Aliro Trusco 1 Pty Ltd
C/- Aliro Management Pty Ltd

Detailed Site Investigation

Masterplan Area
13 Endeavour Road, Caringbah NSW

30 October 2024

64957/153895 (Rev 2)

JBS&G Australia Pty Ltd

www.jbsg.com.au

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Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AHD	Australian Height Datum
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
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environment Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GIL	Groundwater Investigation Levels
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
LCS	Laboratory Control Sample
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
RPD	Relative Percent Difference
SWL	Standing Water Level
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 1, the client) care of Aliro Management Pty Ltd (Aliro Management) to complete a Detailed Site Investigation (DSI) 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 and area of 12.5 hectares (ha). The site location and site layout are shown in **Figures 1** and **2,** respectively.

It is understood that the client is proposing to redevelop the site for mixed land uses (commercial spaces, warehouses etc. inclusive of a childcare centre). Redevelopment activities are proposed for Stage of 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 seven new warehouse buildings and augmentation to existing peripheral driveways/carpark, hardstand pavements and landscaped areas. The land use is generally consistent with a commercial/industrial land use scenario, noting the proposed redevelopment is inclusive of more sensitive land uses (childcare centre), consistent with residential with accessible soils pursuant to the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM) (NEPC 2013[1]).

The site has been the subject of multiple phases of environmental investigation by JBS&G (2020a[2]) and others. Historical investigations reported that 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 Woolooware Bay. Natural/reworked natural material underlying fill was identified to comprise a combination of organic rich estuarine sediments (former reclaimed tidal mangroves) and alluvial/marine silty clays which were identified to be potential and actual acid sulfate soils (P/ASS).

A detailed review of site history and environmental records, including previous investigation, Areas of Environmental Concern (AECs) and Contaminants of Potential Concern (COPCs) were identified as part of the DSI outlined herein. Review of previous investigations identified data gaps (**Section 7**) including the presence of bonded asbestos containing material (ACM) at one isolated location (BH24) and the presence of Hazardous Ground Gas (HGG), specifically methane and carbon dioxide underlying the site (JBS&G 2020a). As such, further investigation and preparation of a DSI was required to demonstrate the site is suitable or could be made suitable for its proposed uses or provide recommendations to allow such conclusions to be made.

The soil investigation presented herein included the advancement of 12 additional sampling locations to delineate asbestos impacts at location BH24, including asbestos quantification and laboratory analysis of fill material in accordance with Western Australia Department of Health (WA DOH 2018[3]) and NEPC (2013) guidelines. The investigation identified a concentration of asbestos containing material (ACM) exceeding the adopted health criteria at one investigation location (BH24C), adjacent to BH24. Asbestos impacted fill within this hotspot area is considered to pose an unacceptable health risk (pursuant to NEPC 2013) and will require remediation and/or management.

Recent remediation works within the Warehouse E1 Developable Area (beyond the Masterplan Development Area) were conducted under DA21/0777 and a subsequent Validation Report was

[1] *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* National Environment Protection Council (NEPC 2013)

[2] *L02 Toyota Caringbah Due Diligence Assessment.* JBS&G Australia Pty Ltd. Document reference 58037/127800 (Revision 1). Dated 25 February 2020 (JBS&G 2020a)

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

prepared for this portion of the site (JBS&G 2023a[4]) documenting remediation works including the removal of historically abandoned underground petroleum storage systems (UPSS). A HGG screening assessment was undertaken and presented herein. The assessment included review of previous data available on HGG aspects and sub-surface conditions at the site. An initial Conceptual Site Model (CSM) was developed, with monitoring of onsite wells and sub-slab vapour pins carried out in January 2020. Installation of two ground gas monitoring wells, high frequency Gas Flux units and a program of ambient air monitoring within existing structures was also carried out. HGG conditions were continuously monitored at the two HGG monitoring well locations over a 23-day period to capture 'worst case' atmospheric conditions in accordance with EPA (2020a).

The CSM considered the primary HGG to be predominately methane and carbon dioxide. The primary source of HGG was from the buried natural marine sediments underlying the site. To a lesser extent limited inclusion of anthropogenic biodegradable waste were considered to be generating methane and carbon dioxide by bacterial decomposition in the fill layer.

The results of the continuous monitoring demonstrated that advective HGG flow in the highly compacted sub-slab fill was unlikely to pose a risk to the future development. The dominant mechanism leading to potential HGG accumulation under the future floor slab was considered to be diffusion at a negligible flow rate via the pore space in the soil and fill. This diffusive risk was considered to be low consistent with the identified source material (man-made fill or reclaimed mangrove/estuarine deposits), as outlined in EPA (2020a) and widely throughout the sources of literature reviewed (e.g. CIRIA 2007[5]) as methane and carbon dioxide gases exist trapped in small gas pockets that do not move because of surface tension forces, dissolved in pore water or adsorbed to organic material.

Without consideration of the CSM the initial HGG screening assessment, using the Gas Screening Values (GSV) approach, identified that some elevated methane and carbon dioxide concentrations recorded at five locations (MW3, MW4, LFG02, VP21 and VP21) could pose a 'low risk' in accordance with EPA (2020a). It is noted that the area where elevated methane and carbon dioxide were recorded was limited to the north-eastern portion of the site in an area where the underlying lithology is comprised of consolidated and compacted fill.

The fill layer itself has been observed to contain organic inclusions that could generate small amounts of methane and carbon dioxide. The fill overlies peat in the former swamp area that contains organic material (Golder 1998[6]), this organic material is also known to generate methane and carbon dioxide as part of the natural microbial degradation processes.

All other wells and monitoring locations recorded methane and carbon dioxide below the adopted threshold for the assessment. No elevated concentrations of HGG were identified within ambient air monitored as part of the additional investigation.

Based on the CSM and future land uses it is likely that the negligible risks associated with ingress and accumulation of HGG into the future structures is low and that it may be feasible to develop the site under a Characteristic Site (CS) score of 1 where an engineered well-sealed concrete floor slab is appropriate for mitigation of low amounts of naturally occurring HGG.

Based on the results of the investigation and subject to the limitations in **Section 14**, JBS&G conclude the site could be made suitable for the proposed land use subject to management of the identified

[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 2023a)

[5] *Assessing Risks Posed by Hazardous Ground Gases to Buildings*. CIRIR published December 2007 (CIRIA 2007)

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

contamination. A remedial action plan (RAP) is recommended to present a management strategy including any remediation and validation required to make the site suitable for the proposed land use.

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Aliro Trusco 1 Pty Ltd (Aliro 1, the client) care of Aliro Management Pty Ltd (Aliro Management) to complete a Detailed Site Investigation (DSI) 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 and area of 12.5 hectares (ha). The site location and site layout are shown in **Figures 1** and **2,** respectively.

It is understood that the client is proposing to redevelop the site for mixed land uses (commercial spaces, warehouses etc. inclusive of a childcare facility), detailed in **Section 1.4**. Redevelopment activities 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 seven new warehouse buildings and augmentation to existing peripheral driveways/carparks, hardstand pavements and landscaped areas. The land use is generally consistent with a commercial/industrial land use scenario, noting the proposed redevelopment is inclusive of more sensitive land uses (childcare facility), consistent with residential with accessible soils pursuant to the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM) (NEPC 2013[7]).

The site has been the subject of multiple phases of environmental investigation by JBS&G (2020a[8]) and others. Historical investigations reported that 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 Woolooware 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 sulfate soils (P/ASS).

Previous investigations identified several areas of environmental concern (AEC) and isolated soil and groundwater contamination generally exceeding the adopted ecological criteria at relatively few locations. Bonded asbestos containing material (ACM) was identified at one isolated location (BH24) and a limited ground gas assessment (JBS&G 2020a) identified the presence of hazardous ground gases (HGG) (specifically methane and carbon dioxide) underlying the site. As such, further investigation is required to characterise/delineate bonded ACM impacts and assess potential risks posed by HGG underlying the site and preparation of a DSI is required to demonstrate the site is suitable or can be made suitable for its proposed uses or provide recommendations to allow such conclusions to be made.

The DSI documented herein has been developed in accordance with guidelines made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards.

1.2 Objective

The objective of the DSI is to:

- Collate and review available data, including previous investigations, and supplement this with current information to identify areas of potential AECs and associated contaminants of potential concern (COPCs) as may be present at the site;

[7] *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* National Environment Protection Council (NEPC 2013)

[8] *L02 Toyota Caringbah Due Diligence Assessment.* JBS&G Australia Pty Ltd. Document reference 58037/127800 (Revision 1). Dated 25 February 2020 (JBS&G 2020a)

- Review and document regional geological, hydrogeological, topographical and services infrastructure information to identify site media and potential contaminant transportation pathways at the site;
- Develop and document a conceptual site model (CSM) of potential contamination sources, pathways and receptors to guide the investigations;
- Carry out HGG screening assessment based on the CSM, installed monitoring infrastructure and HGG monitoring;
- Assess the site suitability for mixed land uses inclusive of commercial/industrial and more sensitive land use (childcare facility), consistent with a residential with accessible soils land use scenario, pursuant to NEPC (2013);
- Report on additional environmental assessment works undertaken to address data gaps in accordance with relevant regulatory requirements and guidelines made or approved by the EPA; and
- Address the requirements of Chapter 4 Remediation of Land of *State Environmental Planning Policy (Resilience and Hazards) 2021* to demonstrate the suitability of the site for development or provide recommendations that will enable the site to be considered suitable prior to commencement of future use(s).

1.3 Scope of Work

The scope of work to prepare this DSI comprised:

- Review of previous environmental assessments conducted at the site including:
  - *Toyota Caringbah, Phase 1 & 2 Environmental Site Assessment 2019 – 13 Endeavour Road, Caringbah, NSW*, AECOM Australia Pty Ltd dated 28 October 2019 (AECOM 2019[9]);
  - *Review of Land Contamination Information, Toyota Caringbah*, JBS& Australia Pty Ltd dated 16 September 2019 (JBS&G 2019[10]); and
  - *Toyota Caringbah Due Diligence Assessment*, JBS&G Australia Pty Ltd dated 25 February 2020 (JBS&G 2020a).
- An updated review of available site history and background information to identify potential areas of environmental concern and associated contaminants of concern including:
  - Records of publicly available information held by NSW EPA, where readily available;
  - Records of publicly available information regarding heritage, where readily available; and
  - Update licensed groundwater bores data present within a 1 km radius of the assessment area available on the online NSW Office of Water.
- Review of the environmental setting including topography, geology and hydrogeology of the site and surrounding areas;
- Review of historic aerial photographs;
- Development and documentation of a CSM based on available information;

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

[10] *L02 (Review of Land Contamination Information, Toyota Caringbah) Rev 0*. JBS&G Australia Pty Ltd document reference 58037-126401, dated 16 December 2019 (JBS&G 2019)

- Development of the sampling, analytical and quality plan (SAQP) and associated data quality objectives (DQOs) in accordance with relevant EPA guidelines;
- A detailed inspection of the site and immediate surrounds;
- Advancement of 12 targeted soil bores within vicinity of historic sample location BH24:
    - Field asbestos quantification and delineation of identified bonded ACM impacted fill material; and
    - Collection and analysis of selected soil samples and sampling analysis at National Association of Testing Authority (NATA) accredited laboratories;
- Installation of two new ground gas monitoring wells (LFG01 and LFG02) and installation of high frequency Gas Flux continuous monitors for a period of 23 days;
- Assessment of ambient indoor air at select locations;
- Comparison of collected and relevant historic data against EPA published and/or relevant endorsed criteria to facilitate an assessment of land use suitability; and
- Collation of a representative site data set and preparation of this DSI, in general accordance with the requirements of EPA and NEPC (2013) guidelines presenting the outcomes of the assessment and associated conclusions.

1.4 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 childcare 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.

2. Site Condition & Surrounding Environment

2.1 Site Identification

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 Site Condition

A detailed inspection was completed on 9 May 2020 as described below, noting conditions observed in June 2023 are provided given the elapsed time. The following key features were observed by JBS&G and are shown on **Figure 2** and relevant photographs provided in **Appendix B**:

- A large main warehouse was observed within the centre of the site and understood to be used as a motor vehicle spare parts storage and distribution centre. It is understood the warehouse was constructed between 1984 and 1989. The warehouse has since been refurbished, and during the 2023 inspection the main warehouse was occupied by Woolworths Group, Australia Post, Dutton One, Bowerbird Interiors and Carlile Swimming;
- Surrounding the large main warehouse were several buildings which were noted to house the following:
    - Link House (also referred to as Building 2, **Appendix A**) – located within the northern portion of the site and used to store and detail new vehicles and conduct maintenance on Toyota employee's vehicles. A wash bay and waste water/oil interceptor were present within this portion of the site. The building is currently occupied by Chopt Studios;
    - Toyota House – administration building located within the north-eastern site extent. During the 2023 inspection, it was noted that the former Toyota office building to the south of the warehouse had been demolished and several sheds were present in the southwest of the site associated with E1 Warehouse Developable activities; and;
    - Toyota Institute – training facility for apprentice mechanics located within the south-eastern site extent; and
    - The Hub – located to the west of Thiess House within central portion of the site and noted to contain a car wash and detailing area. A small ground separator was reported to be present within the western extent of The Hub which was bunded to capture spill and grey water associated with car washing;
- The proposed 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; and
- The balance of the proposed 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.

2.3 Surrounding Land Use

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

- North – Woolooware 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 Woolooware 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 Maps[12] indicates that the site is generally flat with an elevation of approximately 3 m Australian Height Datum (AHD) and gently falls towards the northeast/Woolooware Bay. An area (comprising the putt putt golf course (**Section 2.1**)) 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 metres above the site levels.
Hydrology	The nearest surface water receptor is Woolooware 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 Woolooware 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.

[12] http://maps.six.nsw.gov.au/ , *Six Maps*. Accessed by JBS&G on 21 July 2020

Environmental Aspect	Characteristics
Geology	A review of the 1:100 000 scale Wollongong – Port Hacking Geological Map (DMR 1985[13]) 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 2019[14]) 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 4**) confirmed the presence of fill (sand/sandstone) at an average thickness of 2 m across the site associated with former land reclamation activities (discussed in **Section 3.1**). 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 (Woolooware Bay).
Acid Sulfate Soils (ASS)	Review of the Port Hacking Acid Sulfate Soil Risk Map [15] 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 portal[16] 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 Woolooware 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 (JBS&G 2020b[17] which was subsequently updated in 2023 (**Section 4.8**, JBS&G 2023b) to manage the presence of P/ASS (if disturbed).

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

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

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

[16] *https://maps.ssc.nsw.gov.au/LEP/*. Sutherland Shire Council LEP 2015 Online Portal. Accessed on 11 August 2020

[17] *R01 – Toyota Caringbah ASSMP (Rev 0).* JBS&G Australia Pty Ltd, document reference 58037-130619 dated 22 July 2020 (JBS&G 2020b)

Environmental Aspect		Characteristics
Hydrogeology		Previous investigations reported groundwater at depths of approximately 1.0 m below ground surface (bgs) to 4.5 m bgs. A review of the Water NSW groundwater mapping portal (Water NSW 2020[18]) 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 (**Appendix F**) with groundwater ranging in depths from 0.5 m bgs to >5 m. Based on the reported geology, topography and hydrogeology, groundwater within the fill/alluvial sediments is expected to flow to the northeast towards Woolooware Bay and encountered at depths between 0.5 and 5 m AHD.

[18] Groundwater Monitoring Overview Map. https://realtimedata.waternsw.com.au/. Accessed 11 August 2020. Water NSW, 2020.

3. Summary of Site History

3.1 Aerial Photographs and Historic Land Title Records

New South Wales historical aerial photographs dated 1943, 1956, 1975, 1983, 1994, 2005, 2010 and current satellite imagery were reviewed as part of this assessment, and are provided **Appendix G**. The aerial photograph review identified the following features (**Table 3.1**) in relation to the history of the site:

Table 3.1: Summary of Historic Aerial Photographs

1943	The site appeared to be vacant and comprised two distinct estuarine environments, with a fringe of thick tidal mangrove swamp in the north eastern portion of the site. Low lying coastal flood plain/saltmarsh was present covering the majority of the south eastern portion. The surrounding area to the north comprised a continuation of thick mangrove swamp then Woolooware Bay. Land to the immediate east, west and north west of the site was vacant and contained low lying saltmarsh. Cleared rural residential properties were evident to the south of the site comprising small buildings and evidence of small-scale market gardening. A series of earthen roads traversed land from the southern properties, to the north and west.
1956	The site appeared similar to the previous aerial photograph. An earthen road had been constructed parallel to the north western site boundary. Captain Cook Drive has been constructed adjacent to (beyond) the south western boundary of the site, with further development of residential allotments to the south and west. The area to the north and east of the site remained relatively unchanged from the previous aerial photograph.
1975	The site appeared to have undergone significant clearing and potential filling (reclamation), with dense mangrove swamps having been cleared from the site. Several earthen tracks appeared to traverse the site from the south west to the north east. A drainage channel appeared to have been constructed along the north western boundary, with clearing of mangroves and extension of the channel beyond the site to Woolooware Bay. Land to the north west, east and south east appeared to have been subject to similar clearing/filling activities. Land to the south east appeared to have been cleared and turfed (for sporting activities etc.). Further development (residential allotments and associated infrastructure including roadways etc.) had been established to the south, south west and west of the site. Oyster farms were apparent in Woolooware Bay to the north of the site.
1983	The site appeared relatively similar to the previous aerial photograph, with evidence of further ground disturbance and potential filling activities in the southern and central eastern portions of the site. Similar ground disturbance (filling) was apparent on land to the east north and west, with several warehouses having been constructed further north west of the site. The remainder of the surrounding area appeared to be similar to the previous aerial photograph. Oyster farms were not apparent to the north east of the site, in Woolooware Bay.
1994	A large warehouse had been constructed within the central north western portion of the site. Peripheral hardstand driveways and associated car parks present within the

	southern portion of the site with an additional (smaller) newly constructed building in the south east. A vehicular access point had been established fronting Captain Cook Drive at the south eastern boundary of the site. The northern portion of the site appeared to have been subject to further disturbance (filling). A series of several small warehouses and Endeavour Road had been constructed to the north west of the site. Land to the east had been turfed with minor construction of small buildings/carpark areas noted further east. The area to the south and west of the site was similar to the previous aerial photograph
2005	The central east and northern portion of the site had undergone redevelopment, with two new buildings present within the northernmost portion of the site, and to the north east. The remainder of the site appeared to comprise newly constructed car park areas, driveways and landscaped areas (turfed lawns and garden beds). The surrounding area appeared similar to the previous aerial photograph.
2010	The site appeared similar to the previous aerial photograph, with minor additions to car park areas/driveways. The area surrounding the site appeared similar to the previous aerial photograph.
2020	The site appeared similar to the previous photograph with minor additions (sheds) along the northwestern boundary of the site. The surrounding area appeared similar to the previous aerial photograph. Land to the east of the site appeared to be undergoing redevelopment and contained several new large multistorey buildings undergoing construction.

In summary, and based on additional aerial photograph review presented by AECOM (2019), the site was generally vacant comprising low lying mangrove swamp (northern portion) and coastal estuarine saltmarsh (southern portion) until 1965, when reclamation activities were observed along the coastline associated with the surrounding urban development. The whole site area to the northern boundary appeared to have been filled by 1965, as had the land immediately northwest. Significant commercial/industrial developments were observed on the site and surrounding reclaimed land in 1994 aerial photographs similar the current site configuration.

It is noted no historical land title records were completed as part of the assessment herein. However, based on anecdotal evidence provided by Toyota's Manager as presented in AECOM (2019), the site was purchased by Toyota in 1982 as a storage and training facility and commenced construction of the first portion of the warehouse in approximately 1986 and extended in 1989 to the current size (consistent with historical aerial photographs). Therefore, it is considered that the site was vacant land prior to 1965, after which reclamation occurred to raise site levels, then was used for commercial/industrial land use by Toyota from 1982 onwards.

3.2 EPA Searches

Search of the NSW EPA database was undertaken on 11 August 2020 (**Appendix H**) for the site and immediate surroundings. The search consisted of the:

- NSW EPA public register of licences, applications and notices (maintained under Section 308 of the *Protection of the Environment Operations Act 1997* (POEO Act));
- NSW EPA public register of contaminated land notices (under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act));
- NSW contaminated sites notified to the EPA (under Section 60 of the *CLM Act*); and
- EPA's public per- and poly- fluoroalkyl substances (PFAS) register.

The search identified that, for the site, there were:

- No prevention, clean-up or prohibition notices and no transfer, suspension, surrender or revocation of an environment protection licence under the *POEO Act*;
- No notices issued under the *CLM Act*; and
- No records of the site published on the list of NSW contaminated sites notified to the EPA.

Some properties were identified within close proximity to the site (within a 2 km radius) and had held former licences or notices under the *POEO Act* for metal waste generation, concrete works, petroleum product storage, pharmaceutical and veterinary products productions, boat construction/maintenance, clean up notices related to asbestos waste and/or Group A Waste Generation or storage. All notices were either no longer in force or related to approval to surrender the site's former licence.

Three former notices under the *CLM Act* were issued for a property located at 101-103 Cawarra Road, Caringbah and four former notices were issued to the adjacent property located on 105 Cawarra Road, Caringbah. It is noted that these two properties have undergone remediation due to total petroleum hydrocarbons (TPH), benzene, toluene ethylbenzene and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAH) contamination identified in the groundwater which had the potential to migrate off-site. Notices to end remediation were issued to for these properties in 2006 and 2005, respectively. Given the two properties are located approximately 720 m to the northwest and cross-gradient from the subject site, and remediation was completed to a level deemed satisfactory to the EPA, it is considered there is low potential for contaminants to have migrated onto the subject site.

Six properties in Caringbah and one property in Woolooware were published on the register of contaminated sites notified to the EPA. These properties were all within a 1 km radius of the site, including the abovementioned sites (101-103 & 105 Cawarra Road, Caringbah). Five of the six sites in Caringbah were located upgradient, however, only BP Caringbah located at 54 Captain Cook Drive was still under assessment, the other sites had been assessed as not required to be regulated under *CLM Act*.

A search of the EPA's PFAS register indicated that there were no records pertaining to the site or areas immediately surrounding the site. PFAS investigations into Botany Bay are focussed on Sydney Airport and Botany Industrial Park, on the opposite side of Botany Bay from Woolooware Bay.

3.3 Heritage Searches

A search of both the Australian Heritage Trust database and the NSW Heritage Inventory did not identify any heritage listed items at the site. Several mature trees fronting Caringbah Road were noted to be listed on NSW Heritage Inventory database.

Heritage information is included in **Appendix I**.

3.4 Dangerous Goods Storage

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 within the central northern portion of the site, and was indicated to have been decommissioned/abandoned by AECOM (2019) and subsequently removed and validated by JBS&G (JBS&G 2023a).

3.5 Services Infrastructure Review

Review of service infrastructure maps provided by the online Dial Before You Dig (DBYD[19]) portal indicated services at the site are generally positioned at the periphery of the site, fronting Endeavour Road and Captain Cook Drive. Few service easements exist within the site, notably a system of stormwater culverts situated adjacent to established roadways and an Ausgrid alignment which traverses the central northern portion of the site (from east to west).

[19] https://www.1100.com.au/ Accessed 14 August 2020, Association of Australian Dial Before You Dig Services Ltd (Dial Before You Dig).

4. 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 (1999[20]) and EPA (1994[21]) for investigation results generally up to and including the end of 2012; ANZECC (2000[22]) for groundwater thresholds until 2018; and NEPC (2013) and ANZG (2018[23]) for results from 2012 and 2019, respectively.

4.1 Geotechnical and Environmental Assessment Report (Golder 1998)

Golder Associates Pty Ltd (Golder, 1998) 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 (as shown in **Figure 2**).

The scope of works included review of historical information, a site inspection, advancement of fifteen test pits (GA1 to GA15, as shown in **Figure 2**), soil sampling and analysis for heavy metals, 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
- 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 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 m 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;

[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 Waste 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)*

- 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 in **Section 2** and **Section 3**, respectively.

4.2 Soil Quality Assessment (CES 2005)

Consulting Earth Sciences (CES 2005[24]) 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 this area of the site.

The scope of works included drilling of eight boreholes (BH1 to BH8, shown in **Figure 2**) to a maximum of 2.4 m bgs, soil sampling and analysis for heavy metals, TPH, BTEX, 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 1999[25]) 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 within all samples. All samples reported concentrations within the "inert waste" classification in accordance with the EPA (1999) waste classification guidelines in force at the time, and low likelihood of ASS in the investigated area.

4.3 Targeted Soil Contamination Assessment (NA 2012)

Noel Arnold and Associates (NA 2012[26]) were engaged by Toyota to prepare a targeted soil contamination assessment to identify if significant contamination was present in soils immediately surrounding a disused UST at the western boundary of the site, which has since been removed as validated by JBS&G (2023a).

The scope of works included drilling of four boreholes (SB01 to SB04) 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 of site. AECOM (2019) noted that previous records indicated the UST was decommissioned in 2003 as confirmed by a UPSS removal certificate,

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

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

[26] *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)

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. As noted and validated by JBS&G (2023a), the UST has been removed from the site.

4.4 Hazardous Building Materials Survey (BV 2018)

Bureau Veritas HSE (BV) was engaged by Toyota to conduct a hazardous materials survey report for the site in September 2018 (BV 2018[27]).

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.

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

AECOM were engaged by Toyota to prepare a combined Stage 1 and 2 Environmental Site Assessment (ESA) of the site. The objectives of the combined ESA were to obtain and review available historical and current information of site, identify and address the 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 site, it appeared that the site was historically vacant land, potentially used by locals to access Woolooware 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 2019 to 13 September 2019. The field program comprised a detailed site inspection, advancement of twenty-four boreholes (BH1 to BH24), conversion of five boreholes into groundwater monitoring wells (MW1 to MW5) and soil and groundwater sampling. Sampling locations are shown in **Figure 2**. 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.

[27] *Hazardous Building Materials Survey – Toyota Australia Woolooware Bay.* Bureau Veritas HSE dated September 2018 (BV 2018)

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 in BH24 below 1.3 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 (2018[28]) 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.

As discussed in **Section 2**, site development activities are proposed to accommodate a childcare centre. As such, JBS&G compared the soil analytical data from AECOM (2019) against the more sensitive land use criteria – Residential A including child care centres (pursuant to NEPC 2013). TRH >C_{16} – C_{34} fractions in sample BH24_0.3 reported a concentration of 330 mg/kg, marginally exceeded the more sensitive ecological screening level (ESL) of 300 mg/kg for coarse soil. All other +contaminants were reported within the residential/child care land use criteria.

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.

4.6 Review of Land Contamination (JBS&G 2019)

JBS&G (2019) 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 available at the site) and a review of publicly available historical and environmental information. The review identified a number of data gaps were 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.

4.7 Due Diligence Assessment (JBS&G 2020a)

Based on the findings of JBS&G (2019), JBS&G (2020a) conducted a due diligence contamination assessment to address identified data gaps to evaluate the potential for contamination at the site.

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

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) and soil sampling and analysis targeting AECs and to provide broad site coverage;
- Field screening of excavated material for indicators of PASS and subsequent laboratory analysis to assess for ASS in underlying soils at the site;
- Conversion of two soil bores to groundwater monitoring wells (MW6 and MW7) and groundwater sampling and analysis of groundwater from the two new and five existing (MW1 to MW5) monitoring wells;
- Soil vapour screening from twenty-one sub-slab locations (VP01 to VP21) and sampling and analysis of soil vapour from nine of the locations; and
- Field screening for 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 was 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 (JBS&G 2020a)) in sub-grade blue metal road base, exceeding the adopted ecological criteria for the most sensitive land uses (HIL A, NEPC (2013));
- Potential and actual ASS were identified within soils at depths of between 2-3 m 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 was reported at three locations (MW3, MW4 and MW7), reported 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 is 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.
- 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 to be expected in reclaimed coastal or estuarine swamps and mangrove flats (EPA 2020[29]);

[29] *Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases*, NSW EPA, May 2020 (EPA 2020a)

- Elevated carbon dioxide and methane were reported within the north eastern portion of the site at sub slab sample locations VP20, VP21 and at ground gas monitoring well locations MW3 and MW4, 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 (2020a) 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 (2020a) 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 2018[30]) guidance.

JBS&G (2020a) 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.

4.8 Acid Sulfate Soil Management Plan (JBS&G 2023b)

JBS&G (2023b[31]) updated the original ASSMP (prepared for the entire site, JBS&G 2020b) to document procedures to be implemented to manage the potential environmental risk associated with disturbance of ASS materials identified by JBS&G (2020a) and to provide a framework for ongoing management of ASS/PASS as part of the Masterplan Area development works. 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;
- 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.

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

[31] *Masterplan Area Acid Sulfate Soil Management Plan, 13 Endeavour Road, Caringbah NSW*. Prepared by JBS&G Australia Pty Ltd doc ref 64957/153701 dated 1 September 2023 (JBS&G 2023b)

4.9 Validation of Warehouse E1 (JBS&G 2023a)

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.

5. Conceptual Site Model

5.1 Potential Areas of Concern

Based on the site history review and observations of site conditions during the detailed site inspection, AECs and COPCs have been identified for the site and are presented in **Table 5.1**. Site features are shown on **Figure 2**. As per the methodology provided in EPA (2020a) a cross section of the site-specific ground gas CSM has been provided in **Appendix C**, based on a source-pathway pollutant linkage, with further discussion presented below and in **Section 6**.

Table 5.1 AECs and Associated COPC

AECs	COPC
AEC 1: Fill material from unknown sources	Heavy metals, PAHs, TRH, BTEX, OCPs, PCBs, PFAS and asbestos.
AEC 2: Petroleum/lubricant/chemical/vehicle use and/or storage	Heavy metals, PAHs, PCBs, VOC/sVOC, TRH and PFAS.
AEC 3: Hazardous Building Materials	Heavy metals, PCBs and asbestos
AEC 4: Natural soils/disturbed natural materials	P/ASS and HGG

5.2 Potentially Contaminated Media

Potentially contaminated media present at the site include:

- Fill materials;
- Natural soils/bedrock;
- Soil vapour/ground gases; and
- Groundwater.

Table 5.2 below provides a breakdown of potentially contaminated media with identified AECs presented in **Table 5.1**.

Table 5.2: Potentially Contaminated Media

AEC	Potentially Contaminated Media	Comment
AEC 1	Fill material	Potential remains for contamination in fill material resultant from historical/current manufacturing land uses, importation of fill materials of unknown origin, dredged sediments and/or use of site won materials to create former/existing site levels as may be associated with land reclamation activities.
	Natural soils	Natural soils underlie fill materials and may potentially be impacted by the downward migration of contaminants through fill, particularly in open areas where infiltration is possible and/or where seepage water may pass through fill. Natural soils may also be impacted by contaminated groundwater migration.
	Groundwater	There is the potential for the leaching of contaminants vertically from fill into groundwater and/or potential off-site impacts.
AEC 2	Fill material	Potential remains for contamination in fill resultant from spills, leaks of chemical, oil, petroleum and vehicle storage associated with the commercial/industrial land use of the site and the historical use of underground petroleum storage systems (UPSS) at the site.
	Natural soils	Natural soils underlie fill materials and may potentially be impacted by the downward migration of contaminants through fill, particularly in open areas where infiltration is possible or where subsurface leakage (i.e. from USTs) could occur or seepage water passes. Natural soils may also be impacted by contaminated groundwater migration.

AEC	Potentially Contaminated Media	Comment
	Soil vapour	Given the potential volatile nature of some contaminants, there is a potential for soil vapour to be a contaminated medium.
	Groundwater	There is the potential for the leaching of contaminants vertically from fill into groundwater and/or potential off-site impacts.
AEC 3	Fill material	Potential remains for hazardous building materials to have contaminated surrounding surface soil/fill material.
AEC 4	Fill material	There is the potential for underlying P/ASS to be present in site fill material as a result of historic site augmentation and re-working of underlying P/ASS to form current site fill material.
	Natural soils	Given the location of the site (within 'disturbed terrain') adjacent to Woolooware Bay, underlying reworked/organic rich and/or alluvial sand deposits there is the potential for natural material to be P/ASS.
	Ground Gas	Review of the site environmental setting (**Section 2**), history (**Section 3**), and previous investigations (**Section 4**) identified sediments underlying the site comprised a combination of sandy/clayey fill overlying natural organic rich sandy clays (peat) and deeper sandy clays/silty sands (estuarine and marine sediments) with varied inclusions of calcareous materials (shells). As such, there is the potential for naturally occurring methane and carbon dioxide in the north-eastern portion of the site associated with natural sediments (reclaimed mangrove swamps and coastal estuarine deposits). A detailed consideration of HGG with respect to the CSM is provided in **Section 6**.

5.3 Potential for Migration

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 investigations are generally in either a solid form (e.g. heavy metals, asbestos, etc.) and liquid form (e.g. fuel, lubricants, etc.), however, dependent upon concentrations, there is the potential for TRH/VOC impacts to occur in a vapour form in soils underlying the site. Further, there is the potential for HGG to be present underlying the site, as discussed in **Section 6**.

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 considered generally to be low were impermeable pavements and moderate where exposed surface soil is present. Where exposed soils are present, infiltration is considered to be reflective of the underlying site fill material, comprising silty sands/crushed sandstone and as such, in these areas is considered there is a moderate potential of subsequent contaminant migration (where present) through the soil profile (dependant on the nature and extent of potential contamination). Fill has been noted to be highly compact across the majority of the site, which is likely to reduce the rate of infiltration and migration of potential contamination.

The underlying natural soil is anticipated to be of a lower permeability (silty clayey sand and sandy clays) which retard the movement of subsurface water. Noting the anticipated depth to groundwater (relatively shallow), there is considered to be a moderate risk of potential for migration

of contamination through surface soils and subsequently via groundwater (dependant on the nature and distribution of contamination). Notwithstanding, the risk of groundwater impact is higher where current/former petroleum/chemical storage has been identified (particularly USTs).

The vapour generation potential associated with volatile and semi-volatile potential contaminants of concern (TRH, BTEX, VOCs) are identified as a potential migration pathway, particularly in areas where subsurface infrastructure, such as stormwater, sewer, USTs underlie the site. Notwithstanding, previous investigations (JBS&G 2020a) did not identify the presence of significant vapour generation at the site, as such the migration of such contaminants is considered to be low.

5.4 Potential Exposure Pathways

Based on the contaminants of concern identified in various media as discussed above, and the HGG-specific discussion in **Section 6**, the potential exposure pathways for the site include:

- Inhalation of potential COPC including asbestos, heavy metal impacted dust and/or vapours migrating upwards from fill material of unknown origins or impacted surface soils resulting from historical leaks/spills etc.; and/or
- Potential dermal and oral contact to impacted soils as present at shallow depths and/or accessible by future service excavations across the extent of the site; and/or
- Potential inhalation exposure to ground gases migrating upward and laterally from underlying natural soils and/or groundwater underlying the site; and/or
- Potential contaminant uptake by vegetation within landscaped areas.

5.5 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 who may potentially be exposed to contaminants of concern through direct contact with impacted soils/groundwater and/or inhalation of dusts/fibres/vapours/gases 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/groundwater present within excavations and/or inhalation of dusts/fibres/vapours/gases associated with impacted soils; and/or
- Flora species established on the site; and/or
- Downgradient ecological receptors including the marine waters of Woolooware Bay.

5.6 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.

The man-made fill is not considered to act as a preferential pathway. The pre-loading required for the construction of the slab, gradual settlement and compression of the fill over the lifetime of the building is likely to have reduced the pore space and therefore permeability of the underlying material. Golder (1998) estimate that 90 % maximum dry density (MDD) would be achieved by the pre-load alone.

Sub-surface services are also present, or will be present as part of site redevelopment, throughout the site. Preferential pathways can be created by the generally higher permeability backfill used to re-instate these trenches. The aspects that pose the highest potential risks is HGG migration through

penetrations in the floor slab such as where water, sewer and electrical conduits are installed through the slab.

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.

6. Initial Conceptual Model for Hazardous Ground Gas

6.1 Scope of the CSM for HGG

The initial CSM for HGG is a simplified representation of a complex relationship between the gas source/s, pathways and receptors i.e. pollution linkages. The purpose of the HGG CSM is to provide the technical basis for further investigations. Inherently, the CSM will be an iterative tool that will evolve as the assessment, risk characterisation and response actions are developed.

Based on the site background information, an initial CSM was developed to summarise the potential pathways of HGG emissions and migration (predominately methane and carbon dioxide was considered). The CSM also assisted in identification of various temporal and operational effects that could influence the source-pathway-receptor linkages and the ground gas regime. This affects were assessed further by deployment of continuous monitoring analysers.

Using available site information (e.g. borehole logs, contour plans and existing survey data) the CSM was articulated in a cross-section and plan scale drawing, presented in **Appendix C**.

The scope of the initial CSM addressed the following concepts:

- Source of gas including the origin, dimension of plume, composition, rate of generation and properties of gas e.g. is the gas pressure in the waste mass greater than atmospheric pressure? The generation and transport of HGG through the subsurface is highly variable and will be affected by atmospheric conditions such as rainfall and barometric pressure fluctuations.
- Potential pathways in which HGG can move are affected by the presence of preferential pathways, geology and hydrogeology. Capping, containment, perched water, layers and types of fill and their compaction are also significant in affecting gas movement. Natural attenuation mechanisms and chemical reactions likely to occur in the sub-surface were also considered.
- Potential receptors, where and what they are, types of construction e.g. crawl space, concrete floor directly laid on the ground i.e. a slab on grade construction, presence of basements and confined spaces.

6.2 Potential Sources of HGG at the site

The CSM considered the primary HGG to be predominately methane and carbon dioxide. The primary source of this HGG was from the buried natural marine sediments underlying the site. To a lesser extent limited inclusion of anthropogenic biodegradable waste were considered to be generating methane and carbon dioxide by bacterial decomposition in the fill layer.

It is also possible there is methane present that is derived from other sources:

- Natural attenuation gas derived from the biodegradation of groundwater impacted by organic carbon compounds such as Volatile Fatty Acids in leachates created outside of the site;
- Partitioning of methane and carbon dioxide dissolved in migrating groundwater;
- Imported fill and man-made ground.

Each source of gas will typically contain a range of different compounds in different proportions and is referred to as the ‘gas fingerprint’. The differences in compounds present can be used to ascertain the most likely source of the gas.

Methane is generated by microbial activity on carbonaceous matter, and so the total gas quantity depends on the size of the carbon reservoir (potential or actual). The total carbon reservoir in an

area will influence the potential lifetime of gas generation, and may indicate that the potential exists for gas generation even if it is not occurring at present.

Given the site is currently surfaced by a combination of sealed hardstand and landscaped garden beds (unsealed surfaces) with generally highly compacted (Golder 1998)sandy fill materials overlying naturally occurring organic rich sediments/estuarine deposits (reclaimed mangrove swamp), HGG migration will be predominantly controlled by the potential for ground gas generation (anticipated to be negligible based on the source material comprising reclaimed mangrove/low lying estuarine sediment) and subsequent diffusion of HGG from areas of higher concentration to lower concentration through the unsaturated pore space in the fill.

Various literature sources also report that risks associated with release of methane and carbon dioxide from peat, alluvium and marine sediments are low for several reasons:

- When alluvium was initially deposited it contained organic material. Initially this would have degraded to produce gas, however only the labile (easily degradable material) would have been used up. There is a reservoir of organic material that is left in the ground that is non – labile or very slowly degradable. The turnover rate for this material will be many thousands of years (Couwenberg 2009);
- As the gas was generated it would have been emitted from the surface of the alluvium. As more layers are deposited eventually the gas becomes trapped in the soil in various forms such as:
    - Trapped in small gas pockets that do not move because of surface tension forces;
    - Dissolved in pore water; or
    - Adsorbed to organic material.

The diffusive source risk is considered to be low consistent with the identified source material (reclaimed mangrove/estuarine deposits), as outlined in EPA (2020a).

For a hazard to exist there must be enough flow of methane from the available soil gas source to cause gas concentrations greater than the lower explosive limit (LEL) inside the structure. ASTM (2016[32]) state that there are no known examples of methane incidents from diffusive transport alone. ASTM (2016) state that the potential for significant rates of soil gas transport can be recognised by relatively high differential pressure > (or 5mb) along with high concentrations.

6.3 Pathways for HGG migration at the site

Methane that migrates into the shallow soil may be oxidised to carbon dioxide and water by aerobic methanotrophic bacteria present in the soil. Therefore, this mode is potentially not as hazardous as deep HGG migration that could migrate through the sandy geology and up directly under a structure is a fault, fissure or preferential pathway.

Diffusive flow depends on a concentration gradient being present i.e. HGG moves from an area of high concentration to a low concentration. The dominant pathway for HGG migration on the site is considered to be diffusion flow alone and this migration mechanism is widely regarded as a low risk pathway when compared to HGG migration via advection (pressure difference). HGG can travel greater distances under pressure than due to diffusion alone (CIRIA C665, 2007 [33]). This opinion is supported by the absence of any detectable well flow or differential pressure by continuous measurement (refer to **Section 11.2**).

[32] *Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone,* ASTM International, West Conshohocken, ASTM E2993-16, PA, 2016 (ATSM 2016)

[33] *Assessing Risks Posed by Hazardous Ground Gases to Buildings*. CIRIR published December 2007 (CIRIA 2007)

A large portion of the site is currently covered with hardstand, and the proposed redevelopment (**Appendix A**) comprises augmentation and additional construction of new buildings (areas of hardstand pavement), which are considered to represent a physical barrier and provide a low permeability separation from the underlying soil to the future site users. Highly compacted (lower permeability) fill underlying hardstand pavements (Golder 1998) are considered to further reduce the potential for migration of ground gas from the underlying source material.

Notwithstanding, potential zones where limited volumes of HGG may accumulate at the site were considered in this assessment:

- Diffusion via preferential pathways such as manmade exactions such as services, stormwater lines, piled or deep foundations etc.;
- Diffusion via ingress points into the current and/or proposed development by cracks in the floor slab construction, joints in the floor construction, cracks/gaps within lift pits or walls, and gaps around service penetrations in contact with ground gas; and
- Site investigation boreholes and monitoring well installs installed within the footprint of the proposed development that could act as a preferential pathway.

6.3.1 Migration of HGG with Groundwater Flow in the Dissolved Phase

Methane can be transported as a dissolved product in groundwater (although solubility is very low around 25-35 mg/L) and when the pressure is reduced the methane can volatise out of solution and migrate via groundwater. Estimates of dissolved methane equate to 25 mg/L or 3 to 6 %v/v in a monitoring bore (Card, 1995[34]).

It is unlikely that a significant risk is posed from HGG dissolved in groundwater due to:

- Methane gas will not easily dissolve into groundwater or leachate at, or close to, atmospheric pressures. Carbon dioxide is more likely to dissolve into ground water than methane; and
- It is unlikely that there would be a sufficient volume of HGG dissolved to present a hazard, although this cannot be discounted.

Previous investigations identified low levels of dissolved methane in groundwater at the site, between 0.4 mg/L and 6.2 mg/L (**Table B, Appendix D**), below the adopted site criterion. The highest dissolved methane concentrations were reported in the north eastern portion of the site, closest to Woolooware Bay and in vicinity of current/former mangrove swamps. Dissolved methane in groundwater is expected to be present at low detectable levels within regional groundwater as a result of anerobic decay of naturally occurring organic rich sediments. As such, HGG in the dissolved phase at the site are considered unlikely to present a potential migration risk, noting concentrations of dissolved methane and carbon dioxide are anticipated to increase beyond the site (within the current mangrove swamp).

[34] *Protecting Development from Methane* – CIRIA Report 149, GB Card (Card 1995)

7. Identification Data Gaps

Based on review of previous investigation and understanding of the development scenario, the following data gaps have been identified:

1. Bonded ACM fragments were identified at one historic sample location (BH24), as such, additional investigation is required to further characterise fill material in accordance with DOH (2018) and determine any requirement for future management and/or remediation;
2. HGG assessment at the site has been limited to two rounds of spot monitoring which identified elevated concentrations of methane and carbon dioxide underlying the site. As such further ground gas monitoring was required to supplement the existing data and determine the nature and temporal variation in ground gases at the site, and to better draw conclusions on the requirement for potential future management and/or implications on the proposed redevelopment of the site; and
3. Elevated methane concentrations were reported within two sub-slab points within the Lynx Building (northern portion of the site, **Figure 2**). As such, given limitations in the sub-slab assessment method and interpretation, additional ambient air monitoring was considered prudent to assess for the potential gas intrusion/accumulation (in higher risk areas i.e. ground level office spaces within the northern portion of the site).

8. Sampling Analysis and Quality Plan

8.1 Data Quality Objectives

DQO's were developed for the investigation to address data gaps, as discussed below.

Previous contamination assessments did not identify the presence of gross or widespread contamination. Investigation identified the presence of Bonded ACM impacted fill materials at one location and elevated HGG underlying the site.

8.1.1 State the Problem

The site is proposed to be utilised for a commercial/industrial land use setting, pursuant to NEPC (2013). Following review of previous investigations (**Section 4**) conducted at the site, data gaps that pose potential risks from soil contamination and ground gas underlying the site were identified.

The investigation outlined herein has been undertaken to address identified data gaps at the site. As discussed in **Section 7**, additional investigation is required to be undertaken in assess the nature and extent of bonded ACM impacted fill at sample location BH24 in accordance with WA DOH (2018) and NEPC (2013). In addition, HGG have been identified underlying the site and further assessment is required to determine the nature of ground gases which may pose an unacceptable risk to future site receptors for the proposed land uses.

In addition, a site wide DSI is required to address the potential for contamination at the site with regard to the proposed mixed land uses (commercial spaces, industrial land use and a childcare facility). Information of known and potential site contamination conditions inferred from the desktop assessment, review of previous investigations (**Section 4**) and observations made during the site inspection and current investigation, resulted in the development of the CSM presented in **Section 5**, and the respective data forms the basis of the DSI as outlined herein.

8.1.2 Identify the Decision

The decisions below generally follow the EPA (2017[35]) decision making process for assessing urban redevelopment sites:

1. Are there any unacceptable risks to likely future onsite receptors from soils?
2. Are there any issues relating to local area background soil concentrations that exceed the appropriate soil criteria?
3. Are there any unacceptable risks to likely onsite receptors from groundwater underlying the site?
4. Are there any unacceptable risks to likely onsite receptors from vapours or ground gases underlying the site?
5. Are there any impacts of chemical mixtures?
6. Are there any aesthetic issues at the site?
7. Is there any evidence of, or potential for, migration of contaminants from the site?
8. Is a site management strategy required?

8.1.3 Identify Inputs to the Decision

Inputs to the decisions are:

[35] *Contaminated land Management Guidelines for the NSW Site Auditor Scheme* (3rd Edition). NSW EPA 2017 (EPA 2017)

- The results of previous assessments relevant to the site, including background historical information, site observations, laboratory results and report findings;
- New environmental data collected by sampling and analysis and site observations made during the current investigation;
- Characterisation of site fill conditions in vicinity of BH24 via sampling of soil and asbestos quantification at investigation locations and subsequent laboratory analysis of samples;
- Installation of two new ground gas monitoring wells and Gas Flux units and the continuous monitoring of ground gas conditions at the site;
- Indoor ambient air assessment (in areas of higher potential for elevated HGG) to assess for potential ground gas intrusion/accumulation;
- Comparison of collected data against applicable guidelines made or endorsed by the NSW EPA, as nominated in **Section 9**; and
- Confirmation that data generated by sample analyses were of sufficient quality to allow reliable comparison to assessment criteria as undertaken by assessment of 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) at the site relating to the in the identified AECs and associated COPC.

8.1.4 Define the Study Boundaries

The study boundary comprises the lateral extent of the site as shown on **Figure 2** and detailed in **Sections 2.1** and **2.2**. In addition, the following boundaries were also adopted:

- The vertical extent of the investigation was to a maximum depth of installed ground gas monitoring wells, being 3.5 m bgs;
- Temporal variations in ground gas conditions were assessed over a 23-day period between 9 April and 1 May 2020; and
- Due to the project objectives, seasonality was not be assessed as part of this investigation. Data was therefore representative of the timing and duration of the investigation.

8.1.5 Develop a Decision Rule

Laboratory/ground gas analytical data will be assessed against EPA endorsed criteria as identified in **Section 8**. Alternate criteria will be applied with appropriate justification where there are no EPA endorsed criteria.

The decision rules adopted to answer the decisions identified in **Section 8.1.2** are summarised in **Table 8.1** below.

Table 8.1: Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to on-site future receptors?	Analytical soil contaminant data was compared against EPA endorsed criteria. Statistical analysis of the data was completed, where necessary, in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The criteria in **Section 9** were adopted with respect to soil. Either: the reported concentrations were all below the adopted Site criteria; Or: no single analyte concentration exceeded 250 % of the adopted site criterion; and the standard deviation of the results was less than 50 % of the Site criterion; And: the 95 % UCL of the average concentration for each analyte was below the adopted site criterion.

Decision Required to be Made	Decision Rule
	If the statistical criteria stated above were satisfied, the answer to the decision was **No**. If the statistical criteria were not satisfied, the answer to the decision was **Yes**.
2. Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?	If COPC concentrations in soils exceeded published background concentrations (NEPC 2013), the answer to the decision was **Yes**. Otherwise the answer to the decision was **No**.
3. Are there any unacceptable risks to likely onsite receptors from groundwater underlying the site?	Are contaminants present in groundwater at concentrations exceeding the adopted criteria and are there any future likely on-site receptors of groundwater that may be at risk during development or future site use? If yes to both, the decision was **Yes**. Otherwise, the decision was **No**.
4 Are there any unacceptable risks to likely onsite receptors from vapours or ground gases underlying the site?	Are there contaminants potentially in soil vapour or HGG beneath the site that may migrate to surface and accumulate in confined areas during development or future use of the site, based on consideration of appropriate guidance and qualitative assessment of risks? If yes to vapours, the decision was **Yes**. Otherwise, the decision was **No**.
5. Are there any chemical mixtures?	Were there more than one group of contaminants present which increase the risk of harm? If there is, the answer to the decision was **Yes**. Otherwise, the answer to the decision was **No**.
6. Are there any aesthetic issues?	If there were any asbestos containing material (ACM) fragments on the ground surface, any unacceptable odours or soil discolouration, or excessive extraneous/foreign/waste materials, the answer to the decision was **Yes**. Otherwise, the answer to the decision was **No**.
7. Is there any evidence of, or potential for, migration of contaminants from the site?	Based on assessment results, is there any evidence of, or the potential for, migration of unacceptable contaminant concentrations to migrate from the site? If yes, the answer to the decisions was **Yes**. Otherwise, the answer to the decision was **No**.
8. Is a site management strategy required?	Is the answer 'yes' for any of Decisions 1 to 7 above? If yes, a site management strategy is required. If no, a site management strategy is not required.

8.1.6 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 made or endorsed by the EPA including NEPC (2013), EPA (2017) and those outlined in **Section 8**, appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G procedures for field sampling and sample 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 8.2**.

- **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 will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data. Corrective actions may include requesting further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Table 8.2: Summary of Quality Assurance / Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)[4]	1 / 20 samples	<50% RPD[2], asbestos in agreement
Blind duplicates (inter laboratory)[4]	1 / 20 samples	<50% RPD[2], asbestos in agreement
Laboratory duplicates[1,4]	1 / 20 samples	<50% RPD[2], asbestos in agreement
Accuracy		
Surrogate spikes[1]	All organic samples	70-130%
Laboratory control samples[1]	1 per lab batch	70-130%
Matrix spikes[1]	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	All samples	-[3]
Samples extracted and analysed within holding times.	All samples	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)
Trip spike[1]	1 per sampling event	70-130% recovery
Storage blank[1]	1 per sampling event	<LOR
Rinsate blank[1]	1 per sampling data where reusable equipment is used	<LOR
Laboratory blanks[1]	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples[3]
Standard analytical methods used for all analyses	All Samples	All samples[3]
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[3]
Limits of reporting appropriate and consistent	All Samples	All samples[3]
Completeness		
Sample description, field sampling notes and COCs completed and appropriate	All Samples	All samples[3]

Data Quality Objectives	Frequency	Data Quality Indicator
Appropriate documentation	All Samples	All samples[3]
Satisfactory frequency and result for QC samples	All QA/QC samples	-[3]
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] For soil and groundwater samples only

[2] If the RPD between duplicates is greater than the pre-determined DQI, 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.

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

8.2 Optimise the Design for Obtaining Data

The following sections incorporate sampling locations from previous investigations (**Section 4**) and the additional data gap investigations undertaken by JBS&G, as documented herein.

Various strategies for developing a statistically based sampling plan are identified in EPA (1995,[36]), including judgemental, random, systematic and stratified sampling patterns. However, for sites greater than 5 ha, EPA (1995) does not provide specific guidance on sampling density, rather it recommends a stratified sampling approach.

Historic sampling at the site was undertaken using a stratified approach combining systematic and targeted sampling to ensure adequate samples were collected across widespread areas with little potential contamination as well as areas with a greater potential for contamination. Previous investigations included sampling at 59 soil borehole locations, seven of which were converted to groundwater monitoring wells to characterise the condition of groundwater at the site. In addition, 21 soil vapour sampling locations were advanced on a systematic grid and targeting areas of environmental concern.

Previous investigations (**Section 4**) identified bonded ACM at one location (BH24), as such, in accordance with DOH (2018) and NEPC (2013), for an area of approximately 1,000 m^2, in accordance with Table 1 of WA DOH (2018), 12 locations (2 x EPA 1995) were advanced as part of the investigation outlined herein.

Previous limited ground gas assessment (spot monitoring) identified the presence of elevated HGG underlying the site. As such continuous ground gas Gas Flux monitors were installed at two new ground gas monitoring well locations to develop a better understanding of the nature and temporal variation in ground gases at the site. In addition, elevated methane concentrations in two sub-slab locations were reported within the northern portion of the site, characterised as representing a 'low risk' in accordance with EPA (2020). As such, additional ambient air monitoring within site structures in the northern portion of the site was required to assess for potential intrusion and accumulation of HGG within site structures.

The overall sampling plan is considered appropriately to have characterised site conditions to an appropriate level to meet investigation objectives. Sampling locations are shown in **Figure 4**.

[36] *Sampling Design Guidelines,* NSW EPA, September 1995 (EPA 1995). JBS&G note that EPA (1995) was in force at the time the intrusive investigations reported herein were planned and implemented but have since been revised as EPA (2022) *Sampling design part 1 – application*.

8.2.1 Soil Investigation

8.2.1.1 Soil Sampling Methodology

JBS&G soil sampling locations were advanced using a drill rig with 200mm diameter solid flight auger attachment and were generally extended to 0.5 m beyond the depth of natural materials. Soil samples were collected from the ground surface (0-0.1 m) or directly underneath hardstand pavements, to a maximum depth of 3.2 m or 0.5 m into natural materials (or prior refusal), whichever was shallower. Bulk composite samples were collected at a rate of one sample per 1 m depth or change in lithology (if shallower) for fill materials, in general accordance with WA DOH (2018). During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted.

Bulk soil samples (minimum 10L) were collected and sieved in the field (≤7mm passing) and/or spread on contrasting plastic for inspection and separated fragments retained and weighed using a calibrated scale. The asbestos concentration as ACM in soil was calculated in accordance with NEPC (2013) and WA DOH (2018), as per the following equation, w/w % =

$$\frac{\text{Weight of ACM x 0.15 (assuming 15\% asbestos content}^{37}\text{) x 100}}{\text{Weight of soil (minimum 10L sample)}}$$

Following field quantification, a separate 500mL soil sample (sub-sample) was collected from the same location as a bulk sample, labelled and sent to the laboratory for asbestos analysis (AF/FA) according to NEPC (2013) protocol. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory. Based upon field observations, soil samples were analysed in accordance with the laboratory schedule (**Table 8.3**).

Not all samples collected were analysed. All samples will remain at the primary laboratory for a period of two months for possible future analysis (subject to holding times) if required following the receipt of sample results.

8.2.1.2 Decontamination

Prior to the commencement of sampling activities, non-disposable sampling equipment (hand trowel, bucket/sieve, etc) was cleaned with a steel brush and/or pressure water/detergent spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no soil, oil, debris or other contaminants were apparent prior to the commencement of works. Sampling equipment will subsequently be decontaminated using the above process between each sampling locations. Decontamination forms are provided in **Appendix J.**

8.2.2 Duplicate and Triplicate Sample Preparation

At selected sample locations, sufficient soil was collected to provide a field split duplicate (intra-laboratory) and blind duplicate (inter-laboratory) sample using the sampling methodologies outlined above.

Each sample was appropriately labelled with primary or duplicate sample identification before being placed in the esky for transport to the laboratory.

8.2.3 Laboratory Analysis

JBS&G contracted Eurofins MGT (Eurofins) and Envirolab Services for all laboratory analyses. All laboratories are NATA registered for the required analyses. In addition, the laboratories were required to meet JBS&G's internal QA/QC requirements.

[37] Assumed asbestos content of 15% as per WA DOH (2009)

Table 8.3: Analytical Schedule

AEC	Sample Locations	Analysis (exc. QA/QC)
Bonded ACM at Historic BH24 Sample Location	12 Locations (36 samples submitted for analysis)	Asbestos

In addition to the above primary analyses, to address the DQIs, field split and blind duplicate soil samples were analysed at a rate of at least 1/20 primary samples.

8.2.4 Ground Gas Assessment

Meteorological Assessment

EPA (2020) advises that the key requirement for the establishment of a suitably robust monitoring period for the assessment of ground gases should be to capture the worst-case meteorological scenario. As such, it is stated that for Australian conditions, "a worst-case meteorological scenario can be estimated from the fifth percentile three-hour pressure decrease rate for the site, based on a two-year data set for the nearest Bureau of Meteorology (BOM) site with continuous pressure recording."

In accordance with these requirements, JBS&G procured the half-hourly mean sea level (MSL) pressure from the Sydney Airport monitoring station (66037) for the period from 15/04/2018 to 17/04/2020. Due to the size of this data set, JBS&G has not provided this in the appendices of this document, however this information can be made available upon request. Key barometric parameters of the data set are as follows:

- Minimum air pressure: 993.6 hPa;
- Maximum air pressure: 1036.4 hPa; and
- Average air pressure: 1017.40 hPa.

An assessment utilising the three-hour average pressure change for the BOM data indicated that the fifth percentile pressure change for the site was -2.167 hPa. In accordance with the EPA (2020), JBS&G have assessed that atmospheric data as collected by the Gas Flux units has included assessment of periods where a three-hour air pressure decreases greater than 2 hPa has occurred. This is consistent with an EPA (2020) worst-case meteorological scenario.

Ground Gas Monitoring Well Installation Methodology

A site walkover was carried out on 9 April 2020 to assess the condition of the site surface and review access and location to install the *in-situ* continuous gas flux monitors.

Two new monitoring wells (LFG01 and LFG02) were installed to between 2.0 and 3.5 m bgs using a solid flight auger drilling method. Monitoring wells were constructed using Class 18 uPVC (50mm) screen and casing. Each well was installed above the encountered groundwater level (saturated zone), with a 1.5-3 m interval used in the monitoring wells to ensure a discrete response zone (slotted pipe and gravel filter pack) that vertically expanded site fill material with a sealed headspace (0.5 m encased pipe section and bentonite seal) to enable measurement of gas concentrations and flow rate. The wells were finished with a snap-lock gas cap fitting and steel gatic cover.

Monitoring well locations are shown on **Figure 4.** Monitoring well construction details are provided on Soil Profile Logs in **Appendix K.**

In-situ Continuous Gas Monitoring

Two high frequency in-situ gas analysers (Ambisense Gas Flux) were installed at two newly installed ground gas wells (LFG01 and LFG02) on 9 May 2020. LFG01 was established within the central portion of the site, in general vicinity of proposed more sensitive future land uses (childcare facility).

LFG02 was installed within the north-eastern portion of the site, in an area of the former swamp and estuarine sediments, which reported the highest concentrations of bulk gases, in particular methane and carbon dioxide during the previous spot monitoring events (**Section 4.7**). LFG02 was also positioned within the footprint of a new building proposed to be constructed under the redevelopment scenario (**Appendix A**).

The Gas Flux analysers were professionally installed by Biogas Systems Australia, inside a bolt mounted security housing unit directly above each flush mounted gatic cover.

The analyser was set to sample at approximately 1-hour high frequency intervals 24 hours per day for a 23-day period to capture maximum and minimum gas concentrations and provide correlations between gas drivers (i.e. pressure) to better define the gas regime onsite. The Gas Flux units recorded methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulphide, flow rate, differential and barometric pressure and a wide range of atmospheric/meteorological conditions such as temperature, humidity, barometric pressure, wind speed, wind gusts, rainfall etc.

The monitoring data was accessible and available for download periodically throughout the monitoring period. The gas flux units were removed from site on 1 May 2020 following the monitoring period.

Ambient Indoor Air Assessment

Ambient air was recorded approximately 50 mm from the slab surface, and in select locations within accessible indoor service penetrations (drains within bathrooms/kitchens etc) with maximum concentrations of gas (including methane, carbon dioxide, carbon monoxide, oxygen and hydrogen sulphide) recorded using a calibrated GA5000 landfill gas detector and calibrated CH_4 (methane) inspectra laser. Concentrations of volatile organic compounds were also screened at each location via the use of a calibrated photoionisation detector (PID) with maximum concentrations recorded at each location. Ambient air was assessed within representative office spaces, open warehouse areas, bathrooms and storage areas.

Calibration certificates are provided in **Appendix J**.

9. Assessment Criteria

The following outlines the criteria adopted as part of the current assessment and as relevant to the evaluation of the site data set (inclusive of data as presented in historic investigations outlined in **Section 4**, as discussed in **Section 12**.

9.1 Regulatory Guidelines

The investigation was undertaken with consideration to aspects of the following guidelines, as relevant:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), National Environment Protection Council (NEPC 2013);*
- *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme*, 3rd Edition. NSW EPA, 2017 (EPA 2017).
- *Contaminated Land Guidelines, Sampling Design Part 1 – application,* NSW EPA, 2022 (EPA 2022)[38];
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination,* NSW Department of Environment and Conservation March 2007 (DEC 2007);
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018);
- *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009 (updated 2018).* Western Australia Department of Health (WA DOH), (WA DOH 2018);
- *Waste Classification Guidelines Part 1: Classifying Waste*. NSW EPA, November 2014 (EPA 2014a);
- *Waste Classification Guidelines, Part 4: Acid Sulfate Soils*, NSW EPA, November 2014 (NSW EPA 2014b);
- *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Sampling and Identification Methods Manual.* Department of Agriculture and Water Resources, June 2018 (DAWR 2018a);
- *National Acid Sulfate Soils Guidance: National Acid Sulfate Soils Identification and Laboratory Methods Manual.* Department of Agriculture and Water Resources, June 2018 (DAWR 2018b);
- *PFAS National Environmental Management Plan (NEMP) (Version 2.0),* Heads of EPAs Australia and New Zealand (HEPA), January 2020 (HEPA 2020); and
- *Contaminated Land Guidelines: Assessment and Management of Hazardous Ground Gases*, NSW EPA, May 2020 (EPA 2020).

9.2 Soil Assessment Criteria

9.2.1 Human Health Assessment

Given the proposed land use comprises land uses consistent with mixed uses (commercial spaces), inclusive of more sensitive land uses (a childcare centre), compounds in soils have been compared against published guidelines made or endorsed by the NSW EPA for a land use scenario consistent

[38] *The 1995 version was in force at time of the planning and implementation of the sampling approach, and has since been revised as Contaminated Land Guidelines, Sampling Design Part 1 – application*, NSW EPA, 2022 (EPA 2022)

with residential with accessible soils as outlined below, and presented in **Table A** (**Appendix D**) (as relevant):

- Human health investigation levels for uses consistent with low density residential land use, as per NEPC (2013) – (HIL-A);
- Health Screening Levels (HSLs) for petroleum hydrocarbons considering potential for vapour intrusion, coarse grained soil for residential with accessible soils land use (HSL A) land use at 0.0-2.0 m depth (NEPC 2013);
- HSLs for petroleum hydrocarbons considering potential for vapour intrusion, fine grained soil for residential with accessible soils land use (HSL A) land use at 2.0 m + depth (NEPC 2013);
- HSLs for asbestos for low density residential land use (HSL A);
- Human health screening levels for PFAS compounds for residential with accessible soils land use (HEPA 2020);
- Management Limits for TRH, fine and coarse grained soils for residential with accessible soils land use – NEPC (2013); and
- Aesthetic considerations as per NEPC (2013).

It is noted the redevelopment scenario comprises mixed uses inclusive of commercial spaces and industrial land uses. As such, where less sensitive land uses are identified the relevant criteria (i.e. open space, commercial/industrial) pursuant to NEPC (2013) will be considered applicable.

9.2.2 Ecological Assessment

The NEPM (NEPC 2013) requires that ecological assessment be considered on all sites, even those with no significant ecological environments. Ecological Investigation Levels (EILs) and the Ecological Screening Levels (ESLs) are applicable for assessing risk to terrestrial ecosystems. ESLs in particular, are provided for several land use scenarios and soil types. Given the proposed redevelopment scenario and noting the current site configuration and surrounding land uses, ESLs for commercial/industrial land use are considered relevant for the site. Notwithstanding, as a conservative measure, the site data set has been compared to the most sensitive land uses under the proposed redevelopment (childcare centre), consistent with residential with accessible soils (NEPC 2013).

The methodology to derive EILs as presented in NEPC (2013) accommodates consideration of ambient background concentrations (ABCs) and added contaminant limits (ACLs) based on a range of physicochemical soil properties. ABCs were selected from published values in Olzworthy et al. (1995[39]) and ACLs were derived based on the NEPC (2013) EIL calculator incorporating soil physicochemical properties including pH and cation exchange capacity (CEC) (see **Table 9.1**). The derived EILs for the site are presented in **Table A** (**Appendix D**) for residential land uses.

Table 9.1 Derivation of EILs

Physicochemical Parameters (Average)	
CEC (meq/100g)	pH (pH units)
14	85

As such, the following criteria have been selected for the assessment of site contamination to ecological receptors:

- Site specific Ecological Investigation Levels (EILs) for residential land uses; and
- Ecological Screening Levels (ESLs) for fine grained soils for residential land uses.

[39] *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia*. Henry Olzworth Et. Al, 1995, Ozlworthy Et Al 1995

9.3 Application of Soil Criteria

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

9.4 Groundwater Assessment Criteria

Groundwater analytical data for this assessment has been compared against the following groundwater criteria:

- Criteria for the 95% protection in marine ecosystems presented in ANZG (2018);
- Groundwater Health Screening Levels, (HSL-A and HSL-D) (vapour intrusion for coarse 2-<4m) for specified volatile organic compounds (VOCs); and
- PFAS Tier 1 Screening Levels for the 95% protection of marine water ecosystems presented in NEMP (2018).

Groundwater beneath the site is saline in nature, consistent with being adjacent to the marine Woolooware Bay and is not suitable for beneficial use as drinking water. It is unlikely that groundwater beneath the site would be beneficially used for drinking, recreational, or industrial use and so these have not been considered in adopting assessment criteria.

9.5 Soil Vapour Assessment Criteria

The adopted soil vapour investigation levels were as follows:

- ASC NEPM (2013) HSLs for soil vapour (for TRHs, BTEXN); and
- Interim screening levels for chlorinated hydrocarbons.

Where there are no NSW EPA endorsed thresholds for individual COPC the LOR was adopted as an initial screening value for the purposes of this assessment.

9.6 Ground Gas Assessment Screening Criteria

Ground gas concentrations shall be assessed by the calculation of a Gas Screening Value (GSV). As consistent with EPA (2020) the gas screening value (GSV) is calculated as follows:

- GSV = maximum borehole flow rate (L/hr) x maximum gas concentration (%)/100.

The GSV was then assessed to determine a characteristic gas situation as per **Table 9.2** below from EPA (2020).

Table 9.2: Modified Wilson and Card GSV and Gas Risk Classification (as presented in EPA 2020)

	GSV threshold (L/hr)	CS	Risk classification	Additional factors	Typical sources
	<0.07	1	Very low risk	Typically, methane <1% v/v and/or carbon dioxide <5% v/v; otherwise consider increase to CS 2	Natural soils with low organic content Typical fill
	<0.7	2	Low risk	Borehole flow rate not to exceed 70 L/hr; otherwise consider increase to CS 3	Natural soils with high organic content Recent deep fill
	<3.5	3	Moderate risk		Old inert waste landfill Flooded mine workings
	<15	4	Moderate to high risk	Consider need for Level 3 risk assessment	Mine workings susceptible to flooding Closed putrescible waste landfill
	<70	5	High risk	Level 3 risk assessment required	Shallow, unflooded abandoned mine workings
	>70	6	Very high risk		Recently used putrescible waste landfill

The following thresholds outlined in **Table 9.3** were adopted for indoor ambient air monitoring and for assessment of site conditions as part of the ground gas assessment outlined herein. JBS&G note the adopted thresholds are presented for screening purposes.

Table 9.3 - Monitoring Parameters and Adopted Thresholds

Ground gas parameter	Unit of measurement	Adopted Thresholds			
		Buildings	Sub-surface monitoring wells	Utility pits	Surface emission measurement
Methane (CH_4)	%v/v	>0.0 (ppm)	1.0	> 1.25	0.05 %v/v or 500 ppm[40]
Carbon dioxide (CO_2)	%v/v	0.5[41] or above established background concentrations*	1.5 or above established background concentrations*	1.5 or above established background concentrations*	N/A
Oxygen (O_2)	%v/v	19.5% v/v[42]	For reference	For reference	N/A
Carbon monoxide[1] (CO)	ppm	10	10	10	N/A
Hydrogen sulphide[2] (H_2S)	ppm	3	3	3	N/A
VOCs	ppm	10 ppm (above background)	Above background outside air	Above background outside air	N/A
Borehole differential pressure	Millibar (mb)	N/A	±4.0	N/A	N/A

[40] *Environmental Guidelines – Solid Waste Landfills*. NSW EPA 2016. EPA (2016).

[41] *Adopted National Exposure Standard for Atmospheric Contaminants in the Occupation Environment* – Australian Government *[NOHSC:1003(1995)].* NOHSC (1995).

[42] *Safe Working in a Confined Space*. Australia/New Zealand Standard AS/NZS 2865:2001. AS2865 (1995).

Ground gas parameter	Unit of measurement	Adopted Thresholds			
Barometric pressure	mb/hPa	N/A	±4.0	N/A	N/A
Well flow	l/h	N/A	±0.3[3]	N/A	N/A

[*]Carbon dioxide has been recorded over 25.2 %v/v on Site. As no true background wells have been installed, it is not simple to characterise the background concentration of carbon dioxide. This is partly due to the random and ubiquitous presence of organic materials deposited in the soil that could give rise to elevated carbon dioxide concentration (in an aerobic environment in shallow wells/soil), or methane in deeper reducing environments with nitrate or sulphate as the electron acceptor. In Australia, concentrations of over 20 %v/v are not uncommon due to natural soil processes such as microbial or root respiration.

[1] Reference to workplace exposure limit for carbon monoxide of 8 hr at 30 ppm (*National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [National Occupational Health and Safety Commission: 1003(1995)) and lower accuracy range of 0 to 500 ppm cell ±2.0% of full scale

[2]Reference to workplace exposure limit of hydrogen sulphide of 8 hr at 10 ppm (*National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [National Occupational Health and Safety Commission: 1003(1995)) and lower accuracy range of 0 to 200 ppm cell ±1.5% of full scale

[3]Lower accuracy range of GA5000 instrument to be used for calculating gas screening value (GSV)

NSW EPA (2016) thresholds for methane (for surface emissions and ground gas wells) were adopted as a provisional screening tool noting the criteria is based on migration of gas from a licensed landfill, noting the site and adjacent properties are not identified as landfill sites (subject to land reclamation activities).

10. Quality Assurance/Quality Control Assessment

Detailed discussion of the QAQC assessment of the data set is included in **Appendix L**.

The field sampling and handling procedures across the site produced QA/QC results which indicate that soil and groundwater data collected is of an acceptable quality for the DGI objectives.

The NATA certified laboratory reports indicate that the project laboratories were achieving levels of performance within their recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil data are of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

11. Results

Sampling results collected as part of the investigation to address data gaps outlined in **Section 6**, including the presence of bonded ACM in vicinity of historic sample location BH24 and elevated ground gases recorded at some locations, are summarised in the following sections.

11.1 Soil Results

11.1.1 Soil Observations

Sample locations are shown on **Figure 4**, field logs are provided in **Appendix K**.

Hardstand in the form of an asphalt/concrete pavement overlay all borehole locations (BH24A to BH24L). Fill materials were encountered at all borehole locations advanced and were observed to generally comprise the following material types:

- Fill: dark brown gravelly sand, comprising well sorted igneous road base with asphalt gravels, directly underlying hardstand pavement (road base) to a maximum depth of 0.4 m bgs (BH24J);
- Fill: red/brown sand, comprising a loose heterogeneous coarse-grained sand with varied inclusions of small gravel, clay clasts slag, plastic, charcoal, shells and trace glass to a maximum depth of 1.5 m bgs (BH24J); and
- Fill: grey clayey sand, generally reported at all locations typically comprising a homogenous coarse-grained well sorted sand with sparse gravel (concrete/sandstone and trace glass) inclusions at few locations to a maximum depth of 2.5 m bgs.

Underlying natural materials were noted to comprise a combination of grey/brown homogenous silty sands and black organic rich sandy clays to the maximum depth of the investigation (3.2 m bgs BH24A). Moderate organic odours were noted in underlying natural materials at five sample locations (BH24A to BH24C, BH24E and BH24G).

Bonded ACM fragments were identified at one location (BH24C) at a depth of 0.2-1.0 m bgs as discussed in **Section 11.1.2** below. No staining was observed at any location.

11.1.2 Asbestos Quantification Results

The soil sampling locations are shown on **Figure 4**. Detailed laboratory reports and chain of custody documentation are provided in **Appendix M**. Summarised soil laboratory results are presented in **Table A, Appendix D**.

Field quantification was conducted on all fill material in accordance with the methodology presented in **Section 7.2.1.** Bonded ACM fragments were identified at one sample location (BH24C) in a 10L field quantification sample, with a reported concentration of 0.057 % w/w, in exceedance of the adopted site criteria 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)).

A total of 36 representative samples were submitted for laboratory analysis following field quantification. No detectable or trace asbestos was reported in any sample submitted for analysis.

11.2 Ground Gas Results

11.2.1 Field Observations

Two LFG monitoring wells were installed (LFG01 and LFG02) as part of the investigation outlined herein. The soil profile was logged during construction of each well (**Section 7.2.4**). LFG01 was installed adjacent to the proposed future childcare facility (based on client supplied architectural design plans) within the central southern portion of the site. Ground gas well LFG02 was installed in the northern portion of the site, in vicinity of proposed future redevelopment (**Appendix A**) and

within a portion of the site which previously reported the highest concentrations of HGG (methane and carbon dioxide). Ground gas well locations are presented on **Figure 4**.

Fill material was identified at both locations and generally comprised sandstone/loose sands with inclusions of terracotta, charcoal and brick fragments noted at location LFG02 to a depth of 2.7 m bgs. Silty clay (estuarine sediments) were identified at the base of LFG02 between 2.7 m bgs and 3.5 m bgs.

Initial groundwater was observed at depth of between 2.2 (LFG01) and 4 m bgs (LFG02), noting each location was backfilled to ensure the installed the well was positioned within the soil profile above the groundwater table.

Soil Profile Logs are provided in **Appendix K**.

11.2.2 Ground Gas - Continuous Gas Monitoring Data

In-situ Gas Flux units were installed at LFG01 and LFG02 following installation on 9 April 2020. Continuous gas monitoring was conducted at each location over a 23-day period between 9 April and 1 May 2020. Continuous gas monitoring data is summarised in **Table D1**, **Appendix D**.

11.2.2.1 Atmospheric and Well Barometric Pressure

The reported barometric pressure during the monitoring period ranged from 1025 to 999 hectopascals (hPa) which is typical of the barometric pressure variations in the region. Several significant pressure drops were reported, with the most substantial occurring on 11 April 2020 between 8:24am and 13:31pm (5.7 hr duration), with atmospheric pressures dropping from 1010.9 hPa to 999 hPa (11.9 hPa difference) with an average of an approximate 2.08 hpa average pressure drop per hour.

Given climatic conditions and slow-moving weather patterns within Australia, with predominantly high-pressure systems, it is difficult to achieve regular 'significant' pressure drops below 1000 hPa. Given the recorded pressure drop rate (11.9 hPa within 5.7 hours), this is sharp fall in pressure and considered representative of 'worst case' barometric pressure for this assessment. It is noted, barometric pressures were recorded below 1000 hPa, however the magnitude of pressure drop, rather than the absolute value is considered an important risk driver for advective gas migration as stated in NSW EPA (2020) guidelines.

Continuous ground gas monitoring indicated differential pressure (atmospheric pressure and monitoring well pressure (within the headspace)) were low (generally less than 2 millibar (mb)) indicating low gas generation potential (**Table 11.1**).

11.2.2.2 Ground Gas Conditions

Detailed continuous gas monitoring data is summarised in **Table D1**, **Appendix D,** and gas summarised in **Table 11.1** below. Previous ground gas data is presented in **Table D2**, **Appendix D**.

Table 11.1: Summary of Continuous Gas Monitoring Data

	Methane (%v/v)	Carbon Dioxide (%v/v)	Oxygen (%v/v	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Steady State Flow Rate L/hr	Differential pressure (mb)	GSV Methane	GSV CO2	Max GSV	Characteristic Gas Situation
LFG01											
Maximum	0.29	2.37	17.11	0	0.35	0.48	1.93	0	0.01	0.01	1 - Very Low Risk
Minimum	0.01	1.58	15.01	0	0	0.3	-5.59	0	0	0.0	1 - Very Low Risk
LFG02											
Maximum	30.16	14.07	20.51	12.03	0.17	0.61	1.92	0.18	0.07	0.18	2 - Low Risk

	Methane (%v/v)	Carbon Dioxide (%v/v)	Oxygen (%v/v	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	Steady State Flow Rate L/hr	Differential pressure (mb)	GSV Methane	GSV CO2	Max GSV	Characteristic Gas Situation
Minimum	0.03	0.14	0	0	0	0.3	-6.56	-0.03	-0.01	0.0	1 - Very Low Risk

Flow Rate

Flow rates were reported to generally low throughout the continuous ground gas monitoring period. As a conservative measure, where zero flow was recorded, the lower accuracy range of 0.3 L/hr was adopted. Maximum steady state flow rates were reported during significant barometric pressure drops (**Section 11.2.1**) between 0.48 L/hr (LFG01) and 0.61 L/hr (LFG02), generally consistent with previous spot monitoring which reported low flow rates, with a maximum reported flow of 0.5 L/hr (**Table D2, Appendix D**). Peak flow rates which were noted to be instantaneous/reported over short bursts are considered not to be reliable and negative flow rates are considered unrepresentative (BS8576 2013[43]).

Methane and Carbon Dioxide

Maximum carbon dioxide and methane concentrations (**Table 11.1**) were notably constrained to the north eastern portion of the site (in vicinity of former mangrove swamp). Location LFG02 (north-eastern portion of the site) reported peak methane concentrations during significant barometric pressure drops (**Section 11.2.2**). Graphical correlations of the data set are provided in **Appendix N**.

Similar methane concentrations were reported during previous spot monitoring at relatively three locations (MW4, VP20 and VP21) between 32.9% v/v (VP20) and 38.6 (MW3). Maximum carbon dioxide concentrations were reported at MW3 (25.2%), refer to **Table D2** (**Appendix D**).

Concentrations of methane and carbon dioxide were below the adopted threshold for action within the across the remainder of the south eastern portion of the site (LFG01) as summarised in **Table 11.1** above and **Table D2** (**Appendix D**).

Methane, carbon dioxide and peak flow rates were generally inverse to barometric pressure (**Appendix N**) indicating that falling atmospheric pressure leads to expansion of methane and carbon dioxide in the unsaturated soil pore space and well headspace above the water level.

Other Ground Gases

Carbon monoxide and hydrogen sulphide were reported to be low during all monitoring events with concentrations consistent with the underlying lithologies (natural organic rich sediments). Oxygen levels were generally reported to decrease with an increase in HGG concentrations.

Groundwater Level Monitoring

Given the position of the site, adjacent to Woolooware Bay, groundwater levels are anticipated to be influenced by tidal fluctuations which may in turn influence gas flow. As part of the investigation outlined herein, a single groundwater level logger was placed in groundwater well MW7 from the 22 April to 1 May 2020. Comparison of groundwater levels and barometric pressure during this period is provided in **Appendix N**. Groundwater levels within MW7 demonstrated an inverse relationship to barometric pressure, with an increase in air pressure causing water in the well to fall. The data did not demonstrate significant correlation between groundwater levels and peak flow rates. Whilst tidal fluctuations are anticipated to exist within groundwater underlying the site the data suggest they are unlikely to significantly influence ground gas flow rates at the site.

[43] *Guidance for Investigations on Ground Gas*, *Permanent Gases and Volatile Organic Compounds.* Document 8576, British Standards (BS) Institution Group dated 30 April 2013 (BS8576 2018)

11.2.3 Gas Screening Value

The following section is based on data obtained as part of continuous gas monitoring, as described herein and presented in **Table D1** (**Appendix D**) and historic spot monitoring conducted during previous investigations (JBS&G 2020a) presented in **Table D2** (**Appendix D**).

EPA (2020) recommends that a GSV is calculated using the Wilson and Card method to assign a site a ground gas 'risk classification' from very low risk to very high risk, and a Characteristic Situation (CS value), classified as 1 to 6. The CS is normally determined directly from the GSV using Table 7 in EPA (2020) guidelines. However, flexibility based on professional judgement and direct measurement can be used to modify the CS based on a weight-of-evidence approach. In this way an initial CS would be determined from Table 7 in the usual way and that value would then be adjusted based on the evidence presented, ensuring the adjustment is fully justified. It is not expected that the CS would be adjusted up or down by more than one unit (EPA 2020).

GSV values calculated for each continuous ground gas monitoring well are provided in **Table 11.1.**

Based on the continuous ground gas data obtained during the monitoring period, and using a 'worst credible approach', the highest GSV reported during the current investigation was reported within the north eastern portion of the site, with a value of 0.18 (methane at LFG02), which categorises the site as 'low risk' and provides a CS value of 2. The reported GSV is considered to be generally consistent with the historic data set which reported a maximum GSV of 0.15 (methane GSV at VP20, within the northern portion of the site).

Based on a CSV value of between 1 and 2, NSW EPA (2020) recommends a gas protection value of between 1 (for large commercial warehouses) and 2 (for land uses comprising standard commercial buildings). As per guidance in EPA (2020), the maximum measured methane concentration reported during the current investigation exceeded 20% v/v (**Section 11.2.2**) at LFG02. Methane (above 20% v/v) was also reported at relatively few locations during previous investigations in one well (MW4, on one of two occasions) and at two sub-slab vapour points (VP20 and VP21 on one occasion) (noting the limitations of sub-slab assessment methodology and interpretation for the purposes of ground gas risk).

Peak methane concentrations are consistent with Table 1 presented in EPA (2020) for reclaimed wetlands and mangroves (anerobic microbial decay of organic material). As discussed in **Section 5**, known naturally occurring sources of ground gases exist at the site (comprising naturally occurring organic rich sediments and underlying carbonaceous estuarine/marine sediments), as such there is a low potential for significant volumes of methane generation at the site, as such a CS to 3 is not justified.

All other ground gas monitoring locations reported a CS value of 1 'very low risk'. Carbon dioxide concentrations were reported to be generally low, with a peak concentration of 25.2% (MW3). Negligible well pressure and flow, during periods of sharp barometric pressure drops supported he opinion of low risk gas source. Reported carbon dioxide concentrations are considered consistent with the anerobic decay of naturally occurring organic materials and the dissolution of carbonates by acidic groundwater (generally consistent with Table 2 of EPA (2020)), which have been identified underlying the site associated with naturally occurring estuarine/marine sediments.

It is noted continuous monitoring at LFG01 (adjacent to the proposed childcare facility) reported low concentrations of bulk gases/low flow rates (**Table 11.1**) under 'worst case' atmospheric pressure drops (**Section 11.2.2.1**) and demonstrated a CS value of 1 'very low risk'. HGG at the site is not likely to represent a risk under the proposed future redevelopment, inclusive of more sensitive land uses.

With consideration to the reported GSV values, data presented herein and the robust CSM, JBS&G consider a CS score of 1 'very low risk' to be applicable to the site.

11.2.4 Ambient Air Assessment

Ambient air assessment was conducted within ground level spaces of two buildings in the northern portion of the site, as per the methodologies presented in **Section 8.2.4.** Monitoring was conducted using a calibrated GA5000, CH_4 inspectra laser and PID (calibration certificates are provided in **Appendix J**.) Ambient air was recorded at representative locations within ground level spaces of the Lynx Building and Toyota House (**Figure 2**), including offices, storage rooms, warehouse spaces and within accessible indoor service penetrations (drains within bathrooms/kitchens etc).

Maximum concentrations of gas (including methane, carbon dioxide, carbon monoxide, oxygen and hydrogen sulphide) did not exceed the adopted criteria (**Section 9.6**). Methane was not detected using a calibrated GA5000. Maximum methane concentrations detected by the inspectra laser were 8.4 ppm (Lynx Building) and 6.2 ppm (Toyota House). Carbon dioxide was not reported above 0.6% v/v. A maximum PID reading of 0.2 was reported.

Reported concentrations were considered to be at or close to ambient conditions.

12. Site Characterisation

Multiple phases of investigation have been undertaken at the site between 1998 and 2019 (**Section 4**). Previous investigations have included extensive programs of soil, groundwater, soil vapour and ground gas investigations across accessible areas of the site with good systematic coverage generally achieved across the site, with sampling densities increased/targeted in some areas of greater potential for land contamination.

The following sections provide an evaluation of the site data set, which forms the DSI outlined herein. Sample locations are shown on **Figure 4**, exceedances of the adopted site criteria (as outlined in **Section 9**) are presented in analytical tables (**Appendix D**) and on **Figure 5**. Historic analytical results are provided in **Appendix E**.

Based on the decision-making process for assessing urban redevelopment sites detailed in EPA (2017) and discussed in **Section 8.1.2**, the decisions required to be made are discussed below.

12.1 Are there any unacceptable risks to likely future onsite receptors from soils?

Previous investigations have involved the advancement of a total of 59 sampling locations (soil bores) across accessible areas with good systematic coverage generally achieved across the site, with sampling densities increased/targeted in some areas of greater potential for land contamination.

The site was historically identified to be extensively filled with an approximately 2 m depth of gravelly sand/clay/sandstone between 1961 to 1965, as confirmed by historical aerial photographs, previous site investigations and the intrusive investigation as outlined herein. Filling was regional as reclamation of low-lying land adjacent Woolooware Bay and was not limited to the site.

Based on previous investigations it is understood that fill material was placed in a controlled manner effectively surcharging the site. Whilst the origins of the material are unknown, analysis of representative samples collected as part of the previous investigations did not identify the presence of significant contamination within site fill material.

Previous soil investigations reported elevated concentrations of copper at three locations (BH25, BH29 and MW07 (JBS&G 2020a)) in sub-grade blue metal road base, and TRH >C_{16} – C_{34} at sample location sample BH24 (AECOM 2019), which exceeded the adopted ecological criteria for the most sensitive land use scenario (residential/childcare) pursuant to NEPC (2013). Copper concentrations are considered to be associated with igneous road base gravel, which contain naturally occurring elevated heavy metal concentrations that are bound to a chemical matrix, and not considered to be readily available for plant uptake nor represent a risk to site receptors. TRH concentrations marginally exceeded the more sensitive ecological screening levels, noting more sensitive land uses are not proposed in vicinity of sample location BH24. Minor exceedances of the ecological criteria for copper and TRH are considered not to represent an unacceptable risk to future ecological receptors at the site noting the minimal landscaped areas under the proposed redevelopment, and assuming growing media would be used for landscaped/garden beds proposed to establish flora.

Asbestos was identified in one isolated location (BH24) during previous investigations (AECOM 2019). The current investigation included the advancement of 12 additional locations (BH24A to BH24L) in vicinity of BH24 to delineate asbestos impacts. The investigation included asbestos quantification of fill material at each location in general accordance with WA DOH (2018). Fragments of bonded asbestos were identified at one additional location (BH24C) at a concentration exceeding the adopted land-use criteria. ACM impacted fill was identified between 0.2 m and 1.3 m bgs and restricted to a localised hotspot in vicinity of locations BH24 and BH24C. Bonded asbestos impacted fill material at the site is considered to represent an unacceptable health risk (NEPC 2013) and will require remediation and/or management.

JBS&G note investigations did not include an assessment of PFAS in soils. Based on the site history, industrial manufacturing activities have not occurred at the site and as such, the potential for PFAS contamination to soil is considered to be low. JBS&G note there is the potential for isolated impacts to be present due to the potential for PFAS containing substances to have been utilised at the site (e.g. degreasers etc.). Notwithstanding, groundwater assessment (inclusive of PFAS analysis) did not identify the presence of significant PFAS contamination. Given the soluble nature of PFAS, it is considered unlikely that gross or widespread PFAS contamination is present within site soils.

ASS has been identified in the underlying soil and future redevelopment works will be required to be conducted in accordance with the ASSMP (JBS&G 2023b).

Asbestos in soil at isolated locations has been identified to pose a potential health risk, as such the answer to the decision is **'Yes**.

12.2 Are there any issues relating to local area background soil concentrations that exceed the appropriate soil criteria?

Soil samples collected from material indicated contaminant concentrations are generally consistent with background environmental conditions, including heavy metal concentrations for Sydney and NSW as documented in Olszowy et. al. (1995). On this basis there are considered to be no outstanding issues in relation to local area background contaminant concentrations.

The answer to the decision is **'No'.**

12.3 Are there any unacceptable risks to likely onsite receptors from groundwater underlying the site?

Groundwater assessment at the site has considered groundwater monitoring results from seven monitoring locations (MW1 to MW7).

Monitoring well locations were considered to be acceptable with wells installed at locations upgradient and downgradient of general and key site areas, including one downgradient monitoring well targeting the former UST and one downgradient of the current wash bay/interceptor. Groundwater levels were variable and encountered between 1.373 (MW7) to 4.029 m bgs (MW4). The standing water level (SWL) was reported between 0.589 m AHD (MW2) and 0.834 m AHD (MW5) as presented in AECOM (2019). JBS&G did not survey groundwater wells as part of previous investigations. However, AECOM (2019) concluded that site groundwater flows in a northwest direction and considered that it was more likely to the northeast direction which is considered to be similar to the regional hydrology discussed in **Section 2.4**.

As part of previous investigations, groundwater samples were submitted for a broad suite of COPC to address the potential for contamination (AECOM 2019 and JBS&G 2020a). All samples generally reported concentrations of COPC below the LOR or adopted site criteria. Low detections of heavy metals (arsenic concentrations exceeded the JBS&G adopted low reliability values in ANZG (2018)) were reported in groundwater samples (AECOM 2019) however, these are considered representative of the regional geology and surrounding land uses for light industrial uses. AECOM (2019) reported contaminants were generally below the LOR and/or below the adopted criteria, including low-level TRH downgradient of historical source areas (including UPSS infrastructure).

Ammonia was reported at three locations (MW3, MW4 and MW7 (JBS&G 2020a)) above the site-specific ecological criteria (ANZG 2018) for 95 % species protection for marine environments. Elevated ammonia in groundwater is likely associated with the anerobic decay of putrescible organic material within underlying organic rich sandy clays, consistent with the higher concentrations in areas closer to the bay where these sediments dominate the geology. In the absence of nitrate/nitrite JBS&G do not consider elevated ammonia to represent an unacceptable risk and be generally reflective of regional groundwater conditions.

Based on the analytical results (JBS&G 2020a), PFAS is 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.

It is therefore considered that gross groundwater impacts are not present at the site and no on-site or off-site migration had occurred. The investigations did not identify the presence of VOCs within groundwater at the site.

The answer to the decision is **'No'**.

12.4 Are there any unacceptable risks to likely onsite receptors from vapours and/or gases underlying the site?

Hazardous Ground Gas

Previous ground gas assessment comprised spot monitoring of seven wells over two rounds and an assessment of sub-slab conditions at 21 locations (JBS&G 2020a). The investigations identified HGG underlying the site associated with anerobic microbial decay of organic materials present within the sites underlying natural lithologies. Review of the site history identified site fill material overlying natural sediments. Overlying fill was identified to not contain significant inclusions of potential putrescible material, comprising mainly silty sands with some sandy silt/clays with varied anthropogenic waste (building rubble/concrete etc.). A robust CSM outlining the identified ground gas sources and potential migration pathways is presented in **Appendix C**. The main sources of HGG have been identified to be naturally occurring, inclusive of:

- Reclaimed waterlogged low lying estuarine (tidal) mangrove flats; and
- Reclaimed low lying coastal estuarine/marine deposits.

The current investigation included the installation of high frequency Gas Flux continuous monitors at two locations, one in the southern portion of the site (LFG01) in vicinity of proposed more sensitive land uses (childcare facility) and one in the northern portion of the site (LFG02), in vicinity of the highest reported concentrations of methane and carbon dioxide (JBS&G 2020a).

Review of the site data set indicates that reported concentrations and low flow rates encountered at the site are generally consistent with concentrations and low gas generation rates to be to be expected in reclaimed coastal alluvial deposits or estuarine swamps and mangrove flats (EPA 2020).

Methane was generally reported to be low across the majority of the site with concentrations between 0.1 % v/v (MW2) and 38.6 % v/v (MW4). Elevated methane concentrations (+30% v/v) were reported at relatively few locations (ground gas monitoring wells MW4, MW7, LFG02 and sub-slab locations VP20 and VP21 (**Figure 4**)) and were notably limited to the north eastern portion of the site. The reported methane concentrations are considered to be consistent with a reducing environment, associated with the anerobic decay of naturally occurring organic matter, and consistent with EPA (2020).

Methane is often present at elevated concentrations in uncontrolled and engineered fill materials in the unsaturated zone, especially where the soil is wet, and an anaerobic zone exists below the groundwater (Eklund 2011[44]). This results in gas generation from anaerobic decomposition of very small quantities of organic material that are present even in most natural soils. The probability of detecting methane increases with increasing depth and even clean (inert) fill can generate methane. Methane volumes generated under these conditions are low and do not pose a risk of surface emissions, however, can be detectable in monitoring wells (up to 40%).

[44] *Proposed Regulatory Framework for Evaluating the Methane Hazard due to Vapor Intrusion* – URS Corporation, Author: Bart Eklund (Eklund 2011)

There is little published evidence of HGG from alluvial soils or similar low risk sources causing incidents in above ground buildings by diffuse flow through the soil matrix (Eklund (2011). Ekland reported the methane flux from various sources, including the emissions from municipal solid waste (MSW) landfill sites, are orders of magnitude greater than for alluvial/fill sources. The flux from buried geological alluvium/peat will be lower than that from lakes and wetlands because the gas is trapped in a low permeability soil matrix.

Carbon dioxide concentrations were generally reported to be low, between 0 % v/v and 25.2 % v/v (MW3). Reported carbon dioxide concentrations are considered consistent with the anerobic decay of naturally occurring organic materials and the dissolution of carbonates (shell/carbonaceous materials identified underlying the site) by acidic groundwater (generally consistent with Table 2 of EPA (2020)), which have been identified underlying the site associated with naturally occurring estuarine/marine sediments. Further, reported concentrations within groundwater monitoring wells are likely influenced by the dissolution of carbon dioxide and as such may not be representative of actual ground gas conditions.

Soils and sediments such as those found site which were laid down in a shallow sea environment contain small volumes of non-labile organic carbon, shell fragments, calcareous nodules (claystone) and pyrites. When boreholes are drilled into the soils it allows oxygen to be introduced and various chemical and biological process can take place locally immediately around the well that cause high concentrations of carbon dioxide (or methane) in the wells. The rate of gas generation and the volume produced is extremely small and high concentrations in a monitoring well do not indicate a risk to buildings. Microbial respiration takes place wherever organic matter, oxygen and soil moisture are present together.

Concentrations of other ground gases, such as carbon monoxide and hydrogen sulphide were reported largely below level of the accuracy of the instrument and are considered generally reflective of the underlying ground conditions (comprising organic rich and acidic soils).

The CSM considered the source a low risk and the investigation indicated that concentrations of HGG are generally present at low levels and are not actively gassing at significant rates (low flow under ‘worst case’ atmospheric conditions).

An initial screening assessment using a GSV approach was carried out and a maximum GSV of 0.18 (methane at LFG02) was reported under ‘worst case’ barometric pressure drops using peak flow rates as part of continuous gas monitoring at the site, as discussed in **Section 11.2.3.** Similar GSVs were reported at relatively few additional locations (MW3, MW4, VP20 and VP21).

No exceedances of the ambient air criteria were reported during the indoor air assessment within two existing structures in the north eastern portion of the site (the Links House and Toyota House, **Figure 2**). Ambient air assessment included the screening of internal office spaces and service penetrations (bathroom/kitchen drains etc.). It is noted both buildings are relatively newly constructed and ground level concrete slabs were noted to be in good condition, with no evidence of cracks, fissures or open joins between slabs.

It is noted continuous monitoring at LFG01 (adjacent to the proposed childcare facility) reported low concentrations of bulk gases/low flow rates (**Table 11.1**) under ‘worst case’ atmospheric pressure drops (**Section 11.2.2.1**) and demonstrated a CS value of 1 ‘very low risk’. As such, HGG at the site is not likely to represent a risk under the proposed future redevelopment, inclusive of more sensitive land uses. JBS&G consider that minimum construction requirements will be achieved as part of redevelopment activities, including the construction of engineered concrete floor slabs which will provide a physical barrier to potential HGG. Such slabs can include minimal/sealed service

penetrations that would increase protection levels and provide additional gas protection appropriate for the proposed land uses at the site[45].

JBS&G note the investigation outlined herein was able to capture the 'worst case' barometric conditions (i.e. significant atmospheric pressure drop) and assess for other potential pressure drivers (tidal fluxes and temporal rises/falls in regional groundwater levels). As such, the data presented herein is considered to have adequately characterised hazardous ground gases at the site.

With consideration to the known source of ground gas at the site and robust CSM presented herein, the reported concentrations of methane/carbon dioxide are considered associated with the presence of naturally occurring sediments underlying the site are considered not to represent a potential risk to current/future site users. site. Further, there is likely to be minimal interaction between the naturally occurring ground gases and the existing/proposed development. As such a CS score of 1 'very low risk' is considered to be appropriate for the site.

Soil Vapour

Previous investigations (JBS&G 2020a) reported that soil vapour concentrations of volatile COPC were below the adopted site assessment criteria (**Table C**, **Appendix D**). As such, JBS&G do not consider volatile COPC in soil vapour to represent a risk at the site under the current or proposed land uses, including more sensitive land use scenarios (childcare facility).

Based on the above the answer to the decision is **'No**'.

12.5 Are there any impacts of chemical mixtures?

There were no potential chemical mixtures identified during the investigation that may pose an unacceptable contamination risk at the site with respect to future site users.

The answer to the decision is **'No'**.

12.6 Are there any aesthetic issues at the site?

JBS&G noted odorous soils are present at the site, predominately naturally occurring organic odours within reclaimed estuarine sediments and natural materials underlying site fill material at depth. These soils do not present an unacceptable aesthetic issue at the site. Materials which may be required to be removed from the site (due to excavation/piling etc.) will be subject to assessment prior to removal from the site in accordance with EPA (2014).

As such the answer to the decision is **'No'**

12.7 Is there any evidence of, or potential for, migration of contaminants from the site?

The potential for migration of contaminants from the site is low, based on the following:

- Site investigations did not identify any significant contamination in soil; and
- The exceedances of the adopted criteria found in groundwater are consistent across the site and are attributed to background concentration levels. No hotspot or localised impacted groundwater was discovered on site, therefore the level of contaminants migrating from site is not likely to be greater than the level migrating onto site;

The answer is **'No'**.

[45] JBS&G note the data assessment presented herein is based on the current proposed redevelopment scenario and proposed location of more sensitive land uses (i.e. childcare facility, **Figure 3**) and representative continuous ground gas monitoring data in this location. Should the redevelopment scenario change, the assumptions presented herein will be required to be re-assessed.

12.8 Is a site management strategy required?

As outlined in **Section 12.1**, isolated asbestos contamination has been identified in soil at two locations which will require remediation and/or management.

Based on the results of the investigation and above characterisation a management strategy is required to address potential contamination risks such that the site can be made suitable for the intended land use.

13. Conclusions and Recommendations

Based on the scope of the work completed for this investigation as documented herein, and subject to the limitations provided in **Section 14**, the following conclusions and recommendations can be 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 spaces, industrial warehouses and a childcare centre);
- Isolated copper and TRH concentrations exceeding the adopted ecological criteria in soil are 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 are considered reflective of background concentrations to be expected in urban environments and considered not to pose an unacceptable risk at the site. Ammonia is 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 is not considered to pose an unacceptable risk to current/future ecological receptors under the current/proposed land uses;
- Isolated bonded asbestos impacted fill material has been identified underlying the site at two adjacent locations (BH24 and BH24C). Bonded ACM impacted fill material is considered to represent an unacceptable health risk at the site requiring remediation and/or management;
- ASS/PASS has been identified in underlying soils at the site and will be required to be managed in accordance with the ASSMP (JBS&G 2023b;
- There are natural sources of methane and carbon dioxide present in the marine sediments and to a lesser extent the compacted fill under the site. The CSM demonstrates a low risk to the future development based on the limited gas volumes, generation and accumulation mechanisms. The literature review recorded numerous examples of characterisation of similar sites with naturally occurring methane and carbon dioxide as low risk;
- Indoor ambient air assessment did not identify the presence of HGG within existing site structures;
- Based on the gas risk assessment and detailed CSM, giving appropriate consideration to the GSV and CSM as part of the multiple lines of evidence approach, a CS1 was considered the most appropriate for the site. Under the proposed redevelopment scenario, and results of the HGG screening assessment JBS&G consider a CS score of 1 where an engineered well-sealed concrete floor slab is appropriate for mitigation of low amounts of naturally occurring HGG; and
- JBS&G recommend a Remedial Action Plan (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 spaces, industrial warehouses and a childcare centre).

14. 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 inquiries.

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

Approximate Site Boundary

JBS&G

Job No: 64957	
Client: Aliro	
Version: R03 Rev A	Date 08/08/2023
Drawn By: JA	Checked By: CK

Scale 1:40,000

0 500 1,000

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

SITE LOCATION

FIGURE 1

File Name: \\JBSG-NSW-FS01\Company Data\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\R02 Rev A\58037_01_SiteLocation.mxd
Reference: Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA: www.nearmap.com - 20191022



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

JBS&G

Job No: 64957	
Client: Aliro	
Version: R03 Rev A	Date 2/08/2023
Drawn By: IA	Checked By: RC
Scale 1:2,600	

0 25 50
metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road
Caringbah, NSW

SITE LAYOUT

FIGURE 2

File Name: 64957_CaringbahEstateRevisedMasterplanWorks_R02
Reference: Nearmap - www.nearmap.com (Capture Date: 01/06/2020)



Legend

- Approximate Site Boundary
- NSW Cadastre

JBS&G

Job No: 64957

Client: Aliro

Version: R01 Rev 2	Date 16/10/2024
Drawn By: IA/RF	Checked By: RC/AH

Scale 1:2,600

0 25 50

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road
Caringbah, NSW

PROPOSED SITE LAYOUT

FIGURE 2

File Name: 64957_CaringbahEstateRevisedMasterplanWorks_R01_Rev2
Reference: Nearmap - www.nearmap.com (Capture Date: 01/06/2020) - Master Plan - 21366_005_ESTATE MASTERPLAN (D)



Legend

Approximate Site Boundary

Historical Sample Locations

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

Sample Locations

- Borehole Location
- Ground Gas Monitoring Wells

JBS&G

Job No: 64957	
Client: Aliro	
Version: R03 Rev A	Date 08/08/2023
Drawn By: JA	Checked By: CK
Scale 1:2,500	

0 25 50
metres

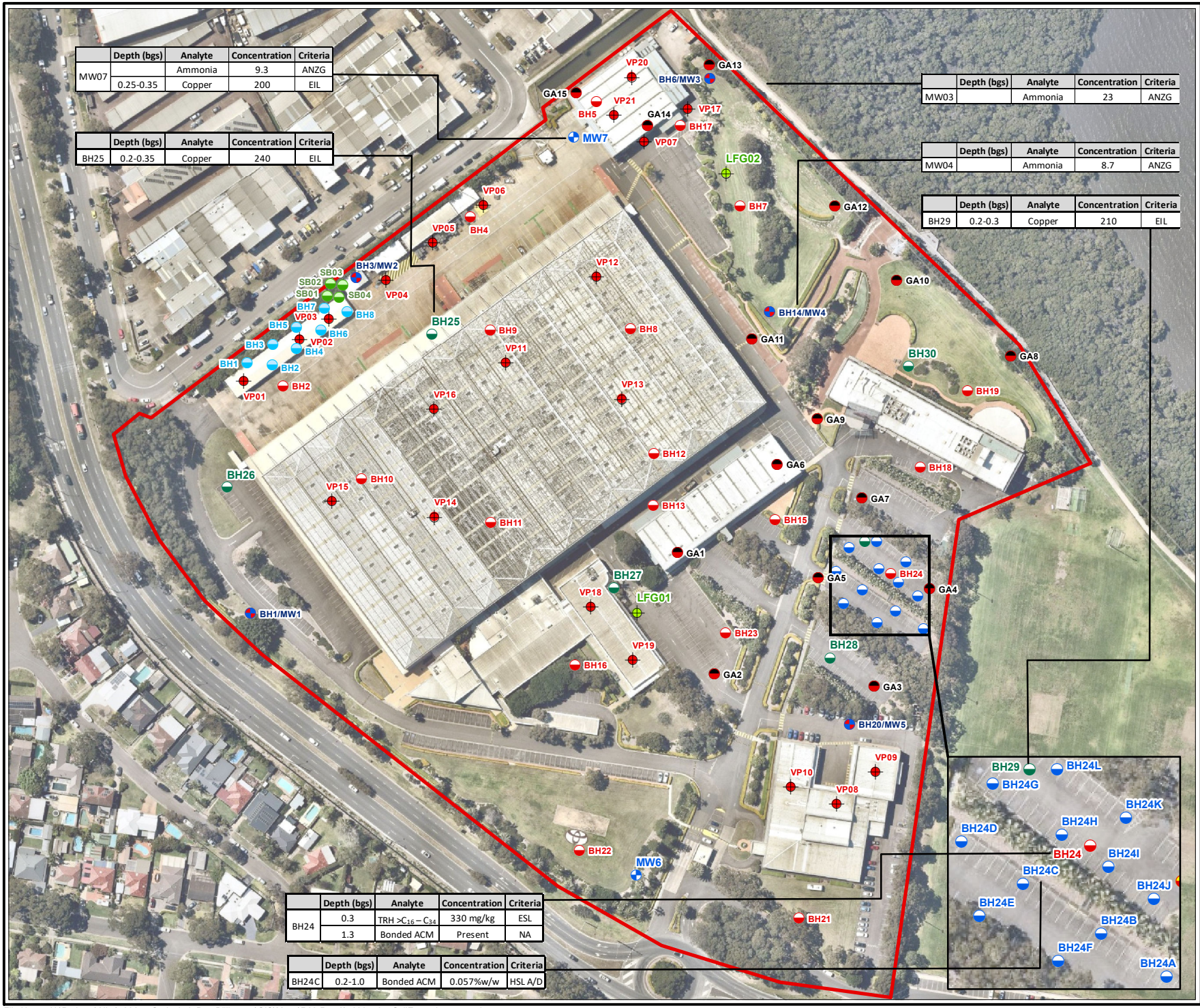
Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

SAMPLE LOCATIONS

FIGURE 4

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\R02 Rev A\58037_04_SampleLocations_v2.mxd
Reference: Nearmap - www.nearmap.com.au (Capture Date: 22/10/2019)



Legend

- Approximate Site Boundary

Historical Sample Locations

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

Sample Locations

- Borehole Location
- Ground Gas Monitoring Wells

JBS&G

Job No: 64957	
Client: Aliro	
Version: R03 Rev A	Date 08/08/2023
Drawn By: JA	Checked By: CK
Scale 1:2,500	

0 25 50
metres

Coord. Sys. GDA 1994 MGA Zone 56

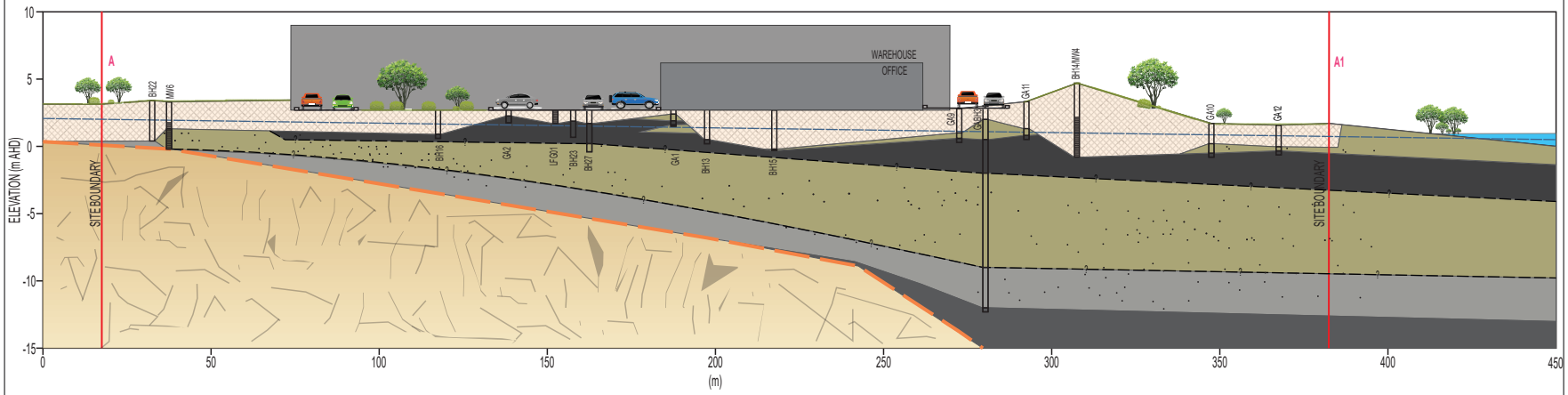
13 Endeavour Road, Caringbah NSW

SOIL AND GROUNDWATER EXCEEDANCES

FIGURE 5

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\R02 Rev A\58037_05_SoilExceedances.mxd
Reference: Nearmap - www.nearmap.com.au (Capture Date: 22/10/2019)





Legend:

- INFERRED SANDSTONE ROCK SURFACE (based on Golder (1998))
- FILL - Highly compacted fill to greater than 90% MDD
- SAND - Dune sand in the upper sequence with clay/silty sandy clays (fluvial) in lower sequence. Interbedded in places with lenses of peat
- ESTUARINE CLAY - Combination of peat, silty/sandy clay. Characterised by high organic content, shells in some places. Minor lenses of organic rich silty sands
- SILTY SAND - Estuarine to marine sandy clays/silty sands with occasional shells
- RESIDUAL CLAY - Residual Hawkesbury Sandstone
- SANDSTONE - Hawkesbury Sandstone Bedrock
- Groundwater - Inferred Maximum Tidal Range
- Inferred Level

JBS&G

Job No: 64957

Client: Aliro

Version: R03 Rev A	Date: 01/09/2020
Drawn By: JA	Checked By: CK

Horizontal Scale 0 5 10 metres

13 Endeavour Road, Caringbah, NSW

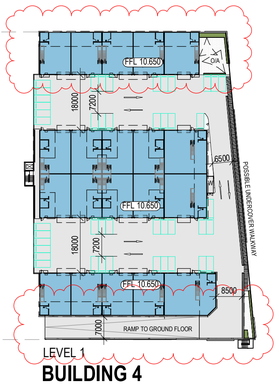
CONCEPTUAL SITE MODEL (CROSS SECTION - CENTRAL)

FIGURE: APPENDIX C

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\R02 Rev A
Reference:

Appendix A Architectural Design Plans





LEVEL 1
BUILDING 4

NOTES

ALL NEW CROSSOVERS 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 (EXCL LOADING ZONE)
BUILDING 3		
WAREHOUSE	3A	649 m²
WAREHOUSE	3B	676 m²
WAREHOUSE	3C	677 m²
WAREHOUSE	3D	677 m²
WAREHOUSE	3E	698 m²
WAREHOUSE	3F	763 m²
OFFICE	3A	126 m²
OFFICE	3B	127 m²
OFFICE	3C	127 m²
OFFICE	3D	127 m²
OFFICE	3E	127 m²
OFFICE	3F	126 m²
TOTAL AREA		4,900 m²
BUILDING 4		
WAREHOUSE	GROUND LEVEL	4,249 m²
WAREHOUSE	LEVEL 1	2,972 m²
OFFICE MEZZANINE	GROUND LEVEL	884 m²
OFFICE MEZZANINE	LEVEL 1	937 m²
TOTAL AREA		9,042 m²
BUILDING 5 BLOCK 1		
WAREHOUSE	5A	1,071 m²
WAREHOUSE	5B	3,048 m²
WAREHOUSE	5C	2,163 m²
OFFICE	5A	333 m²
OFFICE	5B	431 m²
OFFICE	5C	403 m²
TOTAL AREA		7,449 m²
BUILDING 5 BLOCK 2		
WAREHOUSE	5D	2,732 m²
WAREHOUSE	5E	2,023 m²
OFFICE	5D	424 m²
OFFICE	5E	391 m²
TOTAL AREA		5,570 m²
BUILDING 5 COMMERCIAL		
CAFE		112 m²
CHILDCARE		648 m²
CHILDCARE OUTDOOR		571 m²
COMMERCIAL		554 m²
TOTAL AREA		1,885 m²
BUILDING 6		
WAREHOUSE	6A	892 m²
WAREHOUSE	6B	1,688 m²
OFFICE	6A	154 m²
OFFICE	6B	181 m²
ESTATE MANAGER OFFICE		27 m²
TOTAL AREA		2,942 m²
BUILDING 7		
WAREHOUSE	7A	698 m²
WAREHOUSE	7B	647 m²
WAREHOUSE	7C	644 m²
WAREHOUSE	7D	696 m²
WAREHOUSE	7E	647 m²
WAREHOUSE	7F	644 m²
OFFICE	7A	117 m²
OFFICE	7B	118 m²
OFFICE	7C	117 m²
OFFICE	7D	110 m²
OFFICE	7E	118 m²
OFFICE	7F	117 m²
TOTAL AREA		4,673 m²
BUILDING 8		
WAREHOUSE	8A	744 m²
WAREHOUSE	8B	633 m²
OFFICE	8A	139 m²
OFFICE	8B	130 m²
TOTAL AREA		1,646 m²
GRAND TOTAL GFA		38,107 m²

SITE COVERAGE	
TOTAL SITE AREA	123,898 m²
BUILDING 3 - 8 FOOTPRINT	32,119 m²
BUILDING 1 & 2 FOOTPRINT APPROX.	27,878 m²
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 20

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

TRUE NORTH

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 Photographic Log

PHOTO 1: NORTHERN DRIVEWAY FACING NORTH WEST



PHOTO 2: LARGE CENTRAL WAREHOUSE AND LOADING DOCKS (NORTH WESTERN DRIVEWAY)



PHOTO 3: INTERNAL SPACES WITHIN THE WAREHOUSE

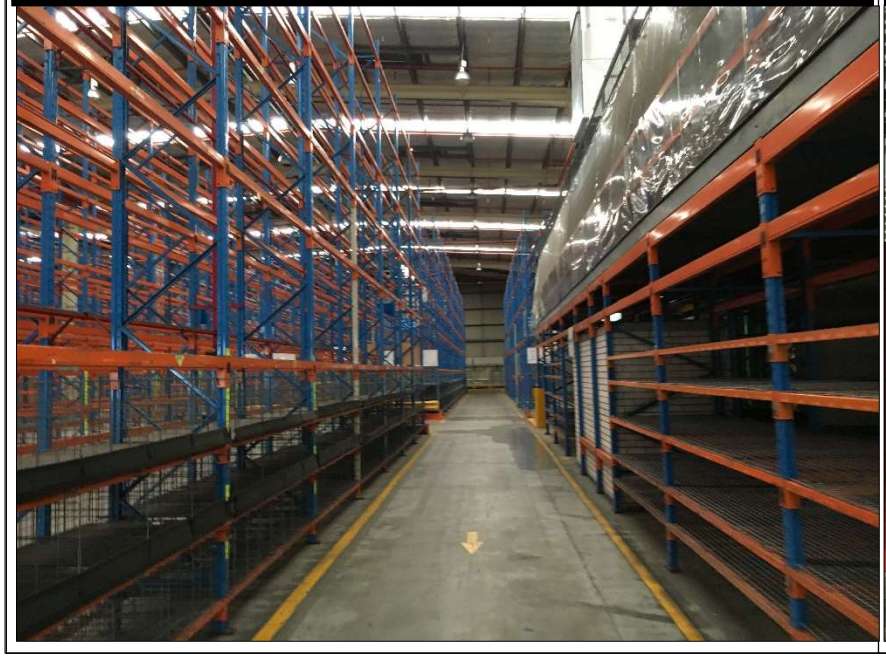


PHOTO 4: CAR WAS AND WASTE WATER INTERCEPTER ADJACENT TO THE LYNX BUILDING



JBS&G

Job No: 58037	
Client: Aliro Management	
Version: Rev A	Date: 14/08/2020
Drawn By: CK	Checked By: MB
Not to Scale	
Coord. Sys n/a	

13 Endeavour Road, Caringbah, NSW

APPENDIX B

PHOTO 5: UST FILL POINT STILL APPARENT



PHOTO 6: UST VENT PIPE DISCARDED IN ADJACENT GARDEN BED



PHOTO 7: BUILDING/SHED ADJACENT TO UST FILL POINT



PHOTO 8: TURFED GARDEN BED IN THE NORTHERN PORTION OF THE SITE (PUTT PUTT GOLF AREA)



JBS&G

Job No: 58037	
Client: Aliro Management	
Version: Rev A	Date: 14/08/2020
Drawn By: CK	Checked By: MB
Not to Scale	
Coord. Sys n/a	

13 Endeavour Road, Caringbah, NSW

APPENDIX B

PHOTO 9: DRIVEWAY AND WAREHOUSE IN THE SOUTH WEST OF THE SITE



PHOTO 10: DRIVEWAY AND GARDEN BEDS IN SOUTH EAST OF SITE



PHOTO 11: EVIDENCE OF SANDSTONE FILL IN THE NORTH OF THE SITE



PHOTO 12: ORGANIC RICH ESTUARINE PEATY CLAYS IDENTIFIED UNDERLYING THE SITE



JBS&G

Job No: 58037

Client: Aliro Management

Version: Rev A	Date: 14/08/2020
Drawn By: CK	Checked By: MB

Not to Scale

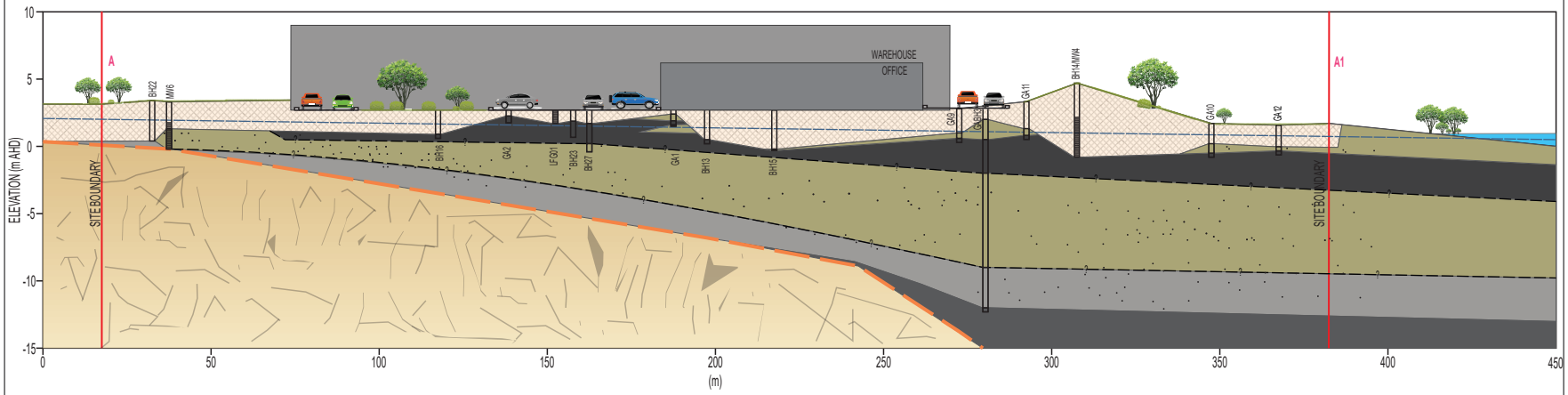
Coord. Sys n/a

13 Endeavour Road, Caringbah, NSW

APPENDIX B

Appendix C Ground Gas Conceptual Site Model





Legend:

- INFERRED SANDSTONE ROCK SURFACE (based on Golder (1998))
- FILL - Highly compacted fill to greater than 90% MDD
- SAND - Dune sand in the upper sequence with clay/silty sandy clays (fluvial) in lower sequence. Interbedded in places with lenses of peat
- ESTUARINE CLAY - Combination of peat, silty/sandy clay. Characterised by high organic content, shells in some places. Minor lenses of organic rich silty sands
- SILTY SAND - Estuarine to marine sandy clays/silty sands with occasional shells
- RESIDUAL CLAY - Residual Hawkesbury Sandstone
- SANDSTONE - Hawkesbury Sandstone Bedrock
- Groundwater - Inferred Maximum Tidal Range
- Inferred Level

JBS&G

Job No: 58037

Client: Aliro

Version: R02 Rev A	Date: 01/09/2020
Drawn By: JA	Checked By: CK

Horizontal Scale 0 5 10 metres

13 Endeavour Road, Caringbah, NSW

CONCEPTUAL SITE MODEL (CROSS SECTION - CENTRAL)

FIGURE: APPENDIX C

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\R02 Rev A
Reference:

Appendix D JBS&G Analytical Summary Tables

Table A: Soil Analytical Results
Project Number: S8037
Project Name: Carringbah Toyota

	Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN						Polycyclic Aromatic Hydrocarbons																			
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	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)	>C16-C34 Fraction	>C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b,j]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-c,d]pyrene	PAHs (Total)	Phenanthrene	Pyrene
	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
EQL	2	0.4	5	5	5	0.1	5	5	20	20	50	50	50	50	100	100	100	50	100	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	0.5
NEPM 2013 EIL - Commercial Industrial (specific)	160		310[#1]	280[#2]	1800		290[#3]	620[#4]																			370																	
NEPM 2013 EIL - Urban Residential (specific)	100		190[#1]	190[#2]	1100		170[#3]	400[#4]																			170																	
NEPM 2013 ESL Commercial and Industrial, Coarse Soil															1700[#5]	3300[#5]		170[#6]		215[#6]	75[#5]	165[#5]	135[#5]			180[#5]					1.4[#5]													
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil															300[#5]	2800[#5]		120[#6]		180[#6]	50[#5]	70[#5]	85[#5]			105[#5]					0.7[#5]													
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 Mgnt Limits - Commercial and Industrial, Coarse														1000[#10]	3500	10000				700[#11]																								
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Coarse														1000[#10]	2500	10000				700[#11]																								
NEPM 2013 Soil HIL A	100[#12]	20	100[#13]	6000	300[#14]	40[#15]	400	7400																160[#16]																			300[#17]		
NEPM 2013 Soil HIL D	3000[#12]	900	3600[#13]	240000	1500[#14]	730[#15]	6000	400000																																		4000[#17]		
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																		110[#19]		45[#20]	0.5	55	160			40	3																		
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																		999999[#19]		260[#20]	3	999999	999999			230	999999																		

| Field_ID | Sampled_Date-Time | Sample_Depth_Range | Lab_Report_Number | | | | | | | | | | | | | | | | | | |

Table A: Soil Analytical Results
Project Number: S8037
Project Name: Carringbah Toyota

| | Organochlorine Pesticides | | | | | | | | | | | | | | | | | | | | | | VOC | Chlorinated Alkanes | | | | | | | | | | | | | | | | | | |

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

	Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons							Chlorinated Benzenes					Trihalomethanes				Asbestos												Organic Sulfur Compounds	Ionic Balance			Other
	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	Methane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Asbestos Field Quantification	Carbon disulfide	Cation Exchange Capacity	EC 1:5 soil:water	pH 1:5 soil:water	%Moisture 103oC
	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	gm	%w/w	%w/w	gm	gm	gm	gm	gm	gm	gm	%w/w	mg/kg	meq/100g	µS/cm	ph Units	%
EQL	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5												0.5	0.05	10	0.1	1
NEPM 2013 EIL - Commercial Industrial (specific)																																					
NEPM 2013 EIL - Urban Residential (specific)																																					
NEPM 2013 ESL Commercial and Industrial, Coarse Soil																																					
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																																					
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Commercial/Industrial - HSL D																							0.05[47]									0.05[47]					
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL A																							0.01[48]									0.01[48]					
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																								0.001[49]													
NEPM 2013 Mgnt Limits - Commercial and Industrial, Coarse																																					
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Coarse																																					
NEPM 2013 Soil HIL A																	10																				
NEPM 2013 Soil HIL D																	80																				
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																																					
NEPM 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																																					
Field_ID	Sampled_Date-Time	Sample_Depth_Range																																			
BH25 0.2-0.35	20/01/2020	0.2-0.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	926	0	0	0	0	0	0	0	0	-	-	-	-	-	10
BH25 0.5-0.6	20/01/2020	0.5-0.6	<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	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	3.9
BH25 2-2.1	20/01/2020	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
BH25 3-3.1	20/01/2020	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	667	0	0	0	0	0	0	0	0	-	-	-	-	-	-
BH26 0.2-0.3	20/01/2020	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	<0.5	520	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	18
BH26 6.7-6.8	21/01/2020	6.7-6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
BH27 0.2-0.3	20/01/2020	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	<0.05	<0.5	<0.5	<0.5	<0.5	794	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	17
BH27 0.5-0.6	20/01/2020	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	715	0	0	0	0	0	0	0	0	-	-	-	-	-	-
BH27 2-2.1	20/01/2020	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	77	8.2	18
BH28 0.2-0.3	21/01/2020	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	<0.5	969	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	5.8
BH28 0.5-0.6	21/01/2020	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	641	0	0	0	0	0	0	0	0	-	-	10	85	8.8	7.8
BH28 2-2.1	21/01/2020	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	522	0	0	0	0	0	0	0	0	-	-	-	-	-	9.1
BH29 0.2-0.3	21/01/2020	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	<0.5	763	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	8.7
BH29 0.5-0.6	21/01/2020	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	731	0	0	0	0	0	0	0	0	-	-	-	-	-	-
BH30 0.2-0.3	21/01/2020	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	<0.5	795	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	16
BH30 1-1.1	21/01/2020	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	820	0	0	0	0	0	0	0	0	-	-	-	-	-	4.7
BH30 4-4.1	21/01/2020	4-4.1	<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	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	47
MW06 0.2-0.3	20/01/2020	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	872	0	0	0	0	0	0	0	0	-	-	-	-	-	-
MW06 0-0.1	20/01/2020	0-0.1	<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	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	18
MW06 1-1.1	20/01/2020	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.7
MW07 0.25-0.35	20/01/2020	0.25-0.35	<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	<0.5	1245	0	0	0	0	0	0	0	0	-	<0.5	-	-	-	18
MW07 0.5-0.6	20/01/2020	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
MW07 2-2.1	20/01/2020	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	949	0	0	0	0	0	0	0	0	-	-	-	-	-	-
MW07 4-4.1	20/01/2020	4-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
BH24A 1.0-2.0	7/04/2020	1-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24A_0.0-0.2	6/04/2020	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	801	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24A_0.2-1.0	6/04/2020	0.2-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	654	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24B 2-2.5	7/04/2020	2-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24B_0.0-0.2	6/04/2020	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	835	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24B_0.2-1.0	6/04/2020	0.2-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	627	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24C 0-0.2	7/04/2020	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	668	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24C_0.2-1.0	6/04/2020	0.2-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	0	0	0	0	0	0	0	0	0.057	-	-	-	-	-
BH24C_1.0-2.0	6/04/2020	1-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	785	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24D 1.8-2.5	7/04/2020	1.8-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	675	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24D_0.0-0.8	6/04/2020	0-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	673	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24D_0.8-1.8	6/04/2020	0.8-1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	720	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24E 2.1-2.5	7/04/2020	2.1-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	772	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24E_0.2-1.1	6/04/2020	0.2-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	872	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24E_1.1-2.1	6/04/2020	1.1-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	703	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24F 1.5-2.2	7/04/2020	1.5-2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	567	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24F_0.2-0.5	7/04/2020	0.2-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	605	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24F_0.5-1.5	7/04/2020	0.5-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	637	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24G 2.0-2.4	7/04/2020	2-2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	871	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24G_0.2-0.4	7/04/2020	0.2-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	689	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24G_1.0-2.0	7/04/2020	1-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	583	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24H 0.6-1.2	7/04/2020	0.6-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	603	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24H_0.3-0.6	7/04/2020	0.3-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	688	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24H_1.2-1.3	7/04/2020	1.2-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	542	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24I 2.2-2.5	7/04/2020	2.2-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	557	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24I_0.2-1.2	7/04/2020	0.2-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	737	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24I_2.5-3.0	7/04/2020	2.5-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	560	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24J 2.5-2.8	7/04/2020	2.5-2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	528	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24J_0.4-0.6	7/04/2020	0.4-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	626	0	0	0	0	0	0	0	0	0	-	-	-	-	-
QA20200407_A	7/04/2020	0.4-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	709	0	0	0	0	0	0	0	0	0	-	-	-	-	-
QC20200407_A	7/04/2020	0.4-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	645	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24J_0.6-1.5	7/04/2020	0.6-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	660	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24K 0-0.3	7/04/2020	0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	747	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24K_0.3-0.5	7/04/2020	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	643	0	0	0	0	0	0	0	0	0	-	-	-	-	-
QA20200407_B	7/04/2020	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	566	0	0	0	0	0	0	0	0	0	-	-	-	-	-
QC20200407_B	7/04/2020	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	582	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24K_0.5-1.2	7/04/2020	0.5-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	617	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24L 1-1.4	7/04/2020	1-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	608	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24L_0.3-1.0	7/04/2020	0.3-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	538	0	0	0	0	0	0	0	0	0	-	-	-	-	-
BH24L 0-0.3	7/04/2020	0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	796	0	0	0	0	0	0	0	0	0	-	-	-	-	-
Statistical Summary																																					
Number of Results			9	9	9	9	9	9	9	9	9	9	9	0	9	9	9	9	5	9	9	9	9	55	55	55	55	55	55	55	55	55	40	9	2	2	2	19
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	55	55	55	55	55	55	55	55	40	0	2	2	2	19
Minimum Concentration			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	99999	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	520	0	0	0	0	0	0	0	0	0	<0.5	10	77	8.2	3.9
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	520	ND	ND	ND	ND	ND	ND	ND	ND	0.057	ND	10	77	8.2	3.9
Maximum Concentration			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	1245	0	0	0	0	0	0	0	0	0.057	<0.5	19	85	8.8	47
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1245	ND	ND	ND	ND	ND	ND	ND	ND	0.057	ND	19	85	8.8	47
Average Concentration			0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25	0.25	0.025	0.25	0.25	0.25	0.25	702	0	0	0	0	0	0	0	0	0.001	0.25				15
Median Concentration			0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		0.25	0.25	0.25	0.25	0.025	0.25	0.25	0.25	0.25	673	0	0	0	0	0	0	0	0	0	0.25	14.5	81	8.5	16
Standard Deviation			0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	0	0	0	0.009	0				9.6
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	0	0	0	0	0	0	0	0	0	1	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	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

Table C: Groundtwater Analytical Results
Project Number: 58037
Project Name: Carringbah Toyota

			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
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
MW2	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	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW3	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
MW4	22/01/2020	698107	<0.02	<0.05	0.1	<0.1	0.1	0.09	<0.1	<0.1	<0.1	0.09	<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
MW5	22/01/2020	698107	<0.02	<0.05	0.2	<0.1	0.2	<0.05	0.2	<0.1	0.2	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.01	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW6	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	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW7	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
Statistical Summary																																								
Number of Results			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects			0	0	2	0	2	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<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
Minimum Detect			ND	ND	0.1	ND	0.1	0.09	0.2	ND	0.2	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.02	<0.05	0.2	<0.1	0.2	0.09	0.2	<0.1	0.2	0.09	<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
Maximum Detect			ND	ND	0.2	ND	0.2	0.09	0.2	ND	0.2	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration			0.01	0.025	0.079	0.05	0.079	0.034	0.071	0.05	0.071	0.034	0.01	0.01	0.0005	0.0005	0.0005	0.0005	0.001	0.0015	0.005	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Median Concentration			0.01	0.025	0.05	0.05	0.05	0.025	0.05	0.05	0.05	0.025	0.01	0.01	0.0005	0.0005	0.0005	0.0005	0.001	0.0015	0.005	0.0025	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Standard Deviation			0	0	0.057	0	0.057	0.025	0.057	0	0.057	0.025	0	0	0	0	0	0	0	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			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 ti aquatic organisims. 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 naohthalene 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 naohthalene from >C10-C16.
#15:To obtain F1 subtract the sum of BTEX from C6-C10.

Table C: Groundwater Analytical Results
Project Number: 58037
Project Name: Carringbah Toyota

			Chlorinated Alkenes										Solvents	PFAS																													
			1,1-dichloroethene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	2-Propanone (Acetone)	Perfluorobutanoic acid (PFBA)	Perfluorohexanoic acid (PFHxA)	2-(N-methylperfluoro-1-octane sulfonamido)-ethanol	Perfluoroheptanoic acid (PFHpA)	2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	Perfluoropentanoic acid (PFPeA)	N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	Perfluorooctanoic acid (PFOA)	N-ethyl-perfluorooctanesulfonamidoacetic acid	Perfluorononanoic acid (PFNA)	N-methyl-perfluorooctanesulfonamidoacetic acid	1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	Perfluorobutanesulfonic acid (PFBS)	Perfluorooctanesulfonamide (FOSA)	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTS)	Perfluoroheptanesulfonic acid (PFHpS)	Perfluoropropanesulfonic acid (PFPrS)	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTS)	Perfluorohexanesulfonic acid (PFHxS)	1H,1H,2H,2H-perfluorododecanesulfonic acid	Perfluorodecanesulfonic acid (PFDS)	Perfluoroundecanoic acid (PFUnA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluoropentanesulfonic acid (PFPeS)	Perfluorooctanesulfonic acid (PFOS)	Sum of PFHxS and PFOS
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	0.05	0.01	0.05	0.01	0.05	0.01	0.01	0.05	0.01	0.05	0.01	0.05	0.01	0.05	0.01	0.05	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ANZG (2018) Marine water 95% toxicant DGVs																																										
NEMP 2018 PFAS Tier 1 Screening Values - Interim Marine 95% species protection																							220[#8]																		0.13[#8]	
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion																																										
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Sand 2 to <4m																																										
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m																																										
Indiana Department of Environmental Management																																										
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**																																									
MW1	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW2	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	0.02	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW3	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	0.02	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
MW4	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
MW5	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW6	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW7	22/01/2020	698107	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	0.03	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	0.01	<0.05	0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.04
Statistical Summary																																										
Number of Results			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	2
Minimum Concentration			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	0.01	ND	0.01	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	0.01	ND	ND	ND	ND	ND	0.02	0.01
Maximum Concentration			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	0.01	ND	0.01	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	0.02	ND	ND	ND	ND	ND	0.02	0.04
Average Concentration			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.5	7.2	7.2	7.2	7.1	7.2	7.1	7.1	7.2	7.1	7.2	7.1	7.2	7.1	7.1	7.2	7.2	7.1	7.1	7.1	7.2	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.2
Median Concentration			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.5	0.025	0.02	0.025	0.005	0.025	0.005	0.005	0.025	0.005	0.025	0.005	0.025	0.005	0.005	0.025	0.025	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Standard Deviation			0	0	0	0	0	0	0	0	0	0	0	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Env Stds Comments
#1:Moderate reliability. DGV may not protect key test species from chronic toxicity (this refers t
#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 ti aquatic organisims. 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) fo
#11:Sensitive setting HSL A and B Sand 2m to 4m criteria adopted. To obtain F2 subtract naohtha
#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: Groundtwater Analytical Results
Project Number: 58037
Project Name: Carringbah Toyota

					Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons							Chlorinated Benzenes				Trihalomethanes				Organic Sulfur Compounds	Non-Metallic Inorganics		Major Anions			Ionic Balance	
			Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	Sum of WA DER PFAS (n=10)	Sum of PFASs (n=28)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	Methane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Carbon disulfide	Ammonia (as N)	Nitrate & Nitrite (as N)	Bicarbonate Alkalinity (as CaCO3)	Carbonate Alkalinity (as CaCO3)	Hydroxide Alkalinity (as CaCO3)	EC_Lab	Total Alkalinity (as CaCO3)
			µg/L	µg/L	µg/L	µg/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	µS/cm	mg/L
EQL			0.01	0.01	0.05	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.05	0.001	0.001	0.001	0.001	0.001	0.005	0.001	0.001	0.001	0.01	0.05	20	10	20	10	20
ANZG (2018) Marine water 95% toxicant DGVs																												3.91[#3]						
NEPM 2018 PFAS Tier 1 Screening Values - Interim Marine 95% species protection																																		
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion																																		
NEPM 2013 Groundwater HSL A & HSL B for Vapour Intrusion - Sand 2 to <4m																																		
NEPM 2013 Groundwater HSL D for Vapour Intrusion - Sand 2 to <4m																																		
Indiana Department of Environmental Management																		10																
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**																																
MW1	22/01/2020	698107	<0.01	<0.01	0.06	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.4	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	0.97	<0.05	680	<10	<20	1500	680
MW2	22/01/2020	698107	<0.01	<0.01	<0.05	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
MW3	22/01/2020	698107	<0.01	0.01	<0.05	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	6.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	23	<0.05	1500	<10	<20	28,000	1500
MW4	22/01/2020	698107	<100	<100	<100	<100	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	8.7	<0.05	790	<10	<20	4600	790
MW5	22/01/2020	698107	<0.01	<0.01	<0.05	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
MW6	22/01/2020	698107	<0.01	<0.01	<0.05	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
MW7	22/01/2020	698107	0.03	0.05	0.09	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.55	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	9.3	<0.05	980	<10	<20	25,000	980
Statistical Summary																																		
Number of Results			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	4	7	7	7	7	7	7	7	7	7	4	4	4	4	4	4	4
Number of Detects			1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0	4	0	0	4	4
Minimum Concentration			<0.01	<0.01	<0.05	<0.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.4	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	0.97	<0.05	680	<10	<20	1500	680
Minimum Detect			0.03	0.01	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.97	ND	680	ND	ND	1500	680
Maximum Concentration			<100	<100	<100	<100	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	6.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	23	<0.05	1500	<10	<20	28000	1500
Maximum Detect			0.03	0.05	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	ND	1500	ND	ND	28000	1500
Average Concentration			7.2	7.2	7.2	7.2	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	2.1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0005	0.0005	0.0005	10	0.025	988	5	10	14775	988
Median Concentration			0.005	0.005	0.025	0.05	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.875	0.0005	0.0005	0.0005	0.0005	0.0005	0.0025	0.0005	0.0005	0.0005	9	0.025	885	5	10	14800	885
Standard Deviation			19	19	19	19	0	0	0	0	0	0	0	0	0	0	0	2.8	0	0	0	0	0	0	0	0	0	9.2	0	363	0	0	13653	363
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	0	0	0	0	4	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	0	0	0	0	4	0	0	0	0	0	0

Env Stds Comments
#1:Moderate reliability. DGV may not protect key test species from chronic toxicity (this refers t
#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
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#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	mg/m3
EQL			3.333333334	3.333333334	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	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**																						
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	<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	<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	<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	<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	<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	<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	<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	<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	<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	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	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	<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	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	<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	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	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	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	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	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	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	Isopropylbenzene	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
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	<0.08333	<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	<0.08333	<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	<0.08333	<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	<0.08333	<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	<0.08333	<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	<0.08333	<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	<0.08333	<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	<0.02083	<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	<0.08333	<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	<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	<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	<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	<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	<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	<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	<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	<0.02083	<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	<0.08333	<1.667
Statistical Summary														
Number of Results			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
Minimum Concentration			<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.02083	<0.4167
Minimum Detect			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	<1.667
Maximum Detect			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	0.76
Median Concentration			0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.041665	0.8335
Standard Deviation			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.21
Number of Guideline Exceedances			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

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

LFG01 Continious Gas Monitoring Data (GasFlux Unit)																	
	Temperature (°C)	Relative Humidity (%)	Wind Speed (km/h)	Wind Gust (km/h)	Barometric Pressure (hPa)	Precipitation (mm)	Precipitiation 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
4/11/2020 19:21	17.8	42	31.5	31.5	1005	0	0.3	1005.79	42	-0.02	0.02	2.11	15.64	NaN	0.08	0	0
4/11/2020 20:24	17.8	36	44.5	63	1006	0	0	1007.21	36	-0.08	0.02	2.08	15.59	NaN	0.04	0	0
4/11/2020 21:26	17.8	31	31.5	31.5	1007	0	0	1008.64	31	-0.07	0.03	2.15	15.54	NaN	0.09	0	0
4/11/2020 22:29	17.2	33	37	55.6	1009	0	0	1009.12	33	-0.03	0.01	2.16	15.46	NaN	0.03	0	0
4/11/2020 23:31	16.1	38	31.5	50	1010	0	0	1010.07	38	0	0.03	2.16	15.39	0	0.03	0	0
4/12/2020 0:34	15	41	24.1	24.1	1010	0	0	1010.55	41	-0.06	0.03	2.2	15.35	0	0.04	0	0
4/12/2020 1:37	15	44	27.8	27.8	1010	0	0	1011.02	44	0	0.02	2.25	15.24	0	0.04	0	0
4/12/2020 2:39	12.8	54	25.9	25.9	1011	0	0	1011.02	54	-0.06	0.02	2.25	15.17	0	0.03	0	0
4/12/2020 3:42	12.8	54	24.1	24.1	1012	0	0	1012.45	54	-0.03	0.02	2.25	15.2	0	0.03	0	0
4/12/2020 4:44	12.2	57	25.9	25.9	1013	0	0	1013.4	57	-0.04	0.01	2.27	15.18	0	0.08	0	0
4/12/2020 5:47	12.2	57	20.4	20.4	1013	0	0	1013.4	57	-0.02	0.02	2.33	15.11	0	0.03	0	0
4/12/2020 6:49	11.1	61	25.9	25.9	1014	0	0	1014.36	61	0	0.03	2.24	15.14	0	0.03	0	0
4/12/2020 7:51	12.8	54	29.6	29.6	1014	0	0	1015.31	54	-0.07	0.02	2.34	15.17	0	0.05	0	0
4/12/2020 8:54	15	47	22.2	22.2	1015	0	0	1015.79	47	-0.03	0.03	2.25	15.21	0	0.19	0	0
4/12/2020 9:56	17.2	48	18.5	18.5	1016	0	0	1016.74	48	-0.03	0.03	2.23	15.39	NaN	0.19	0	0
4/12/2020 10:59	18.9	48	22.2	22.2	1016	0	0	1016.74	48	-0.03	0.03	2.18	15.64	NaN	0.21	0	0
4/12/2020 12:01	18.9	42	22.2	22.2	1015	0	0	1016.26	42	-0.05	0.06	2.04	15.88	NaN	0.17	0	0
4/12/2020 13:04	18.9	48	24.1	24.1	1015	0	0	1015.79	48	0.07	0.07	1.97	15.97	NaN	0.07	0	0
4/12/2020 14:07	18.9	42	18.5	18.5	1015	0	0	1015.79	42	-0.07	0.07	1.96	16.01	NaN	0.05	0	0
4/12/2020 15:09	20	42	14.8	14.8	1015	0	0	1015.79	42	0.01	0.06	1.97	16.04	NaN	0.01	0	0
4/12/2020 16:12	18.9	45	18.5	18.5	1015	0	0	1015.79	45	-0.01	0.03	2.07	15.94	NaN	0.11	0	0
4/12/2020 17:14	17.8	51	16.7	16.7	1015	0	0	1016.26	51	-0.02	0.02	2.08	15.82	NaN	0.07	0	0
4/12/2020 18:17	17.2	55	13	13	1016	0	0	1016.26	55	-0.03	0.03	2.06	15.73	NaN	0.02	0	0
4/12/2020 19:20	17.2	59	9.3	9.3	1016	0	0	1017.21	59	-0.02	0.04	2.14	15.64	NaN	0.04	0	0
4/12/2020 20:22	17.2	59	0	0	1017	0	0	1018.64	59	-0.06	0.04	2.14	15.58	0	0.02	0	0
4/12/2020 21:25	15	71	11.1	11.1	1018	0	0	1019.12	71	-0.05	0.04	2.16	15.49	0	0.03	0	0
4/12/2020 22:27	16.1	67	7.4	7.4	1019	0	0	1019.12	67	-0.02	0.01	2.17	15.39	0	0.04	0	0
4/12/2020 23:30	15	71	9.3	9.3	1019	0	0	1018.64	71	0.01	0.03	2.28	15.29	0	0.07	0	0
4/13/2020 0:32	13.9	76	13	13	1019	0	0	1018.64	76	-0.05	0.04	2.23	15.26	0	0.04	0	0
4/13/2020 1:35	12.8	76	9.3	9.3	1018	0	0	1019.12	76	-0.02	0.03	2.24	15.2	0	0.04	0	0
4/13/2020 2:37	12.2	81	11.1	11.1	1018	0	0	1018.64	81	-0.04	0.03	2.34	15.19	0	0.06	0	0
4/13/2020 3:40	12.2	81	13	13	1019	0	0	1019.12	81	-0.03	0.03	2.29	15.24	0	0.02	0	0
4/13/2020 4:42	12.2	81	14.8	14.8	1019	0	0	1019.6	81	-0.03	0.01	2.23	15.23	0	0.05	0	0
4/13/2020 5:45	12.2	81	9.3	9.3	1019	0	0	1019.6	81	-0.03	0.02	2.33	15.22	0	0.04	0	0
4/13/2020 6:47	12.2	81	13	13	1020	0	0	1021.02	81	-0.05	0.02	2.32	15.27	0	0.06	0	0
4/13/2020 7:50	12.8	76	9.3	9.3	1021	0	0	1021.02	76	-0.03	0.03	2.3	15.28	0	0.07	0	0
4/13/2020 8:52	16.1	63	11.1	11.1	1021	0	0	1021.5	63	-0.03	0.04	2.22	15.36	0	0.07	0	0
4/13/2020 9:54	18.9	52	9.3	9.3	1021	0	0	1021.98	52	-0.02	0.04	2.12	15.57	0	0.21	0	0
4/13/2020 10:57	20	48	9.3	9.3	1021	0	0	1021.5	48	0	0.03	2.16	15.75	NaN	0.21	0	0
4/13/2020 11:59	21.1	45	5.6	5.6	1020	0	0	1021.02	45	-0.02	0.04	2.07	15.94	NaN	0.14	0	0
4/13/2020 13:02	21.1	49	14.8	14.8	1020	0	0	1020.07	49	0.02	0.03	2.07	16.05	NaN	0.11	0	0
4/13/2020 14:04	22.2	43	14.8	14.8	1019	0	0	1020.07	43	-0.07	0.07	2.03	16.09	NaN	0.04	0	0
4/13/2020 15:07	21.1	42	18.5	18.5	1019	0	0	1020.07	42	0	0.04	1.97	16.1	NaN	0.05	0	0
4/13/2020 16:09	21.1	49	22.2	22.2	1019	0	0	1020.07	49	-0.04	0.01	2.03	16.04	NaN	0.06	0	0
4/13/2020 17:12	20	59	18.5	18.5	1020	0	0	1020.55	59	-0.02	0.01	2.03	15.99	NaN	0.03	0	0
4/13/2020 18:15	18.9	67	13	13	1020	0	0	1021.02	67	-0.02	0.02	2.07	15.91	0	0.03	0	0
4/13/2020 19:17	18.9	63	3.7	3.7	1021	0	0	1021.5	63	-0.04	0.03	2.03	15.96	0	0.07	0	0
4/13/2020 20:20	17.8	63	0	0	1022	0	0	1022.45	63	-0.03	0.03	2.04	15.77	0	0.06	0	0
4/13/2020 21:22	17.2	72	0	0	1022	0	0	1022.45	72	-0.04	0.04	2.09	15.7	0	0.1	0	0
4/13/2020 22:25	17.2	77	9.3	9.3	1022	0	0	1022.45	77	-0.01	0.04	2.12	15.58	0	0.06	0	0
4/13/2020 23:27	16.1	82	7.4	7.4	1022	0	0	1022.45	82	-0.04	0.02	2.13	15.57	0	0.05	0	0
4/14/2020 0:30	16.1	82	7.4	7.4	1022	0	0	1022.45	82	-0.03	0.02	2.24	15.52	0	0.07	0	0
4/14/2020 1:32	15	82	0	0	1022	0	0	1022.45	82	-0.02	0.04	2.14	15.49	0	0.04	0	0
4/14/2020 2:35	15	82	9.3	9.3	1022	0	0	1022.93	82	-0.02	0.03	2.24	15.43	0	0.04	0	0
4/14/2020 3:37	13.9	87	11.1	11.1	1022	0	0	1022.45	87	-0.02	0.03	2.23	15.41	0	0.03	0	0
4/14/2020 4:40	13.9	87	11.1	11.1	1023	0	0	1022.93	87	-0.04	0.03	2.14	15.44	0	0.04	0	0
4/14/2020 5:42	13.9	87	11.1	11.1	1023	0	0	1023.4	87	-0.04	0.03	2.12	15.42	0	0.04	0	0
4/14/2020 6:45	13.9	87	13	13	1023	0	0	1023.88	87	-0.04	0.03	2.16	15.42	0	0.06	0	0
4/14/2020 7:47	15	82	11.1	11.1	1024	0	0	1024.36	82	-0.05	0.04	2.2	15.46	0	0.02	0	0
4/14/2020 8:49	17.2	72	11.1	11.1	1025	0	0	1024.83	72	-0.01	0.04	2.23	15.48	0	0.21	0	0
4/14/2020 9:51	20	59	13	13	1024	0	0	1024.36	59	0.02	0.04	2.14	15.6	0	0.27	0	0
4/14/2020 10:54	22.2	52	14.8	14.8	1024	0	0	1023.88	52	0.02	0.06	2.06	15.86	NaN	0.27	0	0
4/14/2020 11:56	23.9	43	13	13	1023	0	0	1023.88	43	0.01	0.07	1.94	16.13	NaN	0.22	0	0
4/14/2020 12:59	25	41	11.1	11.1	1022	0	0	1022.45	41	0.01	0.08	1.94	16.24	NaN	0.29	0	0
4/14/2020 14:01	27.2	34	13	13	1021	0	0	1021.98	34	-0.01	0.08	1.85	16.4	NaN	0.1	0	0
4/14/2020 15:04	23.9	46	18.5	18.5	1021	0	0	1022.45	46	0	0.04	1.86	16.48	NaN	0.04	0	0
4/14/2020 16:07	22.8	56	22.2	22.2	1021	0	0	1021.98	56	-0.02	0.06	1.89	16.44	NaN	0.06	0	0
4/14/2020 17:09	22.2	60	20.4	20.4	1021	0	0	1022.45	60	-0.01	0.04	1.89	16.3	NaN	0.04	0	0
4/14/2020 18:12	21.1	72	11.1	11.1	1022	0	0	1022.93	72	-0.04	0.02	1.9	16.25	NaN	0.12	0	0
4/14/2020 19:15	20	77	7.4	7.4	1023	0	0	1022.93	77	-0.01	0.02	1.97	16.05	NaN	0.11	0	0
4/14/2020 20:17	20	77	11.1	11.1	1023	0	0	1023.88	77	-0.06	0.03	2.03	15.97	0	0.05	0	0
4/14/2020 21:20	18.9	77	0	0	1024	0	0	1024.36	77	-0.02	0.03	2.05	15.9	0	0.1	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	22.2	1012	0	0	1012.45	58	-0.04	0.04	2.21	15.65	0	0.04	0	0
4/18/2020 7:36	16.1	51	20.4	20.4	1013	0	0	1012.45	51	-0.03	0.06	2.19	15.65	0	0.1	0	0
4/18/2020 8:38	17.2	51	22.2	22.2	1013	0	0	1013.4	51	0.02	0.06	2.21	15.7	0	0.16	0	0
4/18/2020 9:40	18.9	45	24.1	24.1	1013	0	0	1013.4	45	0.06	0.11	2.15	15.88	0	0.28	0	0
4/18/2020 10:42	20	39	24.1	24.1	1012	0	0	1012.93	39	0.02	0.16	2.1	16.07	NaN	0.11	0	0
4/18/2020 11:45	21.1	37	14.8	14.8	1012	0	0	1012.45	37	0.02	0.12	2	16.24	NaN	0.12	0	0
4/18/2020 12:48	22.2	37	14.8	14.8	1012	0	0	1011.5	37	-0.01	0.1	1.82	16.53	NaN	0.14	0	0
4/18/2020 13:50	22.2	32	18.5	18.5	1011	0	0	1011.98	32	0.02	0.07	1.78	16.62	NaN	0.09	0	0
4/18/2020 14:53	22.2	32	18.5	18.5	1011	0	0	1011.98	32	0.01	0.07	1.8	16.67	NaN	0.1	0	0
4/18/2020 15:56	22.2	40	18.5	18.5	1011	0	0	1011.5	40	-0.01	0.07	1.81	16.69	NaN	0.06	0	0
4/18/2020 16:58	20	48	13	13	1011	0	0	1011.02	48	-0.02	0.03	1.87	16.44	NaN	0.07	0	0
4/18/2020 18:01	18.9	55	13	13	1011	0	0	1011.98	55	-0.03	0.03	1.92	16.34	0	0.03	0	0
4/18/2020 19:03	18.9	59	9.3	9.3	1012	0	0	1012.45	59	-0.04	0.05	1.98	16.22	0	0.06	0	0
4/18/2020 20:06	18.9	59	0	0	1013	0	0	1012.93	59	-0.04	0.06	1.99	16.12	0	0.07	0	0
4/18/2020 21:09	17.2	67	9.3	9.3	1013	0	0	1013.88	67	-0.02	0.06	2.09	16	0	0.04	0	0
4/18/2020 22:11	17.2	67	7.4	7.4	1013	0	0	1013.88	67	-0.01	0.07	2.09	15.84	0	0.1	0	0
4/18/2020 23:14	16.1	77	5.6	5.6	1013	0	0	1013.4	77	-0.04	0.05	2.2	15.78	0	0.08	0	0
4/19/2020 0:16	15	76	7.4	7.4	1013	0	0	1012.93	76	-0.01	0.05	2.17	15.72	0	0.05	0	0
4/19/2020 1:19	15	76	11.1	11.1	1013	0	0	1012.93	76	-0.01	0.04	2.25	15.66	0	0.04	0	0
4/19/2020 2:21	13.9	76	14.8	14.8	1012	0	0	1012.45	76	-0.04	0.07	2.26	15.67	0	0.04	0	0
4/19/2020 3:24	12.8	81	11.1	11.1	1012	0	0	1012.45	81	-0.01	0.07	2.22	15.63	0	0.05	0	0
4/19/2020 4:26	12.8	81	11.1	11.1	1012	0	0	1012.93	81	-0.03	0.04	2.16	15.68	0	0.11	0	0
4/19/2020 5:29	12.2	87	11.1	11.1	1013	0	0.5	1013.4	87	-0.03	0.05	2.25	15.68	0	0.11	0	0
4/19/2020 6:31	12.2	81	13	13	1013	0	0.5	1013.4	81	-0.02	0.03	2.24	15.64	0	0.07	0	0
4/19/2020 7:34	12.2	81	14.8	14.8	1013	0	0.5	1013.88	81	-0.02	0.04	2.25	15.6	0	0.06	0	0
4/19/2020 8:36	15	71	9.3	9.3	1014	0.3	0.5	1014.36	71	-0.02	0.08	2.27	15.64	0	0.1	0	0
4/19/2020 9:38	17.2	72	13	13	1014	0	0	1014.36	72	-0.02	0.07	2.26	15.79	0	0.26	0	0
4/19/2020 10:40	18.9	72	24.1	24.1	1014	0.3	0.5	1014.83	72	0.01	0.13	2.16	15.94	0	0.22	0	0
4/19/2020 11:43	18.9	72	22.2	22.2	1013	0	1.1	1013.88	72	-0.04	0.13	2.08	16.02	NaN	0.12	0	0
4/19/2020 12:45	20	68	14.8	14.8	1013	0	1.1	1013.4	68	0.01	0.09	1.99	16.27	NaN	0.12	0	0
4/19/2020 13:48	20	68	14.8	14.8	1012	0	1.3	1013.4	68	0.03	0.1	1.94	16.39	NaN	0.08	0	0
4/19/2020 14:51	20	72	18.5	18.5	1013	0	1.6	1013.4	72	-0.07	0.08	1.98	16.42	NaN	0.03	0	0
4/19/2020 15:53	21.1	64	14.8	14.8	1013	0	0.5	1012.93	64	0	0.05	2.01	16.35	0	0.08	0	0
4/19/2020 17:58	18.9	72	13	13	1012	0	1.6	1013.88	72	-0.03	0.04	2.06	16.27	0	0.09	0	0
4/19/2020 19:01	17.8	77	9.3	9.3	1014	0	1.6	1014.83	77	-0.04	0.06	2.03	16.19	0	0.06	0	0
4/19/2020 20:03	17.8	77	7.4	7.4	1015	0	1.6	1015.79	77	-0.01	0.04	2.07	16.1	0	0.06	0	0
4/19/2020 21:06	17.2	87	5.6	5.6	1015	0	1.6	1015.79	87	-0.02	0.07	2.08	16.04	0	0.06	0	0
4/19/2020 22:09	17.2	82	9.3	9.3	1015	0	1.6	1015.79	82	0.01	0.07	2.15	15.91	0	0.06	0	0
4/19/2020 23:11	16.1	87	9.3	9.3	1014	0	1.6	1014.83	87	0.01	0.07	2.24	15.79	0	0.1	0	0
4/20/2020 0:14	16.1	82	9.3	9.3	1014	0	1.6	1014.36	82	0.01	0.06	2.23	15.76	0	0.11	0	0
4/20/2020 1:16	15	87	13	13	1014	0	1.6	1013.88	87	-0.06	0.06	2.17	15.75	0	0.04	0	0
4/20/2020 2:19	13.9	93	11.1	11.1	1014	0	1.6	1013.88	93	-0.05	0.05	2.2	15.71	0	0.07	0	0
4/20/2020 3:21	13.9	93	11.1	11.1	1013	0	1.6	1013.88	93	-0.05	0.06	2.26	15.71	0	0.04	0	0
4/20/2020 4:24	13.9	87	9.3	9.3	1014	0	1.1	1013.88	87	-0.03	0.05	2.27	15.74	0	0.09	0	0
4/20/2020 5:26	15	87	13	13	1014	0	1.1	1013.88	87	0	0.06	2.27	15.72	0	0.11	0	0
4/20/2020 6:29	15	87	11.1	11.1	1014	0	1.1	1014.83	87	-0.1	0.06	2.17	15.78	0	0.04	0	0
4/20/2020 7:31	15	87	13	13	1015	0	1.1	1015.79	87	-0.06	0.06	2.26	15.77	0	0.03	0	0
4/20/2020 8:33	16.1	82	11.1	11.1	1016	0	1.1	1016.26	82	-0.1	0.07	2.25	15.78	0	0.11	0	0
4/20/2020 9:36	16.1	82	14.8	14.8	1016	0	0	1015.79	82	-0.08	0.07	2.15	15.8	0	0.11	0	0
4/20/2020 10:38	17.8	72	16.7	16.7	1015	0	0	1015.79	72	-0.01	0.09	2.26	15.84	0	0.19	0	0
4/20/2020 11:40	17.8	67	16.7	16.7	1015	0	0	1014.83	67	0.1	0.1	2.17	15.86	0	0.09	0	0

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	9.3	1016	0	0	1016.26	55	0	0.06	1.97	16.4	0	0.07	0	0
4/23/2020 21:58	18.9	63	9.3	9.3	1016	0	0	1016.74	63	-0.01	0.07	2.07	16.3	0	0.07	0	0
4/23/2020 23:01	20	52	11.1	11.1	1016	0	0	1015.79	52	-0.03	0.08	2.08	16.22	0	0.05	0	0
4/24/2020 0:03	18.9	52	3.7	3.7	1015	0	0	1015.31	52	0.01	0.06	2.08	16.16	0	0.08	0	0
4/24/2020 1:06	18.9	55	13	13	1015	0	0	1015.31	55	-0.05	0.07	2.08	16.19	0	0.05	0	0
4/24/2020 2:08	17.2	63	1.9	1.9	1015	0	0	1014.83	63	-0.01	0.05	2.09	16.14	0	0.09	0	0
4/24/2020 3:11	17.2	63	0	0	1015	0	0	1015.31	63	0.01	0.05	2.09	16.11	0	0.05	0	0
4/24/2020 4:13	17.8	59	11.1	11.1	1015	0	0	1015.79	59	0.02	0.07	2.15	16.13	0	0.04	0	0
4/24/2020 5:16	17.8	59	13	13	1015	0	0	1015.79	59	-0.01	0.07	2.12	16.1	0	0.03	0	0
4/24/2020 6:18	17.8	59	13	13	1016	0.3	0.3	1016.26	59	-0.04	0.08	2.08	16.17	0	0.05	0	0
4/24/2020 7:20	17.8	59	13	13	1016	0	0.3	1016.74	59	-0.02	0.07	2.08	16.14	0	0.1	0	0
4/24/2020 8:23	20	52	13	13	1017	0	0	1017.21	52	-0.02	0.09	2.17	16.18	0	0.16	0	0
4/24/2020 9:25	22.8	43	13	13	1017	0	0	1017.21	43	0	0.12	2.06	16.35	0	0.29	0	0
4/24/2020 10:27	23.9	33	20.4	20.4	1017	0	0	1016.74	33	0.02	0.24	1.98	16.51	NaN	0.13	0	0
4/24/2020 11:30	26.1	29	20.4	20.4	1016	0	0	1017.21	29	0.01	0.19	1.88	16.68	NaN	0.05	0	0
4/24/2020 12:32	26.1	31	18.5	18.5	1016	0	0	1016.26	31	0.03	0.11	1.77	16.8	NaN	0.1	0	0
4/24/2020 13:35	27.2	29	18.5	18.5	1015	0	0	1015.79	29	0.03	0.1	1.77	16.89	NaN	0.1	0	0
4/24/2020 14:37	27.2	31	16.7	16.7	1015	0	0	1016.26	31	0	0.09	1.77	17	NaN	0.01	0	0
4/24/2020 15:40	26.1	33	14.8	14.8	1016	0	0	1016.26	33	-0.02	0.08	1.69	17.11	NaN	0.01	0	0
4/24/2020 16:43	23.9	49	14.8	14.8	1016	0	0	1017.21	49	-0.02	0.08	1.81	17	NaN	0.02	0	0
4/24/2020 17:45	22.2	60	11.1	11.1	1017	0	0	1017.69	60	-0.04	0.05	1.81	16.88	NaN	0.07	0	0
4/24/2020 18:48	20	77	9.3	9.3	1018	0	0	1018.64	77	-0.03	0.04	1.87	16.78	NaN	0.06	0	0
4/24/2020 19:51	20	72	3.7	3.7	1018	0	0	1019.12	72	-0.04	0.06	1.87	16.67	NaN	0.04	0	0
4/24/2020 20:53	18.9	82	7.4	7.4	1019	0	0	1019.6	82	-0.03	0.07	1.89	16.55	0	0.08	0	0
4/24/2020 21:56	18.9	82	1.9	1.9	1019	0	0	1020.07	82	-0.04	0.07	1.96	16.47	0	0.04	0	0
4/24/2020 22:58	18.9	77	0	0	1020	0	0	1020.07	77	-0.03	0.07	1.97	16.37	0	0.04	0	0
4/25/2020 0:01	17.8	77	0	0	1020	0	0	1020.07	77	-0.06	0.07	2.05	16.29	0	0.07	0	0
4/25/2020 1:03	17.2	82	0	0	1020	0	0	1020.07	82	-0.02	0.05	2.1	16.22	0	0.04	0	0
4/25/2020 2:06	17.2	82	9.3	9.3	1020	0	0	1020.07	82	-0.04	0.05	2.07	16.17	0	0.04	0	0
4/25/2020 3:08	16.1	77	1.9	1.9	1020	0	0	1020.07	77	-0.02	0.07	2.15	16.09	0	0.05	0	0
4/25/2020 4:11	16.1	77	9.3	9.3	1020	0	0	1020.07	77	-0.04	0.07	2.13	16.07	0	0.07	0	0
4/25/2020 5:13	15	82	11.1	11.1	1020	0	0	1020.55	82	-0.05	0.09	2.14	16.07	0	0.04	0	0
4/25/2020 6:16	15	76	11.1	11.1	1020	0	0	1021.02	76	-0.05	0.06	2.12	16.02	0	0.06	0	0
4/25/2020 7:18	15	82	14.8	14.8	1021	0	0	1021.5	82	-0.05	0.06	2.13	16.03	0	0.06	0	0
4/25/2020 8:21	17.2	72	13	13	1022	0	0	1021.98	72	0.01	0.07	2.16	16.04	0	0.08	0	0
4/25/2020 9:23	20	59	11.1	11.1	1022	0	0	1021.5	59	0	0.11	2.11	16.17	0	0.18	0	0
4/25/2020 10:25	22.8	46	13	13	1021	0	0	1021.5	46	-0.01	0.23	2.07	16.33	NaN	0.11	0	0
4/25/2020 11:28	25	46	14.8	14.8	1021	0	0	1021.02	46	0.02	0.25	1.87	16.61	NaN	0.09	0	0
4/25/2020 12:30	26.1	44	14.8	14.8	1020	0	0	1019.12	44	0.03	0.15	1.79	16.8	NaN	0.04	0	0
4/25/2020 13:33	26.1	44	11.1	11.1	1018	0	0	1018.64	44	0.02	0.1	1.84	16.86	NaN	0.05	0	0
4/25/2020 14:35	26.1	50	25.9	25.9	1017	0	0	1018.17	50	0.01	0.1	1.77	16.93	NaN	0.01	0	0
4/25/2020 15:38	25	53	24.1	24.1	1017	0	0	1017.21	53	-0.04	0.09	1.88	16.86	NaN	0.04	0	0
4/25/2020 16:41	25	57	31.5	31.5	1017	0	0	1017.21	57	0.01	0.04	1.92	16.75	NaN	0.1	0	0
4/25/2020 17:43	23.9	60	25.9	25.9	1017	0	0	1017.21	60	-0.01	0.04	2.02	16.66	NaN	0.04	0	0
4/25/2020 18:46	22.8	64	27.8	27.8	1017	0	0	1017.21	64	0	0.05	2.01	16.59	NaN	0.07	0	0
4/25/2020 19:48	22.8	60	31.5	31.5	1017	0	0	1017.21	60	0.01	0.04	2.01	16.53	NaN	0.1	0	0
4/25/2020 20:51	22.2	64	25.9	25.9	1017	0	0	1017.69	64	-0.03	0.07	2.04	16.52	NaN	0.11	0	0
4/25/2020 21:53	21.1	64	14.8	14.8	1018	0	0	1017.69	64	0.01	0.07	2.08	16.43	0	0.11	0	0
4/25/2020 22:56	20	68	13	13	1017	0	0	1017.21	68	0.01	0.07	2.08	16.34	0	0.06	0	0
4/25/2020 23:58	18.9	67	13	13	1016	0	0	1016.74	67	0.03	0.07	2.09	16.31	0	0.07	0	0
4/26/2020 1:01	18.9	67	13	13	1016	0	0	1016.74	67	0	0.08	2.16	16.24	0	0.06	0	0

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	72	0.02	0.16	2.09	16.43	0	0.14	0	0
4/29/2020 10:13	22.8	64	18.5	18.5	1015	0	3	1014.83	64	0	0.23	2	16.5	0	0.07	0	0
4/29/2020 11:15	26.1	50	16.7	16.7	1014	0	2.9	1014.36	50	0.01	0.25	1.92	16.58	0	0.1	0	0
4/29/2020 12:18	27.2	47	25.9	25.9	1013	0	1.6	1013.4	47	0.02	0.19	1.91	16.67	0	0.03	0	0
4/29/2020 13:21	26.1	57	25.9	25.9	1012	0	0.4	1012.45	57	-0.01	0.12	1.92	16.78	0	0.07	0	0
4/29/2020 14:23	25	64	29.6	29.6	1012	0	0.4	1011.98	64	-0.03	0.12	1.83	16.91	0	0.05	0	0
4/29/2020 15:26	25	64	29.6	29.6	1011	0	0.4	1011.98	64	-0.04	0.11	1.81	16.91	0	0.11	0	0
4/29/2020 16:28	23.9	68	29.6	29.6	1011	0	0.4	1011.98	68	-0.02	0.11	1.85	16.85	0	0.08	0	0
4/29/2020 17:31	23.9	64	33.3	33.3	1011	0.3	0.6	1011.98	64	0.02	0.08	1.93	16.79	0	0.04	0	0
4/29/2020 18:33	23.9	68	33.3	33.3	1012	0	0.4	1011.98	68	-0.01	0.07	1.82	16.8	0	0.07	0	0
4/29/2020 19:36	22.8	68	22.2	22.2	1013	0.3	1.7	1013.4	68	-0.05	0.1	1.83	16.85	0	0.06	0	0
4/29/2020 20:38	20	88	14.8	14.8	1013	0.3	1.9	1013.4	88	0.12	0.1	1.91	16.68	0	0.08	0	0
4/29/2020 21:41	20	77	14.8	14.8	1013	0.3	0.5	1012.93	77	0.03	0.08	1.98	16.56	0	0.08	0	0
4/29/2020 22:43	20	77	7.4	7.4	1011	0	0	1010.55	77	0.16	0.1	1.98	16.43	0	0.04	0	0
4/29/2020 23:46	18.9	82	13	13	1009	0	1.3	1009.6	82	0.04	0.1	2.01	16.36	0	0.11	0	0
4/30/2020 0:48	18.9	77	7.4	7.4	1008	0	1.3	1008.64	77	-0.03	0.1	2.09	16.32	0	0.06	0	0
4/30/2020 1:51	20	77	7.4	7.4	1008	0	1.3	1008.17	77	0.01	0.11	2.07	16.3	0	0.04	0	0
4/30/2020 2:53	18.9	82	9.3	9.3	1007	0	1.3	1007.21	82	-0.03	0.1	2.1	16.3	0	0.07	0	0
4/30/2020 3:56	18.9	88	9.3	9.3	1007	0	1.3	1006.74	88	0	0.1	2.04	16.27	0	0.04	0	0
4/30/2020 4:58	18.9	82	9.3	9.3	1006	0	1.3	1006.26	82	0.02	0.1	2.11	16.26	0	0.05	0	0
4/30/2020 6:01	18.9	82	11.1	11.1	1006	0	2.3	1006.74	82	0.01	0.11	2.01	16.33	0	0.06	0	0
4/30/2020 7:03	18.9	88	7.4	7.4	1006	0.5	2.3	1006.26	88	0.01	0.12	2.05	16.33	0	0.04	0	0
4/30/2020 8:06	18.9	88	3.7	3.7	1006	0.3	2.8	1006.74	88	-0.02	0.11	2.02	16.33	0	0.07	0	0
4/30/2020 9:08	20	82	3.7	3.7	1006	0.3	2.5	1006.74	82	-0.07	0.14	2.09	16.35	0	0.1	0	0
4/30/2020 10:11	18.9	88	3.7	3.7	1006	3	3.4	1005.79	88	0.09	0.14	2.01	16.33	0	0.06	0	0
4/30/2020 11:13	17.2	87	25.9	25.9	1004	3	5.3	1004.83	87	0.07	0.12	2.02	16.38	0	0.04	0	0
4/30/2020 12:16	13.9	87	33.3	33.3	1006	5.1	7.9	1005.31	87	0.04	0.1	2.02	16.35	0	0.06	0	0
4/30/2020 13:18	13.9	93	9.3	9.3	1005	3	10	1005.31	93	-0.02	0.12	1.94	16.5	0	0.07	0	0
4/30/2020 14:21	13.9	93	13	13	1006	3	8.8	1005.79	93	0.15	0.1	2	16.35	0	0.05	0	0
4/30/2020 15:23	13.9	93	13	13	1007	0.5	24.1	1006.74	93	0.48	0.1	1.92	16.45	0	0.07	0	0.01
4/30/2020 16:26	15	93	16.7	16.7	1007	0.5	5.3	1007.21	93	-0.21	0.11	1.93	16.4	0	0.04	0	0
4/30/2020 17:28	13.9	82	18.5	18.5	1007	0.5	9.7	1007.21	82	-0.23	0.1	2.03	16.37	0	0.11	0	0
4/30/2020 18:31	12.8	87	20.4	20.4	1007	0.3	8.2	1008.17	87	-0.15	0.11	2.09	16.18	0	0.05	0	0
4/30/2020 19:33	12.8	87	24.1	24.1	1008	0	7.9	1008.64	87	-0.17	0.1	2.04	16.15	0	0.05	0	0
4/30/2020 20:36	12.8	76	18.5	18.5	1008	0	7.9	1008.64	76	-0.09	0.11	2.1	16.13	0	0.04	0	0
4/30/2020 21:38	12.2	76	25.9	25.9	1008	0	8.6	1008.17	76	-0.01	0.12	2.1	16	0	0.07	0	0
4/30/2020 22:41	12.2	71	16.7	16.7	1008	0	6.9	1008.17	71	-0.01	0.11	2.1	15.93	0	0.07	0	0
4/30/2020 23:43	12.2	66	22.2	22.2	1008	0	6.9	1008.17	66	0	0.11	2.12	15.9	0	0.04	0	0
5/1/2020 0:46	12.2	66	20.4	20.4	1007	0	6.9	1007.69	66	-0.03	0.09	2.2	15.88	0	0.04	0	0
5/1/2020 1:48	12.2	62	14.8	14.8	1007	0	6.9	1007.69	62	0	0.12	2.18	15.85	0	0.05	0	0

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	25	27	53.7	72.2	1000	0	7.2	1001.22	45.09	0.16	29.87	11.92	0	1.06	0.05	0.05	0.02
11/4/2020 16:35	23.9	29	46.3	46.3	1001	0	4.8	1002.18	38.99	0.03	26.71	11.37	1.89	0	0.02	0.01	0
11/4/2020 17:36	21.1	28	53.7	72.2	1003	0.3	2.4	1004.1	32.45	-0.17	15.4	7.33	9.68	0	0.06	-0.03	-0.01
11/4/2020 18:38	18.9	39	38.9	38.9	1004	0	0.3	1004.59	30.38	-0.18	7	3.95	15.56	0	0.02	-0.01	-0.01
11/4/2020 19:40	17.8	42	31.5	31.5	1005	0	0	1005.55	32.44	-0.23	2.87	2.12	18.57	0	0.06	-0.01	0
11/4/2020 20:41	17.8	36	44.5	63	1006	0	0	1007.47	35.82	-0.14	0.15	0.5	20.44	0	0.02	0	0
11/4/2020 21:43	17.8	31	31.5	31.5	1007	0	0	1008.92	37.55	-0.06	0.06	0.38	20.51	0	0.02	0	0
11/4/2020 22:44	17.2	33	37	55.6	1009	0	0	1009.4	38.3	-0.02	0.05	0.28	20.51	0	0.02	0	0
11/4/2020 23:46	15	41	31.5	50	1010	0	0	1010.36	38.75	-0.27	0.05	0.28	20.47	0	0.02	0	0
12/4/2020 0:47	15	44	25.9	25.9	1010	0	0	1010.84	39.57	-0.24	0.04	0.27	20.45	0	0.1	0	0
12/4/2020 1:49	13.9	47	16.7	16.7	1011	0	0	1011.32	40.06	-0.15	0.04	0.29	20.38	0	0.02	0	0
12/4/2020 2:51	12.8	54	25.9	25.9	1011	0	0	1011.8	40.45	-0.12	0.06	0.29	20.34	0	0.02	0	0
12/4/2020 3:52	12.8	54	24.1	24.1	1012	0	0	1012.77	40.79	-0.22	0.04	0.28	20.34	0	0.03	0	0
12/4/2020 4:54	12.2	57	25.9	25.9	1013	0	0	1013.73	41.9	-0.22	0.04	0.16	20.35	0	0.04	0	0
12/4/2020 5:55	12.2	57	20.4	20.4	1013	0	0	1013.73	42.25	-0.15	0.06	0.15	20.32	0	0.06	0	0
12/4/2020 6:57	11.1	61	25.9	25.9	1014	0	0	1014.69	42.66	-0.2	0.04	0.14	20.34	0	0.02	0	0
12/4/2020 7:58	12.8	54	29.6	29.6	1014	0	0	1015.65	45.33	-0.19	0.06	0.15	20.32	0	0.02	0	0
12/4/2020 8:59	16.1	44	22.2	22.2	1016	0	0	1016.14	48.01	-0.23	0.04	0.17	20.35	0	0.08	0	0
12/4/2020 10:01	17.8	39	13	13	1016	0	0	1016.62	49.83	-0.24	0.06	0.17	20.38	0	0.04	0	0
12/4/2020 11:02	18.9	48	22.2	22.2	1016	0	0	1016.62	50.17	-0.13	0.04	0.16	20.39	0	0.03	0	0
12/4/2020 12:04	18.9	42	22.2	22.2	1015	0	0	1016.14	49.8	-0.05	0.06	0.27	20.35	0	0.09	0	0
12/4/2020 13:05	18.9	48	24.1	24.1	1015	0	0	1015.65	49.63	-0.03	0.06	0.38	20.29	0	0.05	0	0
12/4/2020 14:07	18.9	42	18.5	18.5	1015	0	0	1015.17	51.49	-0.03	0.06	0.61	19.96	0	0.02	0	0
12/4/2020 15:08	20	42	14.8	14.8	1015	0	0	1015.65	48.62	-0.09	0.06	0.73	19.65	0	0.02	0	0
12/4/2020 16:09	18.9	45	18.5	18.5	1015	0	0	1015.65	53.82	-0.07	0.08	0.83	19.53	0	0.06	0	0
12/4/2020 17:11	17.8	51	16.7	16.7	1015	0	0	1016.14	42.57	-0.11	0.07	0.85	19.78	0	0.01	0	0
12/4/2020 18:12	17.2	55	13	13	1016	0	0	1016.62	31.21	-0.15	0.05	0.59	20.25	0	0.01	0	0
12/4/2020 19:14	17.2	59	9.3	9.3	1016	0	0	1017.1	30.91	-0.19	0.03	0.38	20.45	0	0.01	0	0
12/4/2020 20:16	17.2	59	0	0	1017	0	0	1018.06	34.59	-0.24	0.04	0.38	20.48	0	0.01	0	0
12/4/2020 21:17	15	71	11.1	11.1	1018	0	0	1019.02	37.62	-0.26	0.06	0.28	20.51	0	0.05	0	0
12/4/2020 22:19	16.1	67	7.4	7.4	1019	0	0	1019.5	39.8	-0.19	0.03	0.28	20.42	0	0.02	0	0
12/4/2020 23:20	15	71	9.3	9.3	1019	0	0	1019.02	41.91	-0.14	0.03	0.28	20.31	0	0.06	0	0
4/13/2020 0:22	13.9	76	13	13	1019	0	0	1019.02	42.83	-0.08	0.03	0.37	20.22	0	0.1	0	0
4/13/2020 1:23	12.8	76	9.3	9.3	1018	0	0	1019.02	42.77	-0.12	0.04	0.38	20.14	0	0.03	0	0
4/13/2020 2:25	12.2	81	11.1	11.1	1018	0	0	1019.02	44.24	-0.06	0.04	0.5	20.05	0	0.07	0	0
4/13/2020 3:27	12.2	81	13	13	1018	0	0	1019.02	44.47	-0.12	0.04	0.61	19.92	0	0.07	0	0
4/13/2020 4:28	12.2	81	16.7	16.7	1019	0	0	1019.5	45.56	-0.13	0.04	0.6	19.91	0	0.09	0	0
4/13/2020 5:30	12.2	81	11.1	11.1	1019	0	0	1019.99	45.74	-0.14	0.04	0.49	19.98	0	0.02	0	0
4/13/2020 6:31	11.1	87	11.1	11.1	1019	0	0	1020.47	45.98	-0.21	0.04	0.46	20.02	0	0.03	0	0
4/13/2020 7:33	12.2	81	13	13	1020	0	0	1021.43	49.64	-0.24	0.04	0.29	20.14	0	0.09	0	0
4/13/2020 8:34	13.9	71	11.1	11.1	1021	0	0	1022.39	54.12	-0.24	0.05	0.28	20.16	0	0.08	0	0
4/13/2020 9:35	17.8	59	9.3	9.3	1022	0	0	1022.39	58.49	-0.16	0.06	0.28	20.22	0	0.05	0	0
4/13/2020 10:37	18.9	48	9.3	9.3	1021	0	0	1021.43	58.96	-0.15	0.04	0.27	20.27	0	0.02	0	0
4/13/2020 11:38	21.1	45	5.6	5.6	1021	0	0	1021.43	56.38	-0.05	0.04	0.39	20.29	0	0.01	0	0
4/13/2020 12:39	21.1	45	5.6	5.6	1020	0	0	1020.47	53.83	0.01	0.06	0.49	20.19	0	0.03	0	0
4/13/2020 13:41	21.1	49	16.7	16.7	1019	0	0	1019.99	52.28	0.01	0.11	0.85	18.83	0	0.02	0	0
4/13/2020 14:42	21.1	45	16.7	16.7	1019	0	0	1019.99	50.93	-0.03	0.26	1.4	16.35	0	0.01	0	0
4/13/2020 15:44	21.1	45	20.4	20.4	1019	0	0	1019.99	52.82	-0.03	0.43	1.81	14.55	0	0.02	0	0
4/13/2020 16:45	20	52	18.5	18.5	1020	0	0	1020.47	51.32	-0.09	0.55	2.05	13.8	0	0.01	0	0
4/13/2020 17:47	18.9	63	14.8	14.8	1020	0	0	1020.47	42.13	-0.09	0.42	1.93	14.76	0	0.01	0	0
4/13/2020 18:48	18.9	63	7.4	7.4	1021	0	0	1021.43	39.43	-0.18	0.18	1.27	17.65	0	0.01	0	0
4/13/2020 19:50	18.9	63	3.7	3.7	1021	0	0	1021.91	40.46	-0.16	0.06	0.73	19.58	0	0.01	0	0
4/13/2020 20:52	17.8	67	7.4	7.4	1021	0	0	1022.39	43.39	-0.16	0.05	0.6	20.01	0	0.02	0	0
4/13/2020 21:53	17.2	77	5.6	5.6	1022	0	0	1022.39	45.61	-0.17	0.06	0.49	20.17	0	0.02	0	0
4/13/2020 22:55	16.1	82	9.3	9.3	1022	0	0	1022.39	47	-0.11	0.05	0.5	20.11	0	0.12	0	0
4/13/2020 23:56	16.1	82	5.6	5.6	1022	0	0	1022.39	48.02	-0.11	0.04	0.61	20.05	0	0.08	0	0
4/14/2020 0:58	15	87	7.4	7.4	1022	0	0	1022.87	49.39	-0.11	0.03	0.61	20	0	0.02	0	0
4/14/2020 1:59	16.1	82	9.3	9.3	1022	0	0	1022.87	50.15	-0.11	0.05	0.62	20	0	0.03	0	0
4/14/2020 3:01	15	82	9.3	9.3	1022	0	0	1022.87	50.53	-0.09	0.05	0.72	19.89	0	0.04	0	0
4/14/2020 4:02	13.9	87	13	13	1022	0	0	1023.35	49.81	-0.13	0.04	0.72	19.88	0	0.02	0	0
4/14/2020 5:04	13.9	87	14.8	14.8	1023	0	0	1023.84	50.06	-0.16	0.04	0.62	19.96	0	0.03	0	0
4/14/2020 6:05	13.9	82	13	13	1023	0	0	1023.84	50.79	-0.14	0.04	0.61	19.99	0	0.06	0	0
4/14/2020 7:07	15	82	13	13	1024	0	0	1024.32	52.75	-0.17	0.04	0.48	20.05	0	0.03	0	0
4/14/2020 8:08	16.1	77	11.1	11.1	1024	0	0	1025.28	57.03	-0.21	0.04	0.39	20.19	0	0.02	0	0
4/14/2020 9:10	18.9	63	13	13	1025	0	0	1024.8	60.11	-0.17	0.06	0.28	20.23	0	0.06	0	0
4/14/2020 10:11	21.1	56	13	13	1024	0	0	1024.32	61.66	0.01	0.06	0.37	20.22	0	0.08	0	0
4/14/2020 11:13	22.8	49	11.1	11.1	1023	0	0	1023.84	62.04	-0.02	0.06	0.56	20.17	0	0.03	0	0
4/14/2020 12:14	25	41	13	13	1023	0	0	1022.87	62.6	0.04	0.06	0.84	19.44	0	0.02	0	0
4/14/2020 13:15	25	38	11.1	11.1	1022	0	0	1021.91	60.15	0.09	0.39	2.45	14	0	0.02	0	0
4/14/2020 14:17	26.1	44	20.4	20.4	1021	0	0	1021.43	60.52	0.04	1.48	4.44	8.3	0.71	0.06	0	0
4/14/2020 15:18	23.9	46	18.5	18.5	1021	0	0	1022.39	56.67	-0.01	2.26	5.43	6.02	1.67	0.08	0	0
4/14/2020 16:19	22.8	56	22.2	22.2	1021	0	0	1022.39	61.77	-0.05	3.08	6.35	4.42	2.07	0.08	0	0
4/14/2020 17:21	22.2	60	20.4	20.4	1021	0	0	1022.39	49.09	-0.08	3.21	6.66	4.22	2.11	0.02	0	-0.01
4/14/2020 18:22	21.1	72	11.1	11.1	1022	0	0	1023.35	39.66	-0.14	2.22	5.15	9.54	0	0.01	0	-0.01
4/14/2020 19:24	20	77	7.4	7.4	1023	0	0	1023.35	39.37	-0.12	1.08	3.07	14.69	0	0.01	0	0

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	24.1	24.1	1012	0	0	1012.29	57.39	-0.12	1.83	1.86	18.46	0	0.06	0	0
4/18/2020 0:16	16.1	47	14.8	14.8	1012	0	0	1012.29	62.97	-0.09	1.26	1.55	18.97	0	0.02	0	0
4/18/2020 1:18	16.1	44	24.1	24.1	1012	0	0	1012.29	66.31	0.01	1.16	1.65	18.82	0	0.01	0	0
4/18/2020 2:19	15	51	22.2	22.2	1012	0	0	1011.8	65.98	0.04	1.9	2.68	17.61	0	0.06	0	0
4/18/2020 3:21	15	54	18.5	18.5	1011	0	0	1011.8	65.79	0.01	4.02	5.21	13.52	0	0.08	0	0
4/18/2020 4:22	13.9	58	22.2	22.2	1011	0	0	1011.8	66.67	0	5.98	7.02	10.18	0	0.09	0	0
4/18/2020 5:24	15	54	24.1	24.1	1011	0	0	1012.29	66.82	-0.04	6.16	7.26	9.63	0	0.08	0	0
4/18/2020 6:25	13.9	58	22.2	22.2	1012	0	0	1012.29	67.39	-0.04	5.34	6.53	11.09	0	0.07	0	0
4/18/2020 7:26	15	58	22.2	22.2	1012	0	0	1013.25	70.28	-0.1	3.05	4.27	14.97	0	0.06	0	0
4/18/2020 8:28	16.1	51	14.8	14.8	1013	0	0	1013.73	74.53	-0.06	1.08	1.76	18.58	0	0.05	0	0
4/18/2020 9:29	18.9	45	14.8	14.8	1013	0	0	1013.25	77.73	-0.07	0.49	1.19	19.38	0	0.04	0	0
4/18/2020 10:31	18.9	42	25.9	25.9	1013	0	0	1012.77	77.67	-0.03	0.6	1.63	19	0	0.08	0	0
4/18/2020 11:32	21.1	37	18.5	18.5	1012	0	0	1012.29	77.25	-0.01	1.33	2.8	17.25	0	0.03	0	0
4/18/2020 12:34	22.2	35	9.3	9.3	1012	0	0	1011.8	76.26	0.02	4.6	6.8	10.08	0	0.11	0	0
4/18/2020 13:35	22.2	32	18.5	18.5	1011	0	0	1010.84	75.55	0.04	8.32	9.37	5.18	0.66	0.07	0	0
4/18/2020 14:36	22.8	30	20.4	20.4	1011	0	0	1010.84	73.61	0	10.95	10.38	3.21	1.18	0.09	0	0
4/18/2020 15:38	22.2	40	18.5	18.5	1011	0	0	1011.32	73.33	-0.01	12.59	10.93	2.31	1.47	0.02	0	0
4/18/2020 16:39	21.1	42	14.8	14.8	1011	0	0	1011.8	75.44	-0.01	13.49	11.34	1.79	2.52	0.05	0	0
4/18/2020 17:41	18.9	55	13	13	1011	0	0	1011.8	54.5	-0.06	13.09	11.42	2.16	2.6	0.02	-0.01	-0.01
4/18/2020 18:42	18.9	55	13	13	1012	0	0	1012.29	45.43	-0.09	11.06	10.25	4.93	0	0.01	-0.01	-0.01
4/18/2020 19:44	18.9	55	7.4	7.4	1012	0	0	1013.25	47.22	-0.15	7.49	7.51	9.92	0	0.04	-0.01	-0.01
4/18/2020 20:45	17.2	67	7.4	7.4	1013	0	0	1013.73	52.07	-0.18	3.87	4.25	15.04	0	0.02	-0.01	-0.01
4/18/2020 21:47	17.2	72	9.3	9.3	1013	0	0	1013.73	56.65	-0.15	1.31	1.76	18.66	0	0.04	0	0
4/18/2020 22:49	16.1	77	7.4	7.4	1013	0	0	1013.73	60.19	-0.07	1.22	1.86	18.51	0	0.03	0	0
4/18/2020 23:50	16.1	72	9.3	9.3	1013	0	0	1013.25	62.16	-0.05	1.81	2.68	17.38	0	0.08	0	0
4/19/2020 0:52	15	76	5.6	5.6	1013	0	0	1013.25	63.49	-0.05	2.84	3.95	15.39	0	0.03	0	0
4/19/2020 1:53	13.9	76	11.1	11.1	1012	0	0	1012.77	64.88	-0.02	4.74	6.36	11.35	0	0.03	0	0
4/19/2020 2:55	12.8	81	11.1	11.1	1012	0	0	1012.77	64.16	-0.05	6.93	8.35	7.7	0.02	0.09	0	0
4/19/2020 3:56	12.8	81	9.3	9.3	1012	0	0	1012.77	64.06	-0.06	8.13	9.35	6.03	0.32	0.02	0	-0.01
4/19/2020 4:58	12.2	87	11.1	11.1	1013	0	0	1013.73	64.3	-0.11	7.84	9.19	6.67	0.33	0.02	-0.01	-0.01
4/19/2020 5:59	12.2	87	13	13	1013	0	0.5	1013.73	66.09	-0.11	6.88	8.51	8.17	0.02	0.06	-0.01	-0.01
4/19/2020 7:01	12.2	81	14.8	14.8	1013	0	0.5	1014.21	67.87	-0.14	5.12	6.82	10.92	0	0.05	-0.01	-0.01
4/19/2020 8:02	12.8	81	13	13	1014	0	0.5	1014.69	73.02	-0.15	2.79	4.05	15.37	0	0.06	0	-0.01
4/19/2020 9:04	16.1	72	13	13	1014	0.3	0.5	1014.69	78.45	-0.13	1.4	2.45	17.77	0	0.06	0	0
4/19/2020 10:05	18.9	67	13	13	1014	0	0	1014.69	84.35	-0.09	1.21	2.35	17.97	0	0.02	0	0
4/19/2020 11:06	18.9	72	22.2	22.2	1014	0	0.5	1013.73	83.71	-0.05	1.26	2.55	17.72	0	0.12	0	0
4/19/2020 12:08	20	68	16.7	16.7	1013	0	1.1	1013.25	79.98	-0.02	2.28	3.97	15.49	0	0.06	0	0
4/19/2020 13:09	20	68	14.8	14.8	1013	0.3	1.1	1013.25	75.75	0.02	5.93	8.18	8.12	0.13	0.04	0	0
4/19/2020 14:10	20	68	14.8	14.8	1012	0	1.3	1012.77	77.68	-0.02	8.7	9.89	4.79	0.53	0.07	0	0
4/19/2020 15:12	20	68	16.7	16.7	1013	0	1.6	1013.25	75.01	-0.01	9.88	10.59	3.69	0.82	0.02	0	0
4/19/2020 16:13	20	68	16.7	16.7	1013	0	0.5	1012.77	80.41	0.03	10.75	10.97	2.92	1.28	0.02	0	0
4/19/2020 17:15	18.9	72	14.8	14.8	1012	0	1.1	1013.25	66.74	-0.02	11.87	11.68	2.08	2.15	0.04	0	0
4/19/2020 18:16	18.9	77	11.1	11.1	1013	0	1.6	1013.73	51.59	-0.13	9.64	10.28	5.78	0	0.01	-0.01	-0.01
4/19/2020 19:18	17.8	77	9.3	9.3	1014	0	1.6	1014.69	50.76	-0.17	5.05	5.97	12.6	0	0	-0.01	-0.01
4/19/2020 20:19	17.8	77	7.4	7.4	1015	0	1.6	1015.65	54.66	-0.18	1.11	1.63	18.93	0	0.02	0	0
4/19/2020 21:21	17.2	87	5.6	5.6	1015	0	1.6	1016.14	58.47	-0.16	0.23	0.77	20.09	0	0.06	0	0
4/19/2020 22:23	17.2	82	9.3	9.3	1015	0	1.6	1015.65	61.57	-0.08	0.16	0.86	20.08	0	0.06	0	0
4/19/2020 23:24	16.1	87	9.3	9.3	1014	0	1.6	1014.69	63.91	-0.03	0.44	1.62	19.27	0	0.04	0	0
4/20/2020 0:26	16.1	82	9.3	9.3	1014	0	1.6	1014.21	65.02	-0.02	1.38	2.91	17.12	0	0.07	0	0
4/20/2020 1:27	15	87	13	13	1014	0	1.6	1013.73	65.65	-0.02	4.06	6.23	11.2	0	0.06	0	0
4/20/2020 2:29	13.9	93	11.1	11.1	1014	0	1.6	1013.73	64.94	-0.05	7.09	9.06	6.35	0.49	0.12	0	0
4/20/2020 3:30	13.9	93	11.1	11.1	1013	0	1.6	1013.73	65.67	-0.05	8.84	10.12	4.46	0.94	0.02	0	-0.01
4/20/2020 4:32	13.9	87	9.3	9.3	1014	0	1.1	1014.69	68.36	-0.09	9.42	10.31	4.18	0.78	0.04	-0.01	-0.01
4/24/2020 13:25	27.2	29	18.5	18.5	1015	0	0	1015.17	61.67	0	13.01	10.92	4.99	0	0.03	0	0
4/24/2020 14:26	26.1	31	16.7	16.7	1015	0	0	1015.65	59.26	-0.04	15.13	12.14	3.02	0.28	0.01	-0.01	0

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	1024	0.3	1.9	1024.32	72.92	-0.14	0.06	0.5	20.14	0	0.02	0	0
4/27/2020 20:20	20	77	18.5	18.5	1024	0.3	2.2	1024.32	75.53	-0.13	0.04	0.5	20.19	0	0.06	0	0
4/27/2020 21:21	20	72	18.5	18.5	1025	0.3	2.2	1025.28	78.66	-0.15	0.06	0.4	20.27	0	0.02	0	0
4/27/2020 22:23	20	72	14.8	14.8	1025	0.3	2.2	1025.28	80.26	-0.11	0.06	0.4	20.26	0	0.01	0	0
4/27/2020 23:24	20	72	20.4	20.4	1025	0.3	2.2	1024.32	81.56	-0.07	0.1	0.49	20.14	0	0.05	0	0
4/28/2020 0:26	20	72	24.1	24.1	1024	0	1.9	1024.32	82.39	-0.06	0.07	0.72	19.98	0	0.03	0	0
4/28/2020 1:27	21.1	64	20.4	20.4	1024	0.3	2.2	1023.84	82.82	-0.05	0.1	0.94	19.72	0	0.07	0	0
4/28/2020 2:29	20	72	16.7	16.7	1024	0.3	2.2	1023.84	82.03	-0.05	0.1	1.23	19.13	0	0.02	0	0
4/28/2020 3:30	20	68	22.2	22.2	1023	0	1.9	1023.84	82.73	-0.06	0.1	1.73	17.87	0	0.01	0	0
4/28/2020 4:32	21.1	64	16.7	16.7	1023	0	1.4	1023.84	83.21	-0.07	0.12	2	16.85	0	0.08	0	0
4/28/2020 5:33	21.1	64	18.5	18.5	1023	0	1.4	1023.84	83.32	-0.09	0.13	2.3	16.09	0	0.03	0	0
4/28/2020 6:35	21.1	64	18.5	18.5	1024	0	1.4	1023.84	83.08	-0.1	0.14	2.19	16.27	0	0.07	0	0
4/28/2020 7:36	20	72	14.8	14.8	1024	0	1.4	1024.32	84.4	-0.11	0.12	1.84	17.24	0	0.03	0	0
4/28/2020 8:37	22.2	60	20.4	20.4	1024	0	1.4	1024.32	86.86	-0.1	0.14	1.53	18.19	0	0.12	0	0
4/28/2020 9:39	22.2	56	22.2	22.2	1024	0	0.3	1024.32	89.6	-0.08	0.11	1.51	18.11	0	0.07	0	0
4/28/2020 10:40	22.8	49	24.1	24.1	1024	0	0.9	1024.32	91.7	-0.06	0.13	1.98	17.21	0	0.12	0	0
4/28/2020 11:42	23.9	46	25.9	25.9	1023	0	2	1022.87	91.55	-0.03	0.14	2.96	15.05	0	0.08	0	0
4/28/2020 12:43	22.8	56	24.1	24.1	1022	0	3.6	1022.39	86.55	0.01	0.75	5.46	9.51	0.42	0.08	0	0
4/28/2020 13:45	22.8	56	27.8	27.8	1021	0	3.6	1021.43	81.94	0.03	4.86	9.76	2.53	2.03	0.02	0	0
4/28/2020 14:46	22.8	60	27.8	27.8	1021	0	3.6	1020.95	76.43	-0.02	7.45	11.17	0.91	2.4	0.03	0	0
4/28/2020 15:48	22.2	60	29.6	29.6	1021	0	0.5	1020.95	72.9	-0.02	8.6	11.63	0.47	3.04	0.02	0	0
4/28/2020 16:49	22.2	60	22.2	22.2	1021	0	1.7	1020.47	72.06	-0.03	9.73	11.98	0.2	3.73	0.04	0	0
4/28/2020 17:51	21.1	72	22.2	22.2	1020	0	4.2	1020.47	70.97	-0.04	10.79	12.33	0	3.77	0.02	0	0
4/28/2020 18:52	21.1	72	13	13	1020	0	4.2	1020.95	72.76	-0.07	11.31	12.34	0.13	4.5	0.08	-0.01	-0.01
4/28/2020 19:54	22.2	68	9.3	9.3	1021	0	4.2	1020.95	74.57	-0.06	11.59	12.29	0.36	4.13	0.06	-0.01	-0.01
4/28/2020 20:55	20	88	5.6	5.6	1021	0.3	7.2	1020.47	74.91	-0.05	11.85	12.41	0.32	4.74	0.17	-0.01	-0.01
4/28/2020 21:57	20	88	5.6	5.6	1020	0	7.2	1020.47	75.29	-0.03	12.74	12.66	0	5.03	0.02	0	0
4/28/2020 22:58	20	88	11.1	11.1	1019	0	4.2	1019.5	76.04	0.03	13.68	13.04	0	4.7	0.02	0	0
4/29/2020 0:00	18.9	88	9.3	9.3	1019	0	4.6	1019.02	77.36	0.03	15.23	13.29	0	3.81	0.06	0	0
4/29/2020 1:01	18.9	88	9.3	9.3	1018	0	4.6	1018.54	78.84	0.02	16.86	13.4	0	3.97	0.08	0	0
4/29/2020 2:03	17.8	93	14.8	14.8	1018	0	4.6	1017.58	79.32	0.05	17.87	13.56	0	4.5	0.08	0.01	0.01
4/29/2020 3:04	18.9	88	11.1	11.1	1017	0	4.6	1017.1	78.96	0.05	19.1	13.66	0	5.27	0.03	0.01	0.01
4/29/2020 4:06	18.9	88	16.7	16.7	1016	0	4.6	1016.14	79.43	0.04	20.34	13.64	0	4.22	0.05	0.01	0.01
4/29/2020 5:07	17.8	87	13	13	1016	0	4.6	1016.14	78.7	0.01	20.96	13.88	0	4.1	0.04	0	0
4/29/2020 6:09	17.8	87	11.1	11.1	1016	0	4.1	1016.14	79.15	0.02	21.53	13.77	0	3.77	0.1	0	0
4/29/2020 7:10	18.9	88	13	13	1016	0	4.1	1016.62	81.97	-0.05	21.94	13.84	0	3.77	0.08	-0.01	-0.01
4/29/2020 8:11	20	82	16.7	16.7	1016	0	4.1	1016.14	85.36	-0.04	21.96	13.74	0	4.14	0.09	-0.01	-0.01
4/29/2020 9:13	21.1	72	14.8	14.8	1016	0	4.1	1015.65	89.3	0.02	22.37	13.59	0	4.02	0.05	0	0
4/29/2020 10:14	22.8	64	18.5	18.5	1015	0	3	1014.69	89.77	0.05	22.61	13.7	0	3.97	0.08	0.01	0.01
4/29/2020 11:16	26.1	50	16.7	16.7	1014	0	2.9	1013.73	89.68	0.07	23.42	13.92	0	4.38	0.06	0.02	0.01
4/29/2020 12:17	27.2	47	25.9	25.9	1013	0	1.6	1012.77	88.88	0.1	23.96	14	0	5.03	0.09	0.02	0.01
4/29/2020 13:18	26.1	57	25.9	25.9	1012	0	0.4	1012.29	86.64	0.08	24.47	14.07	0	5.55	0.09	0.02	0.01
4/29/2020 14:20	25	64	29.6	29.6	1012	0	0.4	1011.8	82.93	0.06	24.81	14.03	0	5.27	0.09	0.01	0.01
4/29/2020 15:21	25	64	29.6	29.6	1011	0	0.4	1011.8	77.21	0.05	24.8	14	0	4.42	0.02	0.01	0.01
4/29/2020 16:23	23.9	68	29.6	29.6	1011	0	0.4	1011.8	74.1	0	24.9	13.95	0	4.3	0.13	0	0
4/29/2020 17:24	23.9	64	33.3	33.3	1011	0.3	0.6	1011.8	70.67	0	25.11	13.96	0	4.3	0.06	0	0
4/29/2020 18:26	23.9	68	31.5	31.5	1011	0	0.4	1011.8	71.12	-0.03	25.12	13.96	0	3.93	0.08	-0.01	0
4/29/2020 19:27	23.9	68	31.5	31.5	1012	0	1.7	1013.25	75.1	-0.03	20.17	12.55	3.6	0.06	0.07	-0.01	0
4/29/2020 20:29	21.1	77	27.8	27.8	1013	0.3	1.9	1013.25	73.71	-0.05	16.7	10.53	6.3	0	0.02	-0.01	-0.01
4/29/2020 21:31	20	82	18.5	18.5	1013	0.3	0.5	1012.77	72.69	-0.02	17.89	11.13	5.05	0	0.06	0	0
4/29/2020 22:32	20	77	13	13	1012	0	0	1010.36	74.83	0.13	19.99	12.1	2.97	0.22	0.07	0.03	0.02
4/29/2020 23:34	20	77	11.1	11.1	1010	0	1.3	1009.4	76.96	0.11	23.08	13.12	0.82	2.28	0.06	0.03	0.01
4/30/2020 0:35	18.9	77	7.4	7.4	1009	0	1.3	1008.44	77.11	0.11	25.18	13.37	0.05	3.53	0.12	0.03	0.01
4/30/2020 1:37	18.9	77	7.4	7.4	1008	0	1.3	1007.95	77.35	0.09	26.2	13.43	0	4.14	0.04	0.02	0.01

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 (mBTOC)	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 E Historic Analytical Summary Tables

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Table T1 - Groundwater Gauging Data

Location Code	Date	Easting	Northing	Top of Casing Elevation (mAHD)	Well Depth (mbTOC)	Screen Interval (mbgl)	Standing Water Level (mbTOC)	Groundwater Elevation (mAHD)	Comments
MW1	6/09/2019	327590.0	6232196.1	3.040	--	1.5-4.5	2.261	0.779	--
MW2	6/09/2019	327626.3	6232340.7	2.150	--	1.0-4.0	1.561	0.589	--
MW3	6/09/2019	327803.2	6232444.4	2.845	--	1.5-4.5	2.211	0.634	--
MW4	6/09/2019	327830.2	6232335.1	4.615	5.498	2.5-5.5	3.851	0.764	--
MW5	6/09/2019	327874.5	6232135.5	2.610	--	1.5-4.5	1.776	0.834	--

Notes
mAHD = metres Australian Height Datum
m = metres
mbtoc = metres below top of casing
ppm = parts per million
-- = No Available

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Table T2 - Water Quality Parameters

Parameter		Approximate Purged Volume	Dissolved Oxygen (Field)	Conductivity (Field)	Total Dissolved Solids (TDS) [1,2]	pH (Field)	Redox (Field)	Redox Potential (Eh) [3]	Temperature (Field)	Comments
Units		(L)	ppm	uS/cm	mg/L	pH units	mV	mV	°C	
Well ID	Date									
MW1	6/09/2019	5.0	0.36	1585	951	6.72	-0.5	205.5	19.5	Clear, sulfur odour, no sheen.
MW2	6/09/2019	6.0	0.31	1959	1,175	6.52	-103.8	102.2	18.1	Clear, strong sulfur odour, no sheen.
MW3	6/09/2019	6.0	0.47	5226	3,136	6.72	-60.4	145.6	17.2	Clear, no odour, no sheen.
MW4	6/09/2019	5.0	0.25	4443	2,666	6.58	-5.7	200.3	19.3	Clear, no odour, no sheen.
MW5	6/09/2019	5.0	0.65	3427	2,056	6.63	-10.0	196.0	18.3	Clear, no odour, no sheen.

Notes
(1) TDS = Total Dissolved Solids
(2) TDS approximated as Electrical Conductivity x 0.6
(3) Redox Potential (Er) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 206$ mV (based on a groundwater temperature of 20.0°C)
L = Litres
ppm = parts per million
uS/cm = microsiemens per centimetre
mg/L = milligrams per litre
mV = millivolts
°C = degrees Celsius

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AECOM

Client Name: Toyota Australia Pty Ltd
Project Name: Phase 1 and 2 ESA
Project No.: 60613564

Table T3 - Soil Analytical Results

			Moisture Content	Asbestos				TRH					BTEXN							PAH																		
			Moisture Content	Asbestos Detected	Asbestos (Trace)	Asbestos Type	Synthetic Mineral Fibre	C6 - C10 Fraction minus BTEX (F1)	C10 - C16 Fraction minus Naphthalene (F2)	C16 - C34 Fraction	C34 - C40 Fraction	Total TRH Fraction (sum)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)	Benzo(b+j)fluoranthene
	LOR Range		1.0	0.1	n	-	0.1	10	50	100	100	100	0.2	0.5	0.5	0.5	0.5	0.5	0.2	1	0.5 - 1	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5 - 0.8	0.5	0.5	0.5 - 0.8
	Units		%	g/kg	Fibres	-	g/kg	g/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
NEPC 2013 HIL D - Commercial/Industrial[1]																																			4,000	40	
NEPC 2013 HSL D - Sand 0 to <1 m[1]								260		NL			3	NL	NL			230		NL	NL																
NEPC 2013 HSL D - Sand 1 to <2 m[1]								370		NL			3	NL	NL			NL		NL	NL																
NEPC 2013 HSL D - Sand 2 to <4 m[1]								630		NL			3	NL	NL			NL		NL	NL																
CRC CARE 2011 MW - Sand: 0-<2m[1]							NL		NL				77	NL	NL			NL		NL	NL																
CRC CARE 2011 MW - Sand: 2-<4m[1]							NL		NL				165	NL	NL			NL		NL	NL																
CRC CARE 2011 HSLs for Direct Contact - HSL D[1]							26,000		20,000		27,000	38,000	430	99,000	27,000			81,000		11,000	11,000																
CRC CARE 2011 HSLs for Direct Contact - MW[1]							62,000		43,000		45,000	120,000	1,100	120,000	85,000			130,000		29,000	29,000																
NEPC 2013 Management Limits - Commercial and Industrial (Coarse)[1]							700		1,700		3,500	10,000																									
NEPC 2013 ESL - Commercial and Industrial[1]																				370	370																
NEPC 2013 ESL - Commercial and Industrial (Coarse)[1]								215		170	1,700	3,300		75	135	165			180															1.4			
Sample Location	Date Sampled	Sample ID	Depth Ranges (m)	Work Order	Sample Type																																	
BH1/MW1	2/09/2019	MW1_0.25	0.25	ES1928813	N	16.9	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH1A/MW1A	2/09/2019	MW1A_0.25_190902	0.25	ES1928813	N	27.5	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	2/09/2019	MW1A_2.5_190902	2.50	ES1928813	N	22.1	--	--	--	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH2	5/09/2019	BH02_0.3_0509/19	0.30	ES1928810	N	5.9	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH02_3.0_0509/19	3.00	ES1928810	N	16.1	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH3/MW2	2/09/2019	MW2_0.20	0.20	ES1928813	N	7.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH4	5/09/2019	BH04_0.5_0509/19	0.50	ES1928810	N	8.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH04_1.2_0509/19	1.20	ES1928810	N	21.4	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH5	9/09/2019	BH5_0.50	0.50	ES1922226	N	12.8	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	9/09/2019	BH5_1.20	1.20	ES1922226	N	10.1	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH6/MW3	3/09/2019	MW3_0.90	0.90	ES1928813	N	8.9	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH7	5/09/2019	BH07_0.1_0509/19	0.10	ES1928810	N	19.1	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH07_1.0_0509/19	1.00	ES1928810	N	12.6	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH8	9/09/2019	BH8_0.50	0.50	ES1922226	N	19.1	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	9/09/2019	BH8_3.0	3.00	ES1922226	N	22.9	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	9/09/2019	QC202	3.00	ES1922226	FD	20.9	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH9	9/09/2019	BH9_0.4	0.40	ES1922226	N	4.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH10	9/09/2019	BH10_0.4	0.40	ES1922226	N	6.9	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH11	13/09/2019	SB11_0.1	0.10	ES1927773	N	21.4	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	13/09/2019	SB11_0.2	0.20	ES1927773	N	--	No	No	-	No	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	13/09/2019	SB11_1.4	1.40	ES1927773	N	8.1	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH12	13/09/2019	SB12_0.1	0.10	ES1927773	N	4.9	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	13/09/2019	QC103_13.9.19	0.10	ES1927773	FD	3.8	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	13/09/2019	SB12_1.2	1.20	ES1927773	N	11.8	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH13	9/09/2019	BH13_3.0	3.00	ES1922226	N	20.3	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH13A	9/09/2019	BH13_A_0.3	0.30	ES1922226	N	8.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	9/09/2019	BH13A_2.8	2.80	ES1922226	N	23.7	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	9/09/2019	QC201	2.80	ES1922226	FD	24.2	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH14/MW4	3/09/2019	MW4_0.10	0.10	ES1928813	N	20.9	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	3/09/2019	MW4_1.60	1.60	ES1928813	N	10.9	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH15	5/09/2019	BH15_0.1_0509/19	0.10	ES1928810	N	3.1	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH15_3.0_0509/19	3.00	ES1928810	N	29.0	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	QC102_0509/19	3.00	ES1928812	FD	40.7	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	100	100	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH16	4/09/2019	BH16_0.30	0.30	ES1928813	N	14.5	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH16_3.00	3.00	ES1928813	N	43.3	--	--	-	--	--	< 10	< 10	< 50	< 50	130	210	340	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	QC205	3.00	ES1928813	FD	45.0	--	--	-	--	--	< 10	< 10	< 50	< 50	200	290	490	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH17	5/09/2019	BH17_1.0_0509/19	1.00	ES1928810	N	10.7	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH17_2.4_0509/19	2.40	ES1928810	N	59.5	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 0.5	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
BH18	4/09/2019	BH18_0.30	0.30	ES1928813	N	9.5	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH18_2.00	2.00	ES1928813	N	29.0	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	QC206_0509/19	2.00	ES1928812	FD	22.2	--	--	-	--	--	< 10	< 10	--	--	--	--	--	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	--	--	--	--	--	--	--	--	--	--	--	--	--
	4/09/2019	QC206_040919	2.00	67619	FT	23	--	--	-	--	--	--	--	< 50	--	< 100	< 100	--	--	--	--	< 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	< 0.5
BH19	5/09/2019	BH19_0.1_0509/19	0.10	ES1928810	N	25.8	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	5/09/2019	BH19_3.0_0509/19	3.00	ES1928810	N	47.8	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH20/MW5	4/09/2019	MW5_2.00	2.00	ES1928813	N	21.1	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH21	4/09/2019	BH21_0.50	0.50	ES1928813	N	17.9	No	No	-	No	No	< 10	< 10	< 50	< 50	120	170	290	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH21_3.00	3.00	ES1928813	N	46.2	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH22	4/09/2019	BH22_1.00	1.00	ES1928813	N	18.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH22_3.00	3.00	ES1928813	N	26.6	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	QC100	3.00	ES1928813	FD	28.4	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH23	4/09/2019	BH23_0.30	0.30	ES1928813	N	20.2	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	QC101	0.30	ES1928813	FD	19.7	--	--	-	--	--	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH23_3.00	3.00	ES1928813	N	37.0	No	No	-	No	No	< 10	< 10	< 50	< 50	< 100	< 100	< 50	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
BH24	4/09/2019	BH24_0.3	0.30	ES1928813	N	33.2	No	No	-	No	No	< 10	< 10	< 50	< 50	330	160	490	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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
	4/09/2019	BH24_PACM	0.30	ES1928813	N	25.8	Yes	N/A	Ch + Am + Cr	No	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4/09/2019	BH24_2.40	2.40	ES1928813	N	25.8	--	--	-	--	--	< 10	< 10	< 50	< 50	130	150	280	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 1	< 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

Legend
LOR: Limit of reporting
Sample Type: N - Primary, FD - Intra-laboratory duplicate, FT - Inter-laboratory duplicate
BTEXN: Benzene, toluene, ethylbenzene, xylenes and naphthalene
PAHs: Polycyclic aromatic hydrocarbons
-- Not analysed / not calculated
%: Percent
mg/kg: milligrams per kilogram
ppb: micrograms per litre (ppb)
Asbestos Type: Ch - chrysotile, Am - Amosite, Cr - crocidolite.

Investigation Levels

[1] The Amended Assessment of Site Contamination (ASC). National Environment Protection Measure. (NEPM) (NEPC, 2013) Health Investigation Levels (HILs) Soil - Commercial/Industrial
[2] The Amended NEPM 2013 (NEPC, 2013) Soil Health Screening Levels (HSLs) for vapour intrusion - HSL D Commercial/Industrial
[3] Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report no. 10 - Soil HSLs for Vapour Intrusion – Intrusive Maintenance Worker (Shallow Trench)
[4] CRC CARE Technical Report no. 10 - Soil HSLs for Direct Contact, HSL-D Commercial/Industrial
[5] CRC CARE Technical Report no. 10 - Soil HSLs for Direct Contact, Intrusive Maintenance Worker
[6] The Amended NEPM 2013 (NEPC, 2013), Management Limits - Commercial and Industrial
[7] The Amended NEPM 2013 (NEPC, 2013) Soil Ecological Investigation Levels (EILs) - Commercial and Industrial
[8] The Amended NEPM 2013 (NEPC, 2013) Soil Ecological Screening Levels (ESLs) for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil - Commercial and

AECOM

Client Name: Toyota Australia Pty Ltd
Project Name: Phase 1 and 2 ESA
Project No.: 60613564

Table T3 - Soil Analytical Results

| | | | | | | Metals | | | | | | | | | | | | | | | | | | OCPs | | | | | | | | | | | | | | | | | |

AECOM

Client Name: Toyota Australia Pty Ltd
Project Name: Phase 1 and 2 ESA
Project No.: 60613564

Table T3 - Soil Analytical Results

					OPPs																										PAHs															PCBs	Oxygenated Compounds				Sulfonated Compounds	Trihalomethanes				Fumigants									
					Bolstar/Sulprofos	Bromophos-ethyl	Bromophos-methyl	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Dioxathion	Ethion	Ethoprophos	Fenamiphos	Fenchlorphos	Fenitrothion	Fenthion	Malathion	Methidathion	Mevinphos	Monocrotophos	Naled	Omethoate	Phorate	Pirimiphos-ethyl	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate	Vamidothion	Benzo(a)pyrene TEQ (lower bound)	Benzo(a)pyrene TEQ (medium bound)	Benzo(a)pyrene TEQ (upper bound)	Total Polycyclic Aromatic Hydrocarbons	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	2-Methylnaphthalene	Pyrene	Total Polychlorinated biphenyls	Total Phenols	Total Acetate	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	2-Hexanone (MBK)	Carbon disulfide	Chloroform	Bromodichloromethane	Dibromochloromethane	Bromoform	1,3-Dichloropropene (TCD)	1,2-Dichloroethane	1,2-Dichloropropane	trans-1,2-Dichloroethylene	cis-1,2-Dichloropropylene
LOR Range					0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	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	0.1	5	5	5	5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Units					mg/kg	mg/kg	mg/kg

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Table T3 - Soil Analytical Results

| | | | | | Halogenated Aliphatics | | | | |

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Table T4 - Groundwater Analytical Results

				TRH							BTEXN								Metals							
				C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C10 - C16 Fraction minus Naphthalene (F2)	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Benzene	Toluene	Ethylbenzene	m&p-Xylene	o-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	Arsenic	Chromium	Lead	Zinc	Cadmium	Copper	Nickel	Mercury
			LOR Range	0.02	0.02	0.1	0.1	0.1	0.1	0.1	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.005	0.001	0.001	0.001	0.005	0.0001	0.001	0.001	0.0001
			Units	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
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]					6		NL				5	NL	NL			NL		NL								
NHMRC 2017 - ADWG[2]											0.001	0.8	0.3			0.6			0.05	0.01		0.002	2	0.02	0.001
GMRRW 2008 - Managing Risk in Recreational Waters[3]											0.01	8	3			6			0.5	0.1		3.02	20	0.2	0.01
WHO, 2008 Petroleum Products in Drinking Water[4]				150		0.9		0.9	0.9																	
ANZG 95% Marine Water[5]											700							0.07	0.024*	0.0044	0.0044	0.015	0.0055	0.0013	0.07	0.0004
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type																						
MW1	6/09/2019	MW01_060919	ES1928792	N	**0.06**	**0.06**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.019**	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	**0.004**	< 0.0001
MW2	6/09/2019	MW02_060920	ES1928792	N	**0.04**	**0.04**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.007**	< 0.001	< 0.001	**0.006**	< 0.0001	< 0.001	< 0.001	< 0.0001
	6/09/2019	QC100_060919	ES1928792	FD	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.007**	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
MW3	6/09/2019	MW03_060921	ES1928792	N	**0.03**	**0.03**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.004**	< 0.001	< 0.001	**0.007**	< 0.0001	< 0.001	< 0.001	< 0.0001
MW4	6/09/2019	MW04_060922	ES1928792	N	**0.04**	**0.04**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.009**	< 0.001	< 0.001	**0.005**	< 0.0001	< 0.001	**0.001**	< 0.0001
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.003**	**0.001**	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] **National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)**

[2] **National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017**

[3] **Guidelines for Managing Risk in Recreational Waters (GMRRW, 2008) recommends applying a factor of ten to the ADWG for the assessment of the acceptability for recreational water quality use.**

[4] **WHO, 2008. Petroleum Products in Drinking Water, World Health Organisation (multiplied by 10)**

[5] **Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality 2018. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia - Marine Aquatic Ecosystems**

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Table T4 - Groundwater Analytical Results

					PAHs																
					Naphthalene	Total Xylenes	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b,j,k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)	Benzo(b+j)fluoranthene
				LOR Range	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0005	0.001	0.001	0.001	0.0005	0.0008	0.001
				Units	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
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]					NL																	
NHMRC 2017 - ADWG[2]																0.00001						
GMRRW 2008 - Managing Risk in Recreational Waters[3]																0.0001						
WHO, 2008 Petroleum Products in Drinking Water[4]																						
ANZG 95% Marine Water[5]																						
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type																		
MW1	6/09/2019	MW01_060919	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW2	6/09/2019	MW02_060920	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	6/09/2019	QC100_060919	ES1928792	FD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	6/09/2019	MW03_060921	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW4	6/09/2019	MW04_060922	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] **National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)**

[2] **National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017**

[3] **Guidelines for Managing Risk in Recreational Waters (GMRRW, 2008) recommends applying a factor of ten to the ADWG for the assessment of the acceptability for recreational water quality use.**

[4] **WHO, 2008. Petroleum Products in Drinking Water, World Health Organisation (multiplied by 10)**

[5] **Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality 2018. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia - Marine Aquatic Ecosystems**

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Table T4 - Groundwater Analytical Results

					Phenolic Compounds												
					Phenol	2-Chlorophenol	2-Methylphenol	3, 4-Methylphenol	2-Nitrophenol	2,4-Dimethylphenol	2,4-Dichlorophenol	2,6-Dichlorophenol	4-Chloro-3-Methylphenol	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	Pentachlorophenol
				LOR Range	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
				Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]																	
NHMRC 2017 - ADWG[2]						0.3					0.2			0.02			
GMRRW 2008 - Managing Risk in Recreational Waters[3]						3					2			0.2			
WHO, 2008 Petroleum Products in Drinking Water[4]																	
ANZG 95% Marine Water[5]					0.4												0.022
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type													
MW1	6/09/2019	MW01_060919	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW2	6/09/2019	MW02_060920	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
	6/09/2019	QC100_060919	ES1928792	FD	--	--	--	--	--	--	--	--	--	--	--	--
MW3	6/09/2019	MW03_060921	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW4	6/09/2019	MW04_060922	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)

[2] National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017

[3] Guidelines for Managing Risk in Recreational Waters (GMRRW, 2008) recommends applying a factor of ten to the ADWG for the assessment of the acceptability for recreational water quality use.

[4] WHO, 2008. Petroleum Products in Drinking Water, World Health Organisation (multiplied by 10)

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Table T5 - QA/QC Analytical Results

					Total Recoverable Hydrocarbons							BTEXN								Metals							
					C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C10 - C16 Fraction minus Naphthalene (F2)	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Benzene	Toluene	Ethylbenzene	m&p-Xylene	o-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	Arsenic	Chromium	Lead	Zinc	Cadmium	Copper	Nickel	Mercury
				LOR Range	0.02	0.02	0.1	0.1	0.1	0.1	0.1	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.005	0.001	0.001	0.001	0.005	0.0001	0.001	0.001	0.0001
				Units	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
Sample Location	**Date Sampled**	**Sample ID**	**Work Order**	**Sample Type**																							
Intrusive Works																											
QAQC	2/09/2019	QC300	ES1928813	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	2/09/2019	QC400	ES1928813	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	3/09/2019	QC301	ES1928813	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	3/09/2019	QC401	ES1928813	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	5/09/2019	QC303_050919	ES1928812	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	5/09/2019	QC403_050919	ES1928812	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	13/09/2019	QC300_13.9.19	ES1929773	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	13/09/2019	QC400_13.9.19	ES1929773	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
GME																											
QAQC	6/09/2019	QC304_060919	ES1928792	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	6/09/2019	QC404_060919	ES1928792	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001

Legend
QA/QC: Quality assurance/Quality control
LOR: Limit of reporting
Sample Type: RB - Rinsate Blank, FB - Field Blank
ug/L: micrograms per litres
BTEXN: Benzene, toluene, ethylbenzene, xylenes and naphthalene
PAHs: Polycyclic aromatic hydrocarbons

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Table T5 - QA/QC Analytical Results

					PAHs																
					Naphthalene	2-methylnaphthalene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b+j)fluoranthene	Benzo(k)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)	Benzo(b+j)fluoranthene
				LOR Range	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0005	0.001	0.001	0.001	0.0005	0.0005	0.001
				Units	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
Sample Location	**Date Sampled**	**Sample ID**	**Work Order**	**Sample Type**																		
Intrusive Works																						
QAQC	2/09/2019	QC300	ES1928813	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	2/09/2019	QC400	ES1928870	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/09/2019	QC301	ES1928813	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	3/09/2019	QC401	ES1928813	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/09/2019	QC303_050919	ES1928812	RB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/09/2019	QC403_050919	ES1928812	FB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	13/09/2019	QC300_13.9.19	ES1929773	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	13/09/2019	QC400_13.9.19	ES1929773	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GME																						
QAQC	6/09/2019	QC304_060919	ES1928792	RB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/09/2019	QC404_060919	ES1928792	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Legend
QA/QC: Quality assurance/Quality control
LOR: Limit of reporting
Sample Type: RB - Rinsate Blank, FB - Field Blank
ug/L: micrograms per litres
BTEXN: Benzene, toluene, ethylbenzene, xylenes and naphthalene
PAHs: Polycyclic aromatic hydrocarbons

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Table T1 - Groundwater Gauging Data

Location Code	Date	Easting	Northing	Top of Casing Elevation (mAHD)	Well Depth (mbTOC)	Screen Interval (mbgl)	Standing Water Level (mbTOC)	Groundwater Elevation (mAHD)	Comments
MW1	6/09/2019	327590.0	6232196.1	3.040	--	1.5-4.5	2.261	0.779	--
MW2	6/09/2019	327626.3	6232340.7	2.150	--	1.0-4.0	1.561	0.589	--
MW3	6/09/2019	327803.2	6232444.4	2.845	--	1.5-4.5	2.211	0.634	--
MW4	6/09/2019	327830.2	6232335.1	4.615	5.498	2.5-5.5	3.851	0.764	--
MW5	6/09/2019	327874.5	6232135.5	2.610	--	1.5-4.5	1.776	0.834	--

Notes
mAHD = metres Australian Height Datum
m = metres
mbtoc = metres below top of casing
ppm = parts per million
-- = No Available

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Table T2 - Water Quality Parameters

Parameter		Approximate Purged Volume	Dissolved Oxygen (Field)	Conductivity (Field)	Total Dissolved Solids (TDS) [1,2]	pH (Field)	Redox (Field)	Redox Potential (Eh) [3]	Temperature (Field)	Comments
Units		(L)	ppm	uS/cm	mg/L	pH units	mV	mV	°C	
Well ID	Date									
MW1	6/09/2019	5.0	0.36	1585	951	6.72	-0.5	205.5	19.5	Clear, sulfur odour, no sheen.
MW2	6/09/2019	6.0	0.31	1959	1,175	6.52	-103.8	102.2	18.1	Clear, strong sulfur odour, no sheen.
MW3	6/09/2019	6.0	0.47	5226	3,136	6.72	-60.4	145.6	17.2	Clear, no odour, no sheen.
MW4	6/09/2019	5.0	0.25	4443	2,666	6.58	-5.7	200.3	19.3	Clear, no odour, no sheen.
MW5	6/09/2019	5.0	0.65	3427	2,056	6.63	-10.0	196.0	18.3	Clear, no odour, no sheen.

Notes
(1) TDS = Total Dissolved Solids
(2) TDS approximated as Electrical Conductivity x 0.6
(3) Redox Potential (Er) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 206$ mV (based on a groundwater temperature of 20.0°C)
L = Litres
ppm = parts per million
uS/cm = microsiemens per centimetre
mg/L = milligrams per litre
mV = millivolts
°C = degrees Celsius

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Table T3 - Soil Analytical Results

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Table T3 - Soil Analytical Results

| | | | | | Metals | | | | | | | OCPs | | | | | | |

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Table T3 - Soil Analytical Results

						OPPs																										PAHs															PCBs	Oxygenated Compounds				Sulfonated Compounds	Trihalomethanes				Fumigants									
						Bolstar/Sulprofos	Bromophos-ethyl	Bromophos-methyl	Carbophenothion	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-S-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Ethoprop	Fenamiphos	Fenchlorphos	Fenitrothion	Fenthion	Malathion	Methidathion	Mevinphos	Monocrotophos	Naled	Omethoate	Phorate	Pirimiphos-methyl	Profenofos	Prothiofos	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate	Vamidothion	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Total Polychlorinated biphenyls	Vinyl Acetate	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	2-Hexanone (MBK)	Carbon disulfide	Chloroform	Bromodichloromethane	Dibromochloromethane	Bromoform	1,2-Dibromoethane (EDB)	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	trans-1,2-Dichloroethylene	cis-1,2-Dichloroethylene
LOR Range						0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	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	0.5	0.5	0.5	0.5	0.1	5	5	5	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
Units						mg/kg	mg/kg	mg/kg

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Table T3 - Soil Analytical Results

| | | | | Halogenated Aliphatics | | | |

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Table T4 - Groundwater Analytical Results

				TRH							BTEXN								Metals							
				C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C10 - C16 Fraction minus Naphthalene (F2)	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Benzene	Toluene	Ethylbenzene	m&p-Xylene	o-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	Arsenic	Chromium	Lead	Zinc	Cadmium	Copper	Nickel	Mercury
			LOR Range	0.02	0.02	0.1	0.1	0.1	0.1	0.1	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.005	0.001	0.001	0.001	0.005	0.0001	0.001	0.001	0.0001
			Units	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
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]					6		NL				5	NL	NL			NL		NL								
NHMRC 2017 - ADWG[2]											0.001	0.8	0.3			0.6				0.05	0.01		0.002	2	0.02	0.001
GMRRW 2008 - Managing Risk in Recreational Waters[3]											0.01	8	3			6				0.5	0.1		0.02	20	0.2	0.01
WHO, 2008 Petroleum Products in Drinking Water[4]				150		0.9		0.9	0.9																	
ANZG 95% Marine Water[5]											700							0.07	0.024*	0.0044	0.0044	0.015	0.0055	0.0013	0.07	0.0004
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type																						
MW1	6/09/2019	MW01_060919	ES1928792	N	**0.06**	**0.06**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.019**	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	**0.004**	< 0.0001
MW2	6/09/2019	MW02_060920	ES1928792	N	**0.04**	**0.04**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.007**	< 0.001	< 0.001	**0.006**	< 0.0001	< 0.001	< 0.001	< 0.0001
	6/09/2019	QC100_060919	ES1928792	FD	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.007**	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
MW3	6/09/2019	MW03_060921	ES1928792	N	**0.03**	**0.03**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.004**	< 0.001	< 0.001	**0.007**	< 0.0001	< 0.001	< 0.001	< 0.0001
MW4	6/09/2019	MW04_060922	ES1928792	N	**0.04**	**0.04**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.009**	< 0.001	< 0.001	**0.005**	< 0.0001	< 0.001	**0.001**	< 0.0001
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	**0.003**	**0.001**	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] **National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)**

[2] **National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017**

[3] **Guidelines for Managing Risk in Recreational Waters (GMRRW, 2008) recommends applying a factor of ten to the ADWG for the assessment of the acceptability for recreational water quality use.**

[4] **WHO, 2008. Petroleum Products in Drinking Water, World Health Organisation (multiplied by 10)**

[5] **Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality 2018. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia - Marine Aquatic Ecosystems**

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Table T4 - Groundwater Analytical Results

					PAHs																
					Naphthalene	Total Xylenes	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b,j,k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)	Benzo(b+j)fluoranthene
				LOR Range	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0005	0.001	0.001	0.001	0.0005	0.0008	0.001
				Units	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
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]					NL																	
NHMRC 2017 - ADWG[2]																0.00001						
GMRRW 2008 - Managing Risk in Recreational Waters[3]																0.0001						
WHO, 2008 Petroleum Products in Drinking Water[4]																						
ANZG 95% Marine Water[5]																						
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type																		
MW1	6/09/2019	MW01_060919	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW2	6/09/2019	MW02_060920	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	6/09/2019	QC100_060919	ES1928792	FD	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	6/09/2019	MW03_060921	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW4	6/09/2019	MW04_060922	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)

[2] National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017

[3] Guidelines for Managing Risk in Recreational Waters (GMRRW, 2008) recommends applying a factor of ten to the ADWG for the assessment of the acceptability for recreational water quality use.

[4] WHO, 2008. Petroleum Products in Drinking Water, World Health Organisation (multiplied by 10)

[5] Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality 2018. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia - Marine Aquatic Ecosystems

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Table T4 - Groundwater Analytical Results

					Phenolic Compounds												
					Phenol	2-Chlorophenol	2-Methylphenol	3, 4-Methylphenol	2-Nitrophenol	2,4-Dimethylphenol	2,4-Dichlorophenol	2,6-Dichlorophenol	4-Chloro-3-Methylphenol	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	Pentachlorophenol
				LOR Range	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
				Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
NEPM 2013 GW HSLs for Vapour Intrusion - HSL D (Sand) 2 m to <4 m[1]																	
NHMRC 2017 - ADWG[2]						0.3					0.2			0.02			
GMRRW 2008 - Managing Risk in Recreational Waters[3]						3					2			0.2			
WHO, 2008 Petroleum Products in Drinking Water[4]																	
ANZG 95% Marine Water[5]					0.4												0.022
Sample Location	Date Sampled	Sample ID	Work Order	Sample Type													
MW1	6/09/2019	MW01_060919	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW2	6/09/2019	MW02_060920	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
	6/09/2019	QC100_060919	ES1928792	FD	--	--	--	--	--	--	--	--	--	--	--	--
MW3	6/09/2019	MW03_060921	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW4	6/09/2019	MW04_060922	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002
MW5	6/09/2019	MW05_060923	ES1928792	N	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002

Legend:
-- Not analysed / not calculated
LOR = Limit of Reporting
Sample Type: N = Primary, FD = Intra-laboratory Duplicate
ug/l = micrograms per litre
BTEXN = Benzene, Toluene, Ethylbenzene, Total Xylenes and Naphthalene
PAHs = Polycyclic Aromatic Hydrocarbons
*Guideline used for Freshwater ecosystems

Investigation Levels

[1] National Environmental Protection Council (NEPC) 2013 Amendment of the National Environmental Protection Measure (NEPM) 1999. Soil Health Screening Levels (HSL) D and C for Groundwater Vapour Intrusion - Commercial/Industrial (Sand)

[2] National Health and Medical Research Council (NHMRC), National Water Quality Management Strategy, Australian Drinking Water Guidelines 6, 2011, Version 3.4, Updated October 2017

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AECOM

Client Name: Toyota Australia Pty Ltd
Project Name: Phase 1 and 2 ESA
Project No: 60613064

Table T5 - QA/QC Analytical Results

					Total Recoverable Hydrocarbons							BTEXN								Metals								
					C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	>C10 - C16 Fraction minus Naphthalene (F2)	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)	Benzene	Toluene	Ethylbenzene	m&p-Xylene	o-Xylene	Total Xylenes	Sum of BTEX	Naphthalene	Arsenic	Chromium	Lead	Zinc	Cadmium	Copper	Nickel	Mercury
				LOR Range	0.02	0.02	0.1	0.1	0.1	0.1	0.1	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.005	0.001	0.001	0.001	0.005	0.0001	0.001	0.001	0.0001
				Units	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
Sample Location	**Date Sampled**	**Sample ID**	**Work Order**	**Sample Type**																								
Intrusive Works																												
QAQC	2/09/2019	QC300	ES1928813	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	2/09/2019	QC400	ES1928813	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	3/09/2019	QC301	ES1928813	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	3/09/2019	QC401	ES1928813	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	5/09/2019	QC303_050919	ES1928812	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	5/09/2019	QC403_050919	ES1928812	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
	13/09/2019	QC300_13.9.19	ES1929773	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	13/09/2019	QC400_13.9.19	ES1929773	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	--	--	--	--	--	--	--	--
GME																												
QAQC	6/09/2019	QC304_060919	ES1928792	RB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001
	6/09/2019	QC404_060919	ES1928792	FB	< 0.02	< 0.02	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.005	< 0.0001	< 0.001	< 0.001	< 0.0001

Legend
QA/QC: Quality assurance/Quality control
LOR: Limit of reporting
Sample Type: RB - Rinsate Blank, FB - Field Blank
ug/L: micrograms per litres
BTEXN: Benzene, toluene, ethylbenzene, xylenes and naphthalene
PAHs: Polycyclic aromatic hydrocarbons

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Table T5 - QA/QC Analytical Results

					PAHs																
					Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b+j)fluoranthene	Benzo(k)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)	Benzo(b+j)fluoranthene
				LOR Range	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0005	0.001	0.001	0.001	0.0005	0.0005	0.001
				Units	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
Sample Location	**Date Sampled**	**Sample ID**	**Work Order**	**Sample Type**																		
Intrusive Works																						
QAQC	2/09/2019	QC300	ES1928813	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	2/09/2019	QC400	ES1928813	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	3/09/2019	QC301	ES1928813	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	3/09/2019	QC401	ES1928813	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/09/2019	QC303_050919	ES1928812	RB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/09/2019	QC403_050919	ES1928812	FB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	13/09/2019	QC300_13.9.19	ES1929773	RB	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.001	< 0.001	< 0.001	< 0.0005	< 0.0005	< 0.001
	13/09/2019	QC400_13.9.19	ES1929773	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GME																						
QAQC	6/09/2019	QC304_060919	ES1928792	RB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	6/09/2019	QC404_060919	ES1928792	FB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Legend
QA/QC: Quality assurance/Quality control
LOR: Limit of reporting
Sample Type: RB - Rinsate Blank, FB - Field Blank
ug/L: micrograms per litres
BTEXN: Benzene, toluene, ethylbenzene, xylenes and naphthalene
PAHs: Polycyclic aromatic hydrocarbons

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RESULTS OF QUALITATIVE IDENTIFICATION OF ASBESTOS AND OTHER FIBRES

Contract/Report No: 2859906-ID1.0
Client: Toyota Motor Corporation Australia Limited
Sampling Location: Corner Captain Cook Drive and Gannons Road, Caringbah
Sampled By: Nick Bennett
Date Sampled: 8 August 2018
Test Method: Polarised light microscopy, dispersion staining in accordance with AS4964-2004 Method for qualitative identification of asbestos in bulk samples and Internal Procedure No. P-S900-LAB-003

Analyst: Sam Hayes
Date: 24/8/18
Signatory:

NATA Accreditation Number: 19586
Accredited for compliance with ISO/IEC 17025 - Testing

Sample Number	Location	Sample Description	Weight (grams)	Result
S212736	B46122 – Thiess Building, Plant Room 2, floor south.	Dust.	0.1	No asbestos detected. Organic fibre detected.
S212737	B46121 – Thiess Building, Plant Room 2, floor west.	Dust.	0.1	No asbestos detected. Organic fibre detected.
S212738	B46120 – TPC Warehouse, Central Office, under carpet.	Black adhesive.	0.2	No asbestos detected.
S212739	B46117 – TPC Loading Dock, Electric Switch Room, trench.	Dust.	0.2	No asbestos detected. Organic fibre detected.
S212740	B46119 – TPC Loading Dock, Fire Pump Room, floor.	Dust.	0.1	No asbestos detected. Organic fibre detected.
S212741	B46118 – TPC Loading Dock, Engine Room, floor.	Dust.	0.2	No asbestos detected. Synthetic mineral fibre detected.
S212742	B46116 – TPC Loading Dock, Generator Room, floor.	Dust.	0.1	No asbestos detected. Organic fibre detected.
S212743	B46115 – Toyota House, Lift Motor Room, rooftop.	Brake lining.	0.3	No asbestos detected. Synthetic mineral fibre detected.

Limit of Detection – 0.1 g/kg.

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Bureau Veritas Asset Integrity and Reliability Services Australia Pty Ltd
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When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insuffient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI-EN38 (in the absence of specified USEPA limits).
Abbreviations: ***CAS number*** = *Chemical Abstract Services number,* ***LOR*** = *Limit of Reporting.* ***# Indicates a raised LOR, * Indicates failed Surrogate Recoveries.***
When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes.

Analytical Results

				Client Sample ID :				
				Sample Matrix Type / Description :	111105-22-SM			
				Sample Date / Time :	SOIL / SOIL			
				Laboratory Sample ID :	(11 Nov 2005) (15:00)			
Analyte	*CAS number*	*LOR*	*Units*		ES0509562-001			
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%		3.6			
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg		<5			
Cadmium	7440-43-9	1	mg/kg		<1			
Chromium	7440-47-3	2	mg/kg		2			
Copper	7440-50-8	5	mg/kg		<5			
Lead	7439-92-1	5	mg/kg		<5			
Nickel	7440-02-0	2	mg/kg		<2			
Zinc	7440-66-6	5	mg/kg		<5			
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg		<0.1			
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg		<0.10			
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg		<0.05			
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05			
beta-BHC	319-85-7	0.05	mg/kg		<0.05			
gamma-BHC	58-89-9	0.05	mg/kg		<0.05			
delta-BHC	319-86-8	0.05	mg/kg		<0.05			
Heptachlor	76-44-8	0.05	mg/kg		<0.05			
Aldrin	309-00-2	0.05	mg/kg		<0.05			
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05			
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05			
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05			
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05			
Dieldrin	60-57-1	0.05	mg/kg		<0.05			
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05			
Endrin	72-20-8	0.05	mg/kg		<0.05			
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05			
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05			
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05			
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05			

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Analytical Results

				Client Sample ID :				
				Sample Matrix Type / Description :	SOIL / SOIL			
				Sample Date / Time :	(11 Nov 2005) (15:00)			
				Laboratory Sample ID :	ES0509562-001			
Analyte	*CAS number*	*LOR*	*Units*					
EP068A: Organochlorine Pesticides (OC)								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2				
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05				
Methoxychlor	72-43-5	0.2	mg/kg	<0.2				
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05				
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05				
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2				
Dimethoate	60-51-5	0.05	mg/kg	<0.05				
Diazinon	333-41-5	0.05	mg/kg	<0.05				
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05				
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2				
Malathion	121-75-5	0.05	mg/kg	<0.05				
Fenthion	55-38-9	0.05	mg/kg	<0.05				
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05				
Parathion	56-38-2	0.2	mg/kg	<0.2				
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05				
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05				
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05				
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05				
Prothiofos	34643-46-4	0.05	mg/kg	<0.05				
Ethion	563-12-2	0.05	mg/kg	<0.05				
Carbophenothion	786-19-6	0.05	mg/kg	<0.05				
Methyl Azinphos	86-50-0	0.05	mg/kg	<0.05				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5				
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5				
Acenaphthene	83-32-9	0.5	mg/kg	<0.5				
Fluorene	86-73-7	0.5	mg/kg	<0.5				
Phenanthrene	85-01-8	0.5	mg/kg	<0.5				
Anthracene	120-12-7	0.5	mg/kg	<0.5				
Fluoranthene	206-44-0	0.5	mg/kg	<0.5				
Pyrene	129-00-0	0.5	mg/kg	<0.5				
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5				
Chrysene	218-01-9	0.5	mg/kg	<0.5				
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5				
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5				

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Analytical Results

	Client Sample ID :	111105-22-SM
	Sample Matrix Type / Description :	SOIL / SOIL
	Sample Date / Time :	(11 Nov 2005) (15:00)
	Laboratory Sample ID :	ES0509562-001

Analyte	CAS number	LOR	Units	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons				
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5
Indeno(1,2,3,cd)pyrene	193-39-5	0.5	mg/kg	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5
EP080/071: Total Petroleum Hydrocarbons				
C6 - C9 Fraction		2	mg/kg	<2
C10 - C14 Fraction		50	mg/kg	<50
C15 - C28 Fraction		100	mg/kg	<100
C29 - C36 Fraction		100	mg/kg	<100
EP080: BTEX				
Benzene	71-43-2	0.2	mg/kg	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2
EP066S: PCB Surrogate				
Decachlorobiphenyl	2051-24-3	0.1	%	60.4
EP068S: Organochlorine Pesticide Surrogate				
Dibromo-DDE		0.1	%	101
EP068T: Organophosphorus Pesticide Surrogate				
DEF	78-48-8	0.1	%	126
EP075(SIM)S: Phenolic Compound Surrogates				
2-Fluorophenol	367-12-4	0.1	%	114
Phenol-d6	13127-88-3	0.1	%	* 116
2-Chlorophenol-D4	93951-73-6	0.1	%	114
2,4,6-Tribromophenol	118-79-6	0.1	%	114
EP075(SIM)T: PAH Surrogates				
2-Fluorobiphenyl	321-60-8	0.1	%	108
Anthracene-d10	1719-06-8	0.1	%	107
4-Terphenyl-d14	1718-51-0	0.1	%	108
EP080S: TPH(V)/BTEX Surrogates				
1,2-Dichloroethane-D4	17060-07-0	0.1	%	102
Toluene-D8	2037-26-5	0.1	%	108
4-Bromofluorobenzene	460-00-4	0.1	%	90.9

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Client	: CONSULTING EARTH SCIENTISTS	Work Order	: ES0509562	Page Number	: 5 of 7
Project	: CES051003-TOY	ALS Quote Reference	: SY01305	Issue Date	: 23 Nov 2005

ALS Environmental

Analytical Results

	Client Sample ID :	111105-22-SM						
	Sample Matrix Type / Description :	WATER / TCLP LEACHATE						
	Sample Date / Time :	(11 Nov 2005) (15:00)						
	Laboratory Sample ID :	ES0509562-001						
Analyte	*CAS number*	*LOR*	*Units*					
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	<0.1				
Cadmium	7440-43-9	0.05	mg/L	<0.05				
Chromium	7440-47-3	0.1	mg/L	<0.1				
Copper	7440-50-8	0.1	mg/L	<0.1				
Lead	7439-92-1	0.1	mg/L	<0.1				
Nickel	7440-02-0	0.1	mg/L	<0.1				
Zinc	7440-66-6	0.1	mg/L	# <0.1				
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.001	mg/L	<0.001				
EN33: TCLP Leach								
Initial pH		0.1	pH Unit	8.7				
After HCl pH		0.1	pH Unit	1.6				
Extraction Fluid Number		1		1				
Final pH		0.1	pH Unit	5.4				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0				
Acenaphthylene	208-96-8	1.0	µg/L	<1.0				
Acenaphthene	83-32-9	1.0	µg/L	<1.0				
Fluorene	86-73-7	1.0	µg/L	<1.0				
Phenanthrene	85-01-8	1.0	µg/L	<1.0				
Anthracene	120-12-7	1.0	µg/L	<1.0				
Fluoranthene	206-44-0	1.0	µg/L	<1.0				
Pyrene	129-00-0	1.0	µg/L	<1.0				
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0				
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5				
Indeno(1,2,3,cd)pyrene	193-39-5	1.0	µg/L	<1.0				
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0				
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0				
EP075(SIM)S: Phenolic Compound Surrogates								
2-Fluorophenol	367-12-4	0.1	%	50.1				
Phenol-d6	13127-88-3	0.1	%	35.8				
2-Chlorophenol-D4	93951-73-6	0.1	%	96.7				
2,4,6-Tribromophenol	118-79-6	0.1	%	* 131				

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Analytical Results

	Client Sample ID :	111105-22-SW			
	Sample Matrix Type / Description :	WATER / TCLP LEACHATE			
	Sample Date / Time :	(11 Nov 2005) (15:00)			
	Laboratory Sample ID :	ES0509562-001			
Analyte	CAS number	LOR	Units		
EP075(SIM)T: PAH Surrogates					
2-Fluorobiphenyl	321-60-8	0.1	%	89.5	
Anthracene-d10	1719-06-8	0.1	%	87.8	
4-Terphenyl-d14	1718-51-0	0.1	%	83.5	

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Sample ID	Depth (m)	Sample Type	pH	Copper	Lead	Zinc	Cadmium	Chromium	Nickel	Arsenic	Mercury	Chloride	Sulphate
C1	0.0 - 0.2	Fill	-	11	20	49	< 0.5	12	6	5	0.05	-	-
C2	0.0 - 0.2	Fill	-	3	12	45	< 0.5	5.5	5	4.5	0.02	-	-
C3	0.0 - 0.2	Fill	-	3.5	13	22	< 0.5	9	3.5	3	0.01	-	-
C4	0.0 - 0.2	Fill	-	3	14	12	< 0.5	4.5	5	3	0.01	-	-
C5	0.5 - 0.7	Fill	-	2	7	10	< 0.5	3	4	3.5	0.01	-	-
C6	1.2-1.4/1.2-1.4/1.1-1.3	Fill	-	2.5	15	20	< 0.5	6.5	5	4.5	0.01	-	-
C7	1.9-2.1/1.7-1.9/1.8-2.0	Sand	-	12	13	22	< 0.5	5	5	4	0.03	-	-
C8	1.6-1.7/1.6-1.7/1.31.4	Sand	-	2	3	6	< 0.5	2.5	3.5	2.5	0.01	-	-
				20	**100**	**67**	**1**	**17**	**20**	**7**	**0.33**	-	
				1667	**500**	**11667**	**33**	**167***	**1000**	**33**	**5**	-	
GA1	0.0 - 0.2	Fill	8.4	2.5	8	12	< 0.5	4.5	3	4	0.045	-	-
GA1	0.5 - 0.7	Fill	8.2	-	-	-	-	-	-	-	-	7	19
GA2	0.0 - 0.2	Fill	8.2	14	25	52	< 0.5	7	6.5	4.5	0.075	-	-
GA2	0.5 - 0.7	Fill	-	9	17	23	< 0.5	6	4.5	3.5	0.030	-	-
GA2	1.0 - 1.2	Fill	-	-	-	-	-	-	-	-	-	9	47
GA7	0.0 - 0.2	Fill	7.8	-	-	-	-	-	-	-	-	13	17
GA8	0.5 - 0.9	Fill	-	-	-	-	-	-	-	-	-	280	380
GA9	1.8 - 2.0	Sand	-	-	-	-	-	-	-	-	-	16	63
GA14	0.7 - 0.8	Fill	8.8	-	-	-	-	-	-	-	-	13	17
GA15	0.0 - 0.2	Fill	8.3	1.5	6	7.5	< 0.5	3.5	4	3.0	< 0.005	-	-
GABH2	4.5-4.9	Soil	8.3										220
GABH3	3.0-3.45	Soil	7.9										1660
GABH3	2.7-2.8	Soil	7.2										2950
GABH4	3.0-3.4	Soil	8.1										390
GABH4	2.5-2.6	Soil	7.4										1800
GA15	1.1 - 1.3	Sand	-	-	-	-	-	-	-	-	-	120	570
Duplicate 1	GA15 (0.0-0.2)	Sand	-	2	3.5	9.5	< 0.5	3.5	2.5	2.5	0.005	-	-
Duplicate 1*	GA15 (0.0-0.2)			10	19	23	<1	7	7	<5	<0.05		
ANZECC/NHMRC or Dutch Level B Criteria				**60**	**300**	**200**	**3**	**50**	**60**	**20**	**1**	-	**2000**
NEHF Guidelines (F)				**5000**	**1500**	**35000**	**100**	**500***	**3000**	**100**	**15**	-	

Notes

All results are expressed as mg/kg except Blank (mg/L) and pH (unit).

Figures in bold italics exceed the ANZECC/NHMRC Level B criteria

Figures in bold italics that have been underlined exceed the NEHF Value

* Chromium (VI)

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TABLE 2

SUMMARY OF ANALYTICAL RESULTS - Inorganics

Toyota Australia

Site Contamination Assessment

Woolooware Bay

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27/07/98

Prepared By: GF Date:20/7/98
checked by CMS Date: 22/7

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Sample ID	Sample Depth (m)	OCPs
C2	surface	nd
C4	surface	nd
GA1	0.0-0.2	nd
Modified Dutch B		**0.33**
Dutch B		**1.00**

Notes
All results are expressed as mg/kg for soils

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TABLE 3
SUMMARY OF ANALYTICAL RESULTS
Organochlorine Pesticides

Toyota Australia
Site Contamination Assessment
Woolooware Bay

Prepared By: GF Date:20/7/98
checked by C.M.F Date: 27/7

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Sample ID	Sample Depth	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}
GA1	0.5-0.7	<20	<20	<50	<50	ND
NSW EPA		**65**				**1000**

Notes

All results are expressed as mg/kg

Figures in bold italics exceed the NSW EPA criteria

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS
Total Petroleum Hydrocarbons

Toyota Australia
Site Contamination Assessment
Woolooware Bay

a822179
27/07/98

Prepared By: GF Date:20/7/98
checked by CMF Date: 22/7

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Sample ID	Depth (m)	Sample Type	TOS	ANC	NAGP*
			%	% CaCO3	kg H2SO4 / tonne
GA1	0.5-0.7	Soil	0.007	2.9	-28.8
GA2	1.0-1.2	Soil	0.008	2.6	-25.7
GA7	0.0-0.2	Soil	0.012	0.39	-3.3
GA14	0.7-0.8	Soil	0.011	3	-29.7

TOS - Total Oxidisable Sulphur
ANC - Acid Neutralisation Capacity
NAGP - Net Acid Generation Potential

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TABLE 5
SUMMARY OF ANALYTICAL RESULTS
Net Acid Generation Potential

Toyota Australia
Site Contamination Assessment
Wooloowara Bay

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27/07/98

Prepared By: GF Date:20/7/98
checked by: CMF Date: 29/7

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SAMPLE ID	DEPTH (m	pH before	pH after	Difference
GA1	0.0 - 0.2	8.1	5.3	2.8
	0.5 - 0.7	7.7	5.0	2.7
	1.0 - 1.2	7.5	5.9	1.6
	1.4 - 1.6	7.3	6.0	1.3
GA2	0.0 - 0.2	7	4	3.0
	0.5 - 0.7	7.7	3.2	4.5
	1.0 - 1.2	7.5	3.5	4.0
	1.5 - 1.6	7.3	3.3	4.0
GA3	0.0 - 0.2	7.3	4.6	2.7
	0.5 - 0.7	7.5	4.7	2.8
	1.0 - 1.2	7.3	5	2.3
GA4	0.0 - 0.2	7	5.3	1.7
	0.5 - 0.7	6.9	5.3	1.6
	1.0 - 1.2	7.7	5.3	2.4
GA5	0.0 - 0.2	7.5	5.1	2.4
	0.5 - 0.7	7.5	5.1	2.4
	1.0 - 1.2	7.5	4.9	2.6
GA6	0.0 - 0.2	8.5	5.3	3.2
	0.5 - 0.7	8.7	5.2	3.5
	0.9 - 1.1	8	5.3	2.7
GA7	0.0 - 0.2	7.7	4.9	2.8
	0.5 - 0.7	7.3	5.1	2.2
	0.9 - 1.1	7.1	5.2	1.9

H2O2 oxidaiton

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TABLE 6
SUMMARY OF RESULTS
Screening for Acid Sulphate Soil

Toyota Australia
Site Contamination Assessment
Woolooware Bay

a822179
27/07/98

Prepared By: GF Date:20/7/98
checked by CMF Date: 22/7

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Sample ID	Depth (m)	pH before	pH after	Difference
GA8	0.0 -0.2	7.1	5	2.1
	0.5 - 0.7	6.5	5	1.5
	0.8 - 1.0	7	5.1	1.9
GA9	0.0 - 0.2	6.5	5.3	1.2
	0.7 - 0.9	7	5.4	1.6
	1.8 - 2.0	7	5.4	1.6
GA10	0.0 - 0.2	7.3	5.8	1.5
	0.5 - 0.7	7.5	5.8	1.7
	1.0 - 1.2	7.5	5.7	1.8
	1.3 - 1.5	7.6	5.8	1.8
GA11	0.0 - 0.2	7.5	5.7	1.8
	0.5 - 0.7	7.5	5.8	1.7
	1.4 - 1.4	7.5	5.2	2.3
	2.0 - 2.1	7.5	5.1	2.4
GA12	0.0 - 0.2	7.6	5.9	1.7
	1.2 - 1.4	7.5	5.9	1.6
	1.6 - 1.7	7.6	5.5	2.1
GA13	0.0 - 0.2	7.7	5.8	1.9
	1.2 - 1.4	7.8	5.9	1.9
	1.6 - 1.7	7.7	5.9	1.8
GA14	0.0 - 0.2	7.8	5.7	2.1
	0.7 - 0.8	7.9	5.9	2.0
	1.3 - 1.4	7.9	5.9	2.0
GA15	0.0 - 0.2	7.9	6	1.9
	0.5 - 0.7	7.9	5.9	2.0
	1.1 - 1.3	7.8	5.8	2.0

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TABLE 6 (Cont)
SUMMARY OF RESULTS
Screening for Acid Sulphate Soil

Tavora Australia
Site Contamination Assessment
Wooloowara Bay

Prepared By: GF Date:20/7/98
checked by CMC Date: 23/7

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	Sample Type	pH	Ec
Sample ID	Type	units	uS/cm
GA1	water	7.1	1460
GA8	water	6.6	7650
GA14	water	7.2	870

Notes

pH (units), Ec as uS/cm

1

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TABLE 7
SUMMARY OF ANALYTICAL RESULTS
Groundwater - Indicator Parameters

Toyota Australia
Site Contamination Assessment
Woolooware Bay

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Prepared By: GF Date:20/7/98
checked by CMC Date: 22/7

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Sample ID	Depth (m)	PID
GA1	0.0 - 0.2	3.6
	0.5 - 0.7	4.1
	1.0 - 1.2	4.5
	1.4 - 1.6	3.8
GA2	0.0 - 0.2	2.3
	0.5 - 0.7	2.1
	1.0 - 1.2	2.1
	1.5 - 1.6	3.6
GA3	0.0 - 0.2	4.8
	0.5 - 0.7	2.9
	1.0 - 1.2	4
GA4	0.0 - 0.2	3.8
	0.5 - 0.7	3.6
	1.0 - 1.2	3.4
GA5	0.0 - 0.2	4.7
	0.5 - 0.7	4
	1.0 - 1.2	2.6
GA6	0.0 - 0.2	6
	0.5 - 0.7	5
	0.9 - 1.1	2.9
GA7	0.0 - 0.2	3.7
	0.5 - 0.7	3.2
	0.9 - 1.1	4.1

PID Calibarated with 90 ppm isobutylene

Sample ID	Depth (m)	PID
GA8	0.0 - 0.2	4
	0.5 - 0.7	3.6
	0.8 - 1.0	3.8
GA9	0.0 - 0.2	4.7
	0.7 - 0.9	3.9
	1.8 - 2.0	4
GA10	0.0 - 0.2	3.6
	0.5 - 0.7	3.7
	1.0 - 1.2	3.9
	1.3 - 1.5	4
GA11	0.0 - 0.2	4.3
	0.5 - 0.7	5.1
	1.2 - 1.4	2.7
	2.0 - 2.2	2.6
GA12	0.0 - 0.2	2.8
	1.2 - 1.4	3
	1.6 - 1.7	3.5
GA13	0.0 - 0.2	3.6
	1.2 - 1.4	2.7
	1.6 - 1.7	2
GA14	0.0 - 0.2	1.9
	0.7 - 0.8	2.5
	1.3 - 1.4	2.8
GA15	0.0 - 0.2	3.6
	0.5 - 0.7	3.4
	1.1 - 1.3	3.2

TABLE 8
SUMMARY OF RESULTS
PID Screening (Volatile Ionisable Compounds)

Toyota Australia
Site Contamination Assessment
Woolooware Bay

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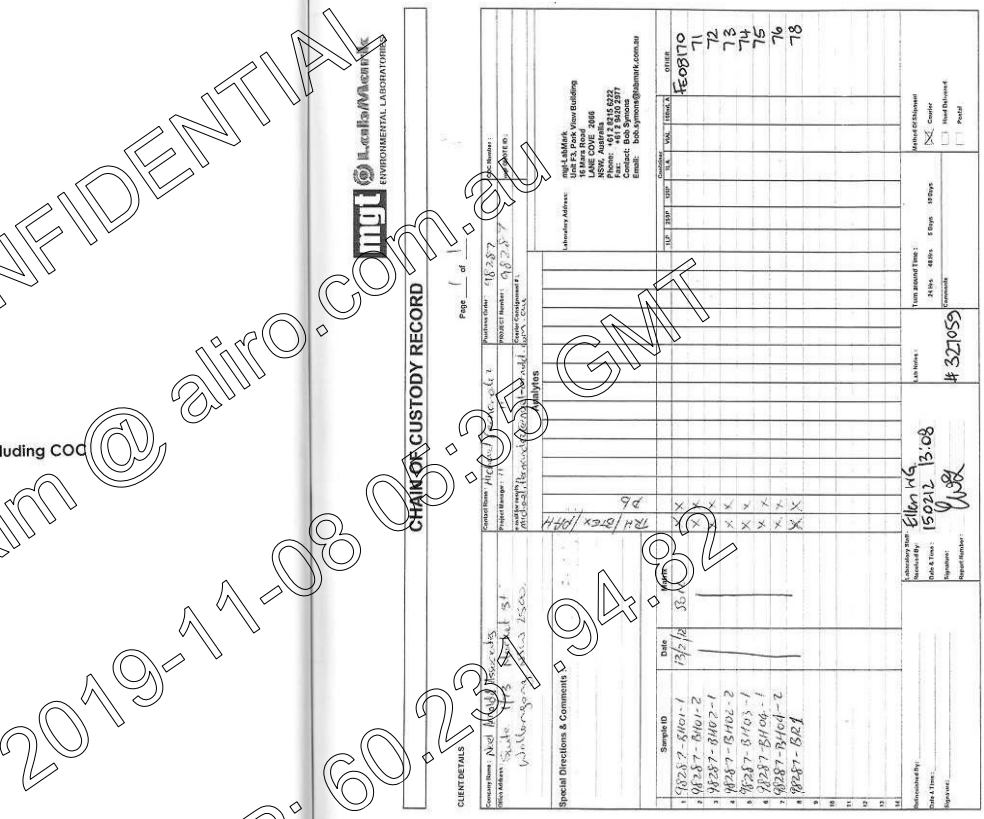
Prepared By: GF Date:20/7/98
checked by: [illegible] Date: 27/7

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Appendix G: NATA Certified Analysis Results including COC



CHAIN OF CUSTODY RECORD

ENVIRONMENTAL LABORATORIES

CLIENT DETAILS

Special Directions & Comments

Analytes

Sample ID

Laboratory Address: mgt-LabMark Unit F3, Park View Building 16 Mars Road LANE COVE 2066 NSW, Australia Phone: +61 2 9910 6222 Fax: +61 2 9420 2377 Contact: Bob Symons Email: bob.symons@labmark.com.au

Quotation Number: 18387

PROJECT Number: 98287

Purchase Order / Work Order Number:

Report Format:

Turn around Time: 24 Hrs 48 Hrs 5 Days 10 Days

Comments

Method Of Shipment: Courier / Hand Delivered / Postal

Laboratory Use Only: Received By: Ellen HG 15/02/12 13:08 # 321059

NOTES:

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ABN – 50 005 085 521 e.mail : mgl@mgtenv.com.au web : www.mgtenv.com.au

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Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA # 1261 & 9645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name:	Noel Arnold & Associates Wollongong
Contact name:	Michael Fernandez
Client job number:	98287
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 14, 2012 2:00 PM
MGT lab reference:	327059

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

SRA reissued - amended as per email | Sample BR1 sent to Envirolab as requested | Suite 1 TPH/BTEX/PAH.

Contact notes

If you have any questions with respect to these samples please contact:

Onur Mehmet on Phone : (+61) (3) 9564 7055 or by e.mail: onur.mehmet@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Michael Fernandez - michael.fernandez@noel-arnold.com.au.

mgt Labmark Sample Receipt

NATA WORLD RECOGNISED ACCREDITATION

Environmental Laboratory
Air Analysis
Water Analysis
Soil Contamination Analysis

NATA Accreditation
Stack Emission Sampling & Analysis
Trade Waste Sampling & Analysis
Groundwater Sampling & Analysis

35Years of Environmental Analysis & Experience – fully Australian Owned

Environmental Laboratories Industry Group

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Noel Arnold & Associates Wollongong
1/73 Market St
Wollongong
NSW 2500

Attention: Michael Fernandez

Report	327059-S
Client Reference	98287
Received Date	Feb 14, 2012

Client Sample ID			**98287-BH01-1**	**98287-BH01-2**	**98287-BH02-1**	**98287-BH02-2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
mgt-LabMark Sample No.			**S12-Fe08170**	**S12-Fe08171**	**S12-Fe08172**	**S12-Fe08173**
Date Sampled			**Feb 13, 2012**	**Feb 13, 2012**	**Feb 13, 2012**	**Feb 13, 2012**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions *						
Naphthalene[#2]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[#2]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[#24]	20	mg/kg	< 20	< 20	< 20	< 20
BTEX						
Benzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1	< 1	< 1	< 1
o-Xylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes (ortho, meta and para)	1.5	mg/kg	< 3	< 3	< 3	< 3
Total BTEX	1.5	mg/kg	< 6	< 6	< 6	< 6
4-Bromofluorobenzene (surr.)	1	%	89	92	88	89
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	10	mg/kg	< 10	< 10	< 10	< 10
TRH C10-C14	50	mg/kg	< 50	< 50	< 50	< 50
TRH C15-C28	100	mg/kg	< 100	< 100	< 100	< 100
TRH C29-C36	100	mg/kg	< 100	< 100	< 100	< 100
TRH C10-36 (Total)	100	mg/kg	< 100	< 100	< 100	< 100
Polyaromatic Hydrocarbons (PAH)						
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b)fluoranthene 2						
Benzo(k)fluoranthene	1	mg/kg	< 1	< 1	< 1	< 1
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

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Client Sample ID			98287-BH01-1	98287-BH01-2	98287-BH02-1	98287-BH02-2
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S12-Fe08170	S12-Fe08171	S12-Fe08172	S12-Fe08173
Date Sampled			Feb 13, 2012	Feb 13, 2012	Feb 13, 2012	Feb 13, 2012
Test/Reference	LOR	Unit				
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	1	mg/kg	< 1	< 1	< 1	< 1
2-Fluorobiphenyl (surr.)	1	%	89	91	89	92
p-Terphenyl-d14 (surr.)	1	%	110	109	108	105
% Moisture	0.1	%	52	22	18	20
Heavy Metals						
Lead	2	mg/kg	58	8.2	4.9	2.6

mgt LabMark
ENVIRONMENTAL LABORATORIES

Client Sample ID			98287-BH03-1	98287-BH0□-1	98287-BH0□-2	98287-BR1
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S12-Fe0817□	S12-Fe08175	S12-Fe08176	S12-Fe08178
Date Sampled			Feb 13, 2012	Feb 13, 2012	Feb 13, 2012	Feb 13, 2012
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions *						
Naphthalene[#02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[#01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[#01]	20	mg/kg	< 20	< 20	< 20	< 20
BTEX						
Benzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1	< 1	< 1	< 1
o-Xylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes(ortho,meta and para)	1.5	mg/kg	< 3	< 1.5	< 1.5	< 1.5
Total BTEX	1.5	mg/kg	< 6	< 3	< 1.5	< 3
4-Bromofluorobenzene (surr.)	1	%	92	105	86	101
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	10	mg/kg	< 10	< 10	< 10	< 10
TRH C10-C14	20	mg/kg	< 50	< 50	< 50	< 50
TRH C15-C28	100	mg/kg	< 100	< 100	< 100	< 100
TRH C29-C36	100	mg/kg	< 100	< 100	< 100	< 100
TRH C10-36 (Total)	100	mg/kg	< 100	< 100	< 100	< 100
Polyaromatic Hydrocarbons (PAH)						
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	< 1	< 1	< 1	< 1
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	1	mg/kg	< 1	< 1	< 1	< 1
2-Fluorobiphenyl (surr.)	1	%	91	89	97	91
p-Terphenyl-d14 (surr.)	1	%	110	104	111	108
% Moisture	0.1	%	9.1	8.1	22	7.9
Heavy Metals						
Lead	2	mg/kg	6.8	3.7	7.3	4.0

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Feb 15, 2012	14 Day
BTEX - Method: E029/E016 BTEX	Sydney	Feb 15, 2012	14 Day
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions * - Method: LM-LTM-ORG2010	Sydney	Feb 15, 2012	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	Feb 15, 2012	14 Day
Heavy Metals - Method: E022 Acid Extractable metals in Soils	Sydney	Feb 15, 2012	180 Day
% Moisture - Method: E005 Moisture Content	Sydney	Feb 15, 2012	28 Day

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NATA # 1261 Site # 1254

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Phone: +61 7 3occ 4600

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone: +61 2 8215 6222
NATA # 1261 Site # 18217

Company Name: Noel Arnold & Associates Wollongong
Address: 1/73 Market St
Wollongong
NSW 2500

Client Job No.: 98287

Order No.: 327059
Report #: 327059
Phone: 02 4228 2499
Fax:

Received: Feb 14, 2012 2:00 PM
Due: Feb 21, 2012 4:00 PM
Priority: 5 Day
Contact name: Michael Fernandez

mgt-LabMark Client Manager: Onur Mehmet

Sample Detail

Laboratory where analysis is conducted				mgt-LabMark Suite ☐		
				Lead		
				☐ Moisture		
Melbourne Laboratory - NATA Site # 1261						
Sydney Laboratory - NATA Site # 16 5				X	X	X
External Laboratory						
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
98287-BH01-1	Feb 13, 2012		Soil	S12-Fe08170	X	X
98287-BH01-2	Feb 13, 2012		Soil	S12-Fe08171	X	X
98287-BH02-1	Feb 13, 2012		Soil	S12-Fe08172	X	X
98287-BH02-2	Feb 13, 2012		Soil	S12-Fe08173	X	X
98287-BH03-1	Feb 13, 2012		Soil	S12-Fe08174	X	X
98287-BH04-1	Feb 13, 2012		Soil	S12-Fe08175	X	X
98287-BH04-2	Feb 13, 2012		Soil	S12-Fe08176	X	X
98287-BR1	Feb 13, 2012		Soil	S12-Fe08178	X	X

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□eneral

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.
**N□TE: pH duplicates are reported as a range NOT as an RPD

□NITS

mg/kg:milligrams per Kilogram
mg/L:milligrams per litre
□g/L:microgrogms per litre
ppm:Parts per million
ppb:Parts per billion
□:Percentage
org/100mL:Organisms per 100 millilitres
NT□:Nephelometric Turbidity Units
MPN/100mL:Most Probable Number of organisms per 100 millilitres

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
L□R:	Limit Of Reporting
SPI□E:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPI□E:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
□SEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
AGLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
C□C:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

□C - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-30%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

□C DATA □ENERAL C□MMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your samples batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample>
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data = 0.05) & Result B = <0.1 (raw data = 0.03) resulting in a RPD of 40% calculated from the raw data.

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□uality Control Results

Test	□nits	Result 1			Acceptance Limits	Pass Limits	□ualifying Code
Method Blank							
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions * LM-LTM-□R□2010							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho,meta and para)	mg/kg	< 1.5			1.5	Pass	
Total BTEX	mg/kg	< 1.5			1.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E004 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	mg/kg	< 10			10	Pass	
TRH C10-C14	mg/kg	< 50			50	Pass	
TRH C15-C28	mg/kg	< 100			100	Pass	
TRH C29-C36	mg/kg	< 100			100	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoranthene	mg/kg	< 1			1	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals, 5022 Acid Extractable metals in Soils							
Lead	mg/kg	< 2			2	Pass	
LCS - □ Recovery							
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions * LM-LTM-□R□2010							
Naphthalene	%	81			70-130	Pass	
TRH >C10-C16	%	88			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
LCS - □ Recovery							
BTEX E029/E016 BTEX							
Benzene	%	125			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total m+p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	101			70-130	Pass	
Xylenes(ortho,meta and para)	%	102			70-130	Pass	
LCS - Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E00 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	%	111			70-130	Pass	
TRH C10-C14	%	81			70-130	Pass	
LCS - Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	%	102			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	101			70-130	Pass	
Benz(a)anthracene	%	86			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoranthene	%	96			70-130	Pass	
Benzo(g,h,i)perylene	%	76			70-130	Pass	
Chrysene	%	97			70-130	Pass	
Dibenz(a,h)anthracene	%	95			70-130	Pass	
Fluoranthene	%	95			70-130	Pass	
Fluorene	%	101			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	79			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	101			70-130	Pass	
LCS - Recovery							
Heavy Metals E022 Acid Extractable metals in Soils							
Lead	%	94			70-130	Pass	

Test	Lab Sample ID	Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - Recovery									
Polyaromatic Hydrocarbons (PAH)				Result 1					
Acenaphthylene	S12-Fe07674	NCP	%	127			70-130	Pass	
Anthracene	S12-Fe07674	NCP	%	97			70-130	Pass	
Benz(a)anthracene	S12-Fe07674	NCP	%	96			70-130	Pass	
Benzo(a)pyrene	S12-Fe07674	NCP	%	89			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoranthene	S12-Fe07674	NCP	%	95			70-130	Pass	
Benzo(g,h,i)perylene	S12-Fe07674	NCP	%	88			70-130	Pass	
Chrysene	S12-Fe07674	NCP	%	95			70-130	Pass	
Dibenz(a,h)anthracene	S12-Fe07674	NCP	%	93			70-130	Pass	
Fluoranthene	S12-Fe07674	NCP	%	98			70-130	Pass	
Fluorene	S12-Fe07674	NCP	%	105			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S12-Fe07674	NCP	%	89			70-130	Pass	
Naphthalene	S12-Fe07674	NCP	%	84			70-130	Pass	
Phenanthrene	S12-Fe07674	NCP	%	102			70-130	Pass	
Spike - Recovery									
Heavy Metals				Result 1					
Lead	S12-Fe08204	NCP	%	119			70-130	Pass	
Spike - Recovery									
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions *				Result 1					
Naphthalene	S12-Fe08171	CP	%	73			70-130	Pass	
TRH C6-C10	S12-Fe08171	CP	%	112			70-130	Pass	
Spike - Recovery									
BTEX				Result 1					
Benzene	S12-Fe08171	CP	%	127			70-130	Pass	
Toluene	S12-Fe08171	CP	%	112			70-130	Pass	
Ethylbenzene	S12-Fe08171	CP	%	109			70-130	Pass	
Total m+p-Xylenes	S12-Fe08171	CP	%	106			70-130	Pass	

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Test	Lab Sample ID	Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
o-Xylene	S12-Fe08171	CP	%	105			70-130	Pass	
Xylenes(ortho,meta and para)	S12-Fe08171	CP	%	105			70-130	Pass	
Spike - Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S	NCP	%	117			70-130	Pass	
Duplicate									
Polyaromatic Hydrocarbons (PAH)				Result 1	Result 2	RPD			
Benzo(b)fluoranthene & Benzo(k)fluoranthene	S12-Fe07674	NCP	mg/kg	1	1	1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S12-Fe08184	NCP	mg/kg	12	14	1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - Draft 2010 NEPM Fractions *				Result 1	Result 2	RPD			
Naphthalene	S12-Fe08171	CP	mg/kg	0.5	0.5	1	30%	Pass	
TRH C6-C10	S12-Fe08171	CP	mg/kg	20	20	2.0	30%	Pass	
TRH C6-C10 less BTEX (F1)	S12-Fe08171	CP	mg/kg	20	20	2.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S12-Fe08171	CP	mg/kg	0.5	0.5	1	30%	Pass	
Toluene	S12-Fe08171	CP	mg/kg	0.5	0.5	3.0	30%	Pass	
Ethylbenzene	S12-Fe08171	CP	mg/kg	0.5	0.5	1	30%	Pass	
Total m+p-Xylenes	S12-Fe08171	CP	mg/kg	1	1	3.0	30%	Pass	
o-Xylene	S12-Fe08171	CP	mg/kg	0.5	0.5	1.0	30%	Pass	
Xylenes(ortho,meta and para)	S12-Fe08171	CP	mg/kg	3	3	2.0	30%	Pass	
Total BTEX	S12-Fe08171	CP	mg/kg	6	6	3.0	30%	Pass	

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Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill □as e□ident	□es
Sample correctly prese□ed	□es
□rganic samples had Teflon liners	□es
Sample containers for □olatile analysis rece□ed □ith minimal headspace	□es
Samples rece□ed □ithin HoldingTime	□es
Some samples ha□e been subcontracted	No

□ualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the □naphthalene□ alue from the □C10-C16□alue. The naphthalene □alue used in the calculation is obtained from □olatiles (Purge & Trap analysis).
N02	□here □e ha□e reported both □olatile (P&T □C□S) and semi□olatile (□C□S) naphthalene data□results may not be identical. This could be due to sample handling protocols ha□e been follo□ed, any obser□ed differences in results are likely to be due to procedural differences □ithin each methodology. Results determined by both techni□ues ha□e passed all □A□C acceptance criteria□and are entirely technically □alid.
N04	F1 is determined by arithmetically subtracting the □Total BTEX□□alue from the □C6-C10□□alue. The Total BTEX□□alue is obtained by summing the concentrations of BTEX analytes. The C6-C10□□alue is obtained by □uantitating against a standard of mi□ed aromatic/aliphatic analytes.

Authorised By

□nur □ehmet	Client Ser□ices
□ames Norford	Senior Analyst-□etal (NS□)
Laura Schofield	Senior Analyst-□olatile (NS□)
Ryan Hamilton	Senior Analyst-□rganic (NS□)

Dr. Bob Symons
Laboratory Manager

Final report - this Report replaces any previously issued Report
- Indicates Not Re□uested
□Indicates NATA accreditation does not co□er the performance of this ser□ice
□ ncertainty data is a□ailable on re□uest

mgt-Lab□ are shall not be liable for loss□ loss□ damages or e□penses incurred by the client□or any other person or company□resulting from the use of any information or interpretation gi□en in this report. In no case shall mgt-Lab□ are be liable for conse□uential damages including□but not limited to□ lost profits□damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced e□cept in full and relates only to the items tested. □nless indicated□ all tests were performed on the samples as recei□ed.

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Noel Arnold & Associates Pty Ltd
Chain of Custody Record
Environmental Consultants

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☐ Level 2, 11 Khartoum Rd North Ryde NSW 2113 ✆ Phone: (02) 9889 1800 🖷 Fax (02) 9889 1811
☐ Level 3, 346 Whitehorse Rd Box Hill VIC 3128 ✆ Phone: (03) 9890 8811 🖷 Fax (03) 9890 8911
☑ Suite 1, 73 Market St Wollongong NSW 2500 ✆ Phone: (02) 4298 2600 🖷 Fax (02) 4227 4664

NAA Project Details: 98287 | **Requested Analyses:** All analyses to be conducted to NATA methods unless agreed

Client No: Job No:	98287
NAA Contact Name:	Michael Fernandez
NAA Contact Email:	michael.fernandez@noelarnold.com.au
Receiving Lab Name:	**Envirolab Services Pty Ltd**
Attention To:	**Aileen Hie / Jacinta Hurst**
Address:	**12 Ashley Street**
	Chatswood NSW 2067 (02 9910 6200)
Relinquished By:	Day, Date & Time: (Signature)
Results Required By (Day, Date & Time):	Thursday 23

Sample ID & Type	Soil	Filter	Tube	Other	TRH/BTEX/PAH/Pb
98287-SR1	x				x

Receiving Laboratory:
Please complete sample receipt details below & then email COC to NAA contact

Received By: (Name) Sequel
Day, Date and Time: 17/02 10:00
☐ COC Emailed to NAA (tick)
Signature: [signature]

Sample Storage Requirements:
All samples are to be stored for a period of 3 months unless otherwise agreed.

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 69053
Date Received: 17/02
Time Received: 10:00
Received by: SB
Temp: Cool/Ambient
Cooling: Ice/Pack
Security: Intact/Broken/None

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Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 69053

Client:
Noel Arnold & Associates Pty Ltd
Level 2, 11 Thaloum Rd
North Ryde
NSW 2113

Attention: Michael Fernandez

Sample log in details:
Your Reference: 98287
No. of samples: 1 soil
Date samples received / completed instructions received: 16.02.12 / 16.02.12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:
Date results requested by / Issue Date: 23.02.12 / 20.02.12
Date of Preliminary Report: Not issued
NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

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Client Reference: 98287

TRH & BTEX in Soil		
Our Reference	UNITS	69053-1
Your Reference	----------	98287-SR1
Type of sample	----------	soil
Date extracted	-	17.02.2012
Date analysed	-	19.02.2012
TRHC6 - C9	mg/kg	25
Benzene	mg/kg	0.2
Toluene	mg/kg	0.5
Ethylbenzene	mg/kg	1
m+p-Xylene	mg/kg	2
o-Xylene	mg/kg	1
Surrogate aaa-Trifluorotoluene	%	102

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sTRH in Soil (C10-C36)	NITS	69053-1
Your Reference	----------	98287-SR1
Type of sample	----------	soil
Date extracted	-	17.02.2012
Date analysed	-	18.02.2012
TRHC10 - C14	mg/kg	50
TRHC15 - C28	mg/kg	100
TRHC29 - C36	mg/kg	100
Surrogate o-Terphenyl	%	85

PAHs in Soil	NITS	69053-1
Your Reference	----------	98287-SR1
Type of sample	----------	soil
Date extracted	-	17.02.2012
Date analysed	-	18.02.2012
Naphthalene	mg/kg	0.1
Acenaphthylene	mg/kg	0.1
Acenaphthene	mg/kg	0.1
Fluorene	mg/kg	0.1
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	0.1
Fluoranthene	mg/kg	0.1
Pyrene	mg/kg	0.1
Benzo(a)anthracene	mg/kg	0.1
Chrysene	mg/kg	0.1
Benzo(b+k)fluoranthene	mg/kg	0.2
Benzo(a)pyrene	mg/kg	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1
Dibenzo(a,h)anthracene	mg/kg	0.1
Benzo(g,h,i)perylene	mg/kg	0.1
Surrogate p-Terphenyl-d14	%	102

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Client Reference: 98287

Acid E tractable metals in soil	NITS	69053-1
ur Reference	----------	98287-SR1
our Reference	----------	soil
Type of sample		
Date digested	-	17/02/2012
Date analysed	-	17/02/2012
Lead	mg/kg	7

Client Reference: 98287

oisture	NITS	69053-1
ur Reference	----------	98287-SR1
our Reference	----------	soil
Type of sample		
Date prepared	-	17/02/2012
Date analysed	-	20/02/2012
oisture	%	7.5

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Client Reference: 98287

ethod ID	ethodology Summary
rg-016	Soil samples are e tracted ith methanol and spiked into ater prior to analysing by purge and trap C- S. ater samples are analysed directly by purge and trap C- S.
rg-003	Soil samples are e tracted ith Dichloromethane Acetone and aters ith Dichloromethane and analysed by C-FID.
rg-012 subset	Soil samples are e tracted ith Dichloromethane Acetone and aters ith Dichloromethane and analysed by C-S.
etals-020 ICP-AES	Determination of arious metals by ICP-AES.
Inorg-008	oisture content determined by heating at 105 deg C for a minimum of 4 hours.

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Client Reference: 98287

ALIT C NTR L TRH & BTEX in Soil	NITS	P L	ETH D	Blank	Duplicate Sm	Duplicate results Base II Duplicate II %RPD	Spike Sm	Spike % Reco ery
Date e tracted	-			17/02/2012	NT	NT	LCS-2	17/02/2012
Date analysed	-			19/02/2012	NT	NT	LCS-2	19/02/2012
TRH C6 - C9	mg/kg	25	rg-016	25	NT	NT	LCS-2	100%
Benzene	mg/kg	0.2	rg-016	0.2	NT	NT	LCS-2	106%
Toluene	mg/kg	0.5	rg-016	0.5	NT	NT	LCS-2	106%
Ethylbenzene	mg/kg	1	rg-016	1	NT	NT	LCS-2	91%
m+p-ylene	mg/kg	2	rg-016	2	NT	NT	LCS-2	98%
o-Xylene	mg/kg	1	rg-016	1	NT	NT	LCS-2	95%
Surrogate aaa-Trifluorotoluene	%		rg-016	104	NT	NT	LCS-2	137%

ALIT C NTR L sTRH in Soil (C10-C36)	NITS	P L	ETH D	Blank	Duplicate Sm	Duplicate results Base II Duplicate II %RPD	Spike Sm	Spike % Reco ery
Date e tracted	-			17/02/2012	NT	NT	LCS-2	17/02/2012
Date analysed	-			18/02/2012	NT	NT	LCS-2	18/02/2012
TRHC10 - C14	mg/kg	50	rg-003	50	NT	NT	LCS-2	119%
TRHC15 - C28	mg/kg	100	rg-003	100	NT	NT	LCS-2	100%
TRHC29 - C36	mg/kg	100	rg-003	100	NT	NT	LCS-2	91%
Surrogate o-Terphenyl	%		rg-003	94	NT	NT	LCS-2	106%

ALIT C NTR L PAHs in Soil	NITS	P L	ETH D	Blank	Duplicate Sm	Duplicate results Base II Duplicate II %RPD	Spike Sm	Spike % Reco ery
Date e tracted	-			17/02/2012	NT	NT	LCS-2	17/02/2012
Date analysed	-			18/02/2012	NT	NT	LCS-2	18/02/2012
Naphthalene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	97%
Acenaphthylene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Acenaphthene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Fluorene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	100%
Phenanthrene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	98%
Anthracene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Fluoranthene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	99%
Pyrene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	100%
Benzo(a)anthracene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Chrysene	mg/kg	0.1	rg-012 subset	0.1	NT	NT	LCS-2	96%

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Client Reference: 98287

ALIT C NTR L PAHs in Soil	NITS	P L	ETH D	Blank	Duplicate Sm	Duplicate results Base II Duplicate II %RPD	Spike Sm	Spike % Reco ery
Benzo(b+k)fluoranthene	mg kg	0.2	rg-012 subset	0.2	NT	NT	NR	NR
Benzo(a)pyrene	mg kg	0.05	rg-012 subset	0.05	NT	NT	LCS 2	94%
Indeno(1 2 3-c d)pyrene	mg kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Dibenzo(a h)anthracene	mg kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Benzo(g h i)perylene	mg kg	0.1	rg-012 subset	0.1	NT	NT	NR	NR
Surrogate p-Terphenyl-d14	%		rg-012 subset	98	NT	NT	LCS-2	104%

ALIT C NTR L Acid E tractable metals in soil	NITS	P L	ETH D	Blank	Duplicate Sm	Duplicate results Base I Duplicate I %RPD	Spike Sm	Spike % Reco ery
Date digested	-			17 02 2012	NT	NT	LCS-2	17 02 2012
Date analysed	-			17 02 2012	NT	NT	LCS-2	17 02 2012
Lead	mg kg	1	etals-020 ICP-AES	1	NT	NT	LCS-2	99%

ALIT C NTR L oisture	NITS	P L	ETH D	Blank
Date prepared	-			NT
Date analysed	-			NT
oisture	%	0.1	Inorg-008	NT

Client Reference: 98287

Report Comments:

Asbestos ID as analysed by Appro ed Identifier
Asbestos ID as authorised by Appro ed Signatory

Not applicable for this ob
Not applicable for this ob

INS Insufficient sample for this test
NA Test not re uired
Less than

P L Practical uantitation Limit
RPD Relati e Percent Difference
reater than

NT Not tested
NA Test not re uired
LCS Laboratory Control Sample

uality Control Definitions

Blank This is the component of the analytical signal hich is not deri ed from the sample but from reagents glass are etc can be determined by processing sol ents and reagents in e actly the same manner as for samples.
Duplicate This is the complete duplicate analysis of a sample from the process batch. If possible the sample selected should be one here the analyte concentration is easily measurable.
Matrix Spike A portion of the sample is spiked ith a kno n concentration of target analyte. The purpose of the matri spike is to monitor the performance of the analytical method used and to determine hether matri interferences e ist.
LCS (Laboratory Control Sample) This comprises either a standard reference material or a control matri (such as a blank sand or ater) fortified ith analytes representati e of the analyte class. It is simply a check sample.
Surrogate Spike: Surrogates are kno n additions to each sample blank matri spike and LCS in a batch of compounds hich are similar to the analyte of interest ho e er are not e pected to be found in real samples.

Laboratory Acceptance Criteria

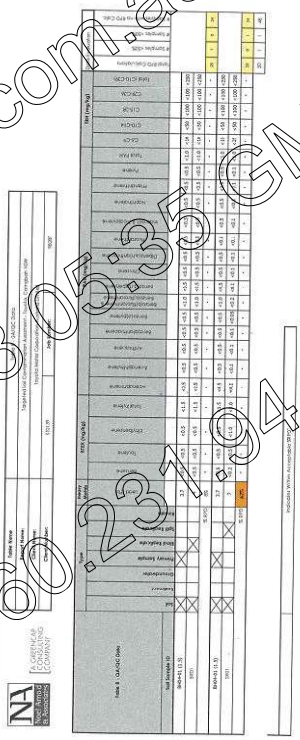
Duplicate sample and matri spike reco eries may not be reported on smaller obs ho e er ere analysed at a fre uency to meet or e ceed NEPM re uirements. All samples are tested in batched of 20. The duplicate sample RPD and matri spike reco eries for the batch ere ithin the laboratory acceptance criteria.

Duplicates 5 P L any RPD is acceptable 5 P L - 0-50% RPD is acceptable.
atri Spikes and LCS enerally 70-130% for inorganics metals 60-140% for organics and 10-140% for S C and speciated phenols is acceptable.

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05 Historical Reports > 06.03 Targeted Soil Contamination Assessment Report dated February 2012.pdf

Appendix H: QA/QC Tables



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05 Historical Reports > 06.03 Targeted Soil Contamination Assessment Report dated February 2012.pdf

Appendix F: Analysis Tables

Table Name:	Table A - Soil Borehole Analysis Summary		
Report Name:	Targeted Soil Contamination Assessment - Toyota, Carringbah NSW		
Client Name:	Toyota Motor Corporation Australia Limited		
Client Number:	ST0139	Job Number:	98287

Table A - Soil Borehole Analysis Summary	Heavy Metals	PAH		
	Lead (Pb)	Naphthalene	Benzo(a)Pyrene	Total PAH -
Health Based Investigation Level	1500	18	3	100
Soil Sample ID				
BH01-01 (2.5)	58.00	<0.5	<0.5	<1.0
BH01-02 (3.5)	9.60	<0.5	<0.5	<1.0
BH02-01 (3.5)	6.80	<0.5	<0.5	<1.0
BH02-02 (4.0)	9.20	<0.5	<0.5	<1.0
BH03-01 (1.0)	8.1	<0.5	<0.5	<1.0
BH04-01 (1.5)	3.70	<0.5	<0.5	<1.0
BH04-02 (4.0)		<0.5	<0.5	<1.0

Table A - Soil Borehole Analysis Summary	BTEX (mg/kg)				TRH (mg/kg)			
	Benzene	Toluene	Ethylbenzene	Xylene	C6-C9	C10-C14	C15-C28	C29-C36+
Health Based Investigation Level	1	130	50	25	65	-	-	-
Soil Sample ID								
BH01-01 (2.5)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH01-02 (3.5)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH02-01 (2.0)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH02-02 (4.0)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH03-01 (1.0)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH04-01 (1.5)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300
BH04-02 (4.0)	<0.5	<0.5	<0.5	<3	<10	<50	<100	<300

Indicates "Exceeds HIL"

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Appendix F Registered Groundwater Bores

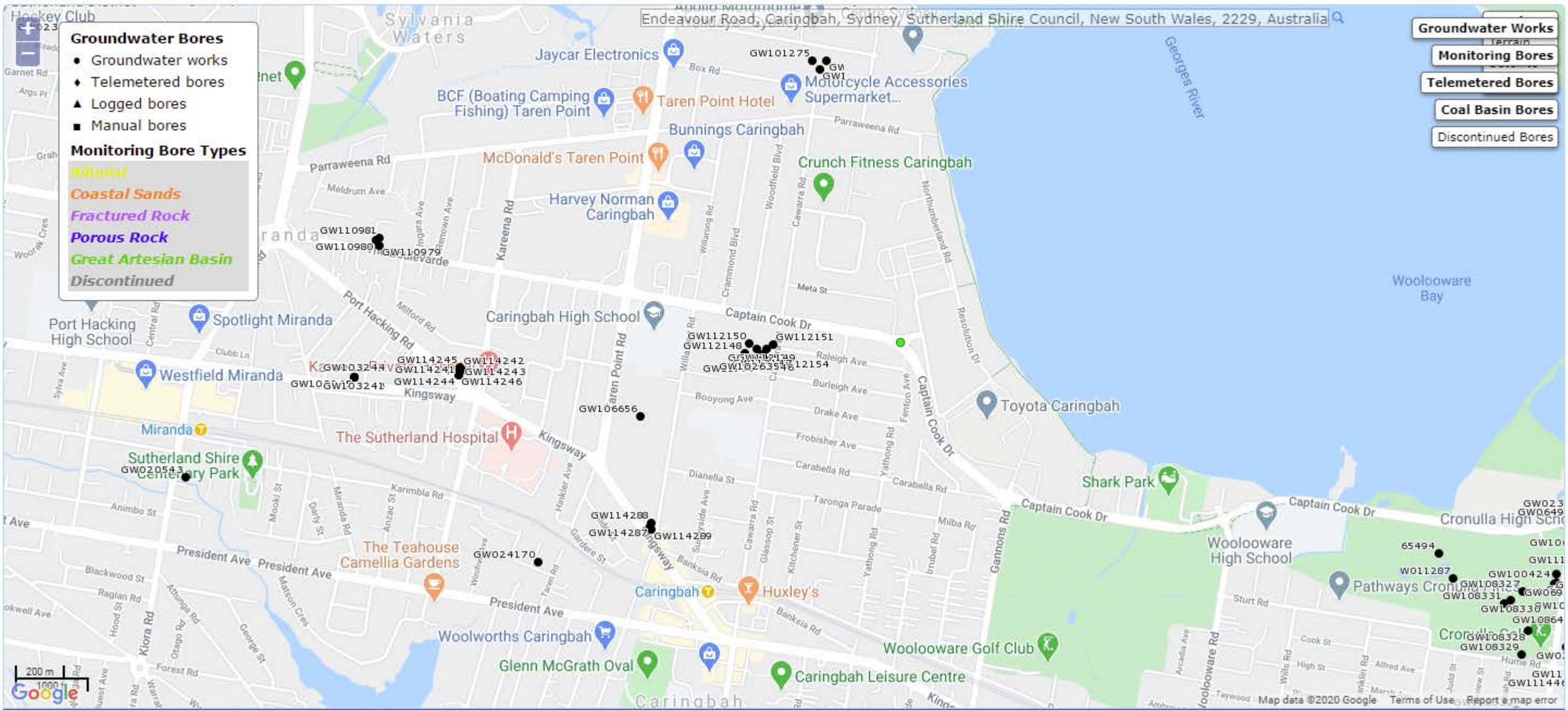
All Groundwater Site Details

ALL GROUNDWATER MAP

bookmark this page

All data times are Eastern Standard Time

Map | Info



Scale = 1 : 14K | 325165, 6231680, 56

WaterNSW
Work Summary

GW101273

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 25/11/1997
Final Depth: 4.20 m
Drilled Depth: 4.20 m

Contractor Name: Macquarie Drilling
Driller: Douglas Stephen Miller
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	LOT20 DP6359
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6233542.000
Easting: 327070.000
Latitude: 34°01'28.3"S
Longitude: 151°07'37.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.20	125			Other
1		Annulus	Waterworn/Rounded	1.60	4.20				Graded
1	1	Casing	Pvc Class 18	0.00	2.20	65	55		Seated on Bottom, Screwed
1	1	Opening	Slots	2.20	4.20			0	PVC Class 18, SL: 2.0mm

Water Bearing Zones

From	To	Thickness	WBZ Type	S.W.L.	D.D.L.	Yield	Hole	Duration	Salinity

(m)	(m)	(m)		(m)	(m)	(L/s)	Depth (m)	(hr)	(mg/L)
2.40	4.20	1.80	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	clayey gravel	Gravel	
0.15	0.85	0.70	gravelly clay	Clay	
0.85	1.80	0.95	sandy clay	Sandy Clay	
1.80	2.40	0.60	sandy silt/organics	Silt	
2.40	2.90	0.50	clayey sand	Sand	
2.90	3.80	0.90	sandy clay	Sandy Clay	
3.80	4.20	0.40	sandstone	Sandstone	

Remarks

25/01/2013: Nat Carling, 25-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101273 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW101274

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 25/11/1997
Final Depth: 4.00 m
Drilled Depth: 4.00 m

Contractor Name: Macquarie Drilling
Driller: Douglas Stephen Miller
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	LOT20 DP6359
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6233573.000
Easting: 327095.000
Latitude: 34°01'27.3"S
Longitude: 151°07'38.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.00	125			Backhoe
1		Annulus	Waterworn/Rounded	1.70	4.00				Graded
1	1	Casing	Pvc Class 18	0.00	2.00	85			Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	2.00	4.00			0	PVC Class 18, SL: 2.0mm

Water Bearing Zones

From	To	Thickness	WBZ Type	S.W.L.	D.D.L.	Yield	Hole	Duration	Salinity

(m)	(m)	(m)		(m)	(m)	(L/s)	Depth (m)	(hr)	(mg/L)
1.40	4.00	2.60	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Asphalt/crushed rock	Fill	
0.40	1.20	0.80	sandy clay	Sandstone	
1.20	3.00	1.80	silty sand	Sand	
3.00	4.00	1.00	clayey sand	Sand	

Remarks

25/01/2013: Nat Carling, 25-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101274 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW101275

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Other
Owner Type: Private

Commenced Date:
Completion Date: 26/11/1997
Final Depth: 4.00 m
Drilled Depth: 4.00 m

Contractor Name: Macquarie Drilling
Driller: Douglas Stephen Miller
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:			
Licensed:	CUMBERLAND	SUTHERLAN	LOT20 DP6359

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6233572.000
Easting: 327044.000
Latitude: 34°01'27.3"S
Longitude: 151°07'36.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.00	125			Other
1		Annulus	(Unknown)	1.70	4.00				
1	1	Casing	Pvc Class 18	0.00	2.00	65			Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	2.00	4.00			0	PVC Class 18, SL: 2.0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.60	4.00	1.40	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.40	1.40	gravelly clay	Clay	
1.40	2.30	0.90	sandy clay	Sandy Clay	
2.30	4.00	1.70	clayey sand	Sand	

Remarks

25/01/2013: Nat Carling, 25-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101275 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW102635

Licence: 10BL158789 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 14/09/1998
Final Depth: 4.50 m
Drilled Depth: 4.50 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: BONCONE 105 Cawarra Rd CARINGBAH 2229 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:		UNKNOWN	
Licensed:	CUMBERLAND	SUTHERLAND	Whole Lot 9//228921

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232490.000
Easting: 326833.000
Latitude: 34°02'02.3"S
Longitude: 151°07'27.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.50	100			Auger
1		Annulus	Waterworn/Rounded	4.00	5.00				Graded, Q:2.000m3
1	1	Casing	P.V.C.	0.00	1.50				Screwed
1	1	Opening	Slots - Vertical	1.50	4.50	50		0	PVC, SL: 3.0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	0.00	0.00	Unknown	2.10					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.80	3.80	SILTY CLAY	Invalid Code	
3.80	4.50	0.70	SANDSTONE	Sandstone	

***** End of GW102635 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW106656

Licence: 10WA109431 **Licence Status:** CURRENT

Authorised Purpose(s): RECREATION (GROUNDWATER)
Intended Purpose(s): RECREATION (GROU

Work Type: Bore
Work Status:
Construct.Method: Rotary Air
Owner Type:

Commenced Date:
Completion Date: 24/09/2004
Final Depth: 103.00 m
Drilled Depth: 103.00 m

Contractor Name: Britt's Water Solutions
Driller: Thomas Garry Britt
Assistant Driller:

Property: CARINGBAH BOWLING & REC CLUB 105-107 Willarong Rd CARINGBAH 2229 NSW
GWMA: -
GW Zone: -
Standing Water Level (m): 11.000
Salinity Description: Fresh
Yield (L/s): 0.300

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	5 31460
Licensed:	CUMBERLAND	SUTHERLAND	Whole Lot 5//31460

Region: 10 - Sydney South Coast
River Basin: 213 - SYDNEY COAST - GEORGES RIVER
Area/District:
CMA Map: 9129-4N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6232269.000
Easting: 326440.000
Latitude: 34°02'09.3"S
Longitude: 151°07'11.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	18.00	200			Rotary Air
1		Hole	Hole	18.00	103.00	162			Rotary Air
1	1	Casing	Pvc Class 6	0.30	18.00	158			Driven into Hole, Glued

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
21.00	21.10	0.10	Unknown	11.00		0.20	24.00		
32.00	32.10	0.10	Unknown	11.00		0.30	35.00		
58.00	58.10	0.10	Unknown	11.00		0.30	61.00		
79.00	79.10	0.10	Unknown	11.00		0.30	82.00		

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	TOPSOIL/CLAY	Topsoil	
1.00	4.00	3.00	COLOURED CLAY	Clay	
4.00	5.50	1.50	WEATHERED SANDSTONE	Sandstone	
5.50	103.00	97.50	SANDSTONE WITH SMALL SHALE BANDS	Sandstone	

Remarks

11/03/2011: Karla Abbs, 11-Mar-2011: Replaced invalid codes in Drillers Log

***** End of GW106656 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112146

Licence: 10BL158918
Licence Status: ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 2.10 m
Drilled Depth: 2.10 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property: S L A S LIMITED 101-103 Cawarra Rd CARINGBAH 2229 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	3//866034
Licensed:	CUMBERLAND	SUTHERLAND	Whole Lot 3//866034

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232489.000
Easting: 326888.000
Latitude: 34°02'02.4"S
Longitude: 151°07'29.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112146 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112147

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 2.20 m
Drilled Depth: 2.20 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	3//866034
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232502.000
Easting: 326882.000
Latitude: 34°02'01.9"S
Longitude: 151°07'29.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112147 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112148

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 1.30 m
Drilled Depth: 1.30 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	3//866034
Licensed:				

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232505.000
Easting: 326816.000
Latitude: 34°02'01.8"S
Longitude: 151°07'26.5"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112148 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112149

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 2.40 m
Drilled Depth: 2.40 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:			
Licensed:	CUMBERLAND	SUTHERLAN	2//866034

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232524.000
Easting: 326896.000
Latitude: 34°02'01.3"S
Longitude: 151°07'29.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112149 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112150

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 1.20 m
Drilled Depth: 1.20 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	2//866034
Licensed:				

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232543.000
Easting: 326832.000
Latitude: 34°02'00.6"S
Longitude: 151°07'27.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112150 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112151

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 3.60 m
Drilled Depth: 3.60 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	2//866034
Licensed:				

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232540.000
Easting: 326919.000
Latitude: 34°02'00.8"S
Longitude: 151°07'30.6"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112151 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112152

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 1.40 m
Drilled Depth: 1.40 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	2//866034
Licensed:				

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232522.000
Easting: 326860.000
Latitude: 34°02'01.3"S
Longitude: 151°07'28.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112152 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112153

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 1.00 m
Drilled Depth: 1.00 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	3//866034
Licensed:				

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232477.000
Easting: 326889.000
Latitude: 34°02'02.8"S
Longitude: 151°07'29.4"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112153 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW112154

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 15/11/1998
Final Depth: 1.70 m
Drilled Depth: 1.70 m

Contractor Name: (None)
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:				
Licensed:		CUMBERLAND	SUTHERLAN	3//866034

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6232490.000
Easting: 326899.000
Latitude: 34°02'02.3"S
Longitude: 151°07'29.8"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status, drill method & drilled depth.

***** End of GW112154 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114287

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 07/05/2012
Final Depth: 7.00 m
Drilled Depth: 7.00 m

Contractor Name: Numac
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	101//788773
Licensed:				
Region:	10 - Sydney South Coast	**CMA Map:**		
River Basin:	- Unknown	**Grid Zone:**	**Scale:**	
Area/District:				
Elevation:	0.00 m (A.H.D.)	**Northing:**	6231872.000	**Latitude:** 34°02'22.2"S
Elevation Source:	Unknown	**Easting:**	326485.000	**Longitude:** 151°07'13.2"E
GS Map:	-	**MGA Zone:**	56	**Coordinate Source:** Unknown

Remarks

04/08/2014: Nat Carling, 4-Aug-2014; Added status, drill method, depth & updated work type.

***** End of GW114287 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114288

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method:
Owner Type: Private

Commenced Date:
Completion Date: 07/05/2012
Final Depth: 7.00 m
Drilled Depth: 7.00 m

Contractor Name: Numac Drilling Services
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

		County	Parish	Cadastre
Form A:		CUMBERLAND	SUTHERLAN	101//788773
Licensed:				
Region:	10 - Sydney South Coast	**CMA Map:**		
River Basin:	- Unknown	**Grid Zone:**	**Scale:**	
Area/District:				
Elevation:	0.00 m (A.H.D.)	**Northing:**	6231883.000	**Latitude:** 34°02'21.8"S
Elevation Source:	Unknown	**Easting:**	326489.000	**Longitude:** 151°07'13.4"E
GS Map:	-	**MGA Zone:**	56	**Coordinate Source:** Unknown

Remarks

04/08/2014: Nat Carling, 4-Aug-2014; Added status, drill method, depth & updated work type.

***** End of GW114288 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114289

Licence:		**Licence Status:**	
		Authorised Purpose(s):	
		Intended Purpose(s):	MONITORING BORE
Work Type:	Bore		
Work Status:	Equipped		
Construct.Method:			
Owner Type:	Private		
Commenced Date:		**Final Depth:**	7.20 m
Completion Date:	07/05/2012	**Drilled Depth:**	7.20 m
Contractor Name:	Numac Drilling Services		
Driller:	Unkown Unknown		
Assistant Driller:			
Property:		**Standing Water Level (m):**	
GWMA:		**Salinity Description:**	
GW Zone:		**Yield (L/s):**	

Site Details

Site Chosen By:

		County	**Parish**	**Cadastre**
	Form A:			
	Licensed:	CUMBERLAND	SUTHERLAN	101//788773
Region:	10 - Sydney South Coast	**CMA Map:**		
River Basin:	- Unknown	**Grid Zone:**		**Scale:**
Area/District:				
Elevation:	0.00 m (A.H.D.)	**Northing:**	6231862.000	**Latitude:** 34°02'22.5"S
Elevation Source:	Unknown	**Easting:**	326486.000	**Longitude:** 151°07'13.2"E
GS Map:	-	**MGA Zone:**	56	**Coordinate Source:** Unknown

Remarks

04/08/2014: Nat Carling, 4-Aug-2014; Added status, drill method, depth & updated work type.

***** End of GW114289 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114899

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 27/08/2009
Final Depth: 3.20 m
Drilled Depth: 3.20 m

Contractor Name: Numac Drilling Services Pty Ltd
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	X//404547
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6231115.000
Easting: 327741.000
Latitude: 34°02'47.5"S
Longitude: 151°08'01.6"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.20	0			Auger - Solid Flight
1	1	Casing	P.V.C.	0.00	2.20	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	CONCRETE	Fill	

0.30	1.00	0.70	FILL GRAVELLY SAND DARK BROWN	Fill	
1.00	2.00	1.00	CLAY SANDY,LIGHT GREY DAMP TO MOIST	Clay	
2.00	2.80	0.80	CLAY SANDY BROWN	Clay	
2.80	3.00	0.20	CLAY AS ABOVE,RED	Clay	
3.00	3.20	0.20	CLAY SANDY, RED,DAMP, LOW PLASTICITY	Clay	

Remarks

27/08/2009: Form A Remarks:
No form A, only log. Coordinates provided by LAS. L.Franchi 11/6/15
10/08/2015: Nat Carling, 10-Aug-2015; Updated work type & coordinate source, fixed rock type errors.

***** End of GW114899 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114900

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 11/06/2015
Final Depth: 4.00 m
Drilled Depth: 4.00 m

Contractor Name: Numac Drilling Services Pty Ltd
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	X//404547
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6231116.000
Easting: 327729.000
Latitude: 34°02'47.4"S
Longitude: 151°08'01.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.00	0			Auger - Solid Flight
1	1	Casing	P.V.C.	0.00	0.50	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	CONCRETE	Fill	

0.30	0.50	0.20	FILL, GRAVELLY SAND BROWN,DAMP	Fill	
0.50	1.00	0.50	SAND CLAYEY, GREY,DAMP	Clay	
1.00	2.00	1.00	CLAY SANDY BROWN WITH GREEN SPECKS	Clay	
2.00	3.00	1.00	CLAY SANDY LIGHT GREY BROWN	Clay	
3.00	3.50	0.50	CLAY SANDY RED MOIST STIFF	Clay	
3.50	4.00	0.50	SAND CEMENTED,OFF WHITE,RED,MOIST	Sand	

Remarks

11/06/2015: Form A Remarks:
No form A on file, only log. Coordinates provided from sketch attached. L.Franchi
10/08/2015: Nat Carling, 10-Aug-2015; Updated coordinate source.

***** End of GW114900 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114901

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 27/08/2009
Final Depth: 4.20 m
Drilled Depth: 4.20 m

Contractor Name: Numac Drilling Services Pty Ltd
Driller: Unkown Unknown
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	SUTHERLAN	X//404547
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6231154.000
Easting: 327702.000
Latitude: 34°02'46.2"S
Longitude: 151°08'00.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.20	0			Auger - Solid Flight
1	1	Casing	P.V.C.	0.00	1.80	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Fill	

0.20	1.50	1.30	FILL, GRAVELLY SAND, DAMP,LOOSE	Fill	
1.50	3.00	1.50	CLAY SANDY BROWN TO ORANGE BROWN	Clay	
3.00	4.00	1.00	CLAY SANDY ORANGE BROWN,WET,SOFT	Clay	
4.00	4.20	0.20	CLAY,SANDY LIGHT GREEN/BROWN,VERY WET	Clay	

Remarks

27/08/2009: Form A Remarks:
No form A on file,, only log. Coordinates provided by sketch. L. Franchi.
10/08/2015: Nat Carling, 10-Aug-2015; Updated work type & coordinate source, fixed rock type errors.

***** End of GW114901 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix G Historical Aerial Photographs



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 1943

AERIAL 1943

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_1943.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037

Client: Aliro

Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK

Scale 1:5,000

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 1956

AERIAL 1956

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_1956.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 1975

AERIAL 1975

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_1975.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 1983

AERIAL 1983

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_1983.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037

Client: Aliro

Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK

Scale 1:5,000

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 1994

AERIAL 1994

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_1994.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 2005

AERIAL 2005

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_2005.mxd
Reference: NSW DFSI



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 2010

AERIAL 2010

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_2010.mxd
Reference: Nearmap - www.nearmap.com.au (Capture Date: 08/01/2010)



Legend

Approximate Site Boundary

JBS&G

Job No: 58037	
Client: Aliro	
Version: Aerials	Date 1/07/2020
Drawn By: JA	Checked By: CK
Scale 1:5,000	

0 50 100

metres

Coord. Sys. GDA 1994 MGA Zone 56

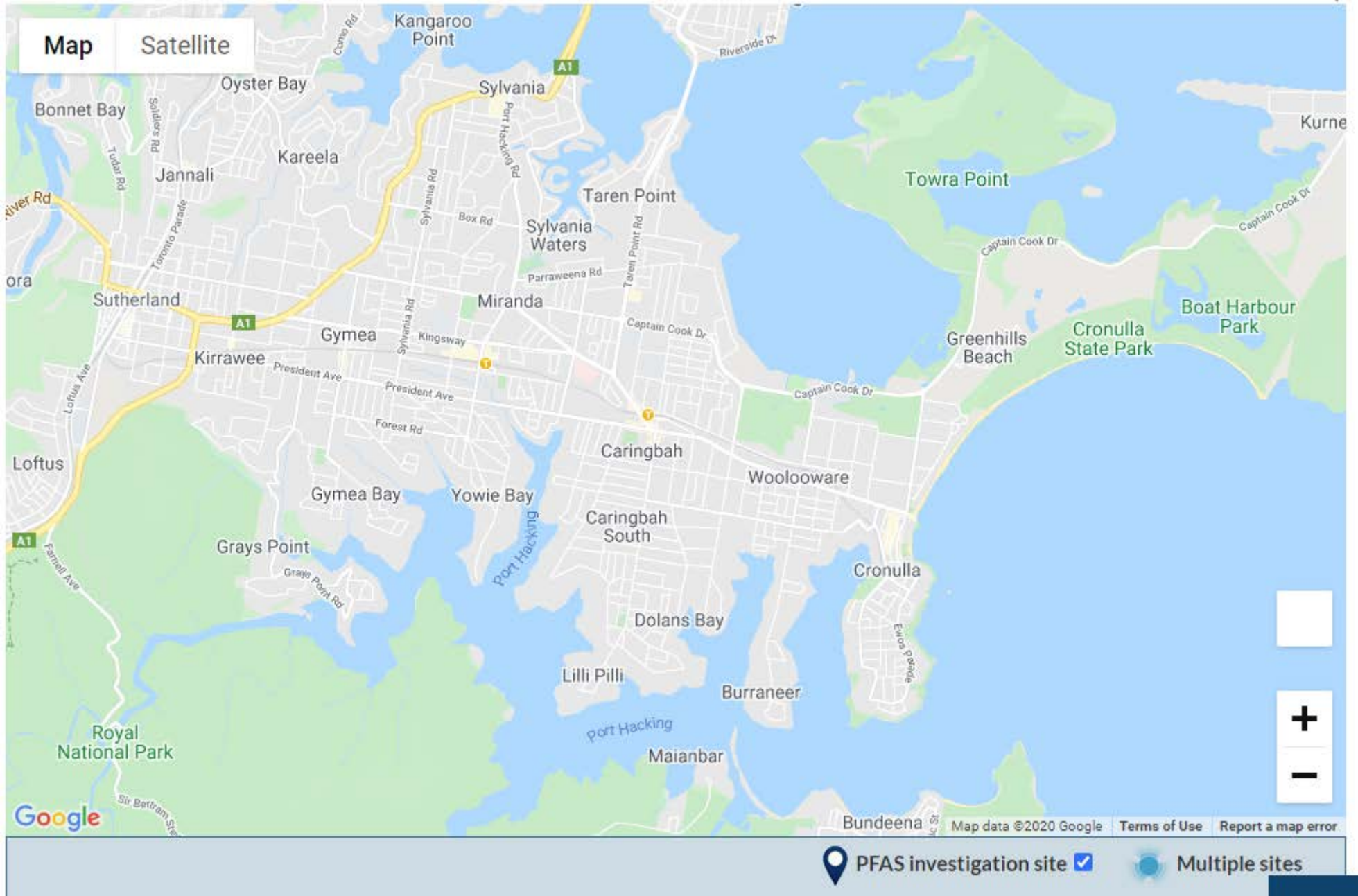
13 Endeavour Road, Caringbah NSW

HISTORICAL IMAGERY 2020

AERIAL 2020

File Name: N:\Projects\Aliro\58037 - Caringbah Due Dilligence\GIS\Maps\Aerials\58037_2020.mxd
Reference: Nearmap - www.nearmap.com.au (Capture Date: 01/06/2020)

Appendix H EPA Records


Map
Satellite
Kangaroo Point
Oyster Bay
Sylvania
Bonnet Bay
Kareela
Jannali
Taren Point
Towra Point
Sylvania Waters
Sutherland
Miranda
Gymea
Kirrawee
Greenhills Beach
Cronulla State Park
Boat Harbour Park
Caringbah
Loftus
Gymea Bay
Yowie Bay
Woolooware
Caringbah South
Grays Point
Cronulla
Dolans Bay
Lilli Pilli
Burraneer
Port Hacking
Royal National Park
Maianbar
Bundeena
Google
Map data ©2020 Google
Terms of Use
Report a map error
PFAS investigation site
Multiple sites



In this section

The NSW Government PFAS Investigation Program

NSW has a nation leading, state-wide PFAS investigation program underway to identify the use and impacts of legacy PFAS.

The EPA is leading an investigation program to assess the legacy of PFAS use across NSW. With the assistance of the NSW PFAS Technical Advisory Group, which includes NSW Health, Department of Primary Industries and the Office of Environment and Heritage, we provide impacted residents with tailored, precautionary dietary advice to help them reduce any exposure to PFAS.

Current investigations are focused on sites where it is likely that large quantities of PFAS have been used. The EPA is currently investigating PFAS at these sites:

Map view

Tags: PFAS (/Search?q=PFAS)

Sampling and analysis

The EPA is collecting samples of soils and/or waters for analysis for PFAS. The EPA is also looking for exposure pathways that may increase people's contact with the chemicals, such as bore and surface water usage.

If significant levels are detected and human or ecological exposure is likely, a more detailed assessment will be undertaken.

The EPA will work with the occupiers and owners of these sites, or the responsible parties, to clean-up the site, where necessary.

Timeframes for the investigation

The initial investigations can take approximately six months, with further testing undertaken where required.

Test findings are made available throughout the investigations.

More information is available on the NSW EPA **PFAS investigation process (/MediaInformation/pfasinvestigationprocess.htm)** page.

Top

Release of the National Environmental Management Plan for PFAS version 2

The PFAS National Environmental Management Plan version 2 (https://www.environment.gov.au/protection/chemicals-management/pfas) has now been released by the Commonwealth Department of Agriculture Water and Environment. This is the current version of the PFAS NEMP. It was agreed by Heads of EPAs in October 2019. It has been endorsed by Environment Ministers and has been endorsed for implementation in NSW.

In those jurisdictions that have endorsed it, this version supersedes the first version of the NEMP published in 2018.

The PFAS NEMP establishes a practical basis for nationally consistent environmental guidance and standards for managing PFAS contamination. The plan has been developed by all jurisdictions and recognises the need for implementation of best practice regulation through individual jurisdictional mechanisms. It represents a how-to guide for the investigation and management of PFAS contamination and waste management.

The PFAS NEMP 2.0 provides new and revised guidance on four of the areas that were identified as urgent priorities in the first version of the NEMP

- Environmental guideline values
- Soil reuse
- Wastewater management
- On-site containment

This new guidance, as well as important clarifications regarding the intent of some of the PFAS NEMP 1.0 material, was developed by the National Chemicals Working Group across 2018 and considered by Heads of EPAs and Environment Ministers in late 2018.

Consultation on version 2 of NEMP

The Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of Agriculture, Water and the Environment (DAWE) worked together to develop the PFAS NEMP 2.0. HEPA's National Chemicals Working Group led the development and consultation process.

The draft PFAS NEMP 2.0 was published on 28 February 2019 with comments due by Friday 21 June 2019. Environmental regulators in all states and territories hosted public consultation sessions in all capital cities across March and April 2019, with the Commonwealth presenting the work on behalf of the National Chemicals Working Group. Around 550 people attended the sessions.

All feedback received was considered by the National Chemicals Working Group and further changes were made in response to that feedback before the document was finalised in late 2019. An ancillary document summarising the feedback and the responses made is expected to be published soon by the Commonwealth Department of Agriculture Water and Environment.

Working with our stakeholders

The NSW Government is committed to working closely with all relevant government agencies, to closely monitor the progress of investigations, and to keep local communities informed. Government agencies include local councils, NSW Department of Primary Industries, NSW Health, NSW Food Authority, and where necessary the Commonwealth Department of Defence, and Commonwealth Department of Health.

In NSW the polluter pays for and manages any clean-up required. Although the NSW Government cannot regulate Defence sites, it has outlined expectations that Defence will carry out investigations in a timely manner that is consistent with the EPA's requirements and processes.

More information

- NSW EPA **PFAS investigation program fact sheet (PDF 213KB) (/-/media/epa/corporate-site/resources/community/factsheet-state-wide-pfas-investigation.pdf?la=en&hash=004EE1C28CEC9F16730FBFF322305DA0DDF1A3ED)**

Top

NSW EPA **PFAS investigation program FAQs (/your-environment/contaminated-land/pfas-investigation-program/pfas-investigation-faqs)** page

NSW Department of Health (http://www.health.nsw.gov.au/factsheets/Pages/RAAF-site-contamination.aspx) FAQs

For specific health inquiries call the NSW Department of Health on **1300 066 055**

Information about the Williamtown RAAF Base contamination (/working-together/community-engagement/community-news/raaf-williamtown-contamination)

If you have any questions about the EPA's PFAS investigation program, please call the Environment Line on **131 555** or email**info@environment.nsw.gov.au (mailto:info@environment.nsw.gov.au)**

Page last updated 7 May 2020

For business and industry

For local government

Contact us

131 555 (tel:131555)

Online (https://yoursay.epa.nsw.gov.au/epa-website-feedback)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (/about-us/contact-us/locations)

Search results

Your search for: **General Search** with the following criteria

Suburb - Caringbah

returned 32 results

Export to excel 1 of 2 Pages Search Again

Number	Name	Location	Type	Status	Issued date
6807	BROWNBUILT PTY LIMITED	3 BOX ROAD, CARINGBAH, NSW 2229	POEO licence	Surrendered	26 Jun 2000
1048517	BROWNBUILT PTY LIMITED	3 BOX ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	06 Jun 2005
1076339	BROWNBUILT PTY LIMITED	3 BOX ROAD, CARINGBAH, NSW 2229	s.80 Surrender of a Licence	Issued	02 Aug 2007
7700	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	POEO licence	Surrendered	09 Aug 2000
1042670	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	30 Nov 2004
1093384	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	26 Feb 2009
1099372	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	02 Jun 2009
1518543	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	29 Nov 2013
1522709	ENWARE AUSTRALIA PTY. LIMITED	64-66 WOODFIELD BLVD, CARINGBAH, NSW 2229	s.80 Surrender of a Licence	Issued	05 Aug 2014
1344	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	POEO licence	No longer in force	30 May 2000
1008248	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	04 Jul 2001
1026130	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	01 Apr 2003
1027164	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	08 May 2003
1028573	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	26 Jun 2003
1076373	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	30 Jul 2007
1080951	HANSON CONSTRUCTION MATERIALS PTY LTD	3 ERSKINE ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	10 Dec 2007
7110	HCOA OPERATIONS (AUSTRALIA) PTY LIMITED	86 KAREENA ROAD, CARINGBAH, NSW 2229	POEO licence	No longer in force	08 Mar 2001
1023031	HCOA OPERATIONS (AUSTRALIA) PTY LIMITED	86 KAREENA ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	03 Dec 2002
1048151	HCOA OPERATIONS (AUSTRALIA) PTY LIMITED	86 KAREENA ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	26 May 2005
981	HOLCIM (AUSTRALIA) PTY LTD	LOT 5 PARRAWEENA ROAD, CARINGBAH, NSW 2229	POEO licence	No longer in force	15 Mar 2000

1 2

For business and industry

For local government

Contact us

11 August 2020

- 131 555 (tel:131555)
- Online (https://yoursay.epa.nsw.gov.au/epa-website-feedback)
- info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)
- EPA Office Locations (https://www.epa.nsw.gov.au/about-us/contact-us/locations)

Accessibility (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/help-index)
Disclaimer (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/disclaimer)
Privacy (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/privacy)
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Find us on

Search results

Your search for: **General Search** with the following criteria

Suburb - Caringbah

returned 32 results

Export to excel 2 of 2 Pages Search Again

Number	Name	Location	Type	Status	Issued date
2184	MCNEIL MANUFACTURING PTY LTD	32 CAWARRA RD, CARINGBAH, NSW 2229	POEO licence	Surrendered	17 Apr 2000
1085061	MCNEIL MANUFACTURING PTY LTD	32 CAWARRA RD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	28 Apr 2008
1104124	MCNEIL MANUFACTURING PTY LTD	32 CAWARRA RD, CARINGBAH, NSW 2229	s.80 Surrender of a Licence	Issued	15 Jul 2009
20516	MERBRON PTY. LIMITED	48 Fernleigh Road, CARINGBAH, NSW 2229	POEO licence	Surrendered	17 Oct 2014
1527679	MERBRON PTY. LIMITED	48 Fernleigh Road, CARINGBAH, NSW 2229	s.80 Surrender of a Licence	Issued	08 Jan 2015
20677	MERBRON PTY. LIMITED	48 Fernleigh Road, CARINGBAH, NSW 2229	POEO licence	Issued	16 Sep 2015
3085780574	Perfect Demo Pty Ltd	42 Willarong Road, CARINGBAH, NSW 2229	Penalty Notice	Court Elected	
1536480	Perfect Demo Pty Ltd	42 Willarong Road, CARINGBAH, NSW 2229	s.91 Clean Up Notice	Issued	22 Dec 2015
3085778677	Perfect Demo Pty Ltd	42 Willarong Road, CARINGBAH, NSW 2229	Penalty Notice	Issued	15 Feb 2016
1020014	PFIZER AUSTRALIA PTY LTD	32 CAWARRA RD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	14 Oct 2002
11767	SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICE	CNR KINGSWAY AND KAREENA ROAD, CARINGBAH, NSW 2229	POEO licence	No longer in force	27 Nov 2002
1048121	SOUTH EASTERN SYDNEY AND ILLAWARRA AREA HEALTH SERVICE	CNR KINGSWAY AND KAREENA ROAD, CARINGBAH, NSW 2229	s.58 Licence Variation	Issued	25 May 2005

1 2

11 August 2020

For business and industry

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Contact us

131 555 (tel:131555)

Online (https://yoursay.epa.nsw.gov.au/epa-website-feedback)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (https://www.epa.nsw.gov.au/about-us/contact-us/locations)

Accessibility (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/help-index)
Disclaimer (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/disclaimer)
Privacy (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/privacy)
Copyright (https://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/copyright)

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Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
WOLLONGONG	Former Wollongong Gasworks	120 and 122 Smith STREET	Gasworks	Regulation under CLM Act not required	-34.42030173	150.8906745
WOLLONGONG	Woolworths Service Station	425 Crown STREET	Service Station	Contamination currently regulated under CLM Act	-34.42637378	150.8799288
WOLLONGONG	Wollongong Harbour Central Spur	Off Endeavour DRIVE	Other Petroleum	Regulation under CLM Act not required	-34.42066879	150.906821
WOODBURN	Caltex Service Station	129 River STREET	Service Station	Regulation under CLM Act not required	-29.07206887	153.3409769
WOODBURN	Crown Reserve 88037 Woodburn	Pacific HIGHWAY	Landfill	Regulation under CLM Act not required	-29.06580577	153.3541886
WOOLGOOLGA	Caltex Woolgoolga Service Station	16 Bosworth ROAD	Service Station	Regulation under CLM Act not required	-30.12569561	153.1946006
WOOLGOOLGA	United Petroleum Service Station	58 Clarence STREET	Service Station	Under assessment	-30.11045544	153.1904609
WOOLLAHRA	Former Service Station	20 Wallis STREET	Service Station	Regulation under CLM Act not required	-33.8901965	151.2372752
WOOLLAHRA	Proposed Jewish Care Centre	7-21 Saber STREET	Unclassified	Regulation under CLM Act not required	-33.8904055	151.2480062
WOOLLAHRA	Caltex Woollahra Service Station	116 Old South Head ROAD	Service Station	Contamination formerly regulated under the CLM Act	-33.88959697	151.2553736
WOOLLOOMOOLOO	Former BP Service Station	2 Dowley STREET	Service Station	Contamination being managed via the planning process (EP&A Act)	-33.86940191	151.2218741
WOOLOMIN	Woolomin Gold Rush Store	65 Nundle ROAD	Other Petroleum	Contamination formerly regulated under the CLM Act	-31.30415134	151.149729
WOOLOOWARE	Caltex Service Station	100 Woolooware ROAD	Service Station	Regulation under CLM Act not required	-34.05274635	151.1408413
WOOLOOWARE	Oyster Farm	Captain Cook DRIVE	Other Industry	Regulation under CLM Act not required	-34.03807914	151.1476055
WOONGARRAH	Former Warnervale Landfill	236-264 Hakone ROAD	Landfill	Regulation under CLM Act not required	-33.2376313	151.464362

Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
CAMPERDOWN	The Spruce	12-14 Marsden STREET	Other Industry	Regulation under CLM Act not required	-33.88720632	151.1784514
CAMPSIE	Budget Petroleum and adjacent property	403 Canterbury Road and 1 Una STREET	Service Station	Contamination currently regulated under CLM Act	-33.91605617	151.1086596
CAMPSIE	Former Sunbeam factory	60 Charlotte STREET	Other Industry	Contamination formerly regulated under the CLM Act	-33.92254225	151.1025796
CANLEY HEIGHTS	Former Caltex Canley Heights	368 Canley Vale ROAD	Service Station	Regulation under CLM Act not required	-33.88271081	150.9154176
CANLEY HEIGHTS	Caltex Canley Heights Service Station	280-286 Canley Vale ROAD	Service Station	Regulation under CLM Act not required	-33.88393501	150.9241656
CANLEY VALE	Coles Express Lansvale	99 Hume HIGHWAY	Service Station	Regulation under CLM Act not required	-33.89295753	150.9606136
CANLEY VALE	Former Mobil Service Station	96 Canley Vale ROAD	Service Station	Regulation under CLM Act not required	-33.88591573	150.9369801
CANOWINDRA	BP-branded Jasbe Service Station	76 Rodd STREET	Service Station	Regulation under CLM Act not required	-33.56131773	148.6682805
CANTERBURY	Metro Petroleum Service Station	13-19 Canterbury ROAD	Service Station	Contamination currently regulated under CLM Act	-33.90783455	151.125207
CARDIFF	7-Eleven Service Station	399 Main ROAD	Service Station	Regulation under CLM Act not required	-32.93391137	151.6562111
CARDIFF	Former Caltex Service Station	367 Main ROAD	Service Station	Regulation under CLM Act not required	-32.93761223	151.6577781
CARDIFF	Maneela Oval	Main ROAD	Other Industry	Regulation under CLM Act not required	-32.93018443	151.6435559
CARDIFF	Former Mobil Depot	7 Ranton STREET	Other Petroleum	Regulation under CLM Act not required	-32.94516764	151.6470387
CARDIFF	BP Service Station (Reliance Petroleum)	Corner Sturt and Main ROADS	Service Station	Regulation under CLM Act not required	-32.93792229	151.6569905
CARDIFF	Woolworths (former Mobil) Cardiff Service Station	43 Macquarie ROAD	Service Station	Regulation under CLM Act not required	-32.94118246	151.6578195

Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
CARINGBAH	Adjacent to Spirent Australia	101-103 Cawarra ROAD	Other Industry	Contamination formerly regulated under the CLM Act	-34.03360747	151.1245577
CARINGBAH	Former Consumer Health Products Manufacturer	32-40 Cawarra ROAD	Other Industry	Regulation under CLM Act not required	-34.03024369	151.1277755
CARINGBAH	Caltex Lilli Pilli Service Station	477-481 Port Hacking ROAD	Service Station	Regulation under CLM Act not required	-34.05243807	151.1216353
CARINGBAH	7-Eleven Service Station	367 The KINGSWAY	Service Station	Regulation under CLM Act not required	-34.03948677	151.1203268
CARINGBAH	Spirent Australia	105 Cawarra ROAD	Other Industry	Contamination formerly regulated under the CLM Act	-34.03425343	151.1245092
CARINGBAH	BP Service Station Caringbah	54 Captain Cook DRIVE	Service Station	Regulation under CLM Act not required	-34.032986	151.1250656
CARLINGFORD	Caltex Service Station Carlingford	131 Pennant Hills ROAD	Service Station	Regulation under CLM Act not required	-33.78762398	151.0279422
CARLINGFORD	Caltex Service Station	797 Pennant Hills ROAD	Service Station	Regulation under CLM Act not required	-33.7757819	151.0516532
CARLTON	Shell Coles Express Service Station	277 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-33.9748579	151.1272732
CARRINGTON	Commercial Metals Company (CMC) Australia Pty Ltd	117-121 Bourke STREET	Other Industry	Regulation under CLM Act not required	-32.9148832	151.7677193
CARRINGTON	Carrington redevelopment site	11 Howden STREET	Other Industry	Regulation under CLM Act not required	-32.91309509	151.7625341
CARRINGTON	Forgacs Dockyard	81 Denison STREET	Other Industry	Regulation under CLM Act not required	-32.9207441	151.764816
CARRINGTON	NAT vacant land	Bourke STREET	Unclassified	Regulation under CLM Act not required	-32.91276029	151.7685894
CARRINGTON	Dyke Point Containment Cell	Dyke ROAD	Other Industry	Regulation under CLM Act not required	-32.91763422	151.7727101
CARRINGTON	Carrington Coal Tar Pavements	Bourke Street to Dyke ROAD	Other Industry	Regulation under CLM Act not required	-32.91441348	151.770271

Appendix I Heritage Records

Search Results

3 results found.

Botany Bay Foreshore Rd	Botany, NSW, Australia	(Nomination now ineligible for PPAL) National Heritage List
Kurnell Peninsula Towra Point Area Captain Cook Dr	Kurnell, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Towra Point Aquatic Reserve Captain Cook Dr	Kurnell, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Tue Aug 11 15:42:16 2020

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Your search did not return any matching results. Please refine your search and try again.

Here you can search the State Heritage Inventory. The State Heritage Inventory is a database of heritage items in New South Wales which includes:

- declared Aboriginal Places
- items listed on the State Heritage Register
- listed Interim Heritage Orders
- items on State Agency Heritage Registers, and,
- items listed of local heritage significance on a local council's Local Environmental Plan.

NSW's maritime heritage, that is not a site listed on the State Heritage Register, is held in a separate database. You can search for shipwrecks, submerged aircraft and other maritime heritage sites in the Maritime Heritage Database.

For more information about Aboriginal Places and other sites of significance refer to Aboriginal Heritage Information Management System.

We work to keep the State Heritage Inventory up to date. We rely on State agencies and local councils to provide updated information when applicable. It's recommended that you check with the relevant State agency or local council for the most up-to-date information.

Basic search criteria

Item name/database ID:

Street name:

Endeavor Road

Suburb/town:

Caringbah

Local Government Area:

Please Choose...

Local Aboriginal Land Council (LALC):

Please Choose...

(For Aboriginal Place and State Heritage Register only)

Heritage listings:

Please Choose...

SHR number:

Additional search criteria

NOTE: For items listed by local councils, there may not be information in the additional search criteria fields.

Owner organisation*:

Designer/builder:

Year of construction:

from to:

Item type:

Please Choose...

Item group:

Please Choose...

Item category:

Please Choose...

Australian historic theme:

Please Choose...

NSW historic theme:

Please Choose...

Significance, description, historical notes:

Information complete:

Search Reset

*View owner organisation names for section 170 heritage and conservation registers

Search Aboriginal Places & State Heritage Register

The map below shows declared Aboriginal Places and items listed on the State Heritage Register. It does not include listed Interim Heritage Orders, items on State Agency Heritage Registers or Local Environmental Plans.

The location of Aboriginal Places and State Heritage Register items are marked on the map as a single approximation point for general identification and research purposes only.

Location information for some Aboriginal Places (e.g. burial grounds and sacred sites) has been generalised because of their cultural sensitivity. Location information for restricted Aboriginal Places is not shown at all. If a

proposed activity or development could potentially impact or harm (i.e. damage, deface or destroy) an Aboriginal Place, the people responsible for the proposed development must undertake a search for the exact boundaries of Aboriginal Places through Aboriginal Heritage Information Management System.

State Heritage Register spatial datasets and associated metadata into a Geographical Information System (GIS) software package is available through Data NSW.

Listing Type:

◉ All ○ Aboriginal Places ○ State Heritage Register

Local government area:

Please Choose...

Item name/Database ID:

SHR number:

Location:

Local Aboriginal Land Council (LALC):

Please Choose...

State theme:

Please Choose...

Item type:

Please Choose...

Item Group:

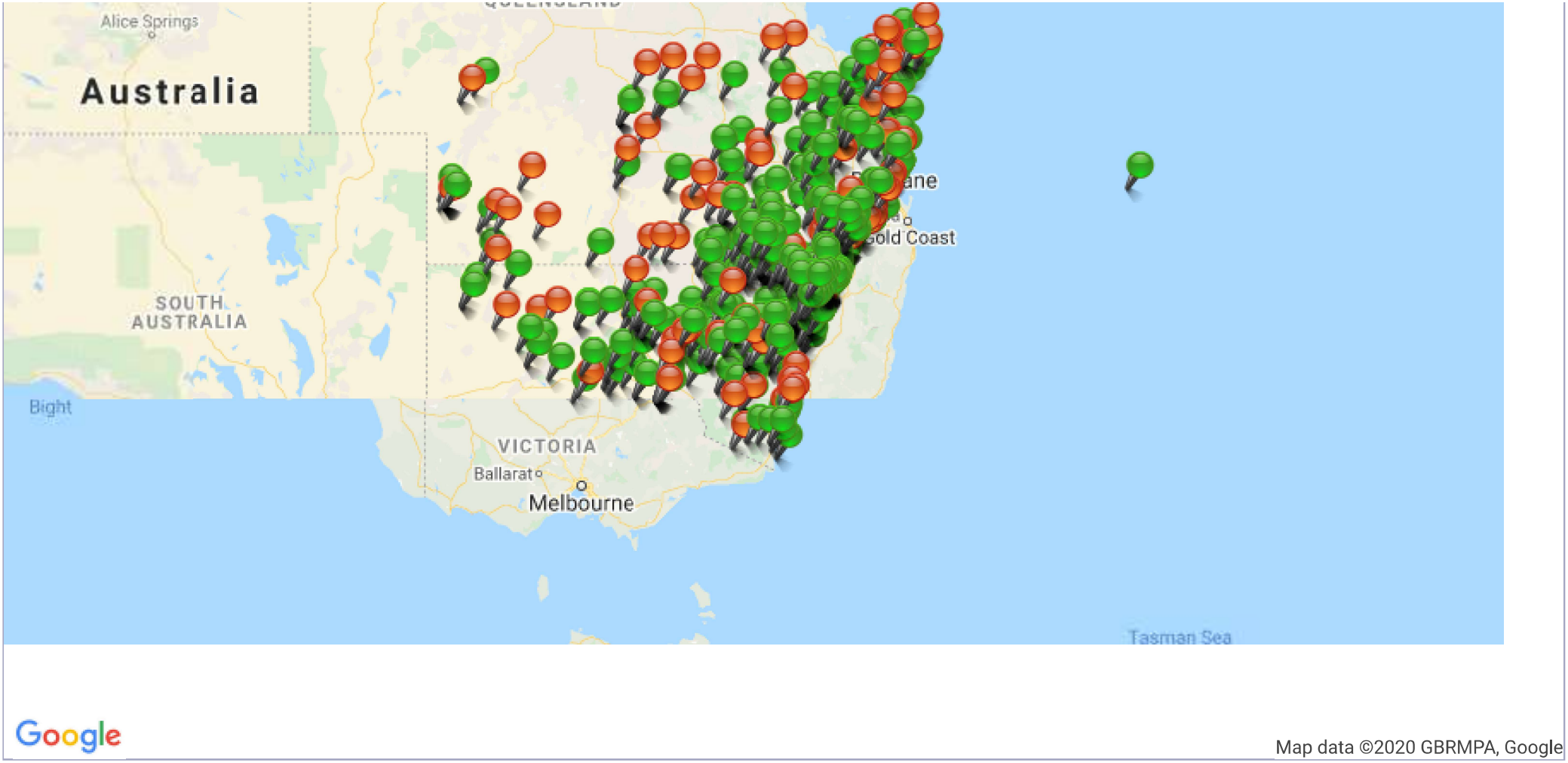
Please Choose...

Item category:

Please Choose...

Search Reset




Alice Springs
Australia
SOUTH AUSTRALIA
Bight
VICTORIA
Ballarat
Melbourne
Gold Coast
Tasman Sea
Google
Map data ©2020 GBRMPA, Google

Appendix J Decontamination and Calibration Forms

airmet
Work with Confidence

Calibration Certificate

AirMet Scientific P/L
Level 3, 18-26 Dickson Avenue
Artarmon
NSW 2064, Australia
Tel: 02 8425 8300
Fax: 02 8425 8399

This document certifies that the instrument detailed has been calibrated to the parameters

Certificate Print Date: 8-Apr-2020
Calibration Date: 08-Apr-2020
Next Calibration Due: 5-Oct-2020

Call ID / Order No: 243006
Job No / Pack No: S2430060001

Customer: JBS&G Australia Pty Ltd-ID 202507 **Serial No:** T-111608
Description: PhoCheck Tiger Li-ion Battery Battery Charger & M

Calibration Summary

Frequency: 180 Days **Temp:** 22°C **As Found:** In Tolerance **Result:** Pass
Humidity: 45% **Certificate:** S2430060001

Desc	As Found Actual	As Found Result	As Left (Cal Status) Actual	As Left (Cal Status) Result
ISOBUTYLENE 100ppm	95.2	Pass	100.0	Pass
ISOBUTYLENE 1000ppm	989.9	Pass	1000.0	Pass

Standard Used

Equip ID	Description	Valid Until	Cert
SY297	Zero Air	11-10-2024	
SY299	Isobutylene 100ppm	19-07-2024	
SY235	ISOBUTYLENE 1000PPM, AIR BALANCE	02-11-2021	BU70910-072518

Completed By: Jason Cheng **Signed:**

CERTIFICATION OF CALIBRATION

4533

Certificate Number: G506373_2/23257

Date Of Calibration: 28-May-2019

Issued by: QED Environmental Systems Ltd.

Customer: **Thermo Fisher Scientific Australia Pty L**
5 Caribbean Drive PO Box 9092 Scoresby
VIC 3179 AUSTRALIA

Description: Gas Analyser

Model: GA5000

Serial Number: G506373

UKAS Accredited results:

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.9	0.41
15.0	14.8	0.64
49.9	49.3	0.94

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.43
15.0	14.8	0.70
50.1	50.3	1.1

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.3	21.4	0.31

All concentrations are molar.

CH_4, CO_2 readings recorded at : 34.4 °C ± 2.5 °C

O2 readings recorded at : 24.1 °C ± 2.5 °C

Barometric Pressure : 1003 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

ANRI INSTRUMENTS & CONTROLS PTY LTD ABN 21 004 771 564

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Date: 9.9.19

Attn: MeeLan Liew
Air-Met Scientific Pty. Ltd.
7-11 Ceylon Street
Nunawading
Vic. 3131

O/N 721424

Calibration Verification Certificate # 5042

Manufacture/Model : Gazomat Inspectra Laser CH4 analyser
S/N : 3810912
Gases Monitored : CH4, 0-100%

		Specification +/-10%	
Gas used N2 BOC High Purity reads	: 0.0ppm		
Gas used Calgaz 50ppm CH4 in Air reads	: 50.2ppm	(45-55ppm)	Conforms
Gas used Calgaz 500ppm CH4 in Air reads	: 502ppm	(450-550ppm)	Conforms
Gas used Calgaz 1.0% CH4 in Air reads	: 10280ppm (1.0%)	(0.9-1.1%)	Conforms
Gas used Calgaz 2.5% CH4 in Air reads	: 2.6%	(2.25-2.75%)	Conforms
Gas used Linde 99.9% CH4 reads	: 103.0%	(90-110%)	Conforms

Comments : Calibration OK

Next Service/calibration Due : 9.9.20

Stephen Hurst
ANRI Instruments & Controls Pty Ltd

Appendix K Bore Logs

SOIL BOREHOLE BH24A

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 06-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,878.26
NORTHING 6,232,194.99
COORD SYS N/A
COORD SOURCE
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 - Gravelly SAND - Dark brown, heterogeneous, dry, loose, coarse sand: angulat 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)
		0.6							
		0.8							
		1		Fill	FILL - SAND - grey, homogeneous, wet, meidum grained, loose	W	BH24A_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
	▽	1.2							
		1.4							
		1.6							
		1.8							
		2		SC	Dark grey, homogeneous, high plasticity, wet, medium grained, medium dense	W			Organic Odour, No Staining or ACM
		2.2							
		2.4							
		2.6							
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24B

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 inculding 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		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6							
		0.8							
	▽	1		Fill	FILL - SAND - grey, wet, homogeneous, medium grained, loose	W	BH24B_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.2							
		1.4							
		1.6							
		1.8							
		2					BH24B_2-2.5		
		2.2							
		2.4							
		2.6		SC	Dark grey, homogeneous, high plasticity, wet, medium grained, medium dense	W			Organic Odour, No Staining or ACM
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24C

PROJECT NUMBER 58037	**DRILLING COMPANY** Terratest	**EASTING** 327,869.26
PROJECT NAME Caringbah Due Dilligence	**DRILLING DATE** 06-Apr-20	**NORTHING** 6,232,188.43
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 - gravellys sand, dark brown, dry, loose, coarse sand, subangular gravels	D	BH24C_0-0.2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.4		Fill	FILL - SAND - clayey sand, brown, heterogeneous, damp, medium dense, coarse sand with gravel and clay chunks, glass, slag	SM	BH24C_0.2-1		No Odour or Staining. 10L AQ: ACM Identified (0.057% w/w)
	▽	1		Fill	FILL - SAND - clayey sand, grey, homogeneous, wet, medium grained, loose, clay chunks (grey, High Plasticity, firm)	W	BH24C_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2					BH24C_2-2.5		
		2.6		SC	Dark grey, homogeneous, wet, medium grained, loose	W			Organic Odour, No Staining or ACM
		3							
		4							
		4.6							

SOIL BOREHOLE BH24D

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 06-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,885.56
NORTHING 6,232,179.12
COORD SYS N/A
COORD SOURCE
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		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6							
		0.8		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)
		1							
		1.2							
		1.4							
		1.6							
		1.8					BH24D_1.8-2.5		
		2							
		2.2							
		2.4							
		2.6		SC	Brown / grey, homogenous, wet, coarse grained, medium density	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24E

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 06-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,872.01
NORTHING 6,232,215.63
COORD SYS N/A
COORD SOURCE
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 - gravellys 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		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6							
		0.8							
		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)
		1.4							
		1.6							
		1.8							
		2							
		2.2					BH24E_2.1-2.5		
		2.4							
		2.6		SC	Brown / grey, homogenous, wet, coarse grained, medium density	W			Organic Odour, No Staining or ACM
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24F

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		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)
		0.8							
		1							
		1.2							
		1.4							
	▽	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)
		1.8							
		2							
		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							

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SOIL BOREHOLE BH24G

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 07-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,895.93
NORTHING 6,232,198.49
COORD SYS N/A
COORD SOURCE
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, hetergenous, 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		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		0.6							
		0.8							
		1		Fill	FILL - SAND - grey, wet, medium density, medium grained	W	BH24G_1-2		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.2							
		1.4							
		1.6							
		1.8							
		2							
		2.2					BH24G_2-2.4		
		2.4		SC	Peat bands, sulfuric odours, saturated, medium density, medium grained	W			Organic Odour, No Staining or ACM
		2.6							
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24H

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							
		1							No Odour or Staining. 10L AQ: No ACM (0% w/w). Refusal on Concrete
		1.2		Fill	FILL - sandy GRAVEL - dense, trace demo waste, slag, tile, mainly rounded gravels	D	BH24H_1.2-1.3		
		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							

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SOIL BOREHOLE BH24I

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		0.2		Fill	FILL - Roadbase - gravelly sand, dry, hetergenous, 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		No Odour or Staining. 10L AQ: No ACM (0% w/w)
	▽	1.2		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)
		2.2					BH24I_2.2-2.5		
		2.6		SC	Peat band, black, saturated, medium grained, medium denstiy	W	BH24I_2.5-3		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24J

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		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							
		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							
		2.2							
		2.4							
		2.6		SC	Peat band, black, saturated, medium grained, medium denstiy	W	BH24J_2.5-2.8		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24K

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 07-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,899.53
NORTHING 6,232,208.65
COORD SYS N/A
COORD SOURCE
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, 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)
		0.8							
		1							
		1.2		Fill	FILL - SAND - grey, saturatured coarse, homogeneous, medium density	W	BH24K_1.2-2.5		No Odour or Staining. 10L AQ: No ACM (0% w/w)
		1.4							
		1.6							
		1.8							
		2							
		2.2							
		2.4							
		2.6		SC	Peat band, black, saturated, medium grained, medium denstiy	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

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SOIL BOREHOLE BH24L

PROJECT NUMBER 58037
PROJECT NAME Caringbah Due Dilligence
CLIENT Aliro Management Pty Ltd
ADDRESS 13 Endeavour Road, Caringbah, NSW

DRILLING COMPANY Terratest
DRILLING DATE 07-Apr-20
DRILL RIG
DRILLING METHOD Solid Flight Auger
DIAMETER 200 mm

EASTING 327,905.24
NORTHING 6,232,191.93
COORD SYS N/A
COORD SOURCE
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, 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		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							
		2.2							
		2.4							
		2.6		SC	Peat band, black, saturated, medium grained, medium denstiy	W			No Odour or Staining. 10L AQ: No ACM (0% w/w)
		2.8							
		3							
		3.2							
		3.4							
		3.6							
		3.8							
		4							
		4.2							
		4.4							
		4.6							

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 01 Jul 2020

GROUNDWATER WELL LFG01

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	▽		0.2		Asphalt	FILL - Asphalt	D			
					Fill	FILL - Roadbase - Gravelly SAND, Dark Brown, Heterogeneous, Damp, Medium Grained, Loose including gravels	D			
			0.4		Fill	FILL - SAND - yellow medium grained, homogeneous, damp, loose, wet at 2.2m bgs	W			
			0.6							
			0.8							
			1							
			1.2							
			1.4							
			1.6							
			1.8							
			2			Termination Depth at:2.00 m.				
			2.2							
			2.4							
			2.6							
			2.8							
			3							
			3.2							
			3.4							
			3.6							
			3.8							

Disclaimer This log is intended for environmental not geotechnical purposes.
produced by ESlog.ESdat.net on 10 Aug 2020

GROUNDWATER WELL LFG02

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							
			0.8							
			1							
			1.2							
			1.4							
			1.6							
			1.8							
			2							
			2.2							
			2.4							
			2.6							
			2.8		SC	Disturbed estuarine sediment: Heterogeneous,damp, M.P, soft high organic content, wet at 4m bgs	W			
			3							
			3.2							
			3.4							
	▽		3.6			Termination Depth at:3.50 m.				
			3.8							

Appendix L Quality Control / Quality Assurance (QAQC)

QA/QC Results

The QA/QC result for soil samples collected are summarised in **Table L.1** and discussed below. Detailed QA/QC results are included following the discussion of DQI exceedances below.

Table L.1: QA/QC Results Summary

Data Quality Indicator	Results	DQO met?
Precision		
Blind duplicates (intra laboratory)	Intra laboratory samples were analysed at a rate greater than 1 in 20 samples.	Yes
Blind duplicates (inter laboratory)	Inter laboratory were analysed at a rate greater than 1 in 20 samples.	Yes
Accuracy		
Laboratory duplicates	N/A	N/A
Laboratory control samples (LCS)	N/A	N/A
Surrogate spikes	N/A	N/A
Matrix spikes	N/A	N/A
Representativeness		
Samples extracted and analysed within holding times	All primary and duplicate samples were extracted within appropriate holding times.	Yes
Sampling appropriate for media and analytes	Samples were collected using appropriate methodology with regard to the sample media (soil) and analytes (volatile, semi-volatile and low volatility organics and inorganics)	Yes
Trip spike	N/A	N/A
Trip blank	N/A	N/A
Rinsate blank	N/A	N/A
Laboratory Blank	N/A	N/A
Standard operating procedures used for sample collection and handling	Standard operating procedures used as listed in JBS&G (2019b) employed for all sampling events and samples collected	Yes
Comparability		
Standard analytical methods used for all analyses	Standard analytical methods used as shown in **Appendix M**	Yes
Consistent field conditions, field staff and laboratories	Sampling was conducted by the same field staff member. Standard operating procedures were implemented throughout the works. Field conditions remained the same throughout the works.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate	Yes
Completeness		
Soil description and COCs completed and appropriate	All field documentation and COCs were completed appropriately.	Yes
Appropriate documentation	All field documentation was appropriately completed.	Yes
Satisfactory frequency and result for QC samples	The QC results are considered adequate for the purposes of the investigation	Yes
Data from critical samples	Samples were analysed at locations designed to address the requirements of the RAP such that a suitable validation data set could be established. All critical samples were analysed for appropriate contaminants of concern and the QA/QC assessment confirmed the reliability of this data.	Yes
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Analytical methods and limits of recovery were considered appropriate for media and adopted site validation criteria for all soil analytes.	Yes

Notes: 1. See discussion below for notes

Precision

Soil Blind Duplicates (intra laboratory)

The rate of blind duplicate sampling and analysis for asbestos was 2 blind duplicate samples per 36 primary samples, greater than 1 per 20 primary samples. As such, the frequency of duplicate sample analysis for asbestos analysis exceeded the nominated frequency.

Soil Split Duplicates (inter laboratory)

The rate of split duplicate sampling and analysis for asbestos was 2 split duplicate samples per 36 primary samples. As such, the frequency of split duplicate sample analysis for asbestos analysis exceeded the nominated frequency.

Laboratory Duplicates

No laboratory duplicates were conducted, noting the assessment comprised asbestos analysis only.

Accuracy

Laboratory Control Samples

No laboratory control samples (LCS) were tested, noting the assessment comprised asbestos analysis only.

Surrogate Spikes

No organic contaminant analysis was conducted, as such surrogate spikes were not completed by the laboratory as part of the soil assessment presented herein.

Matrix Spikes

No matrix spikes were conducted, noting the assessment comprised asbestos analysis only.

Sampling appropriate for media and analytes

All sampling works completed during the investigation were conducted in accordance with JBS&G standard operating procedures as outlined in the Sampling, Analysis, and Quality Plan prepared for the assessment. Sample locations were undertaken for the purposes of visual inspection and/or olfactory assessment of fill/soil conditions and the collection of samples was considered appropriate for identified COPC.

All samples were collected wearing a new pair of disposable nitrile gloves.

Holding Times

Copies of Sample Receipt Notes (SRNs) are included in relevant sections of the report (**Appendix I**) and sample extraction/analysis dates were reported in each laboratory report. All soil analyses were undertaken within appropriate holding times for the respective analytes.

Trip Spike

Given the primary analyte was asbestos, no trip spike was completed as part of the assessment.

Storage Blank

Given the primary analyte was asbestos, no storage blank was completed as part of the assessment.

Rinsate Blank

Given the primary analyte was asbestos, no rinsate blank was completed as part of the assessment.

Laboratory Blank

No laboratory blank was completed as part of the assessment herein. All non-single use field equipment was decontaminated as per the procedure identified in **Section 8.2**.

Experienced JBS&G personnel undertook all sampling in accordance with standard JBS&G sampling methods.

The laboratory LORs are consistent and are considered appropriate.

Comparability

Eurofins, the primary laboratory, and Envirolab, the secondary laboratory were NATA accredited for all analytical methods used. The laboratories used similar analytical methods and the analytical data was considered to be comparable between the laboratories as indicated by the results of inter-laboratory duplicate analyses. Where different LORs were adopted by the laboratories, the primary laboratory typically had a lower LOR than the secondary laboratory, and as such, consideration of the data set was not impacted.

Furthermore, the samples collected for assessment purposes are considered comparable as all samples were collected by experienced JBS&G personnel in accordance with standard JBS&G sampling methods.

Completeness

Documentation

All laboratory documentation is complete and correct. Chain of custody documentation is provided with laboratory reports in **Appendix M.**

Frequency for QC Samples

QC sample frequency was achieved for asbestos analyses and therefore the data set is complete and reliable.

Assessment of QA/QC

The field sampling and handling procedures produced QA/QC results which indicate that the collected soil analytical data are of an acceptable quality and suitable for use which respect to characterisation of the assessment area.

The NATA certified laboratory results sheets indicate that the project laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples for this project were analysed.

Ground Gas Assessment

The assessment of ground gas data presented in **Table L.2** is taken from the worst credible case i.e. highest methane and highest flow from any well during the monitoring. Irrespective of the apparent comprehensiveness of the dataset, the plausible worst case condition should be calculated for each hazardous gas by multiplying the maximum recorded flow in any standpipe in that strata (and zone) with the maximum gas concentration in any other standpipe in that strata (and zone), but discounting any peak instantaneous flows and negative flows that have been judged to be unrepresentative of a possible worst case.

Table L.2 - Assessment of sufficiency of data (BS8576:2013)

Action	Results	
	LFG01 (fill)	LFG02 (reclaimed swamp)
From current results (concentration, flow rates and pressure), estimate likely risk associated with HGG (note steady state flow results are to be used, not peak values that only last a few seconds on opening the gas tap). Results have disregarded from wells with flooded screens	Current estimate of risk GSV (methane) 0.29 x 0.48 = 0.027. Elevated to CS3 as methane >20 %v/v GSV (carbon dioxide) 2.37 x 0.5 =0.01. <0.7 therefore CS1	Current estimate of risk GSV (methane) 30.16 x 0.61 (LFG02) =0.18. CS2 elevated to CS3 as methane >20 %v/v GSV (carbon dioxide) 14.07 x 0.61 (LFG02) =0.07. <0.7 therefore initially CS1 but increased to CS2 as gas concentration >5.0 %v/v

Action	Results	
	LFG01 (fill)	LFG02 (reclaimed swamp)
What increase in gas concentration is required to increase the estimated risk and the form of gas protection to be provided?	Estimated increase in gas concentration: Methane and carbon dioxide concentration increases will not affect the risk rating.	
What increase in flow rate is required to increase the estimated risk and the form of gas protection to be provided?	Estimated increase in flow rate: Keeping the concentration constant, the flow rate would need to exceed 0.8 L/h to move into next risk band. From the current data and knowledge of the gas source and generation potential, this is not considered feasible	
Is the increase in gas concentration flexible given the known source of gas, the collected gas monitoring data and the conceptual site model?	No	No
is the increase in flow rate feasible when compared to gas generation and migration model results, the collected gas monitoring data and conceptual site model?	No Future gas generation in the fill is likely to be low but there is are small pockets of gas trapped in the pore space. Groundwater/tidal variations are likely to be the main variable affecting flow rate. Data collected show that groundwater variations and piston effect of rises in groundwater pushing gas out of ground may exceed 0.8 L/h on a transient basis, however the volumes are negligible. Gas emissions due to variation in atmospheric pressure using permeability of soils also shows flow rate unlikely to exceed 0.8 L/h.	No Future gas generation rates in the reclaimed swamp are negligible and can only be considered a low/finite source that is non-replenishing. Groundwater/tidal variations are likely to be the main variable affecting flow rate. Data collected show that groundwater variations and piston effect of rises in groundwater pushing gas out of ground may exceed 0.8 L/h on a transient basis, however the volumes are negligible. Gas emissions due to variation in atmospheric pressure using permeability of soils also shows flow rate unlikely to exceed 0.8 L/h.

On the basis of the results of the field and laboratory QA/QC program, the soil and gas data is of an acceptable quality in order to achieve the objectives of the validation assessment.

Appendix M Detailed Laboratory Certificates and Chain of Custody

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 240524

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	R Lill
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**58037, Carringbah**
Number of Samples	2 Soil
Date samples received	07/04/2020
Date completed instructions received	07/04/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	16/04/2020
Date of Issue	14/04/2020

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Asbestos Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

Asbestos ID - soils NEPM - ASB-001			
Our Reference		240524-1	240524-2
Your Reference	UNITS	QA20200407_A	QA20200407_B
Date Sampled		07/04/2020	07/04/2020
Type of sample		Soil	Soil
Date analysed	-	14/04/2020	14/04/2020
Sample mass tested	g	709.17	566.14
Sample Description	-	Beige sandy soil & rocks	Beige sandy soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

20479

CHAIN OF CUSTODY

PROJECT NO.: 58037	LABORATORY BATCH NO.:
PROJECT NAME: Caringbah	SAMPLERS: RL
DATE NEEDED BY: STAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ..... @jbsg.com.au; (3) C.Kaufmann@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QA20200407-A	Soil	7/4/20		1x Bag		x		x	
2	QA20200407-B	↓	↓		1x Bag		x		x	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 240524

Date Received: 7/4/20
Time Received: 1530
Received by: SD
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Ryan DATE: 7-4-20	CONSIGNMENT NOTE NO.	NAME: Saisan Dey ESS570 0004	COOLER SEAL – Yes..... No..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 7/4/20 1530 OF:	COOLER TEMP ..... deg C 24.1
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

20478

CHAIN OF CUSTODY

PROJECT NO.: 58037	LABORATORY BATCH NO.:
PROJECT NAME: Caringbah	SAMPLERS: RL
DATE NEEDED BY: Standard tat	QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688	
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ..sill.....@jbsg.com.au; (3) ..ckaufman.....@jbsg.com.au	

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos Hold	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
BH24J-0.6-1.5	soil	7/4/20		Bag		X		X	
1.5-2.5									
2.5-2.8									
BH24K-0-0.3									
0.3-0.5						X			
0.5-1.2						X			
1.2-2.5						X			
QC20200407-A						X			
QC20200407-BB						X			
BH24L-0-0.3						X			
0.3-1.0						X			
1.0-1.4									
1.4-2.5								✓	
FRAG_24C_0.2-1.0	FRAG	6/4/20		Bag		X	X		

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE: 7/4/20 Ryan	CONSIGNMENT NOTE NO.	NAME: Elvis D	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 7/4/20	COOLER TEMP ..... deg C
		OF: Eurofins	
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

20476

CHAIN OF CUSTODY

PROJECT NO.: 58037
PROJECT NAME: Caringbah
DATE NEEDED BY: STD

LABORATORY BATCH NO.:
SAMPLERS: RC
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
BH24A_0.0-0.2	Soil	6/4/20		Bag		X		X	
0.2-1.0						X			
1.0-2.0									
BH24B_0.0-0.2						X			
0.2-1.0						X			
1.0-2.0									
2.0-2.5									
BH24C_0.0-0.2									
0.2-1.0						X			
1.0-2.0						X			
2.0-2.5									
BH24D_0.0-0.2									
0.2-0.8						X			
0.8-1.8						X			
1.8-2.5									
BH24E 0.0-0.2									
0.2-1.1						X			
1.1-2.1						X			
2.1-2.5									

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Dylan DATE: 6/4/20	CONSIGNMENT NOTE NO.	NAME: Elvis D	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 7/4/20	
		OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

20477

CHAIN OF CUSTODY

PROJECT NO.: S8054
PROJECT NAME: Carnegham
DATE NEEDED BY: Standard TAT
LABORATORY BATCH NO.:
SAMPLERS: RL
QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) C.Kaufman.....@jbsg.com.au
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Stored/On Ice	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
BH24F 0-0.2	Soil	7/4/20		Bag				X	
0.5-1.5						X			
0.2-0.5						X			
1.5-2.2									
BH24G 0-0.2									
0.2-0.4						X			
1.0-2.0						X			
2.0-2.4									
BH24H 0-0.3									
0.3-0.6						X			
0.6-1.2									
1.2-1.3						X			
BH24I 0-0.2						/			
0.2-1.2						X			
1.2-2.2									
2.2-2.5									
2.5-3.0						X			
BH24J 0.1-0.4						#			
0.4-0.6						X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Ryan DATE: 7/4/20	CONSIGNMENT NOTE NO.	NAME: Elvis D	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 7/4/20	
NAME: DATE:	CONSIGNMENT NOTE NO.	OF: Eurofins	COOLER TEMP ..... deg C
OF:	TRANSPORT CO	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
		OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW) P/L**
Contact name:	Ryan Lill
Project name:	CARINGBAH
Project ID:	58037
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Apr 7, 2020 5:45 PM
Eurofins reference:	**712676**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

N/A Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Ryan Lill - rlill@jbsg.com.au.

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: CARINGBAH
Project ID: 58037

Order No.:
Report #: 712676
Phone: 02 8245 0300
Fax:

Received: Apr 7, 2020 5:45 PM
Due: Apr 16, 2020
Priority: 5 Day
Contact Name: Ryan Lill

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH24J_0.6-1.5	Apr 07, 2020		Soil	S20-Ap11532	X		
2	BH24K_0.3-0.5	Apr 07, 2020		Soil	S20-Ap11533	X		
3	BH24K_0.5-1.2	Apr 07, 2020		Soil	S20-Ap11534	X		
4	QC20200407_A	Apr 07, 2020		Soil	S20-Ap11535	X		
5	QC20200407_B	Apr 07, 2020		Soil	S20-Ap11536	X		
6	BH24L_0-0.3	Apr 07, 2020		Soil	S20-Ap11537	X		
7	BH24L_0.3-1.0	Apr 07, 2020		Soil	S20-Ap11538	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
8	FRAG_24C_0.2-1.0	Apr 06, 2020		Building Materials	S20-Ap11539		X	
9	BH24A_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11540	X		
10	BH24A_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11541	X		
11	BH24B_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11542	X		
12	BH24B_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11543	X		
13	BH24C_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11544	X		
14	BH24C_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11545	X		
15	BH24D_0.0-	Apr 06, 2020		Soil	S20-Ap11546	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
	0.8							
16	BH24D_0.8-1.8	Apr 06, 2020		Soil	S20-Ap11547	X		
17	BH24E_0.2-1.1	Apr 06, 2020		Soil	S20-Ap11548	X		
18	BH24E_1.1-2.1	Apr 06, 2020		Soil	S20-Ap11549	X		
19	BH24F_0.5-1.5	Apr 07, 2020		Soil	S20-Ap11550	X		
20	BH24F_0.2-0.5	Apr 07, 2020		Soil	S20-Ap11551	X		
21	BH24G_0.2-0.4	Apr 07, 2020		Soil	S20-Ap11552	X		
22	BH24G_1.0-2.0	Apr 07, 2020		Soil	S20-Ap11553	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
23	BH24H_0.3-0.6	Apr 07, 2020		Soil	S20-Ap11554	X		
24	BH24H_1.2-1.3	Apr 07, 2020		Soil	S20-Ap11555	X		
25	BH24I_0.2-1.2	Apr 07, 2020		Soil	S20-Ap11556	X		
26	BH24I_2.5-3.0	Apr 07, 2020		Soil	S20-Ap11557	X		
27	BH24J_0.4-0.6	Apr 07, 2020		Soil	S20-Ap11558	X		
28	BH24J_1.5-2.5	Apr 07, 2020		Soil	S20-Ap11559			X
29	BH24J_2.5-2.8	Apr 07, 2020		Soil	S20-Ap11560			X
30	BH24K_0-0.3	Apr 07, 2020		Soil	S20-Ap11561			X
31	BH24K_1.2-2.5	Apr 07, 2020		Soil	S20-Ap11562			X
32	BH24L_1.0-1.4	Apr 07, 2020		Soil	S20-Ap11563			X
33	BH24L_1.4-2.5	Apr 07, 2020		Soil	S20-Ap11564			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	BH24A_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11565			X
35	BH24B_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11566			X
36	BH24B_2.0-2.5	Apr 06, 2020		Soil	S20-Ap11567			X
37	BH24C_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11568			X
38	BH24C_2.4-2.5	Apr 06, 2020		Soil	S20-Ap11569			X
39	BH24D_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11570			X
40	BH24D_1.8-2.5	Apr 06, 2020		Soil	S20-Ap11571			X
41	BH24E_0.0-	Apr 06, 2020		Soil	S20-Ap11572			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
	0.2							
42	BH24E_2.1-2.5	Apr 06, 2020		Soil	S20-Ap11573			X
43	BH24F_0-0.2	Apr 07, 2020		Soil	S20-Ap11574			X
44	BH24F_1.5-2.2	Apr 07, 2020		Soil	S20-Ap11575			X
45	BH24G_0-0.2	Apr 07, 2020		Soil	S20-Ap11576			X
46	BH24G_2.0-2.4	Apr 07, 2020		Soil	S20-Ap11577			X
47	BH24H_0-0.3	Apr 07, 2020		Soil	S20-Ap11578			X
48	BH24H_0.6-1.2	Apr 07, 2020		Soil	S20-Ap11579			X
49	BH24I_0-0.2	Apr 07, 2020		Soil	S20-Ap11580			X
50	BH24I_1.2-2.2	Apr 07, 2020		Soil	S20-Ap11581			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
51	BH24I_2.2-2.5	Apr 07, 2020		Soil	S20-Ap11582			X
52	BH24J_0-0.4	Apr 07, 2020		Soil	S20-Ap11583			X
Test Counts						26	1	25

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Ryan Lill
Report	712676-AID
Project Name	CARINGBAH
Project ID	58037
Received Date	Apr 07, 2020
Date Reported	Apr 16, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Project Name CARINGBAH
Project ID 58037
Date Sampled Apr 06, 2020 to Apr 07, 2020
Report 712676-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24J_0.6-1.5	20-Ap11532	Apr 07, 2020	Approximate Sample 660g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24K_0.3-0.5	20-Ap11533	Apr 07, 2020	Approximate Sample 643g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24K_0.5-1.2	20-Ap11534	Apr 07, 2020	Approximate Sample 617g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
QC20200407_A	20-Ap11535	Apr 07, 2020	Approximate Sample 645g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
QC20200407_B	20-Ap11536	Apr 07, 2020	Approximate Sample 582g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24L_0-0.3	20-Ap11537	Apr 07, 2020	Approximate Sample 796g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24L_0.3-1.0	20-Ap11538	Apr 07, 2020	Approximate Sample 538g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
FRAG_24C_0.2-1.0	20-Ap11539	Apr 06, 2020	Approximate Sample 63g / 100x80x5mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24A_0.0-0.2	20-Ap11540	Apr 06, 2020	Approximate Sample 801g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24A_0.2-1.0	20-Ap11541	Apr 06, 2020	Approximate Sample 654g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24B_0.0-0.2	20-Ap11542	Apr 06, 2020	Approximate Sample 835g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24B_0.2-1.0	20-Ap11543	Apr 06, 2020	Approximate Sample 627g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24C_0.2-1.0	20-Ap11544	Apr 06, 2020	Approximate Sample 750g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24C_1.0-2.0	20-Ap11545	Apr 06, 2020	Approximate Sample 785g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24D_0.0-0.8	20-Ap11546	Apr 06, 2020	Approximate Sample 673g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24D_0.8-1.8	20-Ap11547	Apr 06, 2020	Approximate Sample 720g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
BH24E_0.2-1.1	20-Ap11548	Apr 06, 2020	Approximate Sample 872g Sample consisted of: Brown fine-grained sandy soil, bitumen, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24E_1.1-2.1	20-Ap11549	Apr 06, 2020	Approximate Sample 703g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24F_0.5-1.5	20-Ap11550	Apr 07, 2020	Approximate Sample 637g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24F_0.2-0.5	20-Ap11551	Apr 07, 2020	Approximate Sample 605g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24G_0.2-0.4	20-Ap11552	Apr 07, 2020	Approximate Sample 689g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24G_1.0-2.0	20-Ap11553	Apr 07, 2020	Approximate Sample 583g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24H_0.3-0.6	20-Ap11554	Apr 07, 2020	Approximate Sample 688g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24H_1.2-1.3	20-Ap11555	Apr 07, 2020	Approximate Sample 542g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24I_0.2-1.2	20-Ap11556	Apr 07, 2020	Approximate Sample 737g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24I_2.5-3.0	20-Ap11557	Apr 07, 2020	Approximate Sample 560g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24J_0.4-0.6	20-Ap11558	Apr 07, 2020	Approximate Sample 626g Sample consisted of: Brown fine-grained sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Apr 08, 2020	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Apr 08, 2020	Indefinite

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: CARINGBAH
Project ID: 58037

Order No.:
Report #: 712676
Phone: 02 8245 0300
Fax:

Received: Apr 7, 2020 5:45 PM
Due: Apr 16, 2020
Priority: 5 Day
Contact Name: Ryan Lill

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	Asbestos Absence /Presence	HOLD
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH24J_0.6-1.5	Apr 07, 2020		Soil	S20-Ap11532	X		
2	BH24K_0.3-0.5	Apr 07, 2020		Soil	S20-Ap11533	X		
3	BH24K_0.5-1.2	Apr 07, 2020		Soil	S20-Ap11534	X		
4	QC20200407_A	Apr 07, 2020		Soil	S20-Ap11535	X		
5	QC20200407_B	Apr 07, 2020		Soil	S20-Ap11536	X		
6	BH24L_0-0.3	Apr 07, 2020		Soil	S20-Ap11537	X		
7	BH24L_0.3-1.0	Apr 07, 2020		Soil	S20-Ap11538	X		

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Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
8	FRAG_24C_0.2-1.0	Apr 06, 2020		Building Materials	S20-Ap11539		X	
9	BH24A_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11540	X		
10	BH24A_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11541	X		
11	BH24B_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11542	X		
12	BH24B_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11543	X		
13	BH24C_0.2-1.0	Apr 06, 2020		Soil	S20-Ap11544	X		
14	BH24C_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11545	X		
15	BH24D_0.0-	Apr 06, 2020		Soil	S20-Ap11546	X		

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Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
	0.8							
16	BH24D_0.8-1.8	Apr 06, 2020		Soil	S20-Ap11547	X		
17	BH24E_0.2-1.1	Apr 06, 2020		Soil	S20-Ap11548	X		
18	BH24E_1.1-2.1	Apr 06, 2020		Soil	S20-Ap11549	X		
19	BH24F_0.5-1.5	Apr 07, 2020		Soil	S20-Ap11550	X		
20	BH24F_0.2-0.5	Apr 07, 2020		Soil	S20-Ap11551	X		
21	BH24G_0.2-0.4	Apr 07, 2020		Soil	S20-Ap11552	X		
22	BH24G_1.0-2.0	Apr 07, 2020		Soil	S20-Ap11553	X		

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Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
23	BH24H_0.3-0.6	Apr 07, 2020		Soil	S20-Ap11554	X		
24	BH24H_1.2-1.3	Apr 07, 2020		Soil	S20-Ap11555	X		
25	BH24I_0.2-1.2	Apr 07, 2020		Soil	S20-Ap11556	X		
26	BH24I_2.5-3.0	Apr 07, 2020		Soil	S20-Ap11557	X		
27	BH24J_0.4-0.6	Apr 07, 2020		Soil	S20-Ap11558	X		
28	BH24J_1.5-2.5	Apr 07, 2020		Soil	S20-Ap11559			X
29	BH24J_2.5-2.8	Apr 07, 2020		Soil	S20-Ap11560			X
30	BH24K_0-0.3	Apr 07, 2020		Soil	S20-Ap11561			X
31	BH24K_1.2-2.5	Apr 07, 2020		Soil	S20-Ap11562			X
32	BH24L_1.0-1.4	Apr 07, 2020		Soil	S20-Ap11563			X
33	BH24L_1.4-2.5	Apr 07, 2020		Soil	S20-Ap11564			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
34	BH24A_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11565			X
35	BH24B_1.0-2.0	Apr 06, 2020		Soil	S20-Ap11566			X
36	BH24B_2.0-2.5	Apr 06, 2020		Soil	S20-Ap11567			X
37	BH24C_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11568			X
38	BH24C_2.4-2.5	Apr 06, 2020		Soil	S20-Ap11569			X
39	BH24D_0.0-0.2	Apr 06, 2020		Soil	S20-Ap11570			X
40	BH24D_1.8-2.5	Apr 06, 2020		Soil	S20-Ap11571			X
41	BH24E_0.0-	Apr 06, 2020		Soil	S20-Ap11572			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
	0.2							
42	BH24E_2.1-2.5	Apr 06, 2020		Soil	S20-Ap11573			X
43	BH24F_0-0.2	Apr 07, 2020		Soil	S20-Ap11574			X
44	BH24F_1.5-2.2	Apr 07, 2020		Soil	S20-Ap11575			X
45	BH24G_0-0.2	Apr 07, 2020		Soil	S20-Ap11576			X
46	BH24G_2.0-2.4	Apr 07, 2020		Soil	S20-Ap11577			X
47	BH24H_0-0.3	Apr 07, 2020		Soil	S20-Ap11578			X
48	BH24H_0.6-1.2	Apr 07, 2020		Soil	S20-Ap11579			X
49	BH24I_0-0.2	Apr 07, 2020		Soil	S20-Ap11580			X
50	BH24I_1.2-2.2	Apr 07, 2020		Soil	S20-Ap11581			X

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Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
51	BH24I_2.2-2.5	Apr 07, 2020		Soil	S20-Ap11582			X
52	BH24J_0-0.4	Apr 07, 2020		Soil	S20-Ap11583			X
Test Counts						26	1	25

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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#AU04_Enviro_Sample_NSW

Subject: FW: Additional Analysis 712676 Carringbah

Importance: High

From: Christopher Kauffman <ckauffman@jbsg.com.au>
Sent: Wednesday, 24 June 2020 2:17 PM
To: Ursula Long <UrsulaLong@eurofins.com>
Subject: Additional Analysis 712676 Carringbah

EXTERNAL EMAIL*

Hi Ursula,

As discussed, can we please schedule additional asbestos analysis for this job. Can we run asbestos (500ml NEPM) on 24 hour TAT for the following:

- BH24A 1.0-2.0
- BH24B 2-2.5
- BH24C 0-0.2
- BH24D 1.8-2.5
- BH24E 2.1-2.5
- BH24F 1.5-2.2
- BH24G 2.0-2.4
- BH24H 0.6-1.2
- BH24I 2.2-2.5
- BH24J 2.5-2.8
- BH24K 0-0.3
- BH24L 1-1.4

Thanks,
Chris

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Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW) P/L**
Contact name:	Chris Kauffman
Project name:	ADDITIONAL CARINGBAH
Project ID:	58037
COC number:	Not provided
Turn around time:	1 Day
Date/Time received:	Jun 24, 2020 2:17 PM
Eurofins reference:	**727516**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

N/A Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Chris Kauffman - ckauffman@jbsg.com.au.

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IANZ # 1327

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IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: ADDITIONAL CARINGBAH
Project ID: 58037

Order No.:
Report #: 727516
Phone: 02 8245 0300
Fax:

Received: Jun 24, 2020 2:17 PM
Due: Jun 25, 2020
Priority: 1 Day
Contact Name: Chris Kauffman

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH24A 1.0-2.0	Apr 07, 2020		Soil	S20-Jn41091	X
2	BH24B 2-2.5	Apr 07, 2020		Soil	S20-Jn41092	X
3	BH24C 0-0.2	Apr 07, 2020		Soil	S20-Jn41093	X
4	BH24D 1.8-2.5	Apr 07, 2020		Soil	S20-Jn41094	X
5	BH24E 2.1-2.5	Apr 07, 2020		Soil	S20-Jn41095	X
6	BH24F 1.5-2.2	Apr 07, 2020		Soil	S20-Jn41096	X
7	BH24G 2.0-2.4	Apr 07, 2020		Soil	S20-Jn41097	X
8	BH24H 0.6-1.2	Apr 07, 2020		Soil	S20-Jn41098	X
9	BH24I 2.2-2.5	Apr 07, 2020		Soil	S20-Jn41099	X
10	BH24J 2.5-2.8	Apr 07, 2020		Soil	S20-Jn41100	X

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Sample Detail						Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
11	BH24K 0-0.3	Apr 07, 2020		Soil	S20-Jn41101	X
12	BH24L 1-1.4	Apr 07, 2020		Soil	S20-Jn41102	X
Test Counts						12

Certificate of Analysis

Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Chris Kauffman
Report	727516-AID
Project Name	ADDITIONAL CARINGBAH
Project ID	58037
Received Date	Jun 24, 2020
Date Reported	Jun 25, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name ADDITIONAL CARINGBAH
Project ID 58037
Date Sampled Apr 07, 2020
Report 727516-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24A 1.0-2.0	20-Jn41091	Apr 07, 2020	Approximate Sample 600g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24B 2-2.5	20-Jn41092	Apr 07, 2020	Approximate Sample 653g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24C 0-0.2	20-Jn41093	Apr 07, 2020	Approximate Sample 668g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24D 1.8-2.5	20-Jn41094	Apr 07, 2020	Approximate Sample 675g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24E 2.1-2.5	20-Jn41095	Apr 07, 2020	Approximate Sample 772g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24F 1.5-2.2	20-Jn41096	Apr 07, 2020	Approximate Sample 567g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24G 2.0-2.4	20-Jn41097	Apr 07, 2020	Approximate Sample 871g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24H 0.6-1.2	20-Jn41098	Apr 07, 2020	Approximate Sample 603g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

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Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH24I 2.2-2.5	20-Jn41099	Apr 07, 2020	Approximate Sample 557g Sample consisted of: Brown fine-grained sandy soil	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24J 2.5-2.8	20-Jn41100	Apr 07, 2020	Approximate Sample 528g Sample consisted of: Brown fine-grained sandy soil and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24K 0-0.3	20-Jn41101	Apr 07, 2020	Approximate Sample 747g Sample consisted of: Brown coarse-grained soil, rocks and bituminous material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH24L 1-1.4	20-Jn41102	Apr 07, 2020	Approximate Sample 608g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 24, 2020	Indefinite

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Address: Level 1, 50 Margaret St
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Project Name: ADDITIONAL CARINGBAH
Project ID: 58037

Order No.:
Report #: 727516
Phone: 02 8245 0300
Fax:

Received: Jun 24, 2020 2:17 PM
Due: Jun 25, 2020
Priority: 1 Day
Contact Name: Chris Kauffman

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	BH24A 1.0-2.0	Apr 07, 2020		Soil	S20-Jn41091	X
2	BH24B 2-2.5	Apr 07, 2020		Soil	S20-Jn41092	X
3	BH24C 0-0.2	Apr 07, 2020		Soil	S20-Jn41093	X
4	BH24D 1.8-2.5	Apr 07, 2020		Soil	S20-Jn41094	X
5	BH24E 2.1-2.5	Apr 07, 2020		Soil	S20-Jn41095	X
6	BH24F 1.5-2.2	Apr 07, 2020		Soil	S20-Jn41096	X
7	BH24G 2.0-2.4	Apr 07, 2020		Soil	S20-Jn41097	X
8	BH24H 0.6-1.2	Apr 07, 2020		Soil	S20-Jn41098	X
9	BH24I 2.2-2.5	Apr 07, 2020		Soil	S20-Jn41099	X
10	BH24J 2.5-2.8	Apr 07, 2020		Soil	S20-Jn41100	X

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Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 23736						
11	BH24K 0-0.3	Apr 07, 2020		Soil	S20-Jn41101	X
12	BH24L 1-1.4	Apr 07, 2020		Soil	S20-Jn41102	X
Test Counts						12

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

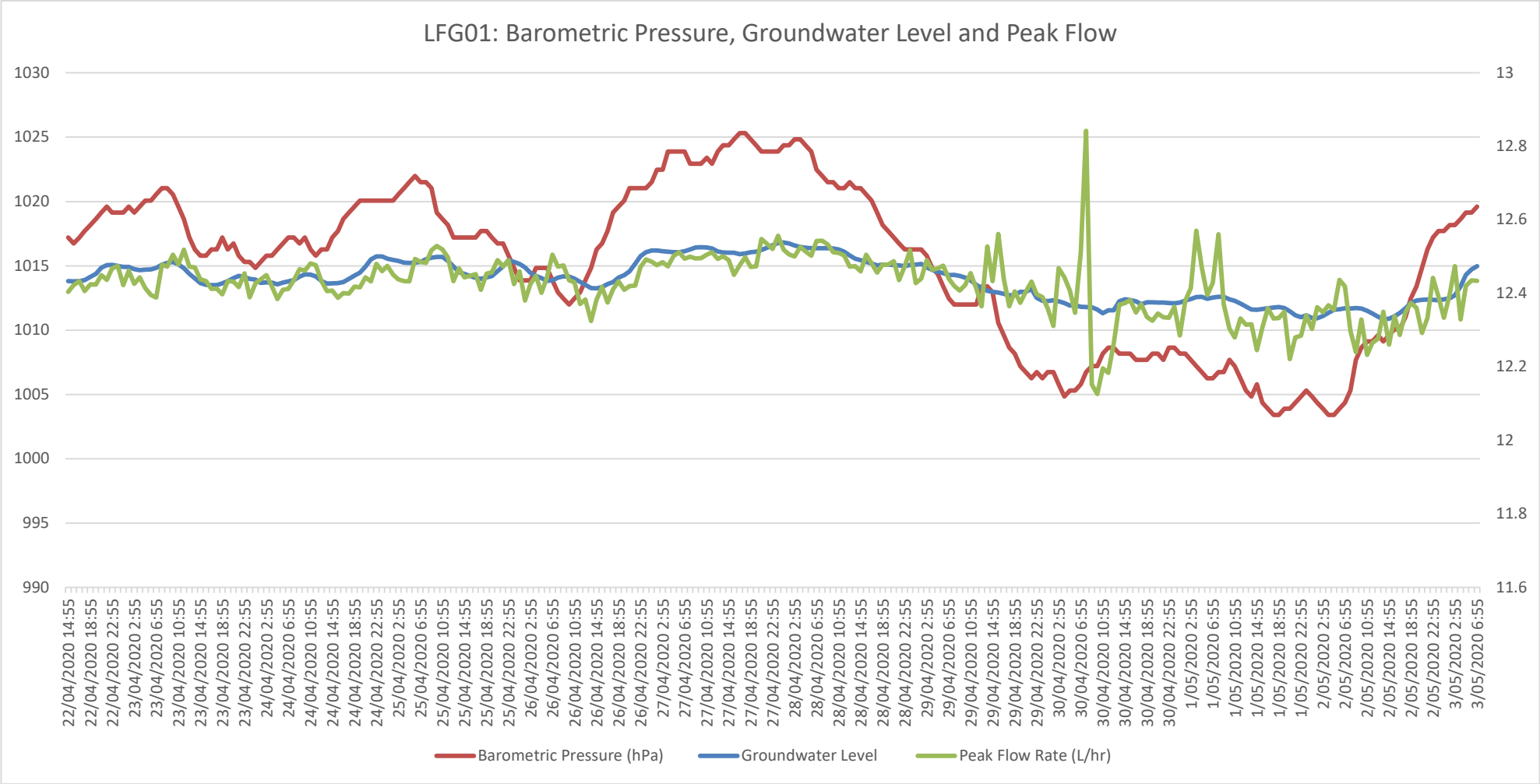
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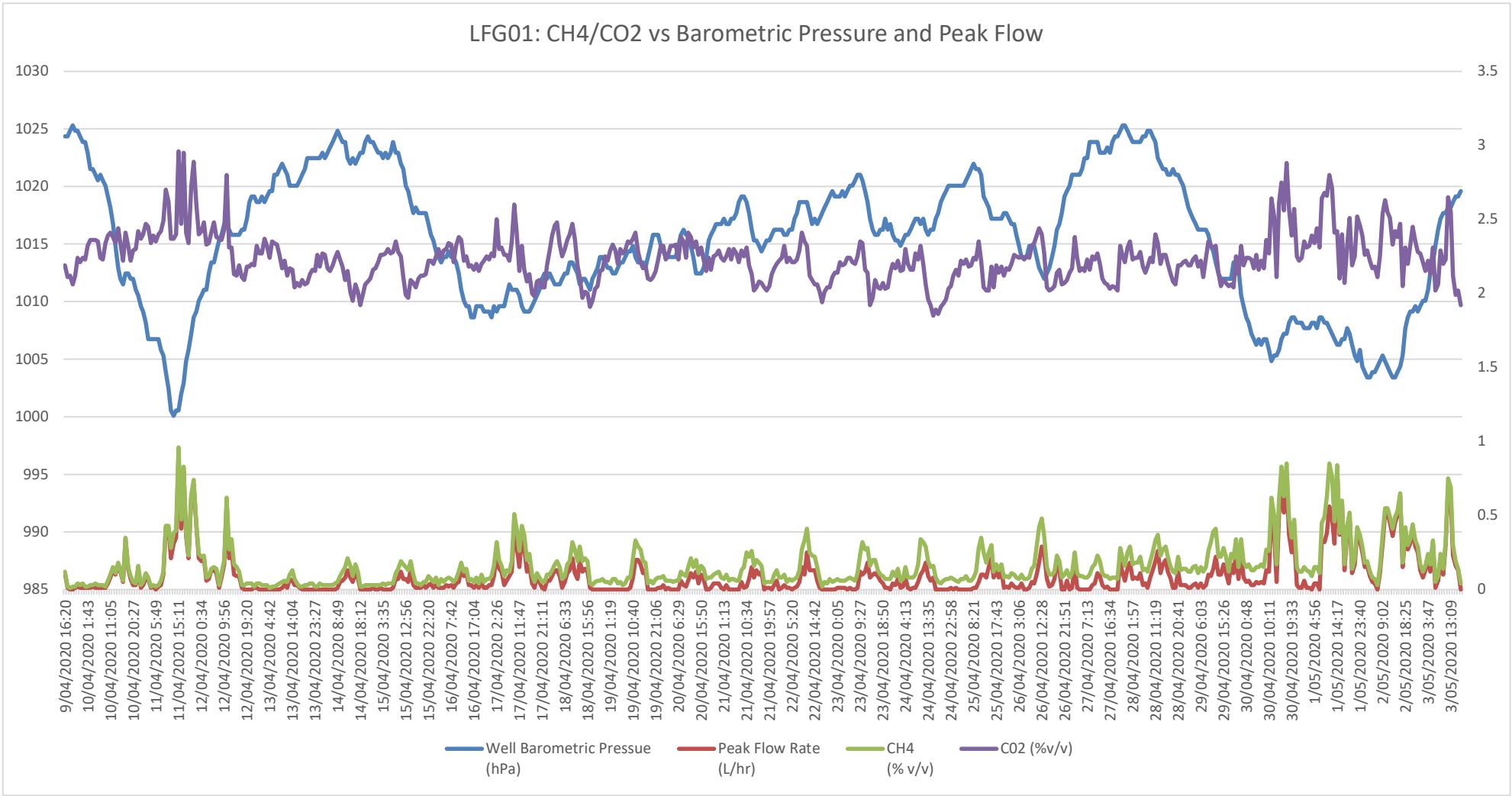
* Indicates NATA accreditation does not cover the performance of this service

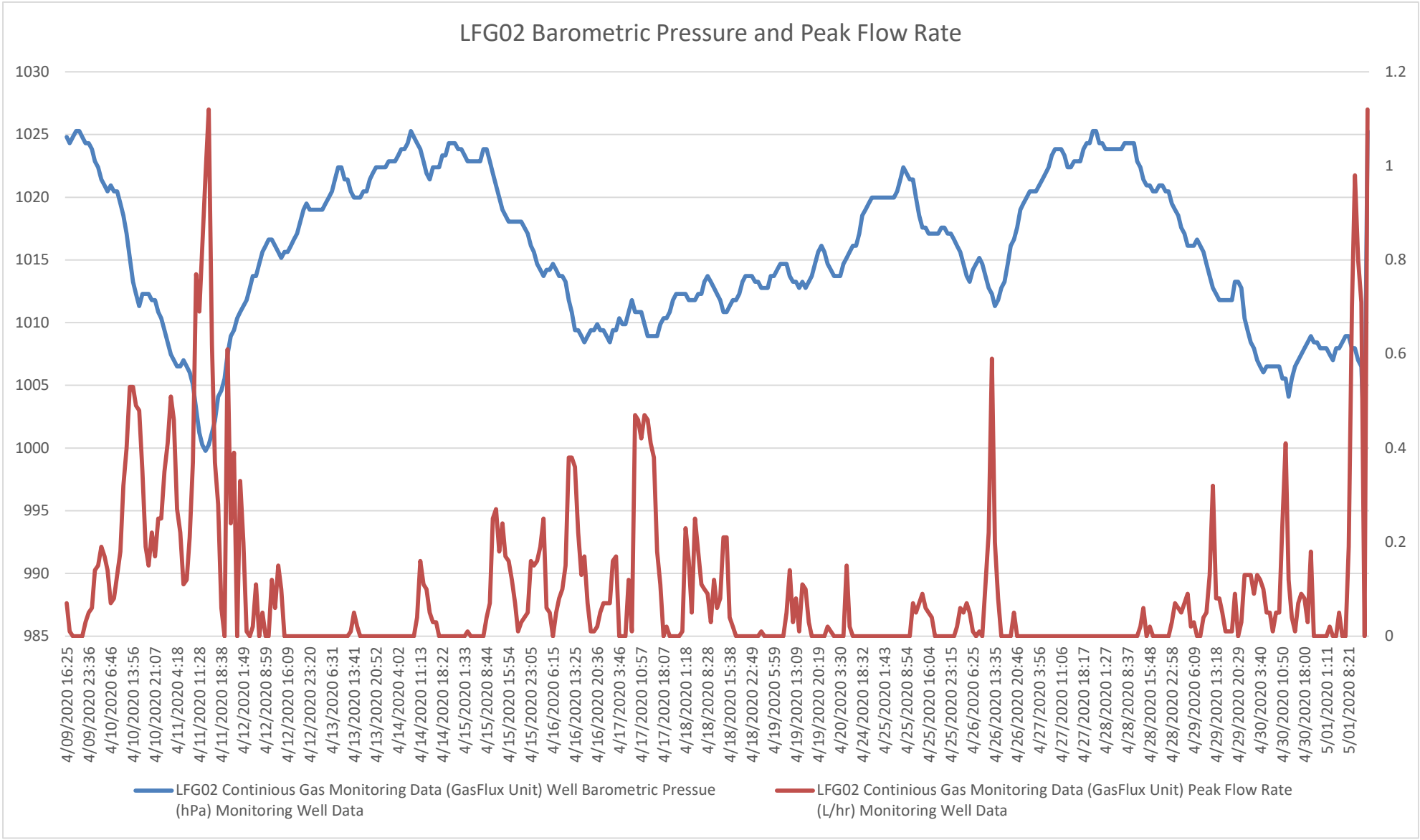
Measurement uncertainty of test data is available on request or please click here.

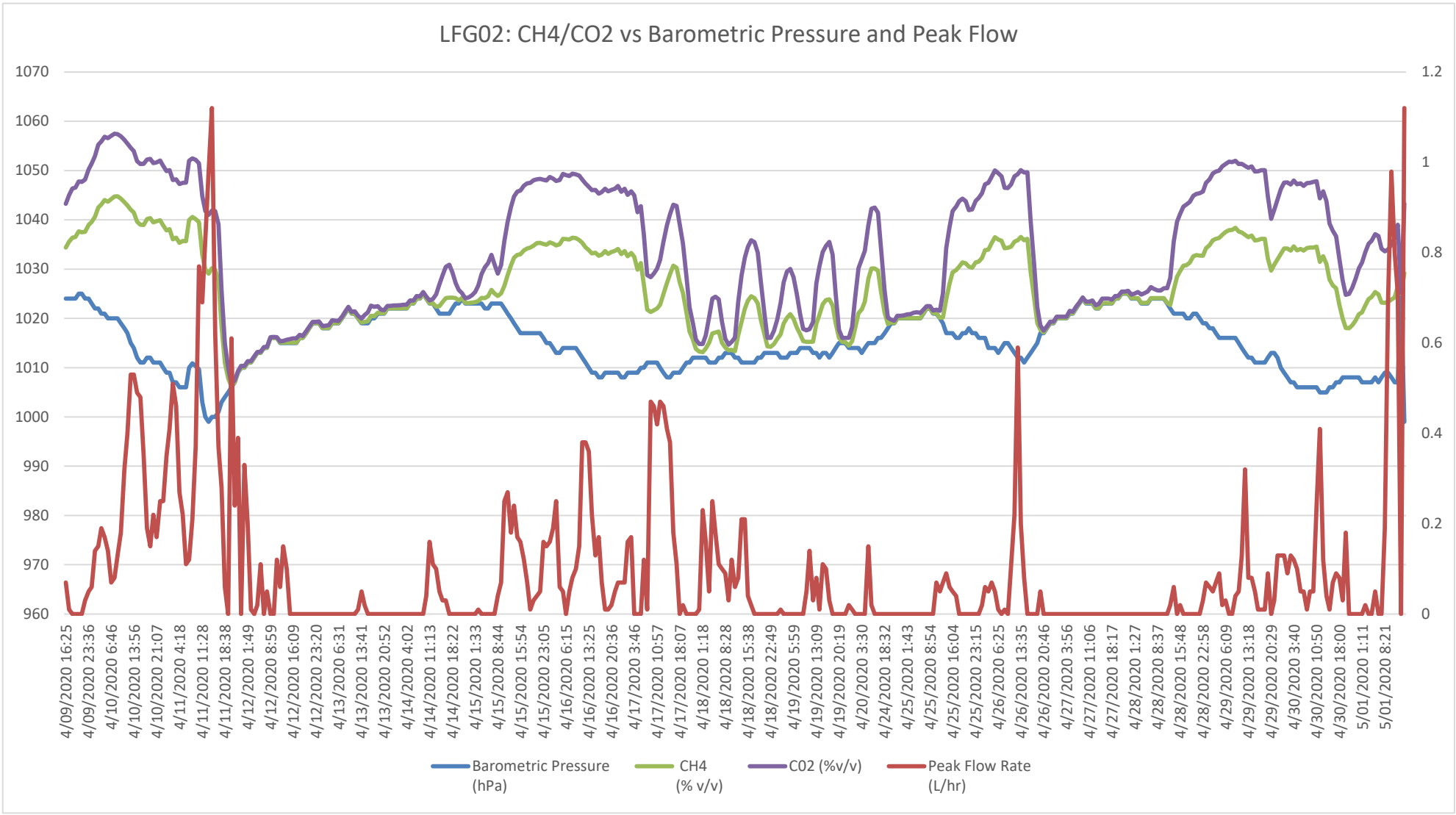
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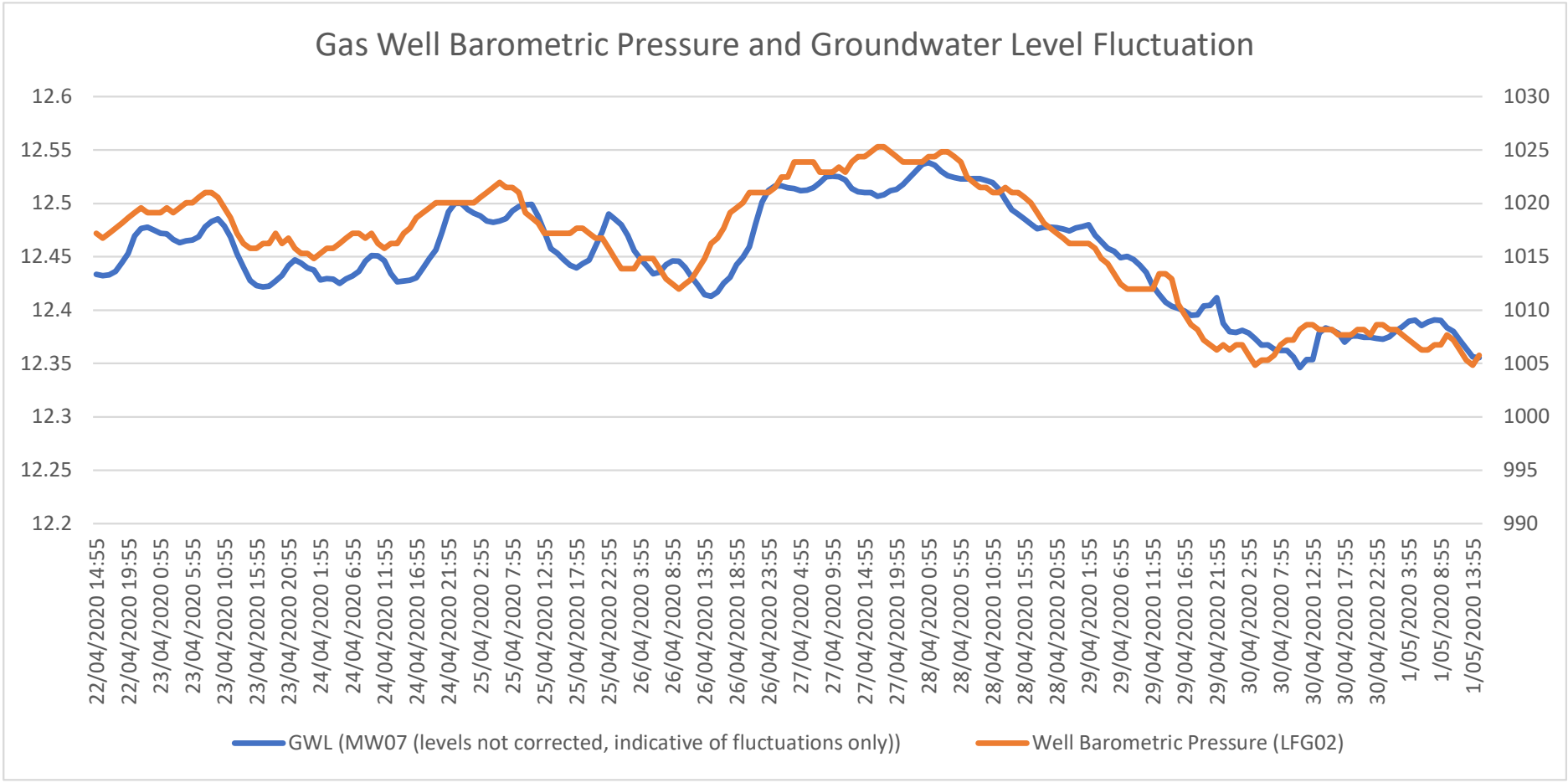
Appendix N Ground Gas Correlation Graphs


LFG01: Barometric Pressure, Groundwater Level and Peak Flow
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1025
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1005
1000
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12.6
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3/05/2020 2:55
3/05/2020 6:55
Barometric Pressure (hPa)
Groundwater Level
Peak Flow Rate (L/hr)


LFG01: CH4/CO2 vs Barometric Pressure and Peak Flow
1030
1025
1020
1015
1010
1005
1000
995
990
985
3.5
3
2.5
2
1.5
1
0.5
0
9/04/2020 16:20
10/04/2020 1:43
10/04/2020 11:05
10/04/2020 20:27
11/04/2020 5:49
11/04/2020 15:11
12/04/2020 0:34
12/04/2020 9:56
12/04/2020 19:20
13/04/2020 4:42
13/04/2020 14:04
13/04/2020 23:27
14/04/2020 8:49
14/04/2020 18:12
15/04/2020 3:35
15/04/2020 12:56
15/04/2020 22:20
16/04/2020 7:42
16/04/2020 17:04
17/04/2020 2:26
17/04/2020 11:47
17/04/2020 21:11
18/04/2020 6:33
18/04/2020 15:56
19/04/2020 1:19
19/04/2020 10:40
19/04/2020 21:06
20/04/2020 6:29
20/04/2020 15:50
21/04/2020 1:13
21/04/2020 10:34
21/04/2020 19:57
22/04/2020 5:20
22/04/2020 14:42
23/04/2020 0:05
23/04/2020 9:27
23/04/2020 18:50
24/04/2020 4:13
24/04/2020 13:35
24/04/2020 22:58
25/04/2020 8:21
25/04/2020 17:43
26/04/2020 3:06
26/04/2020 12:28
26/04/2020 21:51
27/04/2020 7:13
27/04/2020 16:34
28/04/2020 1:57
28/04/2020 11:19
28/04/2020 20:41
29/04/2020 6:03
29/04/2020 15:26
30/04/2020 0:48
30/04/2020 10:11
30/04/2020 19:33
1/05/2020 4:56
1/05/2020 14:17
1/05/2020 23:40
2/05/2020 9:02
2/05/2020 18:25
3/05/2020 3:47
3/05/2020 13:09
Well Barometric Pressue (hPa)
Peak Flow Rate (L/hr)
CH4 (% v/v)
C02 (%v/v)


LFG02 Barometric Pressure and Peak Flow Rate
1030
1025
1020
1015
1010
1005
1000
995
990
985
1.2
1
0.8
0.6
0.4
0.2
0
4/09/2020 16:25
4/09/2020 23:36
4/10/2020 6:46
4/10/2020 13:56
4/10/2020 21:07
4/11/2020 4:18
4/11/2020 11:28
4/11/2020 18:38
4/12/2020 1:49
4/12/2020 8:59
4/12/2020 16:09
4/12/2020 23:20
4/13/2020 6:31
4/13/2020 13:41
4/13/2020 20:52
4/14/2020 4:02
4/14/2020 11:13
4/14/2020 18:22
4/15/2020 1:33
4/15/2020 8:44
4/15/2020 15:54
4/15/2020 23:05
4/16/2020 6:15
4/16/2020 13:25
4/16/2020 20:36
4/17/2020 3:46
4/17/2020 10:57
4/17/2020 18:07
4/18/2020 1:18
4/18/2020 8:28
4/18/2020 15:38
4/18/2020 22:49
4/19/2020 5:59
4/19/2020 13:09
4/19/2020 20:19
4/20/2020 3:30
4/24/2020 18:32
4/25/2020 1:43
4/25/2020 8:54
4/25/2020 16:04
4/25/2020 23:15
4/26/2020 6:25
4/26/2020 13:35
4/26/2020 20:46
4/27/2020 3:56
4/27/2020 11:06
4/27/2020 18:17
4/28/2020 1:27
4/28/2020 8:37
4/28/2020 15:48
4/28/2020 22:58
4/29/2020 6:09
4/29/2020 13:18
4/29/2020 20:29
4/30/2020 3:40
4/30/2020 10:50
4/30/2020 18:00
5/01/2020 1:11
5/01/2020 8:21
LFG02 Continious Gas Monitoring Data (GasFlux Unit) Well Barometric Pressue (hPa) Monitoring Well Data
LFG02 Continious Gas Monitoring Data (GasFlux Unit) Peak Flow Rate (L/hr) Monitoring Well Data


LFG02: CH4/CO2 vs Barometric Pressure and Peak Flow
1070
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
1.2
1
0.8
0.6
0.4
0.2
0
4/09/2020 16:25
4/09/2020 23:36
4/10/2020 6:46
4/10/2020 13:56
4/10/2020 21:07
4/11/2020 4:18
4/11/2020 11:28
4/11/2020 18:38
4/12/2020 1:49
4/12/2020 8:59
4/12/2020 16:09
4/12/2020 23:20
4/13/2020 6:31
4/13/2020 13:41
4/13/2020 20:52
4/14/2020 4:02
4/14/2020 11:13
4/14/2020 18:22
4/15/2020 1:33
4/15/2020 8:44
4/15/2020 15:54
4/15/2020 23:05
4/16/2020 6:15
4/16/2020 13:25
4/16/2020 20:36
4/17/2020 3:46
4/17/2020 10:57
4/17/2020 18:07
4/18/2020 1:18
4/18/2020 8:28
4/18/2020 15:38
4/18/2020 22:49
4/19/2020 5:59
4/19/2020 13:09
4/19/2020 20:19
4/20/2020 3:30
4/24/2020 18:32
4/25/2020 1:43
4/25/2020 8:54
4/25/2020 16:04
4/25/2020 23:15
4/26/2020 6:25
4/26/2020 13:35
4/26/2020 20:46
4/27/2020 3:56
4/27/2020 11:06
4/27/2020 18:17
4/28/2020 1:27
4/28/2020 8:37
4/28/2020 15:48
4/28/2020 22:58
4/29/2020 6:09
4/29/2020 13:18
4/29/2020 20:29
4/30/2020 3:40
4/30/2020 10:50
4/30/2020 18:00
5/01/2020 1:11
5/01/2020 8:21
Barometric Pressure (hPa)
CH4 (% v/v)
C02 (%v/v)
Peak Flow Rate (L/hr)


Gas Well Barometric Pressure and Groundwater Level Fluctuation
12.6
12.55
12.5
12.45
12.4
12.35
12.3
12.25
12.2
1030
1025
1020
1015
1010
1005
1000
995
990
22/04/2020 14:55
22/04/2020 19:55
23/04/2020 0:55
23/04/2020 5:55
23/04/2020 10:55
23/04/2020 15:55
23/04/2020 20:55
24/04/2020 1:55
24/04/2020 6:55
24/04/2020 11:55
24/04/2020 16:55
24/04/2020 21:55
25/04/2020 2:55
25/04/2020 7:55
25/04/2020 12:55
25/04/2020 17:55
25/04/2020 22:55
26/04/2020 3:55
26/04/2020 8:55
26/04/2020 13:55
26/04/2020 18:55
26/04/2020 23:55
27/04/2020 4:55
27/04/2020 9:55
27/04/2020 14:55
27/04/2020 19:55
28/04/2020 0:55
28/04/2020 5:55
28/04/2020 10:55
28/04/2020 15:55
28/04/2020 20:55
29/04/2020 1:55
29/04/2020 6:55
29/04/2020 11:55
29/04/2020 16:55
29/04/2020 21:55
30/04/2020 2:55
30/04/2020 7:55
30/04/2020 12:55
30/04/2020 17:55
30/04/2020 22:55
1/05/2020 3:55
1/05/2020 8:55
1/05/2020 13:55
GWL (MW07 (levels not corrected, indicative of fluctuations only))
Well Barometric Pressure (LFG02)

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Chris Kauffman Aidan Marsh	Matthew Bennett	Matthew Bennett	Draft for Client Review	10/08/2023
0	Chris Kauffman Ruby Chapman	Matthew Bennett	Matthew Bennett		1/09/2023
1	Chris Kauffman	Matthew Bennett	Matthew Bennett		27/09/2023
2	Chris Kauffman (Senior Consultant)	Matthew Bennett, Senior Principal and CenvP-SC	Matthew Bennett		30/10/2024

