Detailed Site Investigation (DSI)

Prepared for:	Penrith City Council
Site	**Proposed Regatta Park Kiosk**
Address:	River Road, Emu Plains NSW 2750
Site contact:	Rebecca Marshall
	Project Manager
Prepared by:	Asfar Riaz
	Environmental Consultant M. Eng. Environmental Engineering M. Eng. Mgmt. Engineering Management
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TRINITAS GROUP
ABN 12 161 759 708
Level 3, 24 Hunter St, PARRAMATTA NSW 2150
Ph: 1800 4 TRINITAS
Email: admin@trinitasgroup.com.au
Web: www.trinitasgroup.com.au

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Table of Contents

Abbreviations **5**

1. Executive Summary **7**
Visual Observations 7
Asbestos Assessment 7
Soil Chemical Assessment 8
Waste Classification Assessment 10

2. Introduction **11**
2.1 General 11
2.2 Objectives 14
2.3 Scope of Work 14

3. Site Description **16**
3.1 Site Location and Identification 16
3.2 Site Features 16
3.3 Site Topography and Drainage 16
3.4 Regional Hydrogeology and Local Groundwater Usage 17
3.5 Acid Sulfate Soils 19

4. Limited Desktop Review **20**
4.1 NSW EPA Records 20
4.2 Council Records 20
4.3 Historical Land Use 20
4.4 Integrity Assessment 21

5. Summary of Previous Site Assessments **22**

6. Data Quality Objectives **23**
6.1 Data Quality Objectives 23
6.1.1 State the Problem 23
6.1.2 Identify the Decision 23
6.1.3 Develop a Decision Rule Identify the Decision 24
6.1.4 Optimise the Design for Obtaining Data 26
6.2 Data Quality Indicators 26

7. Site Assessment Criteria **28**
7.1 Soil Investigation and Screening Levels 28
7.2 Management Limits 29
7.3 Asbestos in Soil Assessment Criteria 29
7.4 Waste Classification for Off-site Soil Disposal 31

8. Methodology, Sampling and Analysis Plan **32**
8.1 Visual Inspection & Assessment 32
8.2 Identification of Materials Containing Asbestos 32

8.3 Soil Sampling and Laboratory Analysis 33
8.3.1 Sampling Plan and Methodology 33
8.3.2 Quality Assurance and Quality Control 33
8.3.3 Laboratory Analysis 34
8.4 Aesthetics 34
8.5 Statistical Treatment 34
9. Findings 35
9.1 Visual Observations 35
9.2 Asbestos Assessment 35
9.3 Soil Chemical Assessment 36
9.4 Waste Classification Assessment 36
9.5 Duty to Report 39
10. Conclusions and Recommendations 41
11. References 42
12. Statement of Limitations 43
APPENDIX A – Representative Photographs 44
Appendix B – Aerial Photographs 49
Appendix C – Summary of Analytical Data 52
Appendix D - Analytical Reports 54
Appendix E - Test Pit Logs 55

Tables

Table 1 Sampling Design Plan for Areas of Concern 14
Table 2. Site Details 16
Table 3. Soil Profile Summary 17
Table 4. Summary of Registered Groundwater Bores (Source: WaterNSW) 18
Table 5 Data Quality Objectives, Requirements and Indicators 26
Table 6 Health Investigation Levels for Asbestos Contamination in Soil (NEPM 2013) 30
Table 9. Summary of Waste Classification Results 38

Figures

Figure 1 Regatta Park Kiosk Plan (Source: Penrith City Council) 12
Figure 2 Trinitas Site Layout and Sampling Locations 13
Figure 3. Hydrogeological Features (WaterNSW) 18
Figure 4. CC 76 ACM Hotspot 35

Abbreviations

ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
AMP	Asbestos Management Plan
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
BGS	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COPC	Contaminant of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development Application
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
EP&A	Environmental Planning and Assessment
Trinitas	Trinitas Group Pty Ltd
HIL	Health Investigation Level
HSL	Health Screening Level
IL	Investigation Level
LOR	Limit of Reporting
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NSW EPA	Environment Protection Authority of New South Wales
NSW OEH	Office of Environment and Heritage of New South Wales
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbons

PCB	Polychlorinated Biphenyl
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
RAP	Remediation Action Plan
RPD	Relative Percent Difference
SEPP	State Environmental Planning Policy
SWMS	Safe Work Method Statement
TRH	Total Recoverable Hydrocarbon
PFAS	Per- and Polyfluoroalkyl Substances
VENM	Virgin Excavated Natural Material

1. Executive Summary

This report presents the findings of a Detailed Site Investigation ("**DSI**") undertaken by Trinitas Group Pty Ltd ("**Trinitas**") for the proposed development at River Road, Regatta, Emu Plains NSW 2750 (the "**Site**").

The objectives of the DSI were to:

- Identify Areas of Environmental Concern ("**AECs**") and Chemicals of Potential Concern ("**COPCs**") for the Site;
- Assess the potential for contamination to exist at the Site, as a result of limited historical and current Site activities;
- Assess the presence of contamination across the Site;
- Assess the suitability of the Site for the proposed land use (from a contamination viewpoint);
- Provide recommendation for further investigation of areas of environmental concern; and
- Provide recommendations for remediation and/or management, if required.

In order to meet the above objectives, Trinitas carried out the following scope of works:

- A review of Site topography, geology, hydrogeology and local groundwater usage;
- A limited Site history review, including a review of historical land titles, aerial photography, and records held by relevant regulatory authorities;
- A Site walkover;
- A sampling program, targeting the AECs across the Site, which were identified during WSP preliminary site investigation report as well as other potential AECs;
- Laboratory analysis of the samples for selected COPCs, including heavy metals, hydrocarbons and asbestos; and
- Preparation of this DSI Report.

Based on the findings of this DSI, Trintas concludes the following:

Visual Observations

The Site features observed during the walkover are described below:

- The Site is described as the northern section of the Regatta Park eastern carpark and the adjoining open space to the north of the carpark, Emu Plains NSW 2750.
- The carpark area is predominantly covered by asphalt-based pavement and the open space is covered by grass with low to moderate tree coverage.
- No foreign material / building waste was observed within the soil materials observed at the Site

Asbestos Assessment

No FA (Friable Asbestos) / AF (Asbestos Fines) was observed at any of the sampling locations or identified in any soil samples collected from the Site. Bonded ACM was detected within test pit CC76 as part of the initial Detailed Site Investigation (DSI) undertaken by Trinitas. CC 76 ACM hotspot has been illustrated in **Figure 4** on the following page;

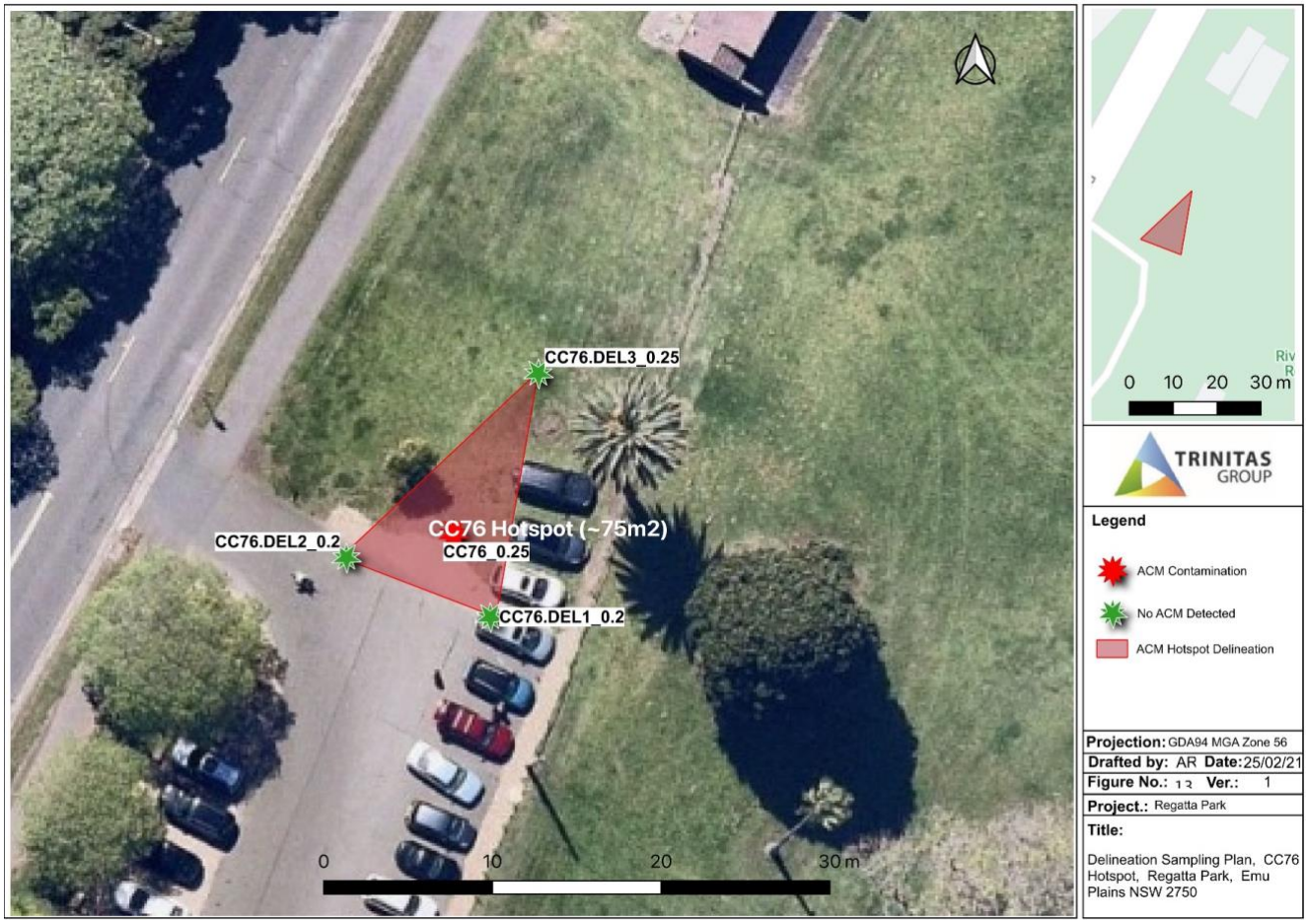

Figure 4. CC 76 ACM Hotspot

Soil Chemical Assessment

Eighteen (18) individual soil samples were collected from the Southern Section of the Site on 12th December 2020 and an additional sixteen (16) soil samples were collected from the Northern Section of the Site on 9th February 2021 by experienced environmental consultants representing Trinitas Group to determine the presence of asbestos and potential Chemicals of Concern.

The samples were sent to Eurofins Environmental Testing ("Eurofins"), a National Association of Testing Authorities, Australia ("NATA") accredited laboratory for asbestos identification and soil analysis. The samples were examined using a stereo microscope and selected fibres were further examined using polarised light microscopy supplemented with dispersion staining.

The NATA endorsed reports are presented in

Appendix D - Analytical Reports.

Key findings from the chemical analysis are presented below;

- The results for chemical analysis from all soil samples analysed during this investigation were reported below the HSL - C recreational/open use, HIL-C recreation and maintenance / excavation worker criteria.

A summary of representative field observation and analytical results are presented within

Appendix C – Summary of Analytical Data**.**

Waste Classification Assessment

Based on waste classification analysis for in-situ soils, Trinitas concludes that:

Topsoil and Fill Materials;

- Topsoil and fill soil materials to a maximum depth of 0.5m and an average depth of 0.3 m bgl within the subject area meet the off-site waste classification criteria of 'General Solid Waste (non-putrescible) with the exception of CC76 ACM hotspot which is classified as 'General Solid Waste (non-putrescible) – Special Waste (Asbestos), due to the presence of bonded ACM.

Natural Soil (ENM);

- Natural soil materials within the subject area located at an average depth of 0.3m bgl are considered to be classified as Excavated Natural Material (ENM) as per NSW EPA ENM Order 2014.

Based on the data and evidence collected in the course of the investigation, it is the opinion of Trinitas that:

- The concentrations of all chemical analytes detected within the soil materials within the Site meet the adopted Site Assessment Criteria (SAC) of HIL-C and HSL-C.
- No AF / FA was observed or detected within the soil materials at the Site;
- The concentrations of all chemical analytes detected within the fill materials meet the off-site disposal criteria for classification as **'General Solid Waste (non-putrescible).'**
- The Natural Soil materials at the Site located at an average depth of 0.3m are considered to be classified as Excavated Natural Material (ENM) as per NSW EPA ENM Order 2014.
- The fill materials at the Site located in CC 76 ACM hotspot area to a maximum depth of 0.5 m are classified as **Special Waste (As GSW Non - Putrescible)**.
- Based on the findings of this investigation, Trinitas concludes that the contamination identified at the Site does not trigger the duty to report.
- Any material being excavated and transported off-site for disposal must be from the subject areas as shown in the attached figures and must be consistent with the waste description provided; and

- If there are any unexpected finds that are not consistent with this classification, please contact Trinitas Group immediately on 1800 487 464 (TRINITAS).

2. Introduction

2.1 General

Trinitas Group Pty Ltd **(Trinitas)** was engaged by Penrith City Council (**The Client**) to perform a Detailed Site Investigation (**DSI**) for the proposed Regatta Park Kiosk at Regatta Park, Emu Plains, NSW 2750 (**The Site**) as part of the Regatta Park Upgrade Project. The Client is planning to build the Kiosk building within the subject area for this investigation. Field investigation works were conducted on 26th November 2020 (Regatta Park DSI) & to 12th February 2021 (Additional Sampling).

The Client conducted two preliminary site investigations (WSP 2017 & WSP 2019) for the Regatta Park precinct to gain an initial understanding of potential contamination risks and to make sure that the site is suitable for the proposed works. During preliminary site investigations limited in-situ soil was conducted at a total of 38 investigation locations (18 locations in 2017 and a further 20 locations in 2019). The Client also conducted a Detailed Site Investigation for the Regatta Park precinct (Trinitas 2020) in November / December 2020 to determine the lateral and vertical extent of potential contaminants at the Site. However, sampling / investigation density did not meet the minimum requirements set be NSW EPA Sampling Design Guidelines (NSW EPA 1995) and was conducted at seven (7) sampling locations, as compared to the required nine (9) sampling points, within the area of concern along River Road during the prior Site Investigation Works. This warranted the need for additional investigation within the area of concern.

The site comprises an area of approximately 2400 m^2 along River Road. The area is currently used as a car park for visitors / residents and is the site of the proposed Regatta Park Kiosk. Site Layout with sampling locations and approximate boundaries of the investigation areas are illustrated below in **Figure 2.** Details of the Sampling Design Plan are provided in **Table 1**.

It is understood that The client is currently utilising Regatta Park as a public open space and the proposed land use is still a reserve and open space for the public. Trinitas understands that the soil along areas of concern will or likely be disturbed, disposed off-site, reused on site and/or managed on site for Recreational C land use.

Council requires further assessment of the site, with additional testing, to better understand the location and quantity of contaminated soil and waste. This assessment report aims to provide a sufficient level of data for Council to quantify the required remediation work on the site and to assist with the financial planning for the project.

The Client seeks two stages of contaminated land consulting services including:

- Stage One: Detailed Site Investigation (Contamination Assessment)
- Stage Two: Remedial Action Plan (RAP)

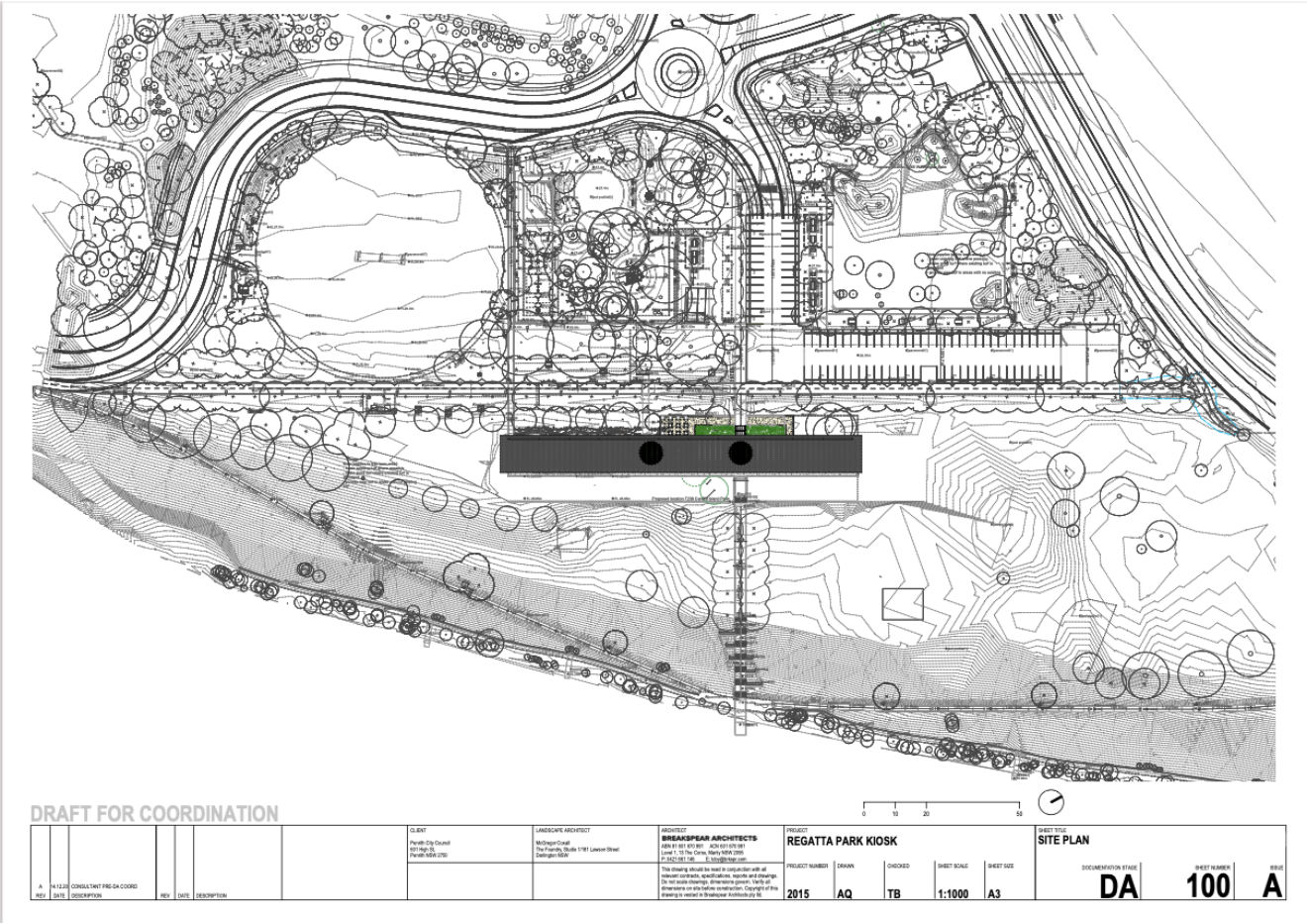

Figure 1 Regatta Park Kiosk Plan (Source: Penrith City Council)

Figure 2 Trinitas Site Layout and Sampling Locations

Table 1 Sampling Design Plan for Areas of Concern

Site Section	Area of Concern	Approx. Area or Length	Minimum Sampling No. (Systematic GRID)	Sampling Method	Sampling Interval	Trinitas Sampling Locations	Sampling No. (On-site Inspection)	Waste Classification for Disposal	Asb	Sampling No. (Lab Analysis including NEPM Asbestos analysis)
Kiosk Site	Eastern car park area, along River Rd	2400 m2	7	Excavator	0.2, ENM	7 Previous 2 additional	18	18	18	18
Total		**2400 m2**	7			**9**	18	18	18	**18**

2.2 Objectives

The objectives of the DSI were to:

- Identify Areas of Environmental Concern ("**AECs**") and Chemicals of Potential Concern ("**COPCs**") for the Site;
- Assess the potential for contamination to exist at the Site, as a result of historical and current Site activities;
- Assess the presence of soil contamination across the Site;
- Assess the suitability of the Site for the proposed land use (from a contamination viewpoint); and
- Provide recommendations for remediation and/or management, if required.
- Assess the extent and nature of asbestos and other contaminants throughout the soil profile at the location of the Site; and
- Provide recommendations for further assessments, remediation and/or management, as required.

Trinitas understands that the soils in the proposed area of the site will or likely to be disturbed, disposed off-site and / or managed on site for proposed recreational / public open space land use in the future.

2.3 Scope of Work

In order to meet Council's development consent, Trinitas proposes to provide the Client with the following environmental and hazardous materials consultancy services (the "**Services**"):

- Review of planning and regulatory requirements;
- Review of the proposed development plan;
- Limited Desktop Review of historical site records, and aerial photographs (where available), publicly available data and web-based information searches, background information relevant to the study area, survey data, and topography;
- Conduct field and laboratory investigations;
- Assess NATA accredited laboratory results;
- Detailed Site Contamination (DSI) Investigation & Assessment Contamination Investigation & Assessment Report (Report will clearly identify areas that require remediation)
- Waste Classification for off-site soil disposal

The Report is to also provide the following:

- Results of all sampling, testing and observations carried out as part of this assessment
- Estimated quantities of any contaminated soil that requires remediation, removal, or disposal;
- GPS mapping of all test pits, boreholes and hand auger pits;
- A site plan indicating areas that require further assessment or remediation;
- Recommendations on any required remediation;
- Outline if any soils are suitable for reuse and how they can be reused;
- Recommendations on suitable controls to allow the site to be managed appropriately until such times as remediation can occur;
- The site will be free of visible asbestos contamination and a clearance certificate will be issued;
- Conduct clearance inspection and certificate; and
- Prepare a Remedial Action Plan (RAP) to evaluate remediation options in consultation with the Council (if required).

The scope of work in the RAP will include the following:

- Background information on the project and Site;
- A summary of previous assessment reports and the detailed investigation works undertaken by Trinitas;
- Based on the findings of the site investigations and assessment reports, a Conceptual Site Model (CSM) for the Site will be prepared. The CSM includes
    - Summary of the Areas of Environmental Concern ("AEC's") and associated Chemicals of Concern ("CoC's") for the Site
    - Identification of the potential sources, pathways and receptors of contamination
- Consideration of different remediation options;
- Identification and justification of the preferred remediation option (with the consultation with the Client and the regulator;
- Procedures to be undertaken to carry out the preferred remediation option (including additional sampling if considered beneficial to the remediation phase of the project);
- Procedures for Site validation, to confirm that remediation has been appropriately completed;
- Site validation reporting requirements;
- Environmental and Workplace Health & Safety ("WHS") management requirements;
- Procedures for the management of unexpected finds (unexpected finds protocol); and
- Communication and consultation requirements (including regulatory authority notification requirements).
- Identification of areas of the site that require remediation. This will be provided in the form of GPS locations and a clear site plan which highlights in red the remediation areas.

The RAP will be undertaken in accordance with all Environmental Protection Authority requirements including but not limited to 'Guidelines for Consultants Reporting on Contaminated Sites'. The RAP will also consider NEPM and SafeWork NSW Codes of Practice relating to asbestos.

3. Site Description

3.1 Site Location and Identification

General Site details are included below in **Table 2.**

Table 2. Site Details

Item	Description
Site Address:	Eastern Carpark area, Regatta Park, River Rd, Emu Plains NSW 2750
Approximate Site Area:	Approximately 2400 m^2 (the required investigation area of environmental concern by the Client).
Site Identification Details:	Lot 2, DP 1117991; Lot A, DP 190049
Current Land Use:	The Site is currently used as a public open space
Future Land Use:	The Site is going to continued be used as recreational / public open space
Surrounding Land Uses:	• Great Western Highway, 4 Punt Rd Site and Emu Hall to the North • Open parkland and Nepean River to the East • River Road to the West. • Carpark and open parkland to the South
Site Co-ordinates:	The approximate centre of the reserve is located at, 150.677209 (Longitude), - 33.748554 (Latitude) (GDA94 MGA Zone 56)

3.2 Site Features

Site walkovers were carried out by Trinitas Consultants during the Regatta Park DSI and on 12th February, 2021, prior to conducting additional sampling. Site features identified during the Site walkover are summarised below:

The Site features observed during the walkover are described below:

- The Site is described as the northern section of the Regatta Park eastern carpark and the adjoining open space to the north of the carpark, Emu Plains NSW 2750.
- The carpark area is predominantly covered by asphalt based pavement and the open space is covered by grass with low to moderate tree coverage.

3.3 Site Topography and Drainage

Reference to the Prospect 9130-2N topographic map 1:25000 (accessed through the Spatial Information Exchange https://six.nsw.gov.au/etopo) indicates that the elevation of the Site is approximately 26 m Australian Height Datum ("AHD").

Regional Geology, Topography and Soils
Reference to the eSPADE from Office of Environment and Heritage NSW (https://www.environment.nsw.gov.au/eSpade2Webapp#), dataset from https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c and with reference to MGA Grid Reference: Zone 56, 294200mE, 6261000mN. Penrith (1:100000) Shale Plains Hydrogeological landscape (HGL) datasheet, the site comprises sedimentary rocks from the Triassic Wianamatta Group (major Bringelly Shale with minor Ashfield Shale and Minchinbury Sandstone) that are made up of shale, carbonaceous claystone, laminite, lithic sandstone and rare coal. These have been intruded by Jurassic volcanic pipes containing basaltic breccia. Isolated remnants of Neogene/Palaeogene unconsolidated clays and sands overlie the consolidated Bringelly Shale. Alluvial sands and gravels derived from the surrounding rocks are present along current streams. This HGL consists of low hills and gently undulating rises and plains, long and low colluvial/alluvial foot slopes and plains (often ponding) and eroded, incised and extensive floodplains. Soil profile observed during field activities is presented below and Test Pit Logs are provided in Appendix E – Test Pit / Borehole Logs.

Table 3. Soil Profile Summary

Soil Type	Description	Depth (m bgl)
Fill	Silty Sand	0.0-0.5
Natural	Sand and Silty Sand	~0.3

3.4 Regional Hydrogeology and Local Groundwater Usage

A search for registered groundwater bores within a 1km radius around the Site was conducted as part of this DSI. A review of the WaterNSW groundwater database (https://realtimedata.waternsw.com.au/water.stm) indicates there are 17 registered groundwater features located within a 1km radius of the centre of the site. Details of the search are provided below in **Table 4.**

The site is located adjacent to the Nepean River to the east. The WSP (2017) and WSP (2019) reports identified that previous geotechnical investigations at the site encountered groundwater at approximately 4.6 metres below ground level (mbgl). Groundwater flow is inferred to flow to the east of the site towards the Nepean River.

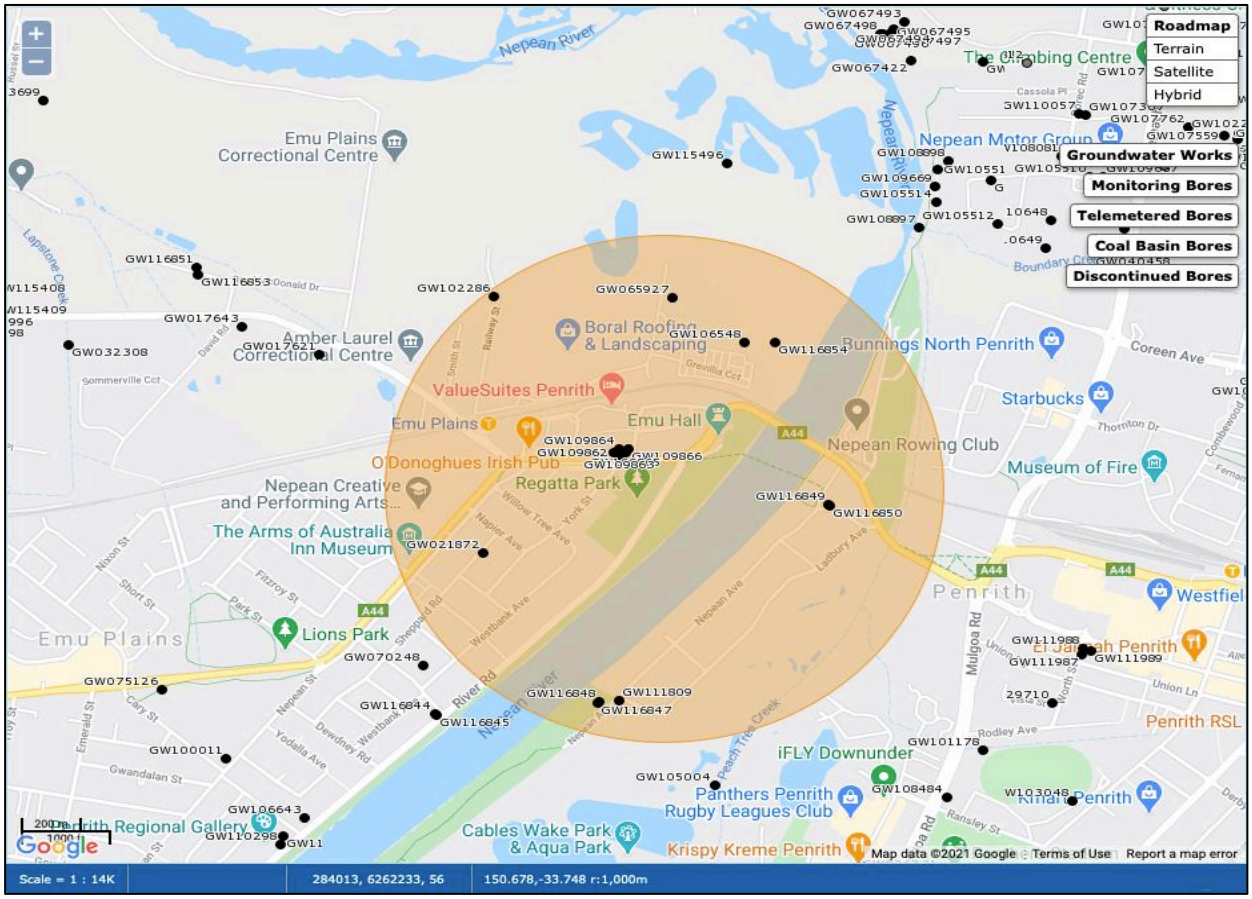

Figure 3. Hydrogeological Features (WaterNSW)

Table 4. Summary of Registered Groundwater Bores (Source: WaterNSW)

Bore ID	Type	Status	Latitude	Longitude	Distance to nominated point (m)	Date completed	Total depth (m)	Drilled bore depth (m)
GW021872	Well	Unknown	-33.749539	150.671719	578	1/5/64	7.9	7.9
GW065927	Bore	Unknown	-33.742039	150.677829	625	29/1/91	15.6	
GW070248	Bore	Unknown	-33.752872	150.669774	924	29/5/92	48	
GW102286	Bore	Supply Obtained	-33.741971	150.67205	811	6/5/99	15.45	15.45
GW105004	Bore	Supply Obtained	-33.756406	150.679192	985	24/9/03	183	183
GW106548	Bore	Unknown	-33.743345	150.680111	535	2/4/96	15.4	15.4
GW109862	Bore	Unknown	-33.746597	150.675939	189	10/10/06	11	11
GW109863	Bore	Unknown	-33.746654	150.676088	175	11/10/06	11.6	11.6
GW109864	Bore	Unknown	-33.746482	150.676093	187	12/10/06	11.85	11.85
GW109865	Bore	Unknown	-33.746586	150.676317	164	11/10/06	12	12
GW109866	Bore	Unknown	-33.746488	150.676406	167	11/10/06	12.5	12.5
GW111809	Bore	Supply Obtained	-33.753903	150.676089	708	30/5/07	15	15
GW116847	Bore	Supply Obtained	-33.753971	150.675405	730	12/3/20	16	16
GW116848	Bore	Supply Obtained	-33.753927	150.675449	724	3/3/20	59	59
GW116849	Bore	Supply Obtained	-33.748142	150.682837	492	14/2/20	13.1	13.1
GW116850	Bore	Supply Obtained	-33.74817	150.68289	498	11/2/20	90.2	90.2
GW116854	Bore	Supply Obtained	-33.743331	150.68111	583	17/4/20	324	324

Note 1. Unknown standing water levels (m BGL).
Note 2. Unknown location method.
Note 3: CRS zone 56.

3.5 Acid Sulfate Soils

A review of the 'Botany Bay Acid Sulfate Soil Risk Map - Edition Two' (Department of Land and Water Conservation (DLWC, 1997) was undertaken to determine the potential for Acid Sulfate Soil (ASS) at the Site. The Site was identified as a 'No Known Occurrence' with regards to ASS risk (refer to Appendix III – Acid Sulfate Risk Map). Reference to the https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/acid-sulfate-soils and https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c) Acid Sulfate Soil ("**ASS**") Risk Mapping (https://www.environment.nsw.gov.au/eSpade2Webapp#) for the site indicates that the Site is located in an area of no known

4. Limited Desktop Review

4.1 NSW EPA Records

A review of the NSW Office of Environment and Heritage (OEH) Contaminated Land – Record of Notices listed by the NSW EPA under the Contaminated Land Management Act 1997 on January 4 2021 identified no former or current notices for the Site. There are no sites within a 1 km radius.

A review on January 4 2021 of the 'List of NSW Contaminated Sites Notified to the EPA' listed by the NSW EPA under the Contaminated Land Management Act 1997 (https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites) identified no sites within the suburb of Emu Plains.

As such, Trinitas considers no further investigation and / or analysis is warranted.

With reference to the NSW Office of Environment and Heritage and the NSW Office of Environment and Heritage's Atlas of NSW Wildlife, no ecological constraints or endangered and vulnerable species have been identified at the Site (or if in doubt, further consulting services should be pursued by the Client).

With reference to the Commonwealth of Australia, Department of Environment, RAMSAR Wetlands Data Source, no RAMSAR wetland have been identified at the Site.

Other regulatory databases were not conducted as the investigation only focuses on the remediation of asbestos in/on soil and limited potential chemical of concern of the Site as instructed by the Client.

4.2 Council Records

Trinitas understands from review of development application records that Council does not hold any records of potentially contaminated land at the site. Further confirmation with the Client is recommended.

4.3 Historical Land Use

Based on the desk study review, the Site history is summarised below:

- Following review of high resolution aerial images from Nearmap, no major landscape change has been observed at the Site since 2009 (oldest Nearmap Image);
- Historical Aerial photographs dating back to 1943, as reviewed using NSW Spatial Services Historical Imagery Web Portal, identified that buildings of unknown use were present in the north-eastern section of the Site and in the western section of the Site adjacent to the vacant Thai restaurant area, posing a potential risk of historical contamination. The following areas of potential historical contamination were identified as part of the historical use investigation;
    - Former land use in the southern portion adjacent York St, where buildings which were present between 1943 to 1975 were demolished (purpose unknown)
    - Former land use in the northern portion, where a building was present at 43 Great Western Highway between 1943 and 1975.
    - Service station present at 49-51 Great Western Highway, Emu Plains since established between 1975 and 1991.

4.4 Integrity Assessment

Where available this limited site history assessment has utilised formal sources of information issued by NSW EPA, and NSW Land & Property Information (data sources from local government and SafeWork are not available for Trinitas at the time of this reporting). These formal sources are supplemented by information provided by the client, previous contamination assessment reports, and observations made by Trinitas professionals during site inspections. Review of the site history summary demonstrates a non-consistent timeline of land use activities and layout with significant data gaps or consistencies to trigger further historical investigations. Hence, the sources and content of this assessment should not be considered to provide an exhaustive, reliable and satisfactory level of accuracy to support this site history assessment and the identification of potential sources of environmental contamination. Further data sources from previous landowners and the client are recommended for a better understanding of the site history.

5. Summary of Previous Site Assessments

The Client engaged Trinitas to carry out a Detailed Site Investigation for the Regatta Park precinct in November / December 2020. The objective of the investigation was to provide classification of waste soils to be disposed offsite during excavation works. Additionally, laboratory data obtained during this investigation were assessed against the site suitability criteria (NEPM, 2013) to establish suitability for on-site reuse. The purpose of this report was to classify soils for future off-site disposal in a cost-effective manner and to determine the feasibility of retaining the excavated spoil on-site. During this investigation, sampling was undertaken at seven (7) locations within the area of concern for this report. Key findings and sampling locations are presented below;

- Samples were taken from sampling points CC76-CC84,
- The results for chemical analysis from all soil samples analysed during this investigation were reported below the NEPM HSL - C recreational/open use, HIL-C recreation and maintenance/excavation worker criteria.
- Bonded ACM was identified within CC76 hotspot.

6. Data Quality Objectives

6.1 Data Quality Objectives

In order to determine the requirements for preliminary characterisation of the Site, Trinitas has adopted the data quality objectives (DQOs) planning process as recommended in the National Environment Protection (Assessment of Site Contamination) Measure 2013 (ASC NEPM, 2013), and DEC (2006) and with consideration to technical details outlined in US EPA (2006) and AS 4482.1.. Details of the DQOs process are presented below.

6.1.1 State the Problem

The Site had historically been utilised for public open space for decades. Previous contaminating activities at the Site could not be reviewed confidently except for those after 2009. Some of the former structures at the Site may have been constructed with asbestos containing materials (ACM). Building rubble and signs of dumped waste were observed in the north-eastern section the site. Previous Site Investigation reports also identified soil lead exceedances in the Thai restaurant area. The sources and contents of potential contamination could not be confidently identified or assumed.

6.1.2 Identify the Decision

To assess whether the historical land use of the Site has led to potential contamination of soils, at concentrations that would preclude future recreational / public open space land use, the following decisions need to be addressed:

- Is there sufficient soil and groundwater information (out of the scope of work) to allow a detailed remediation plan to be developed?
- If the PSI report coincidently underestimated the scale and nature of contamination, will the DSI provide further delineation of areas around hotspots and areas adjacent to the likely disturbed soil during the proposed site development and land use?
- Will the DSI provide a data set that is suitable to assess the risk and potential future liability of material that will remain at the Site?
- Do the findings provide a higher degree of certainty of the source of identified contamination?
- Does the data set provide sufficient information to assess the potential for any off-Site migration of contaminants?
- Will the DSI recommend further site investigation based on limited sampling locations and strict testing numbers?
- Does the DSI provide adequate preliminary characterisation to enable an assessment of remedial options and remedial cost estimates?

6.1.2.1 Identify Inputs into the Decision

The inputs required to make the decision include the following:

- Geological data;
- Hydrogeological data;
- Visual observations of staining, odours and of building waste containing ACM;
- Concentrations of the contaminants of potential concern (COPC) in soil, fill and groundwater (out of the scope of work); and
- The vertical and lateral distribution of contaminants in the subsurface.

6.1.2.2 Define the Boundaries of the Study

The spatial boundaries of the DSI have been identified in **Section 3.1**. The temporal boundaries were determined on the basis of the timeline of five weeks for the current investigation.

6.1.3 Develop a Decision Rule Identify the Decision

The statistical parameters of interest are the COPC and the assessment criteria are presented in Section 7. These criteria have been used as screening levels for residential development to determine whether additional assessment is required. The following decision statements for analysis of the results were adopted with respect to the adopted criteria:

6.1.3.1 Soil Health-based Investigation levels

- Where the data sets are not sufficiently populated to allow calculation of the 95% upper confidence limit (UCLmean) then the individual results must be less than the adopted criteria. If all the individual results are below the adopted criteria then no additional assessment and/or management is required. Where individual results exceed that adopted criteria, then further assessment and/or management is required.
- In accordance with the ASC NEPM (2013), where 95% UCLmean of the average concentration for each soil analyte can be calculated, then the 95% UCLmean must be below the adopted criteria; no single analyte concentration exceeds 250% of the adopted criteria; the standard deviation of the results must be less than 50% of the adopted criteria; and the normal distribution will only be used where the coefficient of variance is not greater than 1.2. Where 95% UCL mean results exceed the aforementioned criteria, then further assessment and/or management is required.

6.1.3.2 Soil Ecological Investigation levels

Only soil samples within the top 2m of the soil profile will be compared to the adopted EILs. Comparison of the data set to the top 2m of the soil profile will be undertaken as follows:

- Where the data sets are not sufficiently populated to allow calculation of the 95% upper confidence limit (UCL mean) then the individual results must be less than the adopted criteria. If all the individual results are below the adopted criteria then no additional assessment and/or management is required. Where individual results exceed that adopted criteria, then further assessment and/or management is required.
- In accordance with the ASC NEPM (2013), where 95% UCL mean of the average concentration for each soil analyte can be calculated, then the 95% UCL mean must be below the adopted criteria; no single analyte concentration exceeds 250% of the adopted criteria; the standard deviation of the results must be less than 50% of the adopted criteria; and the normal distribution will only be used where the coefficient of variance is not greater than 1.2. Where 95% UCL mean results exceed the aforementioned criteria, then further assessment and/or management is required.

Where exceedances are observed, the data will also be compared to published background levels or consideration would be given to the location of areas in the current / future proposed land use.

6.1.3.3 Aesthetic

The decision rule adopted for validation of aesthetic impact including removal of anthropogenic materials is as follows:

- Visual inspection including photographic record of the base and walls of the excavation in the identified burial pit areas must not identify areas containing anthropogenic materials to the extent practicable.
- Visual inspection including photographic record of the material to be backfilled must not identify areas containing anthropogenic materials to the extent practicable.

6.1.3.4 Groundwater and Surface Water

The decision rule adopted for validation of groundwater and surface water should be as follows:

- Comparison of groundwater concentrations against the adopted criteria will be undertaken by comparison to the individual total concentrations.
- Where exceedances are observed, the data will also be compared to groundwater results upgradient groundwater results (where available) to assess whether it is equal to or greater than downgradient groundwater.

Note: All the above water investigations are out of the scope of work in this report.

6.1.3.5 Specify Acceptable Limits of Decision Errors

The acceptable limits will be as follows:

- Individual or 95% UCL_{mean} concentrations are below the adopted criteria.
- 95% of the data will satisfy the Data Quality Indicators (DQIs) which were determined for completeness, representativeness, precision and accuracy of both field and laboratory data. Therefore the limit on the decision error will be 5% that a conclusive statement may be incorrect.
- A comprehensive Quality Assurance/Quality Control (QA/QC) program will be undertaken including representative sampling and sampling at an appropriate density for the purpose of the investigation.

6.1.3.6 Data Representativeness

Expresses the accuracy and precision with which sample data represents and an environmental condition. Data representativeness is achieved by the collection of samples at an appropriate pattern and density as well as consistent and repeatable sampling techniques and procedures.

6.1.3.7 Completeness

Refers to, the percentage of data that can be considered valid data. Sufficient data is required to enable an assessment of the decision rules.

6.1.3.8 Comparability

A qualitative comparison of the confidence with which one data set can be compared to another. This is achieved through consistent sampling and analytical testing and reporting techniques.

6.1.3.9 Precision

Precision is the quality of reproducibility of measurements under a given set of conditions. The relative percent difference (RPD) has been adopted to assess the precision of data between duplicate sample pairs according to the following equation.

$$RPD\% = \frac{(C_p - C_d)}{(C_p + C_p)} \times 200$$

Where:

C_p = Primary sample C_d = Duplicate Sample

An acceptance criterion of ±30% had been adopted for inorganic field duplicates and triplicates and ±50% for organic field duplicates and triplicates. However, it should be noted that exceedances of these criteria are common for heterogeneous soil or fill or for low analyte concentrations.

6.1.3.10 Accuracy

Is a measure of the bias in the analytical results and can often be attributed to: field contamination; insufficient preservation or sample preparation; or inappropriate analytical techniques. Accuracy of the analytical data is assessed by consideration of laboratory control samples, laboratory spikes and analytical techniques in accordance with appropriate standards. Accuracy of the fieldwork is assessed against an assessment of field blank, field trip and rinsate results (if RFQ sampling locations and testing numbers are flexible and requested by the client).

6.1.4 Optimise the Design for Obtaining Data

The Site has historically been utilised for public open space from historical records. The purpose of the adopted targeted sampling strategy was to collect soil and groundwater data to provide a detailed characterisation of potential contamination at the Site from identified historical contaminating activities. Trinitas considers that the adopted sampling program is appropriate for the purposes of the DSI and the DQOs for all Areas of Environmental Concern (AECs) the Site excluding inaccessible areas such as private properties, tree clusters, and underground facilities.

6.2 Data Quality Indicators

The DQOs, requirements and indicators for the assessment are presented in **Table 5.**

Table 5 Data Quality Objectives, Requirements and Indicators

Data Quality Objective	Requirement	Data Quality Indicator
Precision		
Standard operating procedures appropriate and complied with	The sampling methods comply with industry standards and guidelines	Meet Requirement
Intra-laboratory Duplicates	1 per 20 samples	RPDs < 50%
Inter-laboratory Duplicates	1 per 20 samples	RPDs < 50%
Laboratory Duplicates	Minimum of 1 per batch per analyte	RPDs < 50%
Accuracy		
Laboratory Matrix Spikes	1 per batch per volatile/semi-volatile analyte	Recoveries 50% to 150%

Laboratory Surrogate Spikes	1 per batch per volatile/semi-volatile analyte(as appropriate)	Recoveries 70% to 130%
Laboratory Control Samples	At least 1 per batch per analyte tested for	Result < Limit of reporting
Representativeness		
Sampling methodology - preservation	Appropriate for the sample type and analytes	Meet Requirement
Samples extracted and analysed within holding times	Specific to each analyte Meet Requirement	Meet Requirement
Field equipment calibration All field equipment calibrated and	All field equipment calibrated and calibration records provided.	Meet Requirement
Laboratory Method Blanks	At least 1 per batch per analyte tested for	Result < Limit of reporting
Trip Blanks	1 per lab batch for volatile analytes	Result < Limit of reporting
Trip Spikes	1 per lab batch for volatile analytes	Recoveries 60-100%
Rinsate samples	1 per each sampling day	Result < Limit of reporting
Comparability		
Sampling approach	Consistent for each sample	Meet Requirement
Analysis methodology Consistent methodology for each	Consistent methodology for each sample	Meet Requirement

7. Site Assessment Criteria

The Site assessment criteria adopted for this project are predominantly based on the following references:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (2013 amendment); and
- WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

The sections below discuss the adopted Site assessment criteria.

7.1 Soil Investigation and Screening Levels

ASC NEPM (2013) define an 'Investigation Level' ("**IL**") as *"the concentration of a contaminant above which further appropriate investigation and evaluation will be required. The investigation and evaluation is to ascertain:*

- the typical and extreme concentrations of the contaminant(s) on the Site;
- the horizontal and vertical distribution of the contaminant(s) on the Site;
- the physio-chemical form(s) of the contaminant(s); and
- the bioavailability of the contaminant(s)."

Soil ILs have been used in this assessment to identify contaminant(s) that are considered to be present at concentrations that have the potential to present an unacceptable risk to future Site users and identify where further investigation may be required.

The ILs adopted for this assessment are:

- Health Investigation Levels ("HILs"): The HILs for Public Open Space land use (Industrial land use is less conservative as parts of the site and adjacent areas are likely to be used as public open space) are considered to be appropriate for the assessment of human health risk associated with contamination at the Site, based on the proposed future land use and current land use.
- Health Screening Levels ("HSLs"). The HSLs for residential use applicable for clay soils within the top 3m of the soil profile are considered to be appropriate for the assessment of human health risk associated with vapour intrusion, based on the proposed future land use (Public Open Space and Industrial land use), the soil profile encountered and the anticipated depth of contamination.
- Ecological Investigation Levels ("EILs"): The EILs for Public Open Space land use are considered to be appropriate for the assessment of risk to vegetation growth and transitory wildlife associated with soil contamination at the Site. It is noted that EILs only apply to the top 2m of the soil profile. EILs are based on Site specific data relating to soil pH, cation exchange capacity and clay content. In the absence of Site-specific data, generic values are to be established. For this project, laboratory-provided pH, cation exchange capacity and clay content data should be adopted.
- Ecological Screening Levels ("ESLs"): The ESLs for Public Open Space land use applicable for fine-grained soils are considered to be appropriate for the assessment of risk to vegetation growth and transitory wildlife associated with soil contamination at the Site.

The adopted ILs are provided in

Appendix C – Summary of Analytical Data.

For the current and proposed land use: Amended NEPM (2013) Health-based Investigation levels (HILs) for Public Open Space land use, the Health Screening Levels (HSLs) and the CRC Care (2011) Soil Health Screening Levels for Direct Contact (SHSLs). Environmental Criteria: Amended NEPM (2013) Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs) for Public Open Space.

The National Environment Protection Council (NEPC) has amended the National Environment Protection (Assessment of Site Contamination) Measure 1999 on the 11 April 2013. It is understood that the amendment (Amended NEPM, 2013) took effect in each jurisdiction on 16 May 2013, the day after it was registered on the Federal Register of Legislative Instruments (FRLI).

Trintias has adopted the most recent Amended NEPM (2013) Tier 1 Guidelines over the criteria listed in NSW DEC (2006) as it is the most recent guidance available that has been approved by the NSW EPA under Section 105 of the Contaminated Land Management Act, 1997.

Site specific EILs were calculated for the site based upon the methodology provided within the ASC NEPM 2013.

7.2 Management Limits

ASC NEPM (2013) provides management limits to avoid or minimise the following potential effects, relating to petroleum hydrocarbons:

- Formation of observable Light Non-Aqueous Phase Liquids (“LNAPL”);
- Fire and explosive hazards; and
- Effects on buried infrastructure.

ASC NEPM (2013) notes that application of management limits requires consideration of Site specific factors such as the depths of services and basements, and the depth to groundwater. If management limits are exceeded, further site-specific assessments may be undertaken to address identified risks.

For this assessment, Trinitas has adopted the management limits for public open space land use associated with fine-grained soils.

7.3 Asbestos in Soil Assessment Criteria

The WA DoH (2009) Guidelines and ASC NEPM 2013 provide the following definitions / groups for asbestos:

- ACM is defined as material, which is in sound condition, the asbestos is bound in a matrix, and cannot pass through a 7 mm x 7 mm sieve;

- Fibrous Asbestos ("**FA**") encompasses friable asbestos material, such as severely weathered ACM, and loose fibrous materials such as insulation products. This material can be broken or crumbled by hand pressure; and
- Asbestos Fines ("**AF**") includes free fibres of asbestos, small fibre bundles and ACM fragments that can pass through a 7mm x 7mm sieve.

The WA DoH (2009) Guidelines and ASC NEPM 2013 also provide Health Investigation levels ("HILs") for the assessment of asbestos concentrations in soil, for each of the three definitions / groups listed above. The HILs have been developed for various land use scenarios including low-density residential, high-density residential (with minimal access to soils), recreational and commercial / industrial.

Table 6 Health Investigation Levels for Asbestos Contamination in Soil (NEPM 2013)

Form of asbestos	Health Investigation Level (w/w)			
	Residential A[1]	Residential B[2]	Recreational C[3]	Commercial/ Industrial D[4]
Bonded ACM	0.01%	0.04%	**0.02%**	0.05%
FA and AF (friable asbestos)	**0.001%**			
All forms of asbestos	No visible asbestos for surface soil			

1. Recreational C with garden/accessible soil also includes children's day care centres, preschools and primary schools.
2. Residential B with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
3. Recreational C includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.
4. Commercial/industrial D includes premises such as shops, offices, factories and industrial sites.

The NEPM (2013) Schedule B (2) - Guideline on Site Characterisation provide the following management options in accordance with the WA Guidelines:
Small-scale low-risk asbestos soil contamination on single residential lots can be subject to a simplified investigation and remediation process, involving Local Government Environmental Health Officers. Application elsewhere should be discussed first with the Department of Health (DOH). Asbestos buried deeper than 3 m is not usually regarded as contamination provided it is not likely to be disturbed.

The Guidelines provide that the percentage of soil asbestos is calculated using the following formula:

$$\%\ \text{w/w asbestos in soil} = \frac{\%\ \text{asbestos content x (ACM) kg}}{\text{Soil volume (L) x soil density (kg/L)}}$$

In the example included in enHealth (2005) it was assumed that:
% asbestos content (within bonded ACM) = 15% and soil density (for sandy soils) = 1.65 kg/L.

- Given that the current site use is Recreational C (includes public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and unpaved footpaths.), the Site assessment criteria applicable for asbestos in soil adopted for this project are:
- For Areas out of the proposed storm water management system, ACM = 0.02% (weight of asbestos per weight of soil) since the reserve is currently used for Recreational C purpose.
- In the storm water management system, ACM = 0.05% (weight of asbestos per weight of soil) since the reserve is proposed for Industrial D purpose. Since the site is foreseeably used as a public open space during dry seasons, ACM = 0.02% (weight of asbestos per weight of soil) is recommended as a precautionary criterium.
- FA and AF = 0.001% (weight of asbestos per weight of soil); and
- No visible asbestos on the ground surface.

The adopted asbestos in soil assessment criteria are provided in Table 6**.**

7.4 Waste Classification for Off-site Soil Disposal

In order to provide a waste classification of the soils in areas proposed to be excavated and disturbed, the laboratory results are compared to the Contaminant Threshold ("**CT**") criteria for General Solid Waste and Restricted Solid Waste provided in the NSW EPA (2014) *Waste Classification Guidelines*.

The results of the TCLP testing (if it is to be undertaken) are to be compared to the Specific Contaminant Concentration ("**SCC**") and TCLP criteria for General Solid Waste.

The Site assessment criteria adopted for this assessment are based on the following reference:

- NEPC (2013) National Environment Protection (Assessment of Site Contamination Measure) Measure 1999 (2013 amendment) ("ASC NEPM").
- NSW EPA (2014), Waste Classification Guidelines

The Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA, 2014) for off-site disposal, classify wastes into groups that pose similar risk to the environment and human health.

The following classes of waste are defined in clause 49 of Schedule 1 of the Protection of the Environment Operations Act 1997 (Cth.):

- Special waste;
- Liquid waste;
- Hazardous waste;
- Restricted solid waste;
- General solid waste (putrescible); and
- General solid waste (non-putrescible).

8. Methodology, Sampling and Analysis Plan

8.1 Visual Inspection & Assessment

Trinitas Consultants conducted the inspections, allowing inspection to be completed on a grid system walking across the surface at 90 degrees to each walk path within the grid. For each grid (5 m x 5 m) for areas of concern in the site, a walkover visual inspection was undertaken to identify suspected ACM in or on the surface to identify damaged and unstable ACM, fragments and debris as applicable.

- The inspection process is listed below:
- Trinitas personnel walked across the surface. The inspection was carried out by means of a visual observation, during a slow traverse across the materials, with the consultant inspecting on a grid pattern at 90 degrees to each walk path. The surfaces were inspected to detect evidence of suspected asbestos containing materials (ACM). Colour, size and shape are used as indicators.

If suspected ACM was identified during the inspection, it was marked as a suspected ACM sample. The remainder of the surface was inspected for any additional suspected ACM.

A qualitative assessment was made into the location of the ACM and likely exposure of occupants, workers and neighbours.

8.2 Identification of Materials Containing Asbestos

Materials suspected to contain asbestos were collected and selected based on the likely pattern, morphology and appearance of the materials as well as our professional experience in the visual identification of such materials. The collected representative samples were sent to a NATA accredited laboratory for analysis in accordance with Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.

The sampling was undertaken by a senior Trinitas environmental scientist, trained in sampling contaminated land. Trinitas allowed for:

- Collection of soil samples in an approximate grid pattern across the Site. The samples will be collected using excavator, shovels, hand trowels, or other hand tools as appropriate.
- Soil samples collected for chemical analysis will be placed into NATA accredited laboratory-supplied glass jars;
- Sampling for asbestos will be undertaken in accordance with the procedure outlined in the WA Department of Health (2009) Guidelines. Each sample will include:
  - A 10 L soil sample collected from each sample location, which will be weighed;
  - The 10 L sample will then be sieved through a 7mm sieve;
  - ACM fragments captured on the sieve will be placed into a zip-lock plastic bag and weighed in relation to the 10 L sample; and
  - A separate 500 mL soil sample will be collected and placed into a zip-lock plastic bag for NEPM asbestos analysis.
- A clean pair of disposable nitrile gloves will be worn when collecting each sample.
- The sample locations were recorded with a hand-held GPS or measured relative to Site features; or measured on the landscape footing marking piers.

Each sample will be dispatched to a NATA-accredited laboratory and analysed for asbestos identification and quantitation in soil in accordance with the ASC NEPM (2013) guideline and WA Department of Health (2009) Guidelines.

8.3 Soil Sampling and Laboratory Analysis

8.3.1 Sampling Plan and Methodology

Test Pits were advanced throughout the Site using a manual hard clay hand auger. A handheld Global Positioning System (GPS) device was used to record the latitude and longitude of each sample location to an accuracy of less than 5 m. The sample locations and field observations were recorded on test pit logs and a sample register that included sample identification, sample depth and soil profile. For chemical assessment, discrete soil samples were collected from various depths at each sampling location.

The NSW EPA (1995) Sampling Design Guidelines and the WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (adopted by ASC NEPM 2013) recommends minimum sampling points required for site characterisation based on detection of circular hot spots using systematic GRID sampling pattern.

To provide a contamination assessment of asbestos and other potential contaminants of concern, Trinitas generally investigates topsoil (0 – 0.25 m) and subsurface soil (0.25 – 0.5 m) below ground level at the interval of 0.5 m or 1 m up to natural clay material (if fill is observed over 0.5 m) or up to 1.5 m as per the Client requirements.

In accordance with minimum sampling requirement for site investigation, Trinitas proposed that the minimum total sampling design should include **9** Test Pits/Boreholes with **eighteen** (**18**) samples for investigation (Chemical and Asbestos); with the assumption of typical soil profile of topsoil, homogenous fill up to the proposed design depth (<1.5 m) or 1.5 m BGL. **2** QA/QC samples have been also proposed.

Trinitas also proposes to take precautionary and conservative approach by extra sampling at public open space adjacent to areas of environmental concerns after field inspection identifies potential areas of environmental concern.

For each systematic grid, the potential contaminated hotpot grid size is further reduced to around 15 m and then a following remediation or management plan could be achieved locally for each specific hotspot, a NATA accredited laboratory testing and analysis reports are available to assess the individual risk before proceeding the excavation works.

8.3.2 Quality Assurance and Quality Control

The sampling will be carried out in accordance with Trinitas Standard Operating Procedures ("**SOPs**"), which are based on current industry standards.

Duplicate quality control samples were taken among limited total testing numbers and sampling locations.

Field activities were conducted by an experienced Environmental Consultant. The discrete soil samples were placed in sterile glass jars with Teflon lined lids. The sterile glass jars were transferred to a cooler box which contained ice packs (or equivalent) present to maintain the samples at a temperature below approximately 4 °C.

8.3.3 Laboratory Analysis

The samples collected is to be dispatched to Eurofins, a National Association of Testing Authorities ("**NATA**") accredited laboratory. The samples are to be analysed for:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
- Total Recoverable Hydrocarbons ("TRH");
- Benzene, Toluene, Ethylbenzene and Xylenes ("BTEX");
- Polychlorinated Biphenyls ("PCBs");
- Organophosphorus Pesticides ("OPPs");
- Organochlorine Pesticides ("OCPs");
- Polycyclic Aromatic Hydrocarbons ("PAH") including Naphthalene; and
- Asbestos.

8.4 Aesthetics

The NEPC (2013) guidelines require that aesthetic quality of accessible soils be considered even if analytical testing demonstrates that concentrations of the contaminants of potential concern meet the Site Assessment Criteria (SAC). It should be noted that there are no quantifiable guidelines in determining if soils are appropriately aesthetic. However, NEPC (2013) does indicate that professional judgement with regards to quantity, type and distribution of foreign materials and / or odours in relation to the specific land use should be employed. The following examples would trigger further aesthetic assessment:

- Hydrocarbon sheen on surface water;
- Anthropogenic soil staining; and
- Odorous soils (i.e. hydrocarbon or hydrogen sulfide odours).

8.5 Statistical Treatment

Analytical results from the soil sampling program are statistically analysed to determine their applicability to the assessment and recommendation of remedial actions in the event of SAC exceedances. A contaminant concentration in soil will be deemed a non-exceedance if:

- The maximum concentration of all samples meets the specified acceptance criteria; or
- The 95% Upper Confidence Limit (UCL) is below the acceptance criteria; and
- No individual exceedance is greater than 2.5 times the acceptance criteria.

If the 95% UCL of the arithmetic mean of a contaminant concentration is above the acceptance criteria, then the soil will be classified as a contaminated and will require further assessment, remediation, removal or management.

If the 95% UCL of the arithmetic average of a contaminant concentration is below the acceptance criteria, and no individual contaminant concentrations within a designated region of contamination, the location will be considered a non-exceedance requiring no further assessment, remediation, removal or management.

9. Findings

9.1 Visual Observations

The Site features observed during the walkover are described below:

- The Site is described as the northern section of the Regatta Park eastern carpark and the adjoining open space to the north of the carpark, Emu Plains NSW 2750.
- The carpark area is predominantly covered by asphalt based pavement and the open space is covered by grass with low to moderate tree coverage.
- No foreign material / building waste was observed within the soil materials observed at the Site

9.2 Asbestos Assessment

No FA (Friable Asbestos) / AF (Asbestos Fines) was observed at any of the sampling locations or identified in any soil samples collected from the Site. Bonded ACM was detected within test pit CC76 as part of the initial Detailed Site Investigation (DSI) undertaken by Trinitas. Asbestos hotspot area has been illustrated in **Figure 4 below**;

Figure 4. CC 76 ACM Hotspot

9.3 Soil Chemical Assessment

Eighteen (18) individual soil samples were collected from the Southern Section of the Site on 12th December 2020 and an additional sixteen (16) soil samples were collected from the Northern Section of the Site on 9th February 2021 by experienced environmental consultants representing Trinitas Group to determine the presence of asbestos and potential Chemicals of Concern.

The samples were sent to Eurofins Environmental Testing ("Eurofins"), a National Association of Testing Authorities, Australia ("NATA") accredited laboratory for asbestos identification and soil analysis. The samples were examined using a stereo microscope and selected fibres were further examined using polarised light microscopy supplemented with dispersion staining.

The NATA endorsed reports are presented in

Appendix D - Analytical Reports.

Key findings from the chemical analysis are presented below;

- The results for chemical analysis from all soil samples analysed during this investigation were reported below the HSL - C recreational/open use, HIL-C recreation and maintenance / excavation worker criteria.

A summary of representative field observation and analytical results are presented within

Appendix C – Summary of Analytical Data**.**

9.4 Waste Classification Assessment

Based on waste classification analysis for in-situ soils, Trinitas concludes that:

Topsoil and Fill Materials;

- Topsoil and fill soil materials to a maximum depth of 0.5m and an average depth of 0.3 m bgl within the subject area meet the off-site waste classification criteria of 'General Solid Waste (non-putrescible) with the exception of CC76 ACM hotspot which is classified as 'General Solid Waste (non-putrescible) – Special Waste (Asbestos), due to the presence of bonded ACM.

Natural Soil (ENM);

- Natural soil materials within the subject area located at an average depth of 0.3m bgl are considered to be classified as Excavated Natural Material (ENM) as per NSW EPA ENM Order 2014.

A summary of the Waste Classification Results is provided in Table 9 on the following page.

Table 7. Summary of Waste Classification Results – Chemical Characterisation of the Subject Area

Site Assessment Criteria			Results			Conclusion
Analysis	**Maximum Values of Total Concentration Assigned for General Solid Waste CT1/CT2 (mg/kg)**	**Maximum Values of Total Concentration Assigned for General Solid Waste TCLP1 (mg/L) / SCC1 (mg/kg)**	**Maximum Total Concentration Detected (mg/kg)**	**95% Upper Confidence Limit (UCL)**	**TCLP (mg/L)**	**Chemical Characterisation as General Solid Waste**
PAHs						
Total PAHs	200/800	NA/200	50.6	-	-	Acceptable
Benzo(a)pyrene	0.8/3.2	0.04/10	<0.5	-	<0.001	Acceptable
OCPs						
Endosulfan1	60/240	3/108	<0.1	-	-	Acceptable
OPPs						
Chlorpyrifos	4/16	0.2/7.5	<0.2	-	-	Acceptable
PCBs						
Total PCBs	50/50	NA/<50	<0.5	-	-	Acceptable
TRHs						
C_6 –C_9 Petroleum Hydrocarbons	650/2,600	NA/650	<20	-	-	Acceptable
C_{10} –C_{36} Petroleum Hydrocarbons	10,000/40,000	NA/10,000	280	-	-	Acceptable
BTEX						
Benzene	10/40	0.5/18	<0.01	-	-	Acceptable
Toluene	288/1,152	14.4/518	<0.01	-	-	Acceptable
Ethyl-benzene	600/2,400	30/1,080	<0.01	-	-	Acceptable
Xylenes (Total)	1,000/4,000	50/1,800	1.4	-	-	Acceptable
Metals						
Arsenic	100/400	5.0/500	19	-	-	Acceptable
Cadmium	20/80	1.0/100	<0.4	-	-	Acceptable
Chromium2	100/400	5/1,900	68	-	-	Acceptable
Copper	NA	NA	50	-	-	Acceptable
Lead	100/400	5/1,500	230	73.007	-	Acceptable
Nickel	40/160	2/1,050	41	-	0.01	Acceptable
Zinc	NA	NA	200	-	-	Acceptable
Mercury	4/16	0.2/50	0.1	-	-	Acceptable

Notes to Table 5
ND – Not detected / below Practical Quantitation Limit (PQL).
NA – Not Applicable.
1 - Endosulfan (CAS Registry Number 115-29-7) means the total of Endosulfan I (CAS Registry Number 959-98-8), Endosulfan II (CAS Registry Number 891-86-1) and Endosulfan sulfate (CAS Registry Number 10.31-07-8).
2 – Chromium (Total)

9.5 Duty to Report

According to **Guidelines on the Duty to Report Contamination under the *Contaminated Land Management Act 1997,***

For the purposes of section 60(3)(b) of the CLM Act, notification of contamination in, or on, soil on the land is required where:

- the 95 % upper confidence limit on the arithmetic average concentration of a contaminant in or on soil is equal to or above the Health Investigation Level and/or Health Screening Level for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013)

OR

- the concentration of a contaminant in an individual soil sample is equal to or more than 250% of the Health Investigation Level and/or Health Screening Level for that contaminant for the current or approved use of the respective on-site land, as specified in Section 6, Schedule B1 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013)

AND

- a person has been or foreseeably will be exposed to the contaminant or a by-product of the contaminant.

Under section 60 of the *Contaminated Land Management Act 1997* (CLM Act) the following people are required to notify the EPA as soon as practical after they become aware of the contamination:

- Anyone whose activities have contaminated land
- An owner of land that has been contaminated.
- A person is taken to be aware of the contamination if it is considered they should have reasonably been aware of the contamination. Section 2.6 lists the factors that are taken into account in determining when a person should have reasonably been aware of the contamination, including their abilities and whether they could have sought advice.

Such a person is required to notify the EPA of contamination in the following circumstances:

- the level of the contaminant in, or on, soil is equal to or above a level of contamination set out in Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013) or other approved guideline value[8] with respect to a current or approved use of the land, and people have been, or foreseeably will be, exposed to the contaminant

OR

- the contamination meets a criterion prescribed by the regulations

OR

- the contaminant or a by-product has entered, or will foreseeably enter, neighbouring land, the atmosphere, groundwater or surface water, and is above, or will foreseeably be above, a level of contamination set out in National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 2013) or other approved guidelines and will foreseeably continue to remain equal to or above that level.

Trinitas concludes that the contamination identified at the Site does not trigger the duty to report.

10. Conclusions and Recommendations

Based on the data and evidence collected in the course of the investigation, it is the opinion of Trinitas that:

- The concentrations of all chemical analytes detected within the soil materials within the Site meet the adopted Site Assessment Criteria (SAC) of HIL-C and HSL-C.
- No AF / FA was observed or detected within the soil materials at the Site;
- The concentrations of all chemical analytes detected within the fill materials meet the off-site disposal criteria for classification as **'General Solid Waste (non-putrescible).'**
- The Natural Soil materials at the Site located at an average depth of 0.3m are considered to be classified as Excavated Natural Material (ENM) as per NSW EPA ENM Order 2014.
- The fill materials at the Site located in CC 76 ACM hotspot area to a maximum depth of 0.5 m are classified as **Special Waste (As GSW Non - Putrescible)**.
- Based on the findings of this investigation, Trinitas concludes that the contamination identified at the Site does not trigger the duty to report.
- Any material being excavated and transported off-site for disposal must be from the subject areas as shown in the attached figures and must be consistent with the waste description provided; and
- If there are any unexpected finds that are not consistent with this classification, please contact Trinitas Group immediately on 1800 487 464 (TRINITAS).

These recommendations are subject to change should the extent of asbestos or other contaminant of concern related contamination vary.

Should you have any questions or require further clarification please do not hesitate to contact Trinitas Group on 1800 4 TRINITAS.

11. References

- NSW Work Health and Safety Regulation (2017)
- How to Manage and Control Asbestos in the Workplace Code of Practice (2019)
- How to Safely Remove Asbestos Code of Practice (2019)
- Contaminated Land Management Act 1997
- National Environment Protection (Assessment of Site Contamination) Measure 1999
- enHEALTH Management of Asbestos in the Non-Occupational Environment (2005)
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B (1) - Guideline on Investigation Levels for Soil and Groundwater (May 2013)
- National Environment Protection (Assessment of Site Contamination) Measure. Schedule B2 - Guideline on site characterisation.
- NSW Environment Protection Authority (EPA) Waste Classification Guidelines – Part 1: Classification of waste (November 2014)
- Office of Environment & Heritage - Guidelines for Consultants Reporting on Contaminated Sites (2011).
- The NSW EPA, Sampling Design Guidelines (1995)
- Australian Standard AS4964-2004 Method for the qualitative identification of asbestos in bulk samples.
- National Environment Protection Council (NEPC) (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Schedule B2: Guideline on Site Characterisation.
- Department of Environment and Conservation NSW (DEC) (2006) Contaminated Sites: Guidelines for the NSW Auditor Scheme (2nd Edition).
- US Environmental Protection Agency (USEPA) (2006) Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, (Ref. EPA/240/B-06/001).
- Australian Standard AS 4482.1—2005, Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds.
- NSW EPA Contaminated Land Guidelines - Consultants Reporting on Contaminated Land (2020)

12. Statement of Limitations

Investigations are based on inspections conducted in accordance with industry guidelines and standards, and common industry practice, having regard to the client instructions, and interpretations of conditions are based on the data from those inspections and, where relevant and conducted, testing. They will represent to the best of our knowledge, a reasonable interpretation of the condition of the site as able to be inspected. However, there can be no guarantee that conditions at specific points not able to be inspected do not vary from the interpreted conditions based on the available observations/data.

In practice, it is generally impossible to locate all asbestos in the course of an inspection due to factors including but not limited to access restrictions to certain areas including subsoil, the need to avoid damage, minimising inconvenience, operating plant, unavailability of specific information regarding the premises. The presence of asbestos and asbestos containing materials (ACM) is determined visually while the consultant will collect samples of suspected ACM and have them analysed in a laboratory. Any restrictions on the amount of sampling will reduce confidence in the inspection findings. The ACM that cannot be seen will not be found.

No warranty, undertaking, or guarantee, whether expressed or implied, will be made with respect to the data reported or to the findings, observations, conclusions and recommendations expressed in Trinitas report. Furthermore, such data, findings, observations, conclusions and recommendations are based solely upon existence at the time of the investigation. The passage of time, manifestation of latent conditions or impacts of future events (e.g. changes in legislation, scientific knowledge, land uses, climatic conditions, etc) may require further investigation at the site with subsequent data analysis and re-evaluation of the findings, observations, conclusions and recommendations expressed in Trinitas report.

Trinitas report will be prepared on behalf of and for the exclusive use of the Client and is subject to and issued in connection with the provisions of the agreement between Trinitas and the Client. Trinitas accepts no liability or responsibility whatsoever and expressly disclaims any responsibility for or in respect of any use of or reliance upon Trinitas report by any third party or parties. It is the responsibility of the Client to accept if the Client so chooses any recommendations contained within and implement them in an appropriate, suitable and timely manner.

All works undertaken by Trinitas are subject to Trinitas Terms and conditions for professional services and the statement of limitation detailed below.

APPENDIX A – Representative Photographs

Photograph 1. Representative soil materials at the SIte as observed from Test Pit CC76.DEL1.

Photograph 2. Soil materials as observed under asphalt in eastern carpark – Test Pit CC78.

Photograph 3. Test Pit CC78 after being backfilled.

Photograph 4. Test Pit CC76.DEL2 at the time of sampling.

Appendix B – Aerial Photographs

Figure 2. Site Layout and Sampling Plan

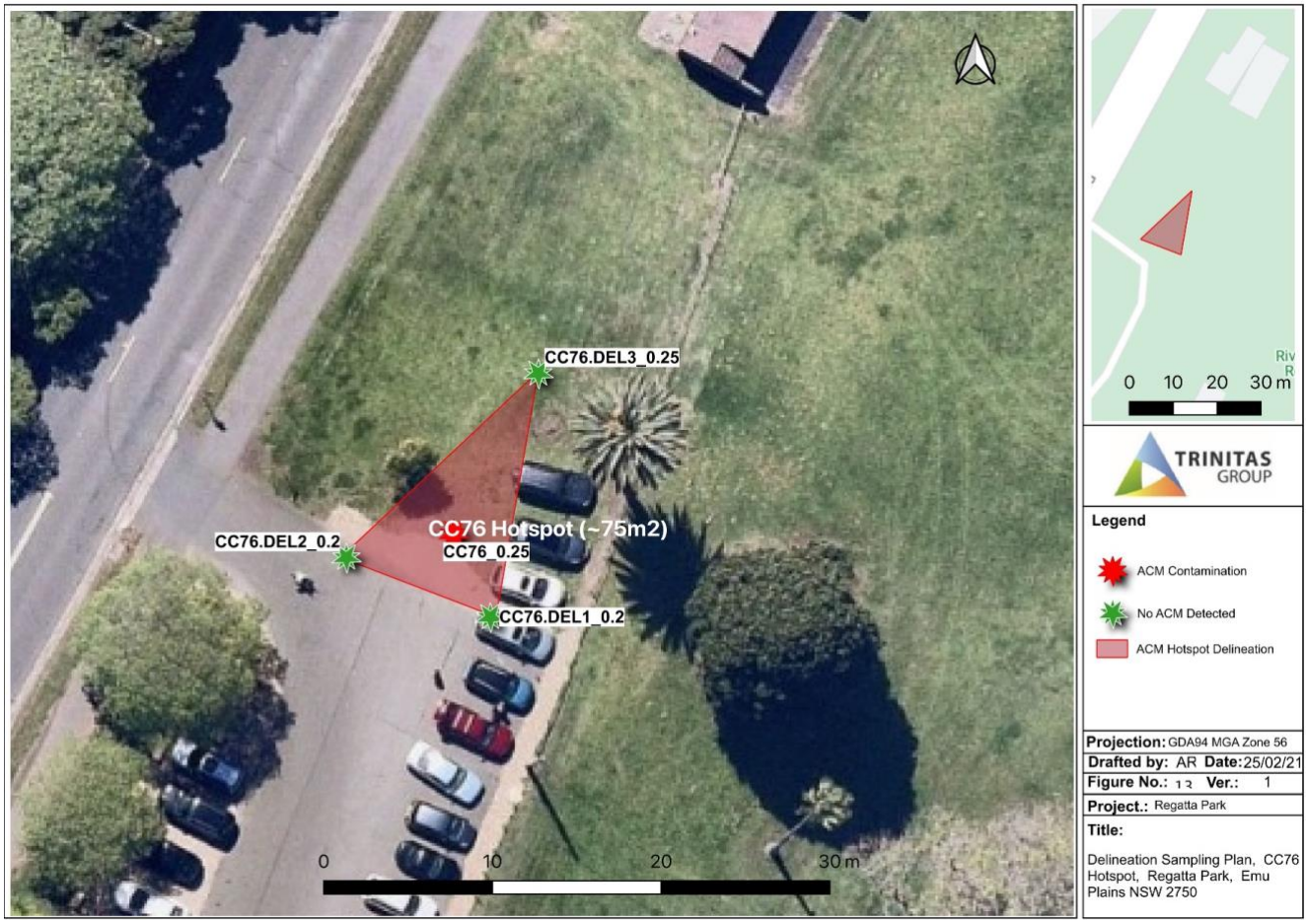

Figure 4 . CC76 ACM Hotspot

Appendix C – Summary of Analytical Data

Regatta Park			Benzene	Ethylbenzene	Toluene	Xylenes - Total*	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury
Sample No. with Depth	Conductivity (1:5 aqueous extract at 25°C as rec.)	pH (1:5 Aqueous extract at 25°C as rec.)	BTEX	BTEX	BTEX	BTEX	Heavy Metals	Heavy Metals	Heavy Metals	Heavy Metals	Heavy Metals	Heavy Metals
Sample No. with Depth	1000		Benzene	Ethylbenzene	Toluene	Xylenes - Total*	As	Cd	Cr	Cu	Pb	Hg
TP55_0.15			< 0.1	< 0.1	< 0.1	< 0.3	5.5	< 0.4	18	19	49	< 0.1
TP55_0.3	0.028	6	< 0.1	< 0.1	< 0.1	< 0.3	5.5	< 0.4	16	13	19	< 0.1
CC76_0.25			< 0.1	< 0.1	< 0.1	< 0.3	4.6	< 0.4	13	9.4	14	< 0.1
CC76_0.5	0.02	7	< 0.1	< 0.1	< 0.1	< 0.3	3.9	< 0.4	12	8	11	< 0.1
CC77_0.15			< 0.1	< 0.1	< 0.1	< 0.3	3.6	< 0.4	16	< 5	15	< 0.1
CC77_0.3	0.034	6.5	< 0.1	< 0.1	< 0.1	< 0.3	5.1	< 0.4	13	8.7	12	< 0.1
CC78_0.15			< 0.1	< 0.1	< 0.1	< 0.3	3.3	< 0.4	14	16	13	< 0.1
CC78_0.3	0.052	6.5	< 0.1	< 0.1	< 0.1	< 0.3	3.7	< 0.4	12	8.5	11	< 0.1
CC79_0.15	0		< 0.1	< 0.1	< 0.1	< 0.3	2.9	< 0.4	19	8.3	14	< 0.1
CC79_0.3	0.046	6.2	< 0.1	< 0.1	< 0.1	< 0.3	3.1	< 0.4	11	7.2	9.9	< 0.1
CC80_0.15	0		< 0.1	< 0.1	< 0.1	< 0.3	4.5	< 0.4	8.8	21	16	< 0.1
CC80_0.3	<0.001	6.9	< 0.1	< 0.1	< 0.1	< 0.3	5.5	< 0.4	17	11	13	< 0.1
CC81_0.15	0		< 0.1	< 0.1	< 0.1	< 0.3	3.8	< 0.4	23	18	61	< 0.1
CC81_0.3	0.06	6.7	< 0.1	< 0.1	< 0.1	< 0.3	4.1	< 0.4	12	7.5	11	< 0.1
CC83_0.1	0		< 0.1	< 0.1	< 0.1	< 0.3	4.6	< 0.4	16	10	17	< 0.1
CC83_0.3	0.01	6.9	< 0.1	< 0.1	< 0.1	< 0.3	4.2	< 0.4	13	11	15	0.1
CC84_0.15	0		< 0.1	< 0.1	< 0.1	< 0.3	2.7	< 0.4	25	12	32	< 0.1
CC84_0.3	0.032	6.3	< 0.1	< 0.1	< 0.1	< 0.3	4.1	< 0.4	14	10	21	< 0.1
CC76.DEL1_0.2			< 0.1	< 0.1	< 0.1	< 0.3	3.9	< 0.4	8.9	6.8	18	< 0.1
CC76.DEL1_0.3			< 0.1	< 0.1	< 0.1	< 0.3	5	< 0.4	15	12	13	< 0.1
CC76.DEL1_0.25			< 0.1	< 0.1	< 0.1	< 0.3	6.5	< 0.4	20	19	71	< 0.1

Regatta Park	Nickel	Zinc	Vic EPA IWRG 621	Total OP	Total PCBs	Benzo(a)pyrene	Total PAH*	TRH C10-C36 (Total	TRH C6-C9			
Sample No. with Depth	Heavy Metals	Heavy Metals	Organochlorine Pesticides	Organophosphorus Pesticides	Polychlorinated Biphenyls	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Asbestos	Asbestos	Asbestos
Sample No. with Depth	Ni	Zn	Vic EPA IWRG 621 OCP (Total)*	ToTal OPPs	Total PCBs	Benzo(a)pyrene	Total PAH*	**TRH C10-C36 (Total)**	**TRH C6-C9**	ACM (10L Sample) /% w/w	Asbestos NEPM for FA &AF %w/w	ACM Visually Observed
TP55_0.15	16	65	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
TP55_0.3	16	55	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC76_0.25	13	42	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	0.38	ND	Yes
CC76_0.5	12	39	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC77_0.15	6.8	32	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC77_0.3	12	37	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC78_0.15	12	35	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	320	< 20	ND	ND	NO
CC78_0.3	12	33	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC79_0.15	16	38	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	64	< 20	ND	ND	NO
CC79_0.3	10	30	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC80_0.15	7.5	35	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC80_0.3	15	47	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC81_0.15	18	58	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 50	< 20	ND	ND	NO
CC81_0.3	11	34	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC83_0.1	12	42	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC83_0.3	14	48	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC84_0.15	19	41	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC84_0.3	14	43	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC76.DEL1_0.2	7.7	41	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC76.DEL1_0.3	15	48	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO
CC76.DEL1_0.25	22	120	< 0.05	< 0.2	< 0.5	< 0.5	< 0.5	< 0	< 20	ND	ND	NO

Maximum concentraion	0	0	0	0	5.5	0	25	21	61	0.1	19	65	0	0	0	0	0	320	0
95% UCL																			
TRINITAS	Benzene	Ethylbenzene	Toluene	Xylenes - Total*	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Vic EPA IWRG 621 OCP (Total)*	ToTal OPPs	Total PCBs	Benzo(a)pyrene	Total PAH*	**TRH C10-C36 (Total)**	**TRH C6-C9**
HIL/HSL C	NL	NL	NL	230	3000	900	300	17000	600	80	1200	30000					300		
EIL/ESLs	50	70	85	105	100	NR	205	90	1260	NR	35	140				0.7			
Site Specific EILs (pH, CEC, OC)					100		410*	**230**	1100		270	770							
Bonded Asbestos HIL C																			
Friable Asbestos HIL C																			
NO Asbestos fragment on surface																			
TP No.> HIL/HSL C																			
TP No. > EIL/ESLs																			
TP No.. >Site Specific EIL/ESLs																			

Waste Classification for Off-site Disposal	Benzene	Ethylbenzene	Toluene	Xylenes - Total*	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Vic EPA IWRG 621 OCP (Total)*	Total OPPs	Total PCBs	Benzo(a)pyrene	Total PAH*	TRH C10-C36 (Total)	**TRH C6-C9**
General Soid Waste CT1 (mg/Kg)	10	600	288	1000	100	20	100		100	4	40		<50	<50	<50	0.8	200	10000	650
General Soid Waste TCLP1 (mg/L)	0.5	50	14.4	50		1				0.2			NR	NR	NR		NR	NR	NR
General Soid Waste SCC1 (mg/Kg)	18	2400	518	1800	500	100	1900		1500	50	1050		<50	<50	<50	10	200	10000	650
Restrict Solid Waste CT2 (mg/Kg)	40	1800	1152	4000	400	80	400		400	16	160		NR	NR	NR	3.2	800	40000	2600
General Soid Waste TCLP2 (mg/L)	2	120	57.6	200	20	4	20		20	0.8	8		NR	NR	NR	0.16	NR	NR	NR
General Soid Waste SCC2 (mg/Kg)	72	4320	2073	7200	2000	400	7600		6000	200	4200		<50	<50	<50	23	800	40000	2600

Waste Classification for VENM; ENM	Electrical Conductivity	pH	Benzene	Ethylbenzene	Toluene	Xylenes - Total*	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Benzo(a)pyrene	Total PAH*	TRH C10-C36 (Total)
Maximum average concentration for characterisation,(mg/kg 'dry weight' unless otherwise specified)	1.5 dS/m	5 to 9	NA	NA	NA	NA	20	0.5	75	100	50	0.5	30	150	0.5	20	250
Absolute maximum concentration, (mg/kg 'dry weight' unless otherwise specified)	3 dS/m	4.5 to 10	0.5	25	65	15	40	1	150	200	100	1	60	300	1	40	500

NEPM, Sch B1, Table 1A(1) Health investigation levels for soil contaminants, Recreational C

NEPM, Sch B7, Table 2 Health investigation levels for soil contaminants using Recreational C

NEPM, Sch B1, Table 4: Soil properties to be measured for site-specific derivation of ACLs for CrIII, Cu, Ni and Zn. EIL=ABC+ACL; Table 1B(1), 1B(2), 1B(3), 1B(4). For Cu/Zn, testing CEC and pH; Ni and CrIII, additonal testing with CEC meansurements;

BTEX and F1, F2 from Sch B1, Table 1A(3) Soil HSLs for vapour intrusion (mg/kg)

Sch B1, Table 1B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil;

Sch B1, Table 1B(7) Management limits for TPH fractions F1-F4 in soil

Notes to Table

ND – Not detected / below Practical Quantitation Limit (PQL).

NA – Not Applicable

Landuse: Recreational C

Appendix D - Analytical Reports

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150

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.

Attention: **- RESULTS/SRAs**

Report **773740-S**
Project name REGATTA PARK
Received Date Feb 12, 2021

Client Sample ID			**01**	**02**	**03**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S21-Fe26167**	**S21-Fe26168**	**S21-Fe26169**
Date Sampled			**Feb 11, 2021**	**Feb 11, 2021**	**Feb 11, 2021**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	81	67	136
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			01	02	03
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S21-Fe26167	S21-Fe26168	S21-Fe26169
Date Sampled			Feb 11, 2021	Feb 11, 2021	Feb 11, 2021
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	79	86	77
p-Terphenyl-d14 (surr.)	1	%	96	103	98
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Toxaphene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	80	83	74
Tetrachloro-m-xylene (surr.)	1	%	81	86	85
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2

Client Sample ID			01	02	03
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			S21-Fe26167	S21-Fe26168	S21-Fe26169
Date Sampled			Feb 11, 2021	Feb 11, 2021	Feb 11, 2021
Test/Reference	LOR	Unit			
Organophosphorus Pesticides					
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	101	102	88
Heavy Metals					
Arsenic	2	mg/kg	3.9	5.0	6.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.9	15	20
Copper	5	mg/kg	6.8	12	19
Lead	5	mg/kg	18	13	71
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.7	15	22
Zinc	5	mg/kg	41	48	120
% Moisture	1	%	4.9	8.9	14

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Feb 16, 2021	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Metals M8	Sydney	Feb 16, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Feb 12, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150

Project Name: REGATTA PARK

Order No.:
Report #: 773740
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Feb 12, 2021 6:35 PM
Due: Feb 19, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Moisture Set	Eurofins Suite B10
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	01	Feb 11, 2021		Soil	S21-Fe26167	X	X	X
2	02	Feb 11, 2021		Soil	S21-Fe26168	X	X	X
3	03	Feb 11, 2021		Soil	S21-Fe26169	X	X	X
Test Counts						3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: 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.
LOR	Limit of Reporting.
SPIKE	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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - 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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

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 sample 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, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene 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 Aroclor 1260 in Matrix Spikes and LCS.
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 RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	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	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	106			70-130	Pass	
TRH C10-C14	%	74			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	108			70-130	Pass	
Toluene	%	116			70-130	Pass	
Ethylbenzene	%	116			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
o-Xylene	%	111			70-130	Pass	
Xylenes - Total*	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	98			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	73			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	104			80-120	Pass	
Cadmium	%	100			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chromium			%	98			80-120	Pass	
Copper			%	98			80-120	Pass	
Lead			%	98			80-120	Pass	
Mercury			%	98			80-120	Pass	
Nickel			%	98			80-120	Pass	
Zinc			%	96			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S21-Fe36149	NCP	%	117			70-130	Pass	
TRH C10-C14	S21-Fe27506	NCP	%	110			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Fe36149	NCP	%	105			70-130	Pass	
Toluene	S21-Fe36149	NCP	%	99			70-130	Pass	
Ethylbenzene	S21-Fe36149	NCP	%	111			70-130	Pass	
m&p-Xylenes	S21-Fe36149	NCP	%	107			70-130	Pass	
o-Xylene	S21-Fe36149	NCP	%	107			70-130	Pass	
Xylenes - Total*	S21-Fe36149	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S21-Fe36149	NCP	%	90			70-130	Pass	
TRH C6-C10	S21-Fe36149	NCP	%	113			70-130	Pass	
TRH >C10-C16	S21-Fe27506	NCP	%	111			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Fe31510	NCP	%	122			75-125	Pass	
Cadmium	S21-Fe26619	NCP	%	95			75-125	Pass	
Chromium	S21-Fe35226	NCP	%	99			75-125	Pass	
Copper	S21-Fe31510	NCP	%	118			75-125	Pass	
Lead	S21-Fe31510	NCP	%	125			75-125	Pass	
Mercury	S21-Fe26619	NCP	%	97			75-125	Pass	
Nickel	S21-Fe31510	NCP	%	122			75-125	Pass	
Zinc	S21-Fe31510	NCP	%	119			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S21-Fe26167	CP	mg/kg	< 20	200	180	30%	Fail	Q15
TRH C15-C28	S21-Fe26167	CP	mg/kg	< 50	750	190	30%	Fail	Q15
TRH C29-C36	S21-Fe26167	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S21-Fe26167	CP	mg/kg	< 50	380	190	30%	Fail	Q15
TRH >C16-C34	S21-Fe26167	CP	mg/kg	< 100	570	180	30%	Fail	Q15
TRH >C34-C40	S21-Fe26167	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Fe25065	NCP	%	12	12	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S21-Fe26168	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Fe26168	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Fe26168	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Fe26168	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-Fe26168	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	S21-Fe26168	CP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethyl parathion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfothion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	S21-Fe26168	CP	mg/kg	< 2	< 2	<1	30%	Pass
Naled	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Omethoate	S21-Fe26168	CP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tetrachlorvinphos	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	S21-Fe26168	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S21-Fe26168	CP	mg/kg	5.0	5.0	<1	30%	Pass
Cadmium	S21-Fe26168	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S21-Fe26168	CP	mg/kg	15	14	6.0	30%	Pass
Copper	S21-Fe26168	CP	mg/kg	12	11	5.0	30%	Pass
Lead	S21-Fe26168	CP	mg/kg	13	12	5.0	30%	Pass
Mercury	S21-Fe26168	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S21-Fe26168	CP	mg/kg	15	15	<1	30%	Pass
Zinc	S21-Fe26168	CP	mg/kg	48	44	9.0	30%	Pass

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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Elvis Dsouza	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)

[redacted]

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.

Trinitas Group Pty Ltd
Level 3, 24 Hunter Street
Parramatta
NSW 2150

Attention:	- RESULTS/SRAs
Report	773740-AID
Project Name	REGATTA PARK
Received Date	Feb 12, 2021
Date Reported	Feb 22, 2021

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 REGATTA PARK
Project ID
Date Sampled Feb 11, 2021
Report 773740-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
01	21-Fe26167	Feb 11, 2021	Approximate Sample 639g Sample consisted of: Brown coarse-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.
02	21-Fe26168	Feb 11, 2021	Approximate Sample 528g 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.
03	21-Fe26169	Feb 11, 2021	Approximate Sample 575g 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	Feb 12, 2021	Indefinite

eurofins | Environment Testing

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Trinitas Group Pty Ltd
Address: Level 3, 24 Hunter Street
Parramatta
NSW 2150

Project Name: REGATTA PARK

Order No.:
Report #: 773740
Phone: 02 8810 4445
Fax: 02 8016 0875

Received: Feb 12, 2021 6:35 PM
Due: Feb 19, 2021
Priority: 5 Day
Contact Name: - RESULTS/SRAs

Eurofins Analytical Services Manager : Elvis Dsouza

Sample Detail						Asbestos - WA guidelines	Moisture Set	Eurofins Suite B10
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	01	Feb 11, 2021		Soil	S21-Fe26167	X	X	X
2	02	Feb 11, 2021		Soil	S21-Fe26168	X	X	X
3	03	Feb 11, 2021		Soil	S21-Fe26169	X	X	X
Test Counts						3	3	3

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:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

[redacted]

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.

Appendix E - Test Pit Logs

ENVIRONMENTAL TEST PIT TP55

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.3

COORDINATES 150.67750,-33.74813
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			TOPSOIL - Grass Cover	
			FILL - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	Tree rootlets, plastic rubber and glass observed
	TP55_0.15 CHEM TP55_0.15 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	Tree rootlets observed
	TP55_0.3 CHEM TP55_0.3 ASB			
0.5			Termination Depth at: 0.3m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC76

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.5

COORDINATES 150.67743,-33.7482
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			TOPSOIL - Grass Cover	
	CC76_0.25 CHEM CC76_0.25 ASB		FILL - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	Brick and ACM fragments observed
	CC76_0.5 CHEM CC76_0.5 ASB		NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	Tree rootlets observed
0.5			Termination Depth at: 0.5m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC77

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.4

COORDINATES 150.67727,-33.74853
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			ASPHALT SURFACE	
			ROAD BASE -Gravelly SAND (SP) : medium grained, well graded, dark brown , dry to moist	Road base observed
	CC77_0.15 CHEM CC77_0.15 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	No foreign materials observed
	CC77_0.3 CHEM CC77_0.3 ASB			
0.5			Termination Depth at: 0.4m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC78

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.4

COORDINATES 150.67712,-33.74863
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			ASPHALT SURFACE	
			ROAD BASE -Gravelly SAND (SP) : medium grained, well graded, dark brown , dry to moist	Road base observed
	CC78_0.15 CHEM CC78_0.15 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	No foreign materials observed
	CC78_0.3 CHEM CC78_0.3 ASB			
0.5			Termination Depth at: 0.4m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC79

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.4

COORDINATES 150.67710,-33.74880
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			ASPHALT SURFACE	
			ROAD BASE -Gravelly SAND (SP) : medium grained, well graded, dark brown , dry to moist	Road base observed
	CC79_0.15 CHEM CC79_0.15 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	No foreign materials observed
	CC79_0.3 CHEM CC79_0.3 ASB			
0.5			Termination Depth at: 0.4m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC83

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.4

COORDINATES 150.67715,-33.74857
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			ASPHALT SURFACE	
			ROAD BASE -Gravelly SAND (SP) : medium grained, well graded, dark brown , dry to moist	Road base observed
	CC83_0.1 CHEM CC83_0.1 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	No foreign materials observed
	CC83_0.3 CHEM CC83_0.3 ASB			
0.5			Termination Depth at: 0.4m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

ENVIRONMENTAL TEST PIT CC84

PROJECT NAME Regatta Park
CLIENT Penrith City Council
ADDRESS River Road, Emu Plains NSW 2750

SAMPLING DATE 05/11/20 - 26/11/20
DRILLING COMPANY TerraCivil
DRILLER Brent Money
DRILLING METHOD 7t Excavator
TOTAL DEPTH 0.4

COORDINATES 150.67723,-33.74876
COORD SYS GDA 94, MGA Zone 56
LOGGED BY Asfar Riaz
CHECKED BY Jeffrey Yu

COMMENTS

Depth (m)	Samples	Graphic Log	Material Description	Additional Observations
			ASPHALT SURFACE	
			ROAD BASE -Gravelly SAND (SP) : medium grained, well graded, dark brown , dry to moist	Road base observed
	CC84_0.15 CHEM CC84_0.15 ASB			
			NAT - Silty SAND (SP) : medium grained, poorly graded, dark brown , dry to moist	No foreign materials observed
	CC84_0.3 CHEM CC84_0.3 ASB			
0.5			Termination Depth at: 0.4m	

Disclaimer This log is intended for environmental not geotechnical purposes.

produced by ESlog.ESdat.net on 07 Jan 2021

How to Contact Us

Mail	Trinitas Group
	PO Box 1376 Parramatta NSW 2124
Email	admin@trinitasgroup.com.au
Address	Level 3 Hunter Street, Parramatta NSW 2150
Website	www.trinitasgroup.com.au
Telephone	1800 4 TRINITAS
Facsimile	02 8016 0875

Trinitas Group Pty Ltd
ABN 12 161 759 708