	0
4/15/2020 11:54	27.2	44	11.1	11.1	1021	0	0	1021.5	44	0.02	0.1	1.94	16.21	NaN	0.29	0	0
4/15/2020 12:56	27.8	41	14.8	14.8	1020	0	0	1020.07	41	0.04	0.08	1.84	16.33	NaN	0.19	0	0
4/15/2020 13:59	26.1	44	24.1	24.1	1019	0	0	1019.6	44	-0.02	0.08	1.84	16.41	NaN	0.1	0	0
4/15/2020 15:01	26.1	47	22.2	22.2	1018	0	0	1018.64	47	0	0.06	1.9	16.39	NaN	0.14	0	0
4/15/2020 16:04	25	53	27.8	27.8	1017	0	0	1017.69	53	0	0.07	1.97	16.29	NaN	0.03	0	0
4/15/2020 17:07	23.9	56	25.9	25.9	1017	0	0	1018.17	56	-0.01	0.03	2	16.18	NaN	0.12	0	0
4/15/2020 18:09	22.8	60	20.4	20.4	1017	0	0	1017.69	60	-0.02	0.03	2.06	16.08	NaN	0.06	0	0
4/15/2020 19:12	22.8	64	18.5	18.5	1017	0	0	1017.69	64	-0.03	0.02	2.09	16.04	NaN	0.1	0	0
4/15/2020 20:14	22.8	64	16.7	16.7	1017	0	0	1017.69	64	-0.03	0.02	2.07	15.93	NaN	0.07	0	0
4/15/2020 21:17	21.1	68	5.6	5.6	1017	0	0	1017.69	68	0.01	0.04	2.08	15.84	NaN	0.05	0	0
4/15/2020 22:20	21.1	72	1.9	1.9	1017	0	0	1016.74	72	-0.01	0.06	2.13	15.79	NaN	0.11	0	0
4/15/2020 23:22	20	77	5.6	5.6	1016	0	0	1015.79	77	0.01	0.03	2.15	15.72	0	0.08	0	0
4/16/2020 0:25	20	72	1.9	1.9	1015	0	0	1015.31	72	0	0.04	2.15	15.66	0	0.07	0	0
4/16/2020 1:27	18.9	72	0	0	1015	0	0	1014.36	72	0	0.05	2.17	15.64	0	0.07	0	0
4/16/2020 2:30	18.9	77	0	0	1014	0	0	1013.88	77	-0.02	0.02	2.27	15.61	0	0.12	0	0
4/16/2020 3:32	17.8	82	11.1	11.1	1013	0	0	1013.4	82	-0.02	0.06	2.17	15.56	0	0.07	0	0
4/16/2020 4:35	18.9	77	13	13	1013	0	0	1013.88	77	-0.07	0.04	2.24	15.6	0	0.06	0	0
4/16/2020 5:37	17.8	77	11.1	11.1	1014	0	0	1013.88	77	0.01	0.04	2.23	15.61	0	0.07	0	0
4/16/2020 6:39	18.9	72	11.1	11.1	1014	0	0	1014.36	72	-0.03	0.06	2.26	15.57	0	0.07	0	0
4/16/2020 7:42	20	68	13	13	1014	0	0	1013.88	68	-0.03	0.04	2.26	15.57	0	0.07	0	0
4/16/2020 8:44	22.2	60	13	13	1013	0	0	1013.88	60	-0.03	0.04	2.16	15.62	0	0.07	0	0
4/16/2020 9:47	23.9	49	14.8	14.8	1013	0	0	1013.4	49	0.01	0.03	2.25	15.63	0	0.21	0	0
4/16/2020 10:49	25	50	22.2	22.2	1012	0	0	1012.45	50	0.01	0.07	2.26	15.64	0	0.14	0	0
4/16/2020 11:51	27.2	41	22.2	22.2	1011	0	0	1011.02	41	0.07	0.04	2.18	15.75	0	0.14	0	0
4/16/2020 12:54	27.2	41	24.1	24.1	1010	0	0	1010.07	41	0.01	0.03	2.1	15.78	0	0.13	0	0
4/16/2020 13:56	27.2	38	16.7	16.7	1009	0	0	1009.6	38	-0.05	0.03	2.11	15.86	0	0.18	0	0
4/16/2020 14:59	26.1	44	18.5	18.5	1009	0	0	1009.6	44	-0.05	0.03	2.12	15.91	NaN	0.11	0	0
4/16/2020 16:01	27.2	41	16.7	16.7	1009	0	0.5	1008.64	41	0	0.04	2.12	15.92	0	0.09	0	0
4/16/2020 17:04	26.1	41	25.9	25.9	1008	0	0.3	1008.64	41	-0.03	0.04	2.11	15.97	0	0.1	0	0
4/16/2020 18:06	26.1	41	18.5	18.5	1009	0	0	1009.6	41	-0.03	0.05	2.12	15.95	0	0.16	0	0
4/16/2020 19:09	25	43	18.5	18.5	1009	0	0	1009.6	43	0	0.03	2.11	15.95	0	0.1	0	0
4/16/2020 20:11	25	43	18.5	18.5	1009	0	0	1009.6	43	0	0.06	2.1	15.87	0	0.06	0	0
4/16/2020 21:14	25	41	18.5	18.5	1009	0	0	1009.12	41	-0.03	0.04	2.17	15.8	0	0.12	0	0
4/16/2020 22:16	25	41	24.1	24.1	1009	0	0	1009.12	41	-0.04	0.06	2.18	15.78	0	0.09	0	0
4/16/2020 23:19	23.9	46	18.5	18.5	1008	0	0	1009.12	46	-0.04	0.04	2.16	15.72	0	0.06	0	0
4/17/2020 0:21	22.8	49	16.7	16.7	1008	0	0	1008.64	49	0	0.06	2.18	15.73	0	0.04	0	0
4/17/2020 1:24	22.2	52	11.1	11.1	1008	0	0	1009.6	52	-0.01	0.07	2.09	15.82	0	0.08	0	0
4/17/2020 2:26	18.9	88	29.6	29.6	1009	0	0	1009.12	88	-0.01	0.07	2.18	15.74	0	0.08	0	0
4/17/2020 3:29	18.9	93	24.1	24.1	1009	0	0	1009.6	93	-0.04	0.06	2.1	15.75	0	0.09	0	0
4/17/2020 4:31	18.9	88	22.2	22.2	1009	0	0	1009.6	88	-0.11	0.04	2.15	15.81	0	0.06	0	0
4/17/2020 5:33	18.9	88	13	13	1010	0	0	1009.6	88	-0.05	0.06	2.17	15.73	0	0.08	0	0
4/17/2020 6:36	17.8	93	1.9	1.9	1010	0	0	1010.55	93	-0.02	0.07	2.13	15.79	0	0.1	0	0
4/17/2020 7:38	20	45	29.6	29.6	1011	0	0	1011.5	45	0.01	0.03	2.1	15.78	0	0.1	0	0
4/17/2020 8:40	21.1	40	31.5	31.5	1011	0	0	1011.02	40	0	0.07	2.16	15.72	0	0.21	0	0
4/17/2020 9:42	22.2	37	25.9	25.9	1011	0	0	1011.02	37	0.04	0.09	2.09	15.88	NaN	0.26	0	0
4/17/2020 10:45	22.8	30	27.8	27.8	1011	0	0	1011.02	30	0.04	0.12	2	16.21	NaN	0.26	0	0
4/17/2020 11:47	25	29	22.2	22.2	1010	0	0	1010.55	29	0.05	0.11	1.89	16.3	NaN	0.16	0	0
4/17/2020 12:50	26.1	23	24.1	24.1	1009	0	0	1009.6	23	0.05	0.08	1.89	16.41	NaN	0.16	0	0
4/17/2020 13:52	27.2	19	25.9	25.9	1009	0	0	1009.12	19	-0.01	0.09	1.79	16.51	NaN	0.14	0	0
4/17/2020 14:55	26.1	20	31.5	31.5	1008	0	0	1009.12	20	0.02	0.08	1.88	16.55	NaN	0.06	0	0
4/17/2020 15:58	26.1	15	25.9	25.9	1008	0	0	1009.12	15	0	0.08	1.89	16.52	NaN	0.11	0	0
4/17/2020 17:00	26.1	13	22.2	22.2	1009	0	0	1009.6	13	0	0.06	1.9	16.45	NaN	0.05	0	0
4/17/2020 18:03	23.9	17	25.9	25.9	1009	0	0	1010.07	17	-0.02	0.04	1.93	16.38	NaN	0.12	0	0
4/17/2020 19:06	22.2	19	20.4	20.4	1010	0	0	1010.55	19	-0.01	0.02	1.97	16.23	NaN	0.07	0	0
4/17/2020 20:08	21.1	19	18.5	18.5	1011	0	0	1011.02	19	-0.03	0.03	2.01	16.2	NaN	0.07	0	0
4/17/2020 21:11	18.9	25	9.3	9.3	1011	0	0	1011.98	25	-0.02	0.04	1.99	16.17	NaN	0.1	0	0
4/17/2020 22:13	17.8	29	11.1	11.1	1012	0	0	1012.45	29	0	0.05	1.99	16.08	0	0.08	0	0
4/17/2020 23:16	17.2	33	24.1	24.1	1012	0	0	1011.98	33	-0.03	0.04	2.09	15.87	0	0.05	0	0
4/18/2020 0:18	16.1	47	14.8	14.8	1012	0	0	1012.45	47	-0.01	0.04	2.19	15.79	0	0.06	0	0
4/18/2020 1:21	16.1	44	24.1	24.1	1012	0	0	1011.98	44	0.01	0.04	2.26	15.7	0	0.06	0	0
4/18/2020 2:23	15	51	22.2	22.2	1012	0	0	1011.5	51	0.01	0.04	2.29	15.61	0	0.1	0	0
4/18/2020 3:26	15	54	18.5	18.5	1011	0	0	1011.5	54	-0.01	0.06	2.29	15.61	0	0.04	0	0
4/18/2020 4:28	13.9	58	22.2	22.2	1011	0	0	1011.5	58	-0.03	0.06	2.18	15.64	0	0.07	0	0
4/18/2020 5:31	15	54	24.1	24.1	1011	0	0	1011.98	54	-0.03	0.06	2.18	15.67	0	0.04	0	0
4/18/2020 6:33	13.9	58	22.2														

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/20/2020 12:43	18.9	63	11.1	11.1	1014	0	0	1013.88	63	0	0.07	2.16	15.9	0	0.11	0	0
4/20/2020 13:45	21.1	49	18.5	18.5	1012	0	0	1012.45	49	0.03	0.08	2.15	15.89	0	0.15	0	0
4/20/2020 14:48	21.1	42	25.9	25.9	1012	0	0	1012.45	42	0.02	0.07	2.15	15.98	0	0.14	0	0
4/20/2020 15:50	20	45	13	13	1012	0	0	1012.45	45	0.03	0.06	2.15	16.01	0	0.1	0	0
4/20/2020 16:53	20	45	13	13	1012	0	0	1012.93	45	-0.1	0.07	2.09	16.04	0	0.03	0	0
4/20/2020 17:55	18.9	52	11.1	11.1	1013	0	0	1013.88	52	-0.09	0.07	2.08	16.07	0	0.1	0	0
4/20/2020 18:58	18.9	52	14.8	14.8	1014	0	0	1015.31	52	-0.01	0.08	2.16	16.07	0	0.07	0	0
4/20/2020 20:00	18.9	55	22.2	22.2	1015	0	0	1015.79	55	-0.04	0.07	2.08	16.01	0	0.07	0	0
4/20/2020 21:03	17.8	59	22.2	22.2	1016	0	0	1016.26	59	0.02	0.06	2.15	15.99	0	0.07	0	0
4/20/2020 22:05	17.8	63	16.7	16.7	1016	0	0	1016.74	63	0	0.07	2.15	15.97	0	0.05	0	0
4/20/2020 23:08	17.2	67	14.8	14.8	1016	0	0	1016.74	67	0	0.08	2.17	15.91	0	0.08	0	0
4/21/2020 0:10	16.1	72	11.1	11.1	1016	0	0	1016.74	72	-0.06	0.07	2.16	15.91	0	0.09	0	0
4/21/2020 1:13	16.1	72	18.5	18.5	1016	0	0	1017.21	72	-0.02	0.07	2.15	15.92	0	0.08	0	0
4/21/2020 2:15	16.1	72	20.4	20.4	1017	0	0	1016.74	72	0.03	0.07	2.15	15.89	0	0.1	0	0
4/21/2020 3:17	16.1	67	16.7	16.7	1016	0	0	1016.74	67	-0.03	0.06	2.24	15.87	0	0.08	0	0
4/21/2020 4:20	15	71	14.8	14.8	1016	0	0	1017.21	71	-0.05	0.07	2.16	15.87	0	0.07	0	0
4/21/2020 5:22	15	71	13	13	1017	0	0	1017.21	71	-0.05	0.07	2.23	15.83	0	0.04	0	0
4/21/2020 6:25	16.1	67	7.4	7.4	1017	0	0	1017.69	67	0	0.06	2.21	15.83	0	0.07	0	0
4/21/2020 7:27	16.1	63	13	13	1018	0	0	1018.64	63	-0.02	0.06	2.15	15.86	0	0.12	0	0
4/21/2020 8:30	17.8	59	9.3	9.3	1019	0	0	1019.12	59	-0.01	0.08	2.16	15.85	0	0.16	0	0
4/21/2020 9:32	20	52	11.1	11.1	1019	0	0	1019.12	52	-0.02	0.14	2.1	16.05	0	0.27	0	0
4/21/2020 10:34	22.2	43	7.4	7.4	1018	0	0	1018.64	43	-0.01	0.23	2.06	16.18	0	0.08	0	0
4/21/2020 11:36	22.8	40	7.4	7.4	1018	0	0	1017.69	40	0.03	0.15	1.97	16.47	NaN	0.04	0	0
4/21/2020 12:39	23.9	35	11.1	11.1	1016	0	0	1016.26	35	0.02	0.11	1.87	16.61	NaN	0.11	0	0
4/21/2020 13:41	25	31	5.6	5.6	1015	0	0	1015.31	31	-0.03	0.08	1.86	16.69	NaN	0.06	0	0
4/21/2020 14:44	23.9	43	24.1	24.1	1014	0	0	1015.31	43	-0.02	0.07	1.84	16.77	NaN	0.02	0	0
4/21/2020 15:47	23.9	43	24.1	24.1	1014	0	0	1014.83	43	-0.01	0.08	1.9	16.7	0	0.04	0	0
4/21/2020 16:49	22.2	52	25.9	25.9	1014	0	0	1014.36	52	-0.02	0.04	1.91	16.57	0	0.04	0	0
4/21/2020 17:52	22.2	56	24.1	24.1	1014	0	0	1014.83	56	-0.03	0.04	2	16.48	0	0.05	0	0
4/21/2020 18:55	22.2	60	20.4	20.4	1015	0	0	1015.31	60	0	0.04	1.97	16.41	0	0.09	0	0
4/21/2020 19:57	22.2	60	22.2	22.2	1015	0	0	1015.31	60	-0.01	0.04	2	16.31	0	0.04	0	0
4/21/2020 21:00	21.1	59	16.7	16.7	1015	0	0	1015.79	59	-0.05	0.05	2.08	16.29	0	0.08	0	0
4/21/2020 22:02	20	63	11.1	11.1	1016	0	0	1016.26	63	-0.04	0.07	2.07	16.24	0	0.11	0	0
4/21/2020 23:05	18.9	67	9.3	9.3	1016	0	0	1016.26	67	0	0.07	2.07	16.14	0	0.07	0	0
4/22/2020 0:07	18.9	63	0	0	1016	0	0	1016.26	63	0	0.08	2.14	16.07	0	0.06	0	0
4/22/2020 1:10	17.2	77	13	13	1016	0	0	1016.26	77	-0.02	0.07	2.16	16.04	0	0.07	0	0
4/22/2020 2:12	16.1	82	11.1	11.1	1015	0	0	1015.79	82	-0.05	0.07	2.22	15.98	0	0.07	0	0
4/22/2020 3:15	16.1	77	16.7	16.7	1015	0	0	1015.79	77	-0.04	0.04	2.16	15.97	0	0.07	0	0
4/22/2020 4:17	16.1	72	14.8	14.8	1015	0	0	1016.26	72	-0.01	0.06	2.17	15.92	0	0.08	0	0
4/22/2020 5:20	16.1	72	13	13	1016	0	0	1016.26	72	-0.05	0.06	2.15	15.94	0	0.05	0	0
4/22/2020 6:22	15	71	9.3	9.3	1016	0	0	1017.21	71	-0.05	0.06	2.14	15.93	0	0.05	0	0
4/22/2020 7:25	15	76	14.8	14.8	1017	0	0	1017.69	76	-0.04	0.06	2.15	15.92	0	0.05	0	0
4/22/2020 8:27	17.2	67	14.8	14.8	1018	0	0	1018.64	67	-0.01	0.08	2.16	15.97	0	0.14	0	0
4/22/2020 9:29	20	48	27.8	27.8	1019	0	0	1018.64	48	0.03	0.12	2.14	16.17	0	0.22	0	0
4/22/2020 10:32	22.2	43	22.2	22.2	1018	0	0	1018.64	43	0.01	0.23	2.02	16.37	NaN	0.12	0	0
4/22/2020 11:34	22.8	40	16.7	16.7	1018	0	0	1018.64	40	0.04	0.16	1.91	16.53	NaN	0.04	0	0
4/22/2020 12:37	23.9	33	20.4	20.4	1017	0	0	1017.69	33	0.02	0.12	1.87	16.68	NaN	0.06	0	0
4/22/2020 13:39	25	31	11.1	11.1	1016	0	0	1016.74	31	0.07	0.1	1.86	16.76	NaN	0.03	0	0
4/22/2020 14:42	25	38	16.7	16.7	1016	0	0	1017.21	38	-0.03	0.09	1.84	16.84	NaN	0.03	0	0
4/22/2020 15:45	22.8	46	14.8	14.8	1016	0	0	1016.74	46	-0.01	0.09	1.91	16.82	NaN	0.01	0	0
4/22/2020 16:47	22.2	49	14.8	14.8	1016	0	0	1017.21	49	0	0.06	1.94	16.69	0	0.03	0	0
4/22/2020 17:50	21.1	52	11.1	11.1	1017	0	0	1017.69	52	-0.03	0.02	1.92	16.59	0	0.06	0	0
4/22/2020 18:53	20	55	3.7	3.7	1017	0	0	1018.17	55	-0.02	0.05	1.96	16.51	0	0.03	0	0
4/22/2020 19:55	18.9	59	5.6	5.6	1018	0	0	1018.64	59	-0.03	0.04	2	16.43	0	0.07	0	0
4/22/2020 20:58	17.8	67	5.6	5.6	1018	0	0	1019.12	67	-0.02	0.07	1.97	16.38	0	0.03	0	0
4/22/2020 22:00	17.8	67	1.9	1.9	1019	0	0	1019.6	67	-0.04	0.05	2.06	16.31	0	0.04	0	0
4/22/2020 23:03	16.1	77	0	0	1019	0	0	1019.12	77	-0.01	0.06	2.08	16.1	0	0.03	0	0
4/23/2020 0:05	16.1	82	11.1	11.1	1019	0	0	1019.12	82	0	0.06	2.07	16.05	0	0.04	0	0
4/23/2020 1:08	16.1	77	0	0	1019	0	0	1019.12	77	-0.05	0.05	2.15	16	0	0.03	0	0
4/23/2020 2:10	15	82	9.3	9.3	1019	0	0	1019.6	82	-0.01	0.05	2.13	15.98	0	0.04	0	0
4/23/2020 3:13	13.9	76	13	13	1019	0	0	1019.12	76	-0.04	0.05	2.14	15.9	0	0.02	0	0
4/23/2020 4:15	13.9	76	13	13	1019	0	0	1019.6	76	-0.02	0.07	2.17	15.92	0	0.05	0	0
4/23/2020 5:18	13.9	67	9.3	9.3	1020	0	0	1020.07	67	-0.05	0.07	2.16	15.92	0	0.04	0	0
4/23/2020 6:20	15	62	14.8	14.8	1020	0	0	1020.07	62	-0.07	0.07	2.14	15.91	0	0.07	0	0
4/23/2020 7:23	15	62	13	13	1020	0	0	1020.55	62	-0.08	0.06	2.14	15.98	0	0.07	0	0
4/23/2020 8:25	17.2	55	11.1	11.1	1021	0	0	1021.02	55	0	0.1	2.14	15.95	0	0.1	0	0
4/23/2020 9:27	18.9	48	14.8	14.8	1021	0	0	1021.02	48	-0.01	0.12	2.11	16.08	0	0.24	0	0
4/23/2020 10:30	21.1	45	16.7	16.7	1020	0	0	1020.55	45	0.02	0.22	2.02	16.3	NaN	0.05	0	0
4/23/2020 11:32	22.8	37	16.7	16.7	1020	0	0	1019.6	37	0	0.15	1.89	16.53	NaN	0	0	0
4/23/2020 12:35	23.9	29	14.8	14.8	1019	0	0	1018.64	29	0.05	0.1	1.86	16.69	NaN	0.07	0	0
4/23/2020 13:37	25	27	14.8	14.8	1017	0	0	1017.21	27	0.02	0.08	1.76	16.83	NaN	0.06	0	0
4/23/2020 14:40	25	25	16.7	16.7	1016	0	0	1016.26	25	0.03	0.1	1.77	16.87	NaN	0.01	0	0
4/23/2020 15:43	23.9	40	22.2	22.2	1016	0	0	1015.79	40	0.01	0.09	1.89	16.85	NaN	0.01	0	0
4/23/2020 16:45	22.2	49	24.1	24.1	1015	0	0	1015.79	49	0.01	0.04	1.91	16.75	0	0.04	0	0
4/23/2020 17:48	22.2	52	20.4	20.4	1016	0	0	1016.26	52	-0.01	0.04	1.93	16.67	0	0.04	0	0
4/23/2020 18:50	21.1	56	16.7	16.7	1016	0	0	1016.26	56	-0.01	0.05	1.98	16.59	0	0.06	0	0
4/23/2020 19:53	21.1	52	13	13	1016	0	0	1017.21	52	-0.03	0.06	1.96	16.49	0	0.02	0	0
4/23/2020 20:56	20	55	9.3														

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/26/2020 2:04	17.2	72	11.1	11.1	1016	0	0	1015.79	72	0	0.07	2.17	16.14	0	0.08	0	0
4/26/2020 3:06	16.1	77	13	13	1014	0	0	1014.83	77	-0.06	0.06	2.17	16.08	0	0.03	0	0
4/26/2020 4:09	16.1	72	9.3	9.3	1014	0	0	1013.88	72	-0.02	0.06	2.15	16.02	0	0.06	0	0
4/26/2020 5:11	15	76	11.1	11.1	1014	0	0	1013.88	76	-0.09	0.07	2.16	16.03	0	0.06	0	0
4/26/2020 6:14	15	82	11.1	11.1	1013	0	0	1013.88	82	-0.03	0.07	2.18	16.04	0	0.06	0	0
4/26/2020 7:16	15	82	7.4	7.4	1014	0	0	1014.83	82	0	0.07	2.16	16.02	0	0.07	0	0
4/26/2020 8:18	17.8	63	11.1	11.1	1015	0	0	1014.83	63	-0.04	0.09	2.18	16.02	0	0.07	0	0
4/26/2020 9:20	20	52	16.7	16.7	1015	0	0	1014.83	52	0.01	0.12	2.18	16.13	0	0.21	0	0
4/26/2020 10:23	25	35	20.4	20.4	1014	0	0	1013.88	35	0.07	0.19	2.1	16.25	NaN	0.09	0	0
4/26/2020 11:25	27.2	34	20.4	20.4	1013	0	0	1012.93	34	0.03	0.24	2.02	16.42	NaN	0.07	0	0
4/26/2020 12:28	27.2	31	25.9	25.9	1012	0	0	1012.45	31	0.03	0.19	1.92	16.67	NaN	0.05	0	0
4/26/2020 13:30	27.2	29	37	37	1012	0	0	1011.98	29	-0.01	0.12	1.91	16.8	NaN	0.1	0	0
4/26/2020 14:33	27.2	29	24.1	24.1	1011	0	0	1012.45	29	-0.01	0.08	1.89	16.8	NaN	0.05	0	0
4/26/2020 15:36	26.1	31	20.4	20.4	1012	0	0	1012.93	31	-0.06	0.08	1.92	16.79	NaN	0.1	0	0
4/26/2020 16:38	25	35	25.9	25.9	1013	0.5	0.5	1013.88	35	-0.04	0.07	1.93	16.77	NaN	0.11	0	0
4/26/2020 17:41	23.9	43	20.4	20.4	1014	0	0	1014.83	43	-0.09	0.05	1.93	16.73	NaN	0.03	0	0
4/26/2020 18:43	22.2	56	33.3	33.3	1015	0	0	1016.26	56	-0.03	0.05	1.91	16.67	0	0.1	0	0
4/26/2020 19:46	21.1	56	25.9	25.9	1017	0	0	1016.74	56	0	0.06	1.97	16.61	0	0.09	0	0
4/26/2020 20:48	20	55	24.1	24.1	1017	0	0	1017.69	55	-0.05	0.08	1.98	16.57	0	0.06	0	0
4/26/2020 21:51	18.9	55	16.7	16.7	1018	0	0	1019.12	55	-0.02	0.1	1.97	16.56	0	0.07	0	0
4/26/2020 22:53	17.8	59	11.1	11.1	1019	0	0	1019.6	59	-0.01	0.07	1.96	16.45	0	0.06	0	0
4/26/2020 23:56	18.9	59	22.2	22.2	1019	0	0	1020.07	59	-0.04	0.08	2.06	16.4	0	0.12	0	0
4/27/2020 0:58	17.8	67	18.5	18.5	1020	0.3	0.3	1021.02	67	-0.04	0.1	2.06	16.38	0	0.07	0	0
4/27/2020 2:01	17.8	67	13	13	1020	0.3	0.3	1021.02	67	-0.06	0.09	2.13	16.34	0	0.05	0	0
4/27/2020 3:03	18.9	82	16.7	16.7	1020	0.3	0.3	1021.02	82	-0.03	0.1	2.13	16.28	0	0.13	0	0
4/27/2020 4:06	17.8	82	14.8	14.8	1021	0.3	0.3	1021.02	82	-0.02	0.09	2.06	16.32	0	0.09	0	0
4/27/2020 5:08	17.2	87	14.8	14.8	1021	0.3	0.3	1021.5	87	-0.03	0.09	2.08	16.31	0	0.08	0	0
4/27/2020 6:11	17.2	87	13	13	1022	0	0.7	1022.45	87	-0.04	0.08	2.07	16.34	0	0.1	0	0
4/27/2020 7:13	17.2	87	13	13	1022	0	0.5	1022.45	87	-0.03	0.08	2.15	16.32	0	0.06	0	0
4/27/2020 8:16	17.8	82	13	13	1023	0	0.5	1023.88	82	-0.04	0.1	2.06	16.35	0	0.1	0	0
4/27/2020 9:18	18.9	77	13	13	1024	0	0	1023.88	77	-0.01	0.12	2.1	16.36	0	0.14	0	0
4/27/2020 10:20	18.9	82	13	13	1023	0	0	1023.88	82	0	0.13	2.06	16.48	0	0.13	0	0
4/27/2020 11:22	20	72	13	13	1023	0	0.5	1023.88	72	-0.02	0.12	2.04	16.6	0	0.11	0	0
4/27/2020 12:25	20	72	13	13	1023	0	1.9	1022.93	72	-0.02	0.1	2.01	16.69	0	0.13	0	0
4/27/2020 13:27	20	77	16.7	16.7	1022	0	1.9	1022.93	77	-0.03	0.08	1.99	16.63	0	0.04	0	0
4/27/2020 14:30	20	77	14.8	14.8	1022	0.3	2.2	1022.93	77	-0.03	0.08	1.98	16.67	0	0.07	0	0
4/27/2020 15:32	20	82	13	13	1023	0	1	1023.4	82	-0.02	0.07	1.97	16.67	0	0.09	0	0
4/27/2020 16:34	21.1	64	11.1	11.1	1023	0	1	1022.93	64	-0.01	0.07	1.96	16.65	0	0.04	0	0
4/27/2020 17:37	20	72	9.3	9.3	1023	0	1.9	1023.88	72	-0.02	0.08	1.97	16.66	0	0.05	0	0
4/27/2020 18:40	20	68	11.1	11.1	1024	0.3	1.9	1024.36	68	-0.01	0.08	1.96	16.59	0	0.04	0	0
4/27/2020 19:42	21.1	68	18.5	18.5	1024	0.3	2.2	1024.36	68	-0.02	0.07	1.95	16.57	0	0.1	0	0
4/27/2020 20:45	20	77	20.4	20.4	1024	0.3	2.2	1024.83	77	-0.06	0.1	2.04	16.52	0	0.06	0	0
4/27/2020 21:47	20	72	16.7	16.7	1025	0.3	2.2	1025.31	72	-0.03	0.1	2.04	16.5	0	0.06	0	0
4/27/2020 22:50	20	72	16.7	16.7	1025	0.3	2.2	1025.31	72	-0.01	0.1	2.05	16.49	0	0.06	0	0
4/27/2020 23:52	20	72	24.1	24.1	1024	0	2.2	1024.83	72	-0.04	0.11	2.06	16.46	0	0.1	0	0
4/28/2020 0:54	20	68	22.2	22.2	1024	0.3	1.9	1024.36	68	-0.04	0.11	2.06	16.44	0	0.11	0	0
4/28/2020 1:57	20	72	16.7	16.7	1024	0.3	2.2	1023.88	72	0.03	0.1	2.06	16.44	0	0.13	0	0
4/28/2020 2:59	20	68	22.2	22.2	1023	0	2.2	1023.88	68	0.01	0.1	2.06	16.43	0	0.07	0	0
4/28/2020 4:02	20	68	20.4	20.4	1023	0	1.9	1023.88	68	-0.01	0.11	2.06	16.44	0	0.1	0	0
4/28/2020 5:04	21.1	64	18.5	18.5	1023	0	1.4	1023.88	64	0.02	0.11	2.06	16.45	0	0.05	0	0
4/28/2020 6:07	21.1	64	18.5	18.5	1024	0	1.4	1024.36	64	-0.02	0.1	2.05	16.45	0	0.11	0	0
4/28/2020 7:09	20	72	14.8	14.8	1024	0	1.4	1024.36	72	-0.03	0.1	2	16.45	0	0.06	0	0
4/28/2020 8:12	22.2	60	20.4	20.4	1024	0	1.4	1024.83	60	-0.03	0.11	2.06	16.49	0	0.1	0	0
4/28/2020 9:14	22.2	56	22.2	22.2	1024	0	0.5	1024.83	56	0	0.11	2.05	16.51	0	0.11	0	0
4/28/2020 10:16	22.2	56	20.4	20.4	1024	0	0.3	1024.36	56	-0.01	0.12	1.96	16.53	0	0.14	0	0
4/28/2020 11:19	23.9	46	25.9	25.9	1024	0	0.9	1023.88	46	-0.02	0.14	2.07	16.53	0	0.12	0	0
4/28/2020 12:21	22.8	52	29.6	29.6	1023	0	2	1022.45	52	0.02	0.11	1.97	16.59	0	0.19	0	0
4/28/2020 13:24	22.8	56	24.1	24.1	1022	0	3.6	1021.98	56	0.02	0.12	1.97	16.6	0	0.07	0	0
4/28/2020 14:26	22.8	60	25.9	25.9	1021	0	3.6	1021.5	60	0.01	0.1	1.99	16.64	0	0.13	0	0
4/28/2020 15:29	22.2	60	27.8	27.8	1021	0	0.5	1021.5	60	-0.01	0.09	1.97	16.65	0	0.09	0	0
4/28/2020 16:31	22.2	60	27.8	27.8	1021	0	1.7	1021.02	60	-0.01	0.1	1.98	16.65	0	0.08	0	0
4/28/2020 17:34	21.1	72	22.2	22.2	1020	0	4.2	1021.02	72	-0.01	0.08	1.98	16.6	0	0.07	0	0
4/28/2020 18:36	22.2	64	16.7	16.7	1020	0	4.2	1021.5	64	-0.03	0.11	1.96	16.59	0	0.11	0	0
4/28/2020 19:39	22.2	68	9.3	9.3	1021	0	4.2	1021.02	68	-0.02	0.1	1.95	16.59	0	0.11	0	0
4/28/2020 20:41	20	88	5.6	5.6	1021	0.3	7.2	1021.02	88	-0.03	0.1	1.97	16.54	0	0.04	0	0
4/28/2020 21:44	20	88	5.6	5.6	1020	0	7.2	1020.55	88	0.02	0.1	2.06	16.46	0	0.08	0	0
4/28/2020 22:46	20	88	13	13	1020	0	4.2	1020.07	88	0	0.11	2.07	16.43	0	0.09	0	0
4/28/2020 23:49	18.9	88	9.3	9.3	1019	0	4.6	1019.12	88	-0.02	0.11	2.08	16.38	0	0.04	0	0
4/29/2020 0:51	18.9	88	9.3	9.3	1018	0	4.6	1018.17	88	0	0.11	2.07	16.36	0	0.07	0	0
4/29/2020 1:54	18.9	88	13	13	1018	0	4.6	1017.69	88	0	0.11	2.07	16.36	0	0.15	0	0
4/29/2020 2:56	17.8	93	11.1	11.1	1017	0	4.6	1017.21	93	0.01	0.12	2.08	16.33	0	0.07	0	0
4/29/2020 3:59	18.9	88	16.7	16.7	1016	0	4.6	1016.74	88	-0.04	0.12	2.09	16.34	0	0.05	0	0
4/29/2020 5:01	17.8	93	18.5	18.5	1016	0	4.6	1016.26	93	0	0.1	2.07	16.36	0	0.1	0	0
4/29/2020 6:03	17.8	87	11.1	11.1	1016	0	4.1	1016.26	87	0.04	0.11	2.07	16.35	0	0.08	0	0
4/29/2020 7:06	18.9	88	13	13	1016	0	4.1	1016.26	88	-0.05	0.11	1.99	16.41	0	0.11	0	0
4/29/2020 8:08	20	82	16.7	16.7	1016	0	4.1	1016.26	82	-0.04	0.12	2.09	16.4	0	0.09	0	0
4/29/2020 9:10	21.1	72	14.8	14.8	1016	0	4.1	1015.79									

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

5/1/2020 2:51	11.1	66	16.7	16.7	1007	0	6.9	1007.69	66	-0.04	0.11	2.2	15.84	0	0.04	0	0
5/1/2020 3:53	11.1	61	16.7	16.7	1007	0	6.9	1008.17	61	-0.05	0.09	2.3	16.07	0	0.05	0	0
5/1/2020 4:56	11.1	66	18.5	18.5	1008	0	6.9	1008.17	66	-0.03	0.11	2.19	15.81	0	0.01	0	0
5/1/2020 5:58	10	71	14.8	14.8	1007	0	6.9	1007.69	71	-0.04	0.11	2.29	15.76	0	0.03	0	0
5/1/2020 7:00	12.2	57	20.4	20.4	1008	0	6.9	1008.64	57	-0.04	0.11	2.2	15.83	0	0.05	0	0
5/1/2020 8:03	13.9	50	20.4	20.4	1009	0	6.9	1008.64	50	-0.01	0.12	2.19	15.83	0	0.04	0	0
5/1/2020 9:05	15	41	29.6	48.2	1009	0	6.1	1008.17	41	-0.09	0.17	2.19	15.91	0	0.08	0	0
5/1/2020 10:07	16.1	38	38.9	38.9	1008	0	22.1	1008.17	38	0	0.25	2.03	16.08	0	0.02	0	0
5/1/2020 11:10	16.1	36	42.6	61.1	1007	0	4.4	1007.69	36	0.03	0.29	1.95	16.21	0	0.11	0	0
5/1/2020 12:12	17.2	33	48.2	48.2	1007	0	4.4	1007.21	33	0.18	0.28	1.95	16.27	0	0.02	0	0
5/1/2020 13:14	17.2	29	33.3	51.9	1006	0	3.6	1006.74	29	0.08	0.15	1.95	16.37	0	0	0	0
5/1/2020 14:17	17.2	33	40.8	40.8	1006	0	2.7	1006.26	33	0.01	0.03	1.58	16.7	0	0	0	0
5/1/2020 15:20	17.2	31	46.3	46.3	1005	0	1.8	1006.26	31	0.04	0.01	1.72	16.59	0	0	0	0
5/1/2020 16:22	16.1	31	40.8	59.3	1006	0	0.9	1006.74	31	0.17	0.03	1.8	16.42	0	0	0	0
5/1/2020 17:25	16.1	33	35.2	35.2	1006	0	0	1006.74	33	-0.02	0.04	1.9	16.3	0	0	0	0
5/1/2020 18:27	15	38	31.5	31.5	1007	0	0	1007.69	38	-0.08	0.04	1.89	16.22	0	0.01	0	0
5/1/2020 19:30	13.9	44	24.1	24.1	1007	0	0	1007.21	44	-0.1	0.03	1.99	16.09	0	0	0	0
5/1/2020 20:32	13.9	47	29.6	29.6	1007	0	0	1006.26	47	-0.04	0.03	2.05	16.01	0	0	0	0
5/1/2020 21:35	13.9	47	31.5	31.5	1006	0	0	1005.31	47	-0.05	0.04	2.04	15.94	0	0	0	0
5/1/2020 22:37	12.8	54	35.2	35.2	1005	0	0	1004.83	54	-0.04	0.04	2.1	15.91	0	0.01	0	0
5/1/2020 23:40	13.9	50	25.9	25.9	1005	0	0	1005.79	50	-0.11	0.04	2.09	15.94	0	0.01	0	0
5/2/2020 0:42	12.8	58	20.4	20.4	1005	0	0	1004.36	58	-0.05	0.04	2.1	15.84	0	0.01	0	0
5/2/2020 1:45	13.9	50	33.3	33.3	1004	0	0	1003.88	50	0	0.03	2.08	15.83	0	0	0	0
5/2/2020 2:47	12.8	54	24.1	24.1	1003	0	0	1003.4	54	-0.03	0.03	2.1	15.83	0	0.01	0	0
5/2/2020 3:50	12.8	54	29.6	29.6	1003	0	0	1003.4	54	-0.03	0.03	2.1	15.84	0	0.01	0	0
5/2/2020 4:52	12.8	54	27.8	27.8	1003	0	0	1003.88	54	-0.01	0.03	2.09	15.84	0	0	0	0
5/2/2020 5:55	13.9	50	24.1	24.1	1003	0	0	1003.88	50	-0.13	0.03	2.11	15.87	0	0.01	0	0
5/2/2020 6:57	13.9	50	13	13	1004	0	0	1004.36	50	-0.06	0.03	2.08	15.85	0	0.01	0	0
5/2/2020 8:00	15	44	31.5	31.5	1004	0	0	1004.83	44	-0.05	0.04	2.1	15.82	0	0.01	0	0
5/2/2020 9:02	15	35	46.3	46.3	1005	0	0	1005.31	35	0	0.06	2.17	15.9	0	0	0	0
5/2/2020 10:04	16.1	33	46.3	46.3	1005	0	0	1004.83	33	-0.03	0.04	2.08	16.07	0	0	0	0
5/2/2020 11:06	17.2	31	40.8	40.8	1004	0	0	1004.36	31	0.03	0.03	2	16.24	0	0.01	0	0
5/2/2020 12:09	17.8	27	40.8	61.1	1003	0	0	1003.88	27	0.01	0.04	2.02	16.42	0	0	0	0
5/2/2020 13:11	18.9	29	44.5	44.5	1003	0	0	1003.4	29	0.02	0.05	1.92	16.59	0	0.01	0	0
5/2/2020 14:14	18.9	27	46.3	64.8	1002	0	0	1003.4	27	0	0.04	1.93	16.66	0	0	0	0
5/2/2020 15:17	18.9	29	46.3	64.8	1002	0	0	1003.88	29	0.08	0.03	1.85	16.6	0	0	0	0
5/2/2020 16:19	17.8	29	35.2	53.7	1004	0	0	1004.36	29	0.06	0.02	1.82	16.48	0	0	0	0
5/2/2020 17:22	16.1	36	33.3	33.3	1005	0	0	1005.31	36	-0.06	0.03	1.87	16.38	0	0.01	0	0
5/2/2020 18:25	15	41	25.9	25.9	1006	0	0	1007.69	41	-0.12	0.03	1.89	16.32	0	0.01	0	0
5/2/2020 19:27	13.9	47	31.5	31.5	1008	0	0	1008.64	47	-0.03	0.03	1.9	16.22	0	0.01	0	0
5/2/2020 20:30	13.9	44	31.5	31.5	1008	0	0	1009.12	44	-0.12	0.03	1.98	16.08	0	0	0	0
5/2/2020 21:32	12.8	47	33.3	33.3	1009	0	0	1009.12	47	-0.08	0.04	2.01	16	0	0.01	0	0
5/2/2020 22:35	12.8	43	33.3	33.3	1009	0	0	1009.6	43	-0.06	0.04	2.02	15.98	0	0.01	0	0
5/2/2020 23:37	12.8	47	31.5	31.5	1009	0	0	1009.12	47	0.02	0.04	1.99	15.94	0	0.01	0	0
5/3/2020 0:40	12.8	50	24.1	24.1	1009	0	0	1009.6	50	-0.07	0.04	2.1	15.91	0	0	0	0
5/3/2020 1:42	12.8	54	25.9	25.9	1009	0	0	1010.07	54	0	0.04	2.09	15.88	0	0.01	0	0
5/3/2020 2:45	12.8	54	29.6	29.6	1010	0	0	1010.07	54	-0.06	0.03	1.99	15.93	0	0.01	0	0
5/3/2020 3:47	12.2	57	14.8	14.8	1010	0	0	1011.02	57	-0.01	0.03	1.98	15.89	0	0.01	0	0
5/3/2020 4:50	11.1	61	16.7	16.7	1011	0	0	1012.45	61	0	0.05	1.96	15.92	0	0	0	0
5/3/2020 5:52	12.2	57	25.9	25.9	1013	0	0	1013.4	57	-0.02	0.02	1.98	15.95	0	0	0	0
5/3/2020 6:55	12.2	57	31.5	31.5	1014	0	0	1014.83	57	-0.09	0.04	1.97	15.96	0	0.02	0	0
5/3/2020 7:57	12.2	57	27.8	27.8	1015	0	0	1016.26	57	-0.05	0.03	1.97	15.94	0	0.01	0	0
5/3/2020 8:59	13.9	50	29.6	29.6	1016	0	0	1017.21	50	0.06	0.06	2.05	15.9	0	0.01	0	0
5/3/2020 10:01	15	47	31.5	31.5	1017	0	0	1017.69	47	0.01	0.04	2.06	16.11	0	0.01	0	0
5/3/2020 11:04	17.2	51	25.9	25.9	1017	0	0	1017.69	51	-0.05	0.02	1.91	16.39	0	0.01	0	0
5/3/2020 12:07	17.8	48	33.3	33.3	1018	0	0	1018.17	48	0.01	0.06	1.9	16.58	0	0.01	0	0
5/3/2020 13:09	17.8	48	29.6	29.6	1017	0	0	1018.17	48	0.08	0.08	1.86	16.71	0	0	0	0
5/3/2020 14:12	17.8	48	27.8	27.8	1017	0	0	1018.64	48	-0.09	0.07	1.82	16.76	0	0.02	0	0
5/3/2020 15:14	17.8	55	27.8	27.8	1018	0	0	1019.12	55	-0.03	0.03	1.8	16.69	0	0	0	0
5/3/2020 16:17	17.2	48	22.2	22.2	1018	0	0	1019.12	48	-0.03	0.01	1.88	16.54	0	0	0	0
5/3/2020 17:20	17.2	48	13	13	1019	0	0	1019.6	48	-0.04	0.04	1.88	16.47	0	0.01	0	0

LFG01 Summary (GasFlux Unit)																	
	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Gust (km/h)	Barometric Pressure (hPa)	Precipitation (mm)	Precip Today (mm)	Well Barometric Pressue (hPa)	Relative Humidity (%)	Steady State Flow Rate (L/hr)	CH4 (% v/v)	C02 (%v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	(CH4)	(CO2)
Maximum	27.8	93	53.7	72.2	1025	5.1	24.1	1025.31	93	0.48	0.29	2.37	17.11	0	0.35	0	0.01
Minimum	10	13	0	0	999	0	0	1000.07	13	-0.23	0.01	1.58	15.01	0	0	0	0

1. Exceeds methane 20% v/v
2. GSV calculated based on highest flow rate per location:

Very Low Risk
Low Risk
Moderate Risk
High Risk

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

LFG02 Continious Gas Monitoring Data (GasFlux Unit)																	
	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Gust (km/h)	Barometric Pressure (hPa)	Precipitation (mm)	Precip Today (mm)	Well Barometric Pressue (hPa)	Relative Humidity (%)	Steady State Flow Rate (L/hr)	CH4 (% v/v)	C02 (%v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	(CH4)	(CO2)
Date / Time	Meterological Data							Monitoring Well Data							Continious GSV		
9/4/2020 16:25	20	77	14.8	14.8	1024	0	1	1024.8	20.18	0.04	10.34	8.89	3.11	12.03	0.01	0	0
9/4/2020 17:26	20	82	11.1	11.1	1024	0	2.4	1024.32	19.44	-0.01	11.58	9.44	2.43	10.45	0.06	0	0
9/4/2020 18:28	18.9	82	9.3	9.3	1024	0	2.7	1024.8	18.83	-0.04	12.38	9.98	1.88	9.4	0.01	-0.01	0
9/4/2020 19:29	18.9	82	0	0	1024	0	2.7	1025.28	18.94	-0.08	12.53	10.01	2.01	7.86	0.01	-0.01	-0.01
9/4/2020 20:31	18.9	88	0	0	1025	0	2.7	1025.28	19.3	-0.03	12.66	10.13	2.52	6.93	0.02	0	0
9/4/2020 21:33	18.9	88	3.7	3.7	1025	0	2.4	1024.8	19.99	-0.02	12.45	10.26	2.68	5.63	0.02	0	0
9/4/2020 22:34	17.2	93	0	0	1024	0	1.7	1024.32	21.2	0	13.57	10.64	1.82	5.59	0.01	0	0
9/4/2020 23:36	17.2	93	0	0	1024	0	2.1	1024.32	22.27	0.03	14.95	11.27	1.07	5.43	0.03	0	0
10/4/2020 0:37	17.8	87	5.6	5.6	1023	0.3	2.3	1023.84	23.19	0.06	16.6	11.81	0.43	5.47	0.02	0.01	0.01
10/4/2020 1:39	17.8	87	0	0	1022	0	2.3	1022.87	23.83	0.12	18.64	12.3	0.01	4.66	0.02	0.02	0.01
10/4/2020 2:40	17.8	87	0	0	1022	0.3	2.5	1022.39	24.44	0.14	20.49	12.73	0	4.91	0.02	0.03	0.02
10/4/2020 3:42	17.8	87	9.3	9.3	1021	0.3	1.9	1021.43	25.34	0.18	22.09	12.82	0	4.5	0.01	0.04	0.02
10/4/2020 4:43	17.8	87	7.4	7.4	1021	0.3	1.7	1020.95	26.22	0.15	22.99	12.85	0	3.98	0.02	0.03	0.02
10/4/2020 5:45	17.8	87	7.4	7.4	1020	0.3	3.5	1020.47	26.06	0.14	23.69	12.87	0	3.89	0.01	0.03	0.02
10/4/2020 6:46	17.8	93	7.4	7.4	1020	0.5	3.8	1020.95	26.34	0.06	24.21	12.85	0	3.89	0.06	0.01	0.01
10/4/2020 7:48	18.9	88	9.3	9.3	1020	0.5	3.8	1020.47	27.1	0.05	24.71	12.78	0	3.57	0.05	0.01	0.01
10/4/2020 8:49	18.9	88	14.8	14.8	1020	0.5	4.5	1020.47	27.78	0.11	24.77	12.61	0	3.98	0.04	0.03	0.01
10/4/2020 9:50	18.9	93	14.8	14.8	1019	0.5	0.5	1019.5	28.73	0.15	25.31	12.65	0	3.65	0.06	0.04	0.02
10/4/2020 10:52	20	82	18.5	18.5	1018	0.5	3.8	1018.54	29.19	0.25	25.58	12.65	0	3.61	0.02	0.06	0.03
10/4/2020 11:53	20	82	24.1	24.1	1017	0.5	4	1017.1	29.29	0.35	25.94	12.55	0	2.6	0.02	0.09	0.04
10/4/2020 12:55	20	82	18.5	18.5	1015	0	4.3	1015.17	29.28	0.48	27.08	12.52	0	2.84	0.03	0.13	0.06
10/4/2020 13:56	21.1	77	18.5	18.5	1014	0	4.5	1013.25	31.6	0.45	27.48	12.48	0	2.28	0.01	0.12	0.06
10/4/2020 14:58	22.8	64	22.2	22.2	1012	0	4.2	1012.29	32.37	0.45	27.65	12.22	0	2.56	0.08	0.12	0.06
10/4/2020 15:59	22.8	60	22.2	22.2	1011	0	2.7	1011.32	35.11	0.38	27.99	12.33	0	1.99	0.02	0.11	0.05
10/4/2020 17:00	22.2	68	16.7	16.7	1011	0.3	2.7	1012.29	25.04	0.29	27.95	12.4	0	3	0.01	0.08	0.04
10/4/2020 18:02	16.1	93	14.8	14.8	1012	3	11.7	1012.29	21.06	0.18	28.16	12.09	0	4.26	0.01	0.05	0.02
10/4/2020 19:04	17.2	87	9.3	9.3	1012	0	11.3	1012.29	23.38	0.13	28.37	12.03	0	3.13	0.02	0.04	0.02
10/4/2020 20:05	16.1	87	14.8	14.8	1011	0	13.4	1011.8	25.95	0.18	28.52	11.99	0	2.8	0.02	0.05	0.02
10/4/2020 21:07	16.1	87	13	13	1011	0	13.4	1011.8	27.05	0.15	28.72	11.94	0	2.32	0.03	0.04	0.02
10/4/2020 22:08	16.1	87	20.4	20.4	1011	0	18.2	1010.84	28.21	0.21	28.91	12.13	0	2.07	0.09	0.06	0.03
10/4/2020 23:10	16.1	82	13	13	1010	0	8.6	1010.36	28.95	0.24	28.86	12.07	0	1.87	0.03	0.07	0.03
11/4/2020 0:12	16.1	77	16.7	16.7	1009	0	13.4	1009.4	30.25	0.27	28.88	12.01	0	1.75	0.02	0.08	0.03
11/4/2020 1:13	15	87	25.9	25.9	1009	0	13.4	1008.44	30.96	0.29	29.12	11.95	0	1.55	0.03	0.08	0.03
11/4/2020 2:15	15	87	20.4	20.4	1007	0	12.6	1007.47	31.32	0.41	29.05	12.03	0	1.63	0.02	0.12	0.05
11/4/2020 3:16	15	82	20.4	20.4	1007	0	11.8	1006.99	31.49	0.34	29.38	11.85	0	1.22	0.05	0.1	0.04
11/4/2020 4:18	13.9	87	14.8	14.8	1006	0	11.8	1006.51	30.69	0.26	29.33	11.92	0	1.18	0.06	0.08	0.03
11/4/2020 5:19	15	76	9.3	9.3	1006	0	11.8	1006.51	30.4	0.21	29.73	11.81	0	0.98	0.08	0.06	0.02
11/4/2020 6:21	15.5	75	14.8	14.8	1006	0	11.8	1006.99	30.98	0.1	29.67	11.91	0	1.06	0.05	0.03	0.01
11/4/2020 7:22	16.2	77	28.2	33.7	1010	0	11.8	1006.51	33.72	0.1	29.94	12.03	0	1.22	0.03	0.03	0.01
11/4/2020 8:24	17.7	74	30.7	35	1010.9	0	11.1	1006.03	37.49	0.17	29.7	11.89	0	1.38	0.17	0.05	0.02
11/4/2020 9:25	21.1	52	25.9	25.9	1010.3	0	11.1	1005.07	39.98	0.32	29.83	12.01	0	1.06	0.03	0.1	0.04
11/4/2020 10:26	22.8	40	33.3	33.3	1009.7	0	11.1	1003.14	41.55	0.51	29.86	11.94	0	0.84	0.02	0.15	0.06
11/4/2020 11:28	22.9	45	35.4	49.7	1003	0	10.3	1001.22	42.19	0.51	29.96	11.87	0	0.69	0.09	0.15	0.06
11/4/2020 12:29	26.1	29	37	37	1000	0	9.6	1000.26	43.62	0.58	29.94	11.81	0	0.65	0.04	0.17	0.07
11/4/2020 13:31	26.1	25	40.8	59.3	999	0	9.6	999.77	45.17	0.61	30.08	11.93	0	1.14	0.02	0.18	0.07
11/4/2020 14:32	23.9	31	46.3	72.2	1000	0	9.6	1000.26	44.33	0.36	30.16	11.72	0	1.3	0.02	0.11	0.04
11/4/2020 15:33	2																

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/14/2020 20:26	20	77	11.1	11.1	1023	0	0	1024.32	42.1	-0.15	0.65	2.17	16.9	0	0.05	0	0
4/14/2020 21:27	18.9	77	0	0	1024	0	0	1024.32	45.72	-0.16	0.17	0.94	19.5	0	0.02	0	0
4/14/2020 22:29	17.8	87	7.4	7.4	1023	0	0	1024.32	48.32	-0.14	0.12	0.93	19.68	0	0.06	0	0
4/14/2020 23:30	17.8	87	9.3	9.3	1023	0	0	1023.84	50.3	-0.09	0.11	1.15	19.4	0	0.02	0	0
4/15/2020 0:32	17.2	93	3.7	3.7	1023	0	0	1023.84	51.64	-0.05	0.17	1.51	18.62	0	0.03	0	0
4/15/2020 1:33	17.2	87	5.6	5.6	1023	0	0	1023.35	52.36	-0.05	0.27	2.07	17.49	0	0.05	0	0
4/15/2020 2:35	17.2	87	9.3	9.3	1023	0	0	1022.87	53.33	0	0.53	3.11	14.73	0	0.02	0	0
4/15/2020 3:37	16.1	87	9.3	9.3	1023	0	0	1022.87	53.9	-0.01	1.2	4.8	10.74	0	0.02	0	0
4/15/2020 4:38	16.1	87	11.1	11.1	1022	0	0	1022.87	54.99	-0.08	2.11	6.24	7.35	0.21	0.02	0	-0.01
4/15/2020 5:40	16.1	87	11.1	11.1	1022	0	0	1022.87	54.79	-0.05	2.49	6.73	6.34	0.13	0.03	0	0
4/15/2020 6:41	16.1	87	11.1	11.1	1023	0	0	1022.87	55.55	-0.13	2.8	7.09	6.05	0.15	0.03	0	-0.01
4/15/2020 7:42	17.8	77	11.1	11.1	1023	0	0	1023.84	58.83	-0.14	2.08	5.89	9.67	0	0.02	0	-0.01
4/15/2020 8:44	18.9	72	14.8	14.8	1023	0	0	1023.84	61.92	-0.07	1.54	4.54	12.3	0	0.02	0	0
4/15/2020 9:45	22.2	60	13	13	1023	0	0	1022.87	65.57	0	2.1	5.69	9.95	0	0.04	0	0
4/15/2020 10:47	23.9	53	13	13	1022	0	0	1021.91	65.15	0.09	4.62	9.08	3.53	2.31	0.08	0	0.01
4/15/2020 11:48	27.2	44	11.1	11.1	1021	0	0	1020.95	64.98	0.16	7.77	10.88	0.84	3.81	0.02	0.01	0.02
4/15/2020 12:50	27.8	41	14.8	14.8	1020	0	0	1019.99	62.89	0.15	10.75	11.88	0	5.39	0.05	0.02	0.02
4/15/2020 13:51	26.1	44	24.1	24.1	1019	0	0	1019.02	63	0.17	13.33	12.38	0	6.16	0.02	0.02	0.02
4/15/2020 14:52	26.1	47	22.2	22.2	1018	0	0	1018.54	58.03	0.13	14.87	12.86	0	5.88	0.02	0.02	0.02
4/15/2020 15:54	25	50	24.1	24.1	1017	0	0	1018.06	63.48	0.14	15.99	12.95	0	6.4	0.14	0.02	0.02
4/15/2020 16:55	23.9	56	25.9	25.9	1017	0	0	1018.06	60.2	0.09	16.83	13.09	0	7.17	0.02	0.02	0.01
4/15/2020 17:57	22.8	60	20.4	20.4	1017	0	0	1018.06	43.66	0.05	17.17	13.23	0	8.1	0.01	0.01	0.01
4/15/2020 18:58	22.8	64	18.5	18.5	1017	0	0	1018.06	40.25	0	17.37	13.13	0	7.46	0.01	0	0
4/15/2020 20:00	22.8	64	16.7	16.7	1017	0	0	1018.06	42.06	0.03	17.77	13.26	0	7.54	0.01	0.01	0
4/15/2020 21:02	22.8	64	11.1	11.1	1017	0	0	1017.58	44.86	0.04	18.27	12.98	0	6.85	0.06	0.01	0.01
4/15/2020 22:03	21.1	72	1.9	1.9	1017	0	0	1017.1	47.17	0.05	18.34	12.97	0	5.27	0.01	0.01	0.01
4/15/2020 23:05	20	77	5.6	5.6	1016	0	0	1016.14	48.98	0.15	19.07	13.02	0	5.23	0.1	0.03	0.02
4/16/2020 0:06	20	72	1.9	1.9	1015	0	0	1015.65	51.17	0.15	19.94	13.03	0	4.5	0.06	0.03	0.02
4/16/2020 1:08	18.9	72	0	0	1015	0	0	1014.69	51.97	0.15	20.46	13.22	0	3.89	0.04	0.03	0.02
4/16/2020 2:09	18.9	77	0	0	1014	0	0	1014.21	54.03	0.16	21.17	13.21	0	3.49	0.06	0.03	0.02
4/16/2020 3:11	17.8	82	11.1	11.1	1013	0	0	1013.73	54.76	0.18	21.81	13.09	0	3.12	0.05	0.04	0.02
4/16/2020 4:12	17.8	82	9.3	9.3	1013	0	0	1014.21	55.96	0.05	22.03	13.02	0	2.88	0.02	0.01	0.01
4/16/2020 5:14	17.8	77	11.1	11.1	1014	0	0	1014.21	58.34	-0.02	22.13	13.18	0	2.88	0.02	0	0
4/16/2020 6:15	18.9	72	7.4	7.4	1014	0	0	1014.69	59.67	-0.05	22.07	13.01	0	3.57	0.04	-0.01	-0.01
4/16/2020 7:17	18.9	72	9.3	9.3	1014	0	0	1014.21	61.04	0.03	21.99	12.89	0	3.33	0.06	0.01	0
4/16/2020 8:18	21.1	68	13	13	1014	0	0	1013.73	62.84	0.06	22.39	13	0	2.88	0.06	0.01	0.01
4/16/2020 9:20	22.8	56	9.3	9.3	1014	0	0	1013.73	64.67	0.08	22.32	12.91	0	2.84	0.09	0.02	0.01
4/16/2020 10:21	23.9	49	16.7	16.7	1013	0	0	1013.25	66.77	0.11	22.9	13.07	0	3.04	0.09	0.03	0.01
4/16/2020 11:22	26.1	47	20.4	20.4	1012	0	0	1011.8	67.72	0.23	23.34	12.83	0	2.28	0.03	0.05	0.03
4/16/2020 12:24	27.2	41	25.9	25.9	1011	0	0	1010.84	67.02	0.26	23.41	12.92	0	2.48	0.03	0.06	0.03
4/16/2020 13:25	27.2	38	25.9	25.9	1010	0	0	1009.4	66.49	0.24	23.86	12.85	0	2.4	0.08	0.06	0.03
4/16/2020 14:27	27.2	38	20.4	20.4	1009	0	0	1009.4	62.34	0.16	24.2	12.82	0	2.84	0.16	0.04	0.02
4/16/2020 15:28	26.1	44	16.7	16.7	1009	0.5	0.5	1008.92	59.25	0.12	24.34	12.73	0	2.8	0.05	0.03	0.02
4/16/2020 16:30	27.2	41	16.7	16.7	1008	0	0	1008.44	57.69	0.14	24.69	12.6	0	2.96	0.06	0.03	0.02
4/16/2020 17:31	26.1	41	25.9	25.9	1008	0	0	1008.92	59.16	0.05	24.93	12.72	0	2.76	0.08	0.01	0.01
4/16/2020 18:33	26.1	41	18.5	18.5	1009	0	0	1009.4	58.81	-0.01	24.65	12.64	0	2.72	0.03	0	0
4/16/2020 19:34	25	43	18.5	18.5	1009	0	0	1009.4	55.13	-0.01	24.09	12.69	0.01	1.91	0.02	0	0
4/16/2020 20:36	25	43	16.7	16.7	1009	0	0	1009.88	53.5	0.02	24.44	12.62	0	3.81	0.06	0	0
4/16/2020 21:37	25	41	27.8	27.8	1009	0	0	1009.4	55.59	0.03	24.72	12.58	0	3.33	0.02	0.01	0
4/16/2020 22:39	25	43	22.2	22.2	1009	0	0	1009.4	57.35	0.06	25.07	12.8	0	2.92	0.02	0.02	0.01
4/16/2020 23:40	23.9	46	16.7	16.7	1008	0	0	1008.92	58.28	0.05	25.05	12.63	0	2.15	0.02	0.01	0.01
4/17/2020 0:42	22.8	49	9.3	9.3	1008	0	0	1008.44	59.29	0.04	25.64	12.67	0	2.48	0.06	0.01	0.01
4/17/2020 1:43	18.9	77	16.7	16.7	1009	0	0	1009.4	62.41	0.03	23.59	12.48	0.98	0.45	0.03	0.01	0
4/17/2020 2:45	18.9	93	25.9	25.9	1009	0	0	1009.4	63.42	0.05	24.29	12.49	0.41	1.26	0.06	0.01	0.01
4/17/2020 3:46	18.9	88	24.1	24.1	1009	0	0	1010.36	63.13	-0.05	23.52	12.49	0.82	1.39	0.03	-0.01	-0.01
4/17/2020 4:48	18.9	88	13	13	1009	0	0	1009.88	61.73	-0.06	20.89	11.63	2.66	0	0.15	-0.01	-0.01
4/17/2020 5:49	17.8	87	9.3	9.3	1010	0	0	1009.88	59.2	-0.05	21.2	11.61	2.37	0	0.11	-0.01	-0.01
4/17/2020 6:51	18.9	67	11.1	11.1	1010	0	0	1010.84	63	-0.03	16.81	10.06	5.87	0	0.04	-0.01	0
4/17/2020 7:52	20	45	29.6	29.6	1011	0	0	1011.8	67.54	-0.07	10.79	6.99	10.92	0	0.09	-0.01	0
4/17/2020 8:54	21.1	40	31.5	31.5	1011	0	0	1010.84	70.66	0.25	10.29	7.07	10.87	0	0.12	0.03	0.02
4/17/2020 9:55	22.2	37	25.9	25.9	1011	0	0	1010.84	72.3	0.03	10.59	7.5	10.13	0	0.03	0	0
4/17/2020 10:57	22.8	30	27.8	27.8	1011	0	0	1010.84	71.79	0.13	11.01	8.05	9.24	0	0.02	0.01	0.01
4/17/2020 11:58	25	25	24.1	24.1	1010	0	0	1009.88	72.31	0.28	12.77	9.1	6.92	0	0.07	0.04	0.03
4/17/2020 12:59	26.1	23	24.1	24.1	1009	0	0	1008.92	72.63	0.18	15.95	10.57	3.77	0	0.03	0.03	0.02
4/17/2020 14:01	27.2	16	22.2	22.2	1008	0	0	1008.92	74.49	0.14	19.15	11.75	1.75	0.98	0.03	0.03	0.02
4/17/2020 15:02	27.2	14	24.1	24.1	1008	0	0	1008.92	71.79	0.09	21	12.17	0.81	2.48	0.08	0.02	0.01
4/17/2020 16:04	26.1	16	27.8	27.8	1009	0	0	1008.92	75.92	0.07	21.72	12.36	0.43	3.33	0.12	0.02	0.01
4/17/2020 17:05	25	17	18.5	18.5	1009	0	0	1009.88	63.23	0.04	21.28	12.55	0.52	4.5	0.02	0.01	0.01
4/17/2020 18:07	23.9	17	25.9	25.9	1009	0	0	1010.36	48.15	-0.07	18.4	11.74	3.05	0.02	0	-0.01	-0.01
4/17/2020 19:08	22.2	19	20.4	20.4	1010	0	0	1010.36	46.86	-0.06	15.15	10.01	5.95	0	0.02	-0.01	-0.01
4/17/2020 20:10	21.1	19	18.5	18.5	1011	0	0	1010.84	47.77	-0.13	10.17	7.25	10.58	0	0.01	-0.01	-0.01
4/17/2020 21:11	18.9	25	9.3	9.3	1011	0	0	1011.8	49.46	-0.19	6.32	4.92	14.19	0	0.04	-0.01	-0.01
4/17/2020 22:13	17.8	29	11.1	11.1	1012	0	0	1012.29	51.42	-0.18	3.73	3.35	16.64	0	0.02	-0.01	-0.01
4/17/2020 23:15	17.2	33															

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/24/2020 15:28	27.2	31	16.7	16.7	1015	0	0	1016.14	59.03	-0.05	15.14	12.34	3.2	0.71	0.01	-0.01	-0.01
4/24/2020 16:29	25	43	16.7	16.7	1016	0	0	1016.14	61.93	-0.08	13.74	11.71	4.68	0.11	0.09	-0.01	-0.01
4/24/2020 17:31	22.8	56	11.1	11.1	1016	0	0	1017.1	47.88	-0.14	9.37	8.73	9.73	0	0.01	-0.01	-0.01
4/24/2020 18:32	21.1	68	11.1	11.1	1017	0	0	1018.54	41.23	-0.17	4.16	4.46	15.77	0	0.01	-0.01	-0.01
4/24/2020 19:34	20	72	3.7	3.7	1018	0	0	1019.02	42.37	-0.17	0.88	1.28	19.72	0	0.02	0	0
4/24/2020 20:36	20	72	5.6	5.6	1019	0	0	1019.5	46.85	-0.16	0.17	0.61	20.38	0	0.01	0	0
4/24/2020 21:37	18.9	82	1.9	1.9	1019	0	0	1019.99	50.14	-0.15	0.06	0.49	20.42	0	0.02	0	0
4/24/2020 22:39	18.9	77	1.9	1.9	1020	0	0	1019.99	54.31	-0.13	0.05	0.5	20.34	0	0.02	0	0
4/24/2020 23:40	17.8	82	0	0	1020	0	0	1019.99	56.08	-0.12	0.05	0.5	20.3	0	0.03	0	0
4/25/2020 0:42	17.2	82	0	0	1020	0	0	1019.99	58.48	-0.08	0.04	0.6	20.17	0	0.03	0	0
4/25/2020 1:43	17.2	82	11.1	11.1	1020	0	0	1019.99	59.21	-0.1	0.06	0.72	20.02	0	0.08	0	0
4/25/2020 2:45	16.1	82	9.3	9.3	1020	0	0	1019.99	60.17	-0.08	0.06	0.85	19.89	0	0.06	0	0
4/25/2020 3:46	16.1	77	9.3	9.3	1020	0	0	1019.99	62.42	-0.08	0.07	1.08	19.69	0	0.03	0	0
4/25/2020 4:48	15	82	13	13	1020	0	0	1019.99	63.25	-0.11	0.07	1.17	19.62	0	0.03	0	0
4/25/2020 5:49	16.1	77	11.1	11.1	1020	0	0	1020.47	65.8	-0.12	0.04	1.09	19.76	0	0.06	0	0
4/25/2020 6:51	16.1	77	13	13	1021	0	0	1021.43	67.35	-0.14	0.06	0.73	19.95	0	0.03	0	0
4/25/2020 7:52	16.1	77	16.7	16.7	1022	0	0	1022.39	72.02	-0.16	0.07	0.38	20.12	0	0.06	0	0
4/25/2020 8:54	18.9	63	13	13	1022	0	0	1021.91	76.77	-0.12	0.08	0.38	20.18	0	0.02	0	0
4/25/2020 9:55	22.2	52	11.1	11.1	1021	0	0	1021.43	81.1	-0.06	0.08	0.5	20.13	0	0.06	0	0
4/25/2020 10:57	23.9	46	11.1	11.1	1021	0	0	1021.43	82.72	0	0.07	0.72	20.05	0	0.03	0	0
4/25/2020 11:58	25	43	13	13	1020	0	0	1019.99	84.66	0.02	0.11	1.41	19.26	0	0.04	0	0
4/25/2020 12:59	27.2	41	16.7	16.7	1019	0	0	1018.54	82.12	0.07	1.21	4.91	11.92	0.11	0.06	0	0
4/25/2020 14:01	26.1	50	25.9	25.9	1017	0	0	1017.58	78.92	0.06	6.88	10.37	3.35	1.18	0.02	0	0.01
4/25/2020 15:02	25	53	24.1	24.1	1017	0	0	1017.58	73.96	0.02	10	11.54	1.7	2.6	0.06	0	0
4/25/2020 16:04	25	53	27.8	27.8	1017	0	0	1017.1	78.42	0.03	12.35	12.41	0.97	2.68	0.02	0	0
4/25/2020 17:05	23.9	60	27.8	27.8	1016	0	0	1017.1	67.8	0	13.79	12.89	0.49	3.77	0.04	0	0
4/25/2020 18:07	22.8	64	29.6	29.6	1016	0	0	1017.1	52.07	-0.03	14.55	13.22	0.28	5.67	0	0	0
4/25/2020 19:08	22.8	64	27.8	27.8	1017	0	0	1017.1	50.85	-0.04	14.39	12.92	0.87	4.58	0.01	-0.01	-0.01
4/25/2020 20:10	22.2	64	27.8	27.8	1017	0	0	1017.58	52.88	-0.07	14.18	12.62	1.27	5.03	0.02	-0.01	-0.01
4/25/2020 21:11	21.1	68	13	13	1018	0	0	1017.58	54.63	-0.08	12.5	11.5	3.6	2.15	0.02	-0.01	-0.01
4/25/2020 22:13	21.1	64	11.1	11.1	1017	0	0	1017.1	56.08	-0.03	13.28	11.85	2.69	2.88	0.02	0	0
4/25/2020 23:15	18.9	67	13	13	1017	0	0	1017.1	57.76	-0.02	14.41	12.41	1.62	4.1	0.06	0	0
4/26/2020 0:16	18.9	67	13	13	1016	0	0	1016.62	59.06	-0.02	15.54	12.91	0.85	3.89	0.05	0	0
4/26/2020 1:18	17.8	72	11.1	11.1	1016	0	0	1016.14	60.83	-0.01	16.31	13.1	0.44	4.74	0.09	0	0
4/26/2020 2:19	17.2	72	11.1	11.1	1016	0	0	1015.65	62.92	0.05	17.86	13.34	0.08	5.03	0.08	0.01	0.01
4/26/2020 3:21	16.1	77	13	13	1014	0	0	1014.69	63.15	0.04	19.94	13.57	0	4.42	0.04	0.01	0.01
4/26/2020 4:22	16.1	72	9.3	9.3	1014	0	0	1013.73	63.89	0.05	21.26	13.48	0	3.29	0.02	0.01	0.01
4/26/2020 5:24	15	76	11.1	11.1	1014	0	0	1013.25	63.95	0.05	22.5	13.54	0	3.57	0.12	0.01	0.01
4/26/2020 6:25	15	82	11.1	11.1	1013	0	0	1014.21	64.23	-0.03	22.98	13.48	0	3.57	0.03	-0.01	0
4/26/2020 7:27	15	82	7.4	7.4	1014	0	0	1014.69	69.88	-0.07	21.74	13.08	1.12	3.24	0.09	-0.02	-0.01
4/26/2020 8:28	17.8	63	11.1	11.1	1015	0	0	1015.17	77.06	-0.1	19.21	12.29	3.15	1.18	0.08	-0.02	-0.01
4/26/2020 9:30	20	52	16.7	16.7	1015	0	0	1014.69	82.01	-0.02	19.32	12.11	2.82	1.44	0.03	0	0
4/26/2020 10:31	25	35	20.4	20.4	1014	0	0	1013.73	86.34	0.04	20.59	12.61	1.72	1.99	0.12	0.01	0.01
4/26/2020 11:32	27.2	34	20.4	20.4	1013	0	0	1012.77	88.54	0.14	22.56	13.25	0.52	4.02	0.08	0.03	0.02
4/26/2020 12:34	27.2	31	24.1	24.1	1012	0	0	1012.29	89.2	0.21	23.87	13.42	0	4.74	0.06	0.05	0.03
4/26/2020 13:35	27.2	29	37	37	1012	0	0	1011.32	82.12	0.1	24.54	13.56	0	5.47	0.02	0.02	0.01
4/26/2020 14:37	27.2	29	24.1	24.1	1011	0	0	1011.8	74.19	0.05	24.84	13.75	0	4.34	0.05	0.01	0.01
4/26/2020 15:38	26.1	31	24.1	24.1	1012	0	0	1012.77	70.4	-0.06	24.1	13.52	0.64	4.06	0.08	-0.01	-0.01
4/26/2020 16:40	25	35	25.9	25.9	1013	0.5	0.5	1013.25	68.75	-0.12	16.35	10.25	6.69	0	0.02	-0.02	-0.01
4/26/2020 17:41	23.9	43	20.4	20.4	1014	0	0	1014.69	69.08	-0.18	10.32	6.93	11.65	0	0.03	-0.02	-0.01
4/26/2020 18:43	22.2	56	33.3	33.3	1015	0	0	1016.14	70.08	-0.11	4.05	3.18	17.06	0	0.08	0	0
4/26/2020 19:44	21.1	56	25.9	25.9	1017	0	0	1016.62	69.86	-0.15	0.73	0.85	19.93	0	0.06	0	0
4/26/2020 20:46	20	55	24.1	24.1	1017	0	0	1017.58	68.97	-0.2	0.15	0.38	20.41	0	0.02	0	0
4/26/2020 21:47	18.9	55	16.7	16.7	1018	0	0	1019.02	66.71	-0.25	0.08	0.27	20.45	0	0.02	0	0
4/26/2020 22:49	17.8	59	11.1	11.1	1019	0	0	1019.5	71.5	-0.17	0.07	0.28	20.42	0	0.09	0	0
4/26/2020 23:50	18.9	59	22.2	22.2	1019	0	0	1019.99	74.4	-0.16	0.09	0.28	20.39	0	0.02	0	0
4/27/2020 0:52	17.8	63	18.5	18.5	1020	0	0	1020.47	75.47	-0.17	0.07	0.28	20.36	0	0.02	0	0
4/27/2020 1:53	17.8	67	13	13	1020	0.3	0.3	1020.47	77.4	-0.12	0.08	0.28	20.34	0	0.03	0	0
4/27/2020 2:55	17.8	87	25.9	25.9	1020	0.3	0.3	1020.47	78.98	-0.12	0.09	0.28	20.26	0	0.05	0	0
4/27/2020 3:56	18.9	82	16.7	16.7	1020	0.3	0.3	1020.95	79.5	-0.12	0.09	0.28	20.23	0	0.12	0	0
4/27/2020 4:58	17.2	87	16.7	16.7	1021	0.3	0.3	1021.43	79.45	-0.11	0.1	0.4	20.21	0	0.03	0	0
4/27/2020 5:59	17.2	87	16.7	16.7	1021	0.3	0.7	1021.91	77.49	-0.14	0.09	0.27	20.25	0	0.08	0	0
4/27/2020 7:01	17.2	87	13	13	1022	0	0.5	1022.39	76.97	-0.15	0.09	0.28	20.24	0	0.04	0	0
4/27/2020 8:02	17.8	82	13	13	1023	0	0.5	1023.35	79.88	-0.17	0.09	0.16	20.27	0	0.06	0	0
4/27/2020 9:04	18.9	77	13	13	1024	0	1	1023.84	85.54	-0.15	0.11	0.16	20.28	0	0.03	0	0
4/27/2020 10:05	18.9	82	13	13	1023	0	0	1023.84	89.46	-0.1	0.1	0.29	20.25	0	0.11	0	0
4/27/2020 11:06	20	72	13	13	1023	0	0.5	1023.84	90.95	-0.09	0.12	0.28	20.24	0	0.09	0	0
4/27/2020 12:08	20	72	13	13	1023	0	1	1023.35	89.6	-0.06	0.12	0.5	20.19	0	0.03	0	0
4/27/2020 13:09	20	77	16.7	16.7	1022	0	1.9	1022.39	85.17	-0.04	0.06	0.61	20.12	0	0.05	0	0
4/27/2020 14:11	20	77	14.8	14.8	1022	0.3	1.9	1022.39	82.34	-0.06	0.08	0.83	19.83	0	0.11	0	0
4/27/2020 15:12	20	82	13	13	1023	0	2.2	1022.87	78.63	-0.07	0.08	0.94	19.74	0	0.02	0	0
4/27/2020 16:14	21.1	64	11.1	11.1	1023	0	1	1022.87	75.2	-0.08	0.08	0.94	19.75	0	0.03	0	0
4/27/2020 17:15	21.1	64	11.1	11.1	1023	0	1	1022.87	73.23	-0.1	0.07	0.94	19.66	0	0.02	0	0
4/27/2020 18:17	20	72	0	0	1023	0	1.9	1023.84	72.53	-0.14	0.05	0.72	19.96	0	0.01	0	0
4/27/2020 19:18	21.1	68	16.7	16.7													

Table D1: Ground Gas Continuous Monitoring
Job Name: Caringbah Toyota
Job Number: 58037

4/30/2020 2:38	18.9	82	9.3	9.3	1007	0	1.3	1006.99	79.61	0.13	26.78	13.4	0	2.8	0.05	0.03	0.02
4/30/2020 3:40	18.9	88	9.3	9.3	1007	0	1.3	1006.51	81.22	0.1	27.64	13.34	0	4.02	0.05	0.03	0.01
4/30/2020 4:41	18.9	82	9.3	9.3	1006	0	1.3	1006.03	81.01	0.08	27.83	13.37	0	4.5	0.13	0.02	0.01
4/30/2020 5:42	18.9	82	11.1	11.1	1006	0	2.3	1006.51	82.21	0.01	28.1	13.28	0	3.41	0.08	0	0
4/30/2020 6:44	17.8	87	9.3	9.3	1006	0	2.3	1006.51	82.75	0.03	27.76	13.15	0	3.77	0.03	0.01	0
4/30/2020 7:45	18.9	82	5.6	5.6	1006	0.3	2.8	1006.51	84.85	0.01	28.29	13.18	0	3.61	0.09	0	0
4/30/2020 8:47	20	82	1.9	1.9	1006	0	2.5	1006.51	86.94	0.01	28.36	13.15	0	3.09	0.16	0	0
4/30/2020 9:48	18.9	88	3.7	3.7	1006	3	3.4	1006.51	86.79	0.04	28.34	13.35	0	2.32	0.06	0.01	0.01
4/30/2020 10:50	18.9	88	3.7	3.7	1006	3	5.3	1005.55	82.8	0.1	28.57	13.27	0	3.33	0.11	0.03	0.01
4/30/2020 11:51	15	93	24.1	24.1	1005	0.3	7.9	1005.55	76.2	0.12	26.5	12.87	1.09	2.31	0.06	0.03	0.02
4/30/2020 12:53	13.9	93	14.8	14.8	1005	0.5	10	1004.1	76.81	0.12	27.62	13.18	0.11	3.61	0.02	0.03	0.02
4/30/2020 13:54	13.9	93	9.3	9.3	1005	3	8.8	1005.55	78.72	0.02	26.03	12.74	1.15	2.44	0.06	0.01	0
4/30/2020 14:56	13.9	93	16.7	16.7	1006	3	8.8	1006.51	79.95	-0.05	21.86	11.37	3.83	0.34	0.08	-0.01	-0.01
4/30/2020 15:57	13.9	93	7.4	7.4	1006	3	24.1	1006.99	81.41	-0.07	20.72	11.01	4.65	0.02	0.09	-0.01	-0.01
4/30/2020 16:59	13.9	82	27.8	27.8	1007	0.5	5.3	1007.47	78.96	-0.05	19.12	10.55	5.32	0.02	0.09	-0.01	-0.01
4/30/2020 18:00	12.8	87	18.5	18.5	1007	0.3	9.7	1007.95	78.11	0.02	15.74	9.29	7.58	0	0.06	0	0
4/30/2020 19:02	12.8	87	22.2	22.2	1008	0.3	8.2	1008.44	80.48	-0.05	11.95	7.76	10.22	0	0.03	-0.01	0
4/30/2020 20:03	12.8	76	22.2	22.2	1008	0	7.9	1008.92	81.82	-0.11	10.05	6.72	11.71	0	0.14	-0.01	-0.01
4/30/2020 21:05	12.2	81	20.4	20.4	1008	0	7.9	1008.44	81.89	-0.08	9.99	7	11.28	0	0.12	-0.01	-0.01
4/30/2020 22:06	12.2	76	20.4	20.4	1008	0	8.6	1008.44	80.82	-0.06	10.63	7.64	10.2	0	0.14	-0.01	0
4/30/2020 23:08	12.2	71	16.7	16.7	1008	0	6.9	1007.95	80.83	-0.04	11.59	8.46	8.91	0	0.09	0	0
1/5/2020 0:09	12.2	66	20.4	20.4	1008	0	6.9	1007.95	79.24	-0.05	12.84	9.31	7.2	0.02	0.06	-0.01	0
1/5/2020 1:11	12.2	62	16.7	16.7	1007	0	6.9	1007.95	78.52	-0.05	14.2	10.12	5.75	0.06	0.08	-0.01	-0.01
1/5/2020 2:12	11.1	66	16.7	16.7	1007	0	6.9	1007.47	77.92	0.01	15.63	10.78	4.32	0.58	0.03	0	0
1/5/2020 3:14	11.1	61	14.8	14.8	1007	0	6.9	1006.99	78.1	-0.05	16.91	11.23	3.39	0.98	0.03	-0.01	-0.01
1/5/2020 4:15	11.1	61	22.2	22.2	1007	0	6.9	1007.95	79.28	-0.06	17.38	11.4	2.98	1.08	0.06	-0.01	-0.01
1/5/2020 5:17	11.1	61	16.7	16.7	1008	0	6.9	1007.95	81.88	-0.05	17.35	11.78	2.9	1.26	0.06	-0.01	-0.01
1/5/2020 6:18	11.1	61	16.7	16.7	1007	0	6.9	1008.44	82.94	-0.08	17.86	11.86	2.43	1.51	0.09	-0.01	-0.01
1/5/2020 7:20	12.2	57	20.4	20.4	1008	0	6.9	1008.92	82.41	-0.09	15.19	10.93	4.87	0.15	0.06	-0.01	-0.01
1/5/2020 8:21	13.9	50	20.4	20.4	1009	0	6.9	1008.92	88.91	0.01	14.16	10.45	5.8	0.18	0.14	0	0
1/5/2020 9:22	15	41	29.6	48.2	1009	0	22.1	1007.95	92.61	0.05	14.38	10.56	5.36	0.1	0.08	0.01	0.01
1/5/2020 10:24	15	35	37	55.6	1008	0	4.4	1007.95	92.21	0.39	15.83	11.18	3.73	0.71	0.06	0.06	0.04
1/5/2020 11:25	16.1	36	42.6	61.1	1007	0	4.4	1006.99	91.01	0.29	17.27	12.09	2.53	0.74	0.06	0.05	0.04
1/5/2020 12:27	17.2	33	48.2	48.2	1007	0	3.6	1006.51	90.07	0.26	19.5	12.52	1.48	1.55	0.06	0.05	0.03
LFG02 Summary (GasFlux Unit)																	
	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Gust (km/h)	Barometric Pressure (hPa)	Precipitation (mm)	Precip Today (mm)	Well Barometric Pressue (hPa)	Relative Humidity (%)	Steady State Flow Rate (L/hr)	CH4 (% v/v)	C02 (%v/v)	O2 (% v/v)	CO (ppm)	H2S (ppm)	(CH4)	(CO2)
Maximum	27.8	93	53.7	72.2	1025	3	24.1	1025.28	92.61	0.61	30.16	14.07	20.51	12.03	0.17	0.18	0.07
Minimum	11.1	14	0	0	999	0	0	999.77	18.83	-0.27	0.03	0.14	0	0	0	-0.03	-0.01

1. Exceeds methane 20%
2. GSV calculated based on highest flow rate per location:

Very Low Risk
Low Risk
Moderate Risk
High Risk

Table D2: Ground Gas Results Spot Monitoring
Job Number: 58037
Job Name: Caringbah

Date	Location	Well Depth (mBGL)	Screen interval (mBGL)	Standing water level (mBTC)	Well Condition	Gas Flow Rate (L/hr)	Methane (%v/v)	Carbon Dioxide (%v/v)	Carbon Monoxide (ppm)	Hydrogen Sulfide (ppm)	Oxygen (%v/v)	Max Flow for Round	GSV Methane	GSV CO2	Max GSV	Characteristic Gas Situation
Ground Gas Monitoring Wells																
22/01/2020	MW1	4.5	1.5	2.473	OK	0.5	0.0	9.1	0.0	0.0	11.2	0.5	0.00	0.05	0.05	1 - Very Low Risk
22/01/2020	MW2	4.0	1.0	1.625	OK	0.1	0.0	2.5	0.0	0.0	17.0	0.5	0.00	0.00	0	1 - Very Low Risk
22/01/2020	MW3	4.5	1.5	2.236	OK	0.4	0.2	21.0	1.0	0.0	1.3	0.5	0.00	0.08	0.08	2 - Low Risk
22/01/2020	MW4	5.5	2.5	4.029	OK	0.4	13.0	10.4	2.0	0.0	4.4	0.5	0.05	0.04	0.05	1 - Very Low Risk
22/01/2020	MW5	4.5	1.5	1.825	OK	-0.3	0.0	4.3	2.0	0.0	14.6	0.5	0.00	-0.01	0	1 - Very Low Risk
22/01/2020	MW6	3.0	1.5	2.081	OK	-0.2	0.0	5.1	0.0	0.0	14.6	0.5	0.00	-0.01	0	1 - Very Low Risk
22/01/2020	MW7	3.5	1.0	1.373	OK	0.2	4.8	9.0	5.0	0.0	1.5	0.5	0.01	0.02	0.02	1 - Very Low Risk
29/01/2020	MW1	4.5	1.5	2.401	OK	0.1	0.0	13.0	0.0	0.0	8.5	0.3	0.00	0.01	0.01	1 - Very Low Risk
29/01/2020	MW2	4.0	1.0	1.655	OK	0.1	0.1	3.4	0.0	0.0	17.2	0.3	0.00	0.00	0	1 - Very Low Risk
29/01/2020	MW3	4.5	1.5	2.263	OK	0.3	0.3	25.2	1.0	0.0	0.3	0.3	0.00	0.08	0.08	2 - Low Risk
29/01/2020	MW4	5.5	2.5	4.132	OK	0.2	38.6	6.5	3.0	0.0	0.1	0.3	0.08	0.01	0.08	2 - Low Risk
29/01/2020	MW5	4.5	1.5	1.802	OK	-0.2	0.0	18.3	2.0	0.0	1.5	0.3	0.00	-0.04	0	1 - Very Low Risk
29/01/2020	MW6	3.0	1.5	2.142	OK	0.0	0.0	6.9	2.0	0.0	1.5	0.3	0.00	0.00	0	1 - Very Low Risk
29/01/2020	MW7	3.5	1.0	1.399	OK	0.1	0.0	1.9	2.0	0.0	17.2	0.3	0.00	0.00	0	1 - Very Low Risk
Sub Slab Points																
21/01/2019	VP01	-	-	-	-	0.1	0.0	4.8	2.0	0.0	4.2	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP02	-	-	-	-	0.1	0.0	4.2	7.0	0.0	9.0	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP03	-	-	-	-	0.1	0.0	2.8	1.0	0.0	13.2	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP04	-	-	-	-	0.1	0.0	5.5	2.0	1.0	6.5	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP05	-	-	-	-	0.1	0.0	0.6	3.0	0.0	12.7	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP06	-	-	-	-	0.1	0.0	5.1	2.0	0.0	8.2	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP07	-	-	-	-	0.1	0.0	1.2	27.0	0.0	7.9	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP08	-	-	-	-	0.1	0.0	0.0	5.0	0.0	20.5	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP09	-	-	-	-	0.1	0.0	0.0	3.0	0.0	20.7	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP10	-	-	-	-	0.1	0.0	0.0	4.0	0.0	20.8	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP11	-	-	-	-	0.1	0.0	6.3	3.0	0.0	10.5	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP12	-	-	-	-	0.1	0.0	14.3	4.0	0.0	1.4	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP13	-	-	-	-	0.1	0.0	10.7	7.0	0.0	0.2	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP14	-	-	-	-	0.1	0.0	0.0	5.0	0.0	16.8	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP15	-	-	-	-	0.1	0.0	2.7	1.0	0.0	17.3	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP16	-	-	-	-	0.1	0.0	0.0	1.0	0.0	18.7	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP17	-	-	-	-	0.1	0.0	0.6	0.0	0.0	9.7	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP18	-	-	-	-	0.2	0.0	0.7	8.0	0.0	18.3	0.5	0.00	0.00	0.00	1 - Very Low Risk
21/01/2019	VP19	-	-	-	-	0.5	0.0	1.5	20.0	0.0	16.5	0.5	0.00	0.01	0.01	1 - Very Low Risk
21/01/2019	VP20	-	-	-	-	0.4	36.9	0.0	2.0	1.0	0.2	0.5	0.15	0.00	0.15	2 - Low Risk
21/01/2019	VP21	-	-	-	-	0.2	32.9	0.3	2.0	0.0	0.2	0.5	0.07	0.00	0.07	2 - Low Risk

- 1. Grey Shaded = screen fully submerged
- 2. GSV calculated based on highest flow rate per location
- 3. Methane above 20% v/v
- 4. Carbon Dioxide above 5% v/v

Appendix C Field Logs

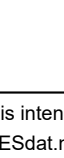
PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,878.26
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 06-Apr-20	NORTHING 6,232,194.99
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	1/2	0.2		Fill	FILL - Gravelly SAND - Dark brown, heterogeneous, dry, loose, coarse sand: angular gravel including asphalt	D	BH24A_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - brown / yellow, heterogeneous, damp, medium grained, including concrete, loose gravel	SM	BH24A_0.2-1		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.2		Fill	FILL - SAND - grey, homogeneous, wet, medium grained, loose	W	BH24A_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.2		SC	Dark grey, homogeneous, high plasticity, wet, medium grained, medium dense	W			Organic Odour, No Staining or ACM
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,865.56
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 06-Apr-20	NORTHING 6,232,203.67
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA		0.2		Fill	FILL - Roadbase - gravelly sand, dark brown, heterogeneous, dry, loose, coarse sand including asphalt	D	BH24B_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - clayey sand, brown, heterogeneous, damp, loose, coarse sand, including large gravels, iron stained gravels	SM	BH24B_0.2-1		
		0.6		Fill	FILL - SAND - grey, wet, homogeneous, medium grained, loose	W	BH24B_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.8							
		1.0							
		1.2		SC	Dark grey, homogeneous, high plasticity, wet, medium grained, medium dense	W			Organic Odour, No Staining or ACM
		1.4							
		1.6					BH24B_2-2.5		
		1.8							
		2.0							
		2.2							
		2.4							
		2.6							
		2.8							
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

COMMENTS

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PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,885.56
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 06-Apr-20	NORTHING 6,232,179.12
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA		0.2		Asphalt	FILL - Roadbase - gravelly sand, dark brown, dry, loose, coarse sand, subangular gravels	D	BH24D_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - gravelly SAND, brown, heterogeneous, coarse sand, loose, dry, subangular gravels, including charcoal, slag, shells, plastic	D	BH24D_0.2-0.8		
		0.6		Fill	FILL - SAND - grey homogenous wet, coarse sand, medium density	W	BH24D_0.8-1.8		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.8							
		1.0							
		1.2							
		1.4							
		1.6							
		1.8							
		2.0							
		2.2							
		2.4							
		2.6							
		2.8							
		3.0							
		3.2		SC	Brown / grey, homogenous, wet, coarse grained, medium density	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,872.01
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 06-Apr-20	NORTHING 6,232,215.63
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA		0.2		Asphalt	FILL - Roadbase - gravelly sand, dark brown, dry, loose, coarse sand, subangular gravels	D	BH24E_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, damp, heterogeneous, including clay chunks, gravel	SM	BH24E_0.2-1.1		
		1.2		Fill	FILL - SAND - grey, wet, homogenous, coarse sand, medium density	W	BH24E_1.1-2.1		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.2					BH24E_2.1-2.5		
		2.6		SC	Brown / grey, homogenous, wet, coarse grained, medium density	W			Organic Odour, No Staining or ACM
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,886.3
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,205.15
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	1/4	0.2		Fill	FILL - Roadbase - Gravelly SAND, dark brown, dry, heterogeneous, coarse grained, sub angular gravels, loose	D	BH24F_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, heterogeneous, damp, coarse, loose, including find gravels, shells	SM	BH24F_0.2-0.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6		Fill	FILL - SAND - brown, heterogeneous, damp, coarse, loose, including find gravels, shells	SM	BH24F_0.5-1.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.6		Fill	FILL - SAND - grey, saturated, coarse, homogenous, medium density	W	BH24F_1.5-2.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.2		SC	brown / grey, homogenous, saturated, coarse, medium density	W			No Odour or Staining
		2.4							
		2.6							
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,895.93
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,198.49
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA		0.2		Fill	FILL - Roadbase - gravelly sand, dry, heterogenous, coarse, loose	D	BH24G_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, heterogeneous, damp, coarse, loose, including gravels, slag, tiles	SM	BH24G_0.2-0.4		
		0.6							
		0.8		Fill	FILL - SAND - grey, wet, medium density, medium grained	W	BH24G_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.0							
		1.2							
		1.4							
		1.6							
		1.8							
		2.0							
		2.2							
		2.4							
		2.6							
		2.8							
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,905.24
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,191.93
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations	
SFA	▽	0.2		Fill	FILL - Roadbase - gravelly sand, dark brown, dry, coarse sand, loose, heterogeneous, including tree roots	D	BH24H_0-0.3		No Odour or Staining. 10L AQ: No ACM (0% w/w)	
		0.4		Fill	FILL - SAND - red / brown, damp, heterogeneous, coarse, loose including gravels	SM	BH24H_0.3-0.6		No Odour or Staining. 10L AQ: No ACM (0% w/w)	
		0.6		Fill	FILL - Clayey SAND - dark brown, damp, coarse, medium density, heterogenous, clay chunks (grey / red, high plasticity, firm), including gravels, charcoal	SM	BH24H_0.6-1.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)	
		0.8							No Odour or Staining. 10L AQ: No ACM (0% w/w). Refusal on Concrete	
		1.0		Fill	FILL - sandy GRAVEL - dense, trace demo waste, slag, tile, mainly rounded gravels	D	BH24H_1.2-1.3			
		1.2								
		1.4								
		1.6								
		1.8								
		2								
		2.2								
		2.4								
		2.6								
		2.8								
		3								
		3.2								
		3.4								
		3.6								
		3.8								
		4								
		4.2								
		4.4								
		4.6								

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,899.53
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,208.65
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	1/2	0.2		Fill	FILL - Roadbase - gravelly sand, dry, heterogenous, coarse, loose	D	BH24I_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - gravelly SAND - red / brown, coarse sand, loose, large, sub angular gravels, including slag	D	BH24I_0.2-1.2		
		0.6		Fill	FILL - SAND - grey, wet, coarse, medium density, trace glass	W	BH24I_1.2-2.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.8							
		1.0					BH24I_2.2-2.5		
		1.2		SC	Peat band, black, saturated, medium grained, medium density	W	BH24I_2.5-3		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.4							
		1.6							
		1.8							
		2.0							
		2.2							
		2.4							
		2.6							
		2.8							
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,885.24
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,218.6
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	11	0.2		Fill	FILL - Roadbase - gravelly sand, dark brown, dry, heterogeneous, coarse, loose, subangular gravels	D	BH24J_0-0.4		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, damp, heterogeneous, coarse, loose	SM	QAQC20200407_A		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6		Fill	FILL - Clayey SAND - brown: heterogeneous, damp, medium grained, medium density, clay clumps (red / grey, high plasticity, firm), including gravels	SM	BH24J_0.6-1.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.8							
		1.0							
		1.2							
		1.4							
		1.6		Fill	FILL - SAND - grey, homogenous, wet, coarse, medium density	W	BH24J_1.5-2.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.8							
		2.0							
		2.2							
		2.4							
		2.6		SC	Peat band, black, saturated, medium grained, medium density	W	BH24J_2.5-2.8		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,899.53
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,208.65
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

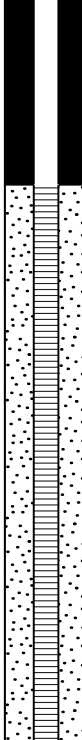
COMMENTS

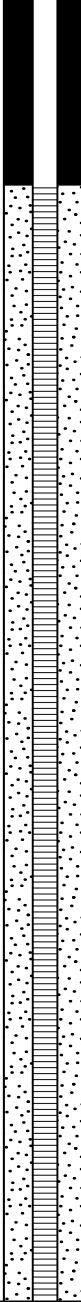
Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	1/2	0.2		Fill	FILL - Roadbase - gravelly sand, dark brown, dry, heterogeneous, coarse, loose, subangular gravels	D	BH24K_0-0.3		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, heterogeneous, damp, coarse, loose, including fine gravels	SM	QAQC20200407_B		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6		Fill	FILL - clayey SAND - dark brown, damp, heterogeneous, coarse, medium density, clay clumps (grey, high plasticity, firm)	SM	BH24K_0.5-1.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.2		Fill	FILL - SAND - grey, saturated coarse, homogeneous, medium density	W	BH24K_1.2-2.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.6		SC	Peat band, black, saturated, medium grained, medium density	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037	DRILLING COMPANY Terratest	EASTING 327,905.24
PROJECT NAME Caringbah Due Dilligence	DRILLING DATE 07-Apr-20	NORTHING 6,232,191.93
CLIENT Aliro Management Pty Ltd	DRILL RIG	COORD SYS N/A
ADDRESS 13 Endeavour Road, Caringbah, NSW	DRILLING METHOD Solid Flight Auger	COORD SOURCE
	DIAMETER 200 mm	LOGGED BY MN

COMMENTS

Drilling Method	Water (m bgl)	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA	V	0.2		Fill	FILL - Roadbase - gravelly sand, dark brown, dry, heterogeneous, coarse, loose, subangular gravels	D	BH24L_0-0.3		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - red / brown, heterogeneous, damp, coarse, loose, including fine gravels	SM	BH24L_0.3-1		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6							
		0.8							
		1.0		Fill	FILL - SAND - light brown, heterogeneous, damp, coarse, loose, including fine gravels	SM	BH24L_1-1.4		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.2							
		1.4		Fill	FILL - SAND - grey, homogeneous, wet, coarse, medium density	W	BH24L_1.4-2.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.6							
		1.8							
		2.0							
		2.2							
		2.4							
		2.6		SC	Peat band, black, saturated, medium grained, medium density	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3.0							
		3.2							
		3.4							
		3.6							
		3.8							
		4.0							
		4.2							
		4.4							
		4.6							

PROJECT NUMBER 58037			DRILLING COMPANY Terratest			EASTING 327,907.89				
PROJECT NAME Caringbah Due Dilligence			DRILLING DATE 06-Apr-20			NORTHING 6,232,175.94				
CLIENT Aliro Management Pty Ltd			DRILL RIG			ELEVATION N/A				
PERMIT NO. N/A			DRILLING METHOD Solid Flight Auger			COORD SYS N/A				
ADDRESS 13 Endeavour Road, Caringbah, NSW			TOTAL DEPTH 2 m bgl			COORD SOURCE				
			DIAMETER 150 mm			LOGGED BY MN				
COMPLETION 06/04/2020			CASING PVC			SCREEN INTERVAL 0.5 - 2 m bgl				
COMMENTS										
Drilling Method	Water (m bgl)	Well Details	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations
SFA					Asphalt	FILL - Asphalt	D			
					Fill	FILL - Roadbase - Gravelly SAND, Dark Brown, Heterogeneous, Damp, Medium Grained, Loose including gravels	D			
					Fill	FILL - SAND - yellow medium grained, homogeneous, damp, loose, wet at 2.2m bgs	W			
						Termination Depth at:2.00 m.				

PROJECT NUMBER 58037				DRILLING COMPANY Terratest				EASTING 327,894.34					
PROJECT NAME Caringbah Due Dilligence				DRILLING DATE 06-Apr-20				NORTHING 6,232,184.73					
CLIENT Aliro Management Pty Ltd				DRILL RIG				ELEVATION N/A					
PERMIT NO. N/A				DRILLING METHOD Solid Flight Auger				COORD SYS N/A					
ADDRESS 13 Endeavour Road, Caringbah, NSW				TOTAL DEPTH 3.5 m bgl				COORD SOURCE					
				DIAMETER 150 mm				LOGGED BY MN					
COMPLETION 06/04/2020				CASING PVC				SCREEN INTERVAL 0.5 - 3.5 m bgl					
COMMENTS													
Drilling Method	Water (m bgl)	Well Details	Depth (m bgl)	Graphic Log	Lithological Class	Lithological Description	Moisture	Samples	PID	Additional Observations			
SFA			0.2		Fill	FILL - SAND - topsoil sandy, S.H, dark brown, heterogeneous, damp, soft, including gravels and rootlets	D						
			0.4		Fill	FILL - SAND - clayey sand, dark brown / grey, heterogeneous, damp, L.P, soft including terracotta, charcoal gravels, brick fragments	D						
			0.6		SC	Disturbed estuarine sediment: Heterogeneous,damp, M.P, soft high organic content, wet at 4m bgs	W						
			0.8										
			1										
			1.2										
			1.4										
			1.6										
			1.8										
			2										
			2.2										
			2.4										
			2.6										
			2.8										
			3										
			3.2										
			3.4										
			3.6			Termination Depth at:3.50 m.							
			3.8										

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Chris Kauffman (Senior Consultant)	Matthew Bennett, Senior Principal and CEnvP-SC	Draft for Review	Draft for Review	2/08/2023
0	Chris Kauffman (Senior Consultant)	Matthew Bennett, Senior Principal and CEnvP-SC	Matthew Bennett		1/09/2023
1	Chris Kauffman (Senior Consultant)	Matthew Bennett, Senior Principal and CEnvP-SC	Matthew Bennett		27/09/2023
2	Chris Kauffman (Senior Consultant)	Matthew Bennett, Senior Principal and CEnvP-SC	Matthew Bennett	  	11/10/2024

