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DETAILED SITE INVESTIGATION (DSI)

21-23 James Street, Lidcombe NSW

prepared for

James St Development Unit Pty Ltd

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ABBREVIATIONS

AIP	*Australian Institute of Petroleum Ltd*	**QA/QC**	*Quality Assurance, Quality Control*
ANZECC	*Australian and New Zealand Environment and Conservation Council*	**RAC**	*Remediation Acceptance Criteria*
AST	*Aboveground Storage Tank*	**RAP**	*Remediation Action Plan*
BGL	*Below Ground Level*	**RPD**	*Relative Percentage Difference*
BTEX	*Benzene, Toluene, Ethyl benzene and Xylene*	**SAC**	*Site Assessment Criteria*
COC	*Chain of Custody*	**SVC**	*Site Validation Criteria*
DA	*Development Approval*	**TCLP**	*Toxicity Characteristics Leaching Procedure*
DP	*Deposited Plan*	**TPH**	*Total Petroleum Hydrocarbons*
DQOs	*Data Quality Objectives*	**UCL**	*Upper Confidence Limit*
EPA	*Environment Protection Authority*	**UST**	*Underground Storage Tank*
ESA	*Environmental Site Assessment*	**VHC**	*Volatile Halogenated Compounds*
HIL	*Health-Based Soil Investigation Level*	**VOC**	*Volatile Organic Compounds*
LGA	*Local Government Area*		
NEHF	*National Environmental Health Forum*		
NEPC	*National Environmental Protection Council*		
NHMRC	*National Health and Medical Research Council*		
OCP	*Organochlorine Pesticides*		
OPP	*Organophosphate Pesticides*		
PAH	*Polycyclic Aromatic Hydrocarbon*		
PCB	*Polychlorinated Biphenyl*		
PID	*Photo Ionisation Detector*		
PQL	*Practical Quantitation Limit*		

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EXECUTIVE SUMMARY

Benviron Group was appointed by James St Development Unit Pty Ltd to undertake a Detailed Site Investigation (DSI) for the property situated at 21-23 James Street, Lidcombe NSW ("the site").

Refer to **Figure 1** - Site Location and **Figure 2** - Site Plan

The site is currently occupied by a two commercial buildings with a laneway access area at the side of the building with rear parking. The site is proposed to be redeveloped into a multistorey residential building with a triple basement. The Site Assessment forms part of SEPP 55 Guideline (Remediation of Land) with a proposed redevelopment to determine the end land-use suitability of the property.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) Table 1A - Residential B.

The project objectives of this Supplementary Contamination Assessment are to satisfy the stated OEH Detailed Site Investigation requirements in accordance with *NSW EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, 2000.* Specifically this investigation will consider the potential for suspected historical activities to have caused contamination at the Site and determine land use suitability for the proposed land use.

A number of potential areas of environmental concerns were identified at the site, particularly:

- Historical uses;
- Carpark areas / driveways where leaks and spills from cars may have occurred;
- Vicinity of degrading building features

Laboratory Results for the soil samples were below detection limits or the relevant guideline criteria with the exception of lead in sample BH5 0.3. An assessment of the 95% UCL of the data was undertaken and indicated that the result was below the relevant guideline criteria.

Laboratory Results for the groundwater samples could not be collected as no groundwater was detected during the investigation within the site. It is possible that groundwater may exist at a deeper depth than drilled, however, it is unlikely that this has been impacted from the site as all soil analytes were below there respective guideline criteria. It is also noted that the bulk of the soils will be removed for the proposed development.

Off-site impacts of contaminants in soil are generally governed by the transport media available and likely receptor(s). The most common transport medium is water, whilst receptors include uncontaminated soils, groundwater, surface water bodies, humans, flora & fauna.

Surface water run-off from within the site would generally be deposited in the stormwater drainage pits and the potential for migration of contamination is low and any infiltration of contaminants is also expected to be low-moderate based on the underlying geology. The potential for significant impact of site soils, if contaminated, on the water bodies collecting surface water run-off from the region is considered low.

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil contamination at the site are low in the context of the proposed use of the site. The site therefore ***is suitable*** for the proposed development, subject to the following recommendations:

- Any soils proposed for removal from the site should initially be classified in accordance with the "*Waste Classification Guidelines, Part 1: Classifying Waste"* NSW DECC (2014).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence

Thank you for the opportunity of undertaking this work. We would be pleased to provide further information on any aspects of this report.

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1.0 INTRODUCTION

Benviron Group was appointed by James St Development Unit Pty Ltd to undertake a Detailed Site Investigation (DSI) for the property situated at 21-23 James Street, Lidcombe NSW ("the site").

Refer to **Figure 1** - Site Location and **Figure 2** - Site Plan

The site is currently occupied by a two commercial buildings with a laneway access area at the side of the building with rear parking. The site is proposed to be redeveloped into a multistorey residential building with a triple basement. The Site Assessment forms part of SEPP 55 Guideline (Remediation of Land) with a proposed redevelopment to determine the end land-use suitability of the property.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) Table 1A - Residential B.

2.0 OBJECTIVE

The NSW Office of Environment and Heritage (OEH) indicate that a Detailed Site Environmental Investigation should provide comprehensive information on:

- Any issues raised in preliminary investigations;
- The type, extent and level of contamination;
- Contaminant dispersal in the air, surface water, soil and dust;
- The potential effects of contaminants on public health and the environment;
- Where applicable, off-site impacts on soil, sediment and biota; and
- The adequacy and completeness of all information available to be used in making decisions on remediation.

The project objectives of this Detailed Site Investigation (DSI) are to satisfy the stated OEH Detailed Site Investigation requirements in accordance with *NSW EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, 2000.* Specifically this investigation will consider the potential for suspected historical activities to have caused contamination at the Site and determine land use suitability for the proposed land use.

The proposed investigation program and the Detailed Site Investigation are designed to assess the presence of any unacceptable on site or off site risk to human health or the environment. The report will draw conclusions regarding the land use suitability of the Site for the current commercial land use or provide recommendations to enable such conclusions and determine the need for a further assessment.

3.0 SCOPE OF WORKS

The scope of works for this Detailed Site Investigation (DSI) included:

- Collecting site information, review of historical information and past site practices, (site surveys, site records on waste management practices, NSW Land Titles Office records of ownership, aerial photographs obtained from the NSW Department of Lands, WorkCover NSW records and site interviews);
- A site inspection to identify areas of environmental concern, on-site waste disposal practices and location of sewers, drains, holding tanks, Underground Storage Tanks, Aboveground Storage Tanks and pits, spills and ground discolouration etc.;
- A targeted soil boring/sampling investigative study – formulating and conducting a sampling plan and borehole investigation; the soil samples are taken and submitted for analysis on particular contaminants;
- Laboratory analysis and results from sample analysis – findings and comparison to regulatory guidelines;
- Quality Assurance/Quality Control (QA/QC) – all QA/QC procedures were undertaken in accordance with the Benviron Group Quality Assurance/Quality Control manual;
- Interpretation of results and findings; and
- Recommendations and final conclusions drawn from interpretation of the results.

4.0 SITE IDENTIFICATION AND SITE HISTORY REVIEW

4.1 Site identification

The site is identified as follows:

Table 1: Site Identification Review

Site Identifier	Site Details	
Site Location	21-23 James Street, Lidcombe NSW	
Lot/DP	Lot 13-16 DP397	
Parish	Liberty Plains	
County	Cumberland	
Nearest Survey Marker	PM33898	
Coordinates (SW Corner)	Lat: 33°51'59.24"S, Long: 151° 2'47.85"E	
Site Area	1,460m^2	
Local Government Area (LGA)	Auburn Council	
Zoning	B4 Mixed Use	
Surrounding Land Uses	*North*	Low density residential
	South	James Street followed by Commercial.
	East	Raphael Street followed by Commercial
	West	High Density Residential.

Refer to **Figure 1 and Figure 2** – Site Locality Map and Site Plan

4.1.1 Underground Search

Dial Before You Dig' plans were requested and reviewed for the Site. Plans were provided by Ausgrid, Jemena Gas West, Sydney Water, Telstra NSW and council information for NSW. The plans provided for Ausgrid, Sydney Water & Telstra did not indicate the presence of any major underground services or utility easements at the Site.

4.1.2 Review of Historical Maps

A review of the Rookwood Map originally produced by Higinbotham & Robinson between 1885-1890 was undertaken. The map revealed that the site had no distinguishable features nor was it occupied by any major industry at the time of development. To the nearby east the site was occupied by Rookwood Cemetary.

4.1.3 WorkCover Search

A WorkCover Search was undertaken for the site however no records were found pertaining to the site.

4.1.4 Council Records

Based on a review of the Section 149 certificate for the site no constraints in regards to contamination was noted.

4.1.5 Review of aerial photographs

A number of aerial photographs obtained from the NSW Department of Lands were reviewed as part of this DSI. Copies of the aerial photographs are kept in the offices of Benviron Group and are available for examination upon request. The results of this review are presented in the following table:

Table 2 Review of Aerial Photographs

Year	Site		Surrounding areas
1943	Vacant	The site is on lots 15-16 are vacant while the lot 13-14 re occupied by a small residential building with a shed at the rear of the site.	The surrounding area is mostly residential in nature.
1961	Vacant	Two warehouses similar to the current construction were identified within the site. The former shed at the rear of lot 13-14 has been removed.	The residential area is expanding to the west and the south.
1980	Residential	The warehouse on lot 13-14 has been expanded slightly. A laneway at the rear of both properties now exists.	The surrounding area is becoming more densely populated and commercial areas continue to nearby roadways.
2003	Residential	No major changes.	No major changes
Current	As per inspection	The site is as inspected (section 5.2)	As per inspection

In summary, the aerial photographs reveal that the site on lot 15-16 was vacant up until the early 1960s when the site was redeveloped and was occupied by a commercial warehouse. Lot 13-14 was occupied by a small residential property up until 1960s when the site was also redeveloped into a warehouse structure. The site layout then remained similar with a laneway construction in the 1980s and was similar up until the current period.

4.1.6 Title search

A review of historical documents held at the NSW Department of Lands offices was undertaken to characterise the previous land use and occupiers of the site.

Refer to **Appendix A** – Land Titles.

Table 3 Historical land title data

Year	Lots 13-14 DP397	Company/Personal Occupation
2015-Current	James Group Properties Pty Ltd	-
1958	Gould Marshall	Telecom Technician
1950	Bert and Elizabeth Limo	Storeman and Packer
1948	Dudley Mckay	Contractor
1936	Richard Walker	Railway Employee
1926	The Australian Bank of Commerce	
1918	Henry and Edith Toogood	Carter
1915	Alexander Larcombe	
1915	Phoebe Royalsky and Ernest Mitchell	

Year	Lots 15-16 DP397	Company/Personal Occupation
2015-Current	James Group Properties Pty Ltd	-
1981	G. Paice Pty Ltd	-
1975	Eric Littlewood and George Gengos	Chartered Accountant and Solicitor
1974	*Lease to George Gittany*	*Cabinet Maker*
1952	Gould Marshall Pty Ltd	-
1947	Benjamin Gould	Furniture Manufacturer

Year	Lots 15-16 DP397	Company/Personal Occupation
1925	Myrtle and Charlie Matthews	Hotel Manager
1912	Herbert and Katherine Webb	Steward
1911	John Heckley	Photographer
1911	Robert Clark	Monumental Mason
1910	The Commercial Banking Company of Sydney	
1880	Robert Larcombe	Monumental Mason

In summary, the site has been owned for private use up until 1950 when the site was owned by Gould Marshall (Furniture Manufacturer) up until the 1970s when the site was purchased by various private and commercial owners up until the current period.

4.1.7 NSW OEH records

The NSW OEH publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act.

A search of the database revealed that the subject site is not listed, and has no listed properties within the Lidcombe area.

It should be noted that the OEH record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

Refer to **Appendix B** – NSW EPA Notice Summary.

4.1.8 Anecdotal evidence

No anecdotal evidence was identified for the site.

4.1.9 Summary of site history

In summary:

- A review of the land titles indicates the site has been owned for private use up until 1950 when the site was owned by Gould Marshall (Furniture Manufacturer) up until the 1970s when the site was purchased by various private and commercial owners up until the current period.
- The aerial photographs reveal that the site on lot 15-16 was vacant up until the early 1960s when the site was redeveloped and was occupied by a commercial warehouse. Lot 13-14 was occupied by a small residential property up until 1960s when the site was also redeveloped into a warehouse structure. The site layout then remained similar with a laneway construction in the 1980s and was similar up until the current period.

4.1.10 Integrity Assessment

The information found in the historical sources has been found to be in general concurrence. It is therefore considered that accuracy of this data is acceptable for this investigation.

4.1.11 Previous Reports

No previous reports were identified for the site.

4.1.12 Proposed Development

The site is proposed to be redeveloped into a multistorey residential building with a triple basement.

Refer to **Appendix C** - Proposed Site Plans

5.0 REVIEW OF ENVIRONMENTAL INFORMATION

Table 4: Site Condition and Surrounding Environment Review

Site Information	Descriptions
Sensitive Receivers within 500m	Haslams Creek was identified within 800m of the site, however the proposed development is not expected to impact on this receiver.
Topography (1:25,000)	The site has a slight slope approximately 5° to the north west.
Geological Profile	The Geological Map of Sydney (Geological Series Sheet 9130, Scale 1:100,000, 1983), published by the Department of Mineral Resources indicates the residual soils within the site to be underlain by Triassic Age Shale of the Wianamatta Group, comprising black to dark grey shale and laminite.
Presence of Acid Sulphate Soils **(Review of NSW Department of Land & Water Conservation (DLWC) *Acid Sulphate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000).**	A review of the aforementioned map indicated that there is a "No Known Occurrence " of acid sulphate soil materials within the soil profile During site investigations no indicators of acid sulphate soils were identified.

Site Information	Descriptions				
Localised Hydrogeology	**Number**	**Distance**	**Depth**	**SWL**	**Use**
	GW102646	2.5km NE	25	6.60	Monitoring Bore
	GW102654	1.5m NW	10	9.5	Monitoring Bore
	GW102656	1.5m NW	25	1.0	Monitoring Bore
Nearest Surface Water Body	Haslams Creek – 800m NW				
Nearest Active Service Station	Approx. 1km from the site				

6.0 REVIEW OF CONSTRUCTION AND SERVICE INFORMATION

6.1 Proposed Development

Table 5: Proposed Development Review

Item	Description
Proposed Development	Construction of a multistorey residential unit complex
Proposed Basements (if any)	Three
Proposed Use	High Density Residential Building
Density of Development	High
Types of End Users	Residents, Workers
DA Approval Number (if applicable)	N/A

Refer to **Appendix D** - *Proposed Development Plans*

7.0 SITE VISIT

7.1 General

The site was visited on 11th April 2016 by Benviron Group Environmental Scientists to inspect the site for any potential sources of contamination.

The following items were considered as part of the site visit:

- Description of the building structures;
- Site surroundings;
- Present and past industrial processes and operations at the site;
- Surface water, groundwater, stormwater and sewer;
- Present and past storage of chemicals and wastes associated with site use and their on-site location;
- Waste management practices and management of hazardous materials;
- Presence of Underground Storage Tanks or Above Ground Storage Tanks;
- Odour; and
- Occupational health and safety.

7.2 Site observations

At the time of the site visit the following observations were made as per the following table:

Table 6: Site Inspection Review

Factors Considered	Description
Buildings & Structures on Site	The site was approximately rectangular in shape and was occupied by a two commercial brick property with a metal roof. A driveway area exists at the rear of the site
Percentage Concrete Covered	90%
Concrete Condition	Very good
Chemical Storage	No chemical storage was noted within the property.
Above and Underground Storage Tanks	USTs and ASTs were not identified within the site inspection. However, based on the site history they may be present within the site but could have been covered up in past history.
Trade Waste Pits	No trade waste agreements or pits were identified for the building.
Nearby Electrical Transformers	No electrical transformers were identified within the site
Asbestos	Possible asbestos sheeting was identified within the building structures on site. The sheeting was in good condition.
Site Vegetation	Vegetation was apparent within the site and appeared healthy and free of stress.
Soil Staining and Odours	No odours were identified within the property. No significant soil staining was noted within the soil profile.

Stormwater and Sewer	Stormwater and sewage were connected to the local utilities.

Refer to **Figure 2** - Site Plans

8.0 CONCEPTUAL SITE MODEL (CSM)

Based on the above information, site history and site walkover, the areas of potential concern and associated contaminants for the site CSM were identified. These are summarised in the following table.

Areas and Contaminants of Concern

Known and potential contamination source	Associated Contaminants
Historical Site Uses-Manufacturing	Heavy Metals, TRH, BTEX, PAH, OCP, PCB
Imported Fill	Heavy Metals, TRH, BTEX, PAH, OCP, PCB
Carparking Areas	TRH, BTEX, PAH
Building degradation/ Demolition	Heavy Metals

Potentially Contaminated Media

Potentially contaminated media present at the site may include:

Known and potential contamination source	Associated Contaminants
Fill Material	There is the potential for contamination to be present in the upper clay/sand fill material.
Groundwater	There is the potential for the leaching of contaminants into groundwater onsite and also migration of the contaminants.
Ground Gas	Given the neighbouring site history and the findings of previous investigations, ground gas on site is not considered to be a potential contaminated medium.

Potential for Migration

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

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

The potential contaminants identified as part of the site history review, site inspection and previous report are present in solid (e.g. impacted fill, asbestos), liquid (e.g. dissolved in water) and gaseous/vapour forms.

Aerial photography has indicated that there are sealed ground surfaces and therefore, while there is the potential for migration of contaminants via wind-blown dust this transport mechanism is unlikely.

Due to unsealed surfaces in some investigation areas, there is the potential for migration of contamination via rainfall in overland surface flow and potential groundwater discharge to impact surface water bodies.

Rainfall infiltration at the site is expected to occur in unsealed areas. There is therefore the potential that soil contamination could result in impacts to shallow groundwater.

The potential presence of vapour in the subsurface soils area indicates a potential for migration of contaminants in gaseous form.

Potential Exposure Pathways

Potential exposure pathways include:

- Dermal;
- Ingestion; and
- Inhalation.

Due to the presence of exposed potentially impacted soil/fill on ground surfaces, dermal exposure is considered a potential exposure pathway.

The potential for ingestion of soil is considered as a potential exposure pathway. Although groundwater is not used at the site, there is the potential, for ingestion of contaminants via groundwater removed from monitoring wells.

There is the potential for vapour to be present in the underlying profile within the site. As such, these gases potentially pose a risk to human health via the inhalation pathway.

The proposed development concerns the construction and development of a multistorey unit development with a triple basement approximately. Because of this dermal and inhalation exposure pathways by potentially contaminated groundwater and vapour may occur.

Receptors

Potential receptors of environmental impact present within the site which will be required to be addressed with respect to the suitability of the site for the proposed use include:

- Excavation/construction/maintenance workers conducting activities at the site, who may potentially be exposed to COPCs through direct contact with impacted soils, Vapour Intrusion and/or groundwater present within excavations and/or inhalation of dusts/fibres associated with impacted soils;
- Future occupants/users of the site may potentially be exposed to COPCs through direct contact with impacted soils and/or ingestion of impacted soils and/or inhalation of dusts/fibres associated with impacted soils and/or exposure to vapour; and/or
- Offsite sensitive receptors of groundwater; and/or
- Flora species to be established on vegetated areas of the site.

Preferential Pathways

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

Man-made preferential pathways are present throughout the site, generally associated with fill materials and services present beneath existing ground surface. Fill materials and service lines are anticipated to have a higher permeability than the underlying natural soil and/or bedrock.

9.0 REVIEW OF DATA QUALITY OBJECTIVES

The DQOs were also prepared using Appendix IV of the Site Auditor Guidelines. These require 7 steps. The steps being

a. State the problem
b. Identify the decisions
c. Identify inputs to decision
d. Define the study boundaries
e. Develop a decision rule
f. Specify limits on decision errors
g. Optimise the design for obtaining data

9.1 State the Problem

The site requires to be confirmed suitable for the proposed development. The site is proposed to be redeveloped and has had some areas of potential concern, those being possible areas of imported fill of unknown origin, historical commercial uses, possible spraying of pesticides, degradation of the building materials and leakages from vehicles on site.

Technically defensible evidence needs to be provided so that the identified Site does not present an unacceptable risk to human health or the environment and is suitable for the intended land use.

9.2 Identify the Decisions

The decisions to be made on the contamination and the new environmental data required includes considering relevant site contamination criteria for each medium (fill, soil and sediment). A proposed use of the 95% UCL on the mean concentrations for all soil chemicals of potential concern must be less than the site criteria identified for the relevant land use suitability.

The decisions made in completing this assessment are as follows:

- Does the site or is the site likely to present a risk of harm to humans or the environment
- Is the site currently suitable for the proposed land use being residential with minimal access
- Is there a potential for soil and groundwater contamination
- Is there a potential for offsite migration issues
- Does the sampling results meet the site criteria proposed
- If not, does the site require remediation works

9.3 Identify Inputs to Decision

This step requires the identification of the environmental variables/characteristics that need measuring, identification of which media (fill, soil etc.) need to be collected, identification of the site criteria for each medium of concern and appropriate analytical testing. Inputs include:

- Existing site information

- Site history
- Regional geology, topography and hydrogeology
- Potential contaminants
- Proposed Land Use
- Site assessment criteria
- Results as measured against criteria

9.4 Define the Study Boundaries

Specific spatial and temporal aspects must be provided to identify the boundaries of the investigation and to identify any restrictions that may hinder the assessment process. The site is located at 21-23 James Street, Lidcombe NSW and is currently registered as Lot 13-16 DP397. The site is approximately 1460m^2 in area.

Refer to **Figure 1** - Site Locality and **Figure 2** – Site Layout Plan.

9.5 Develop a Decision Rule

The information obtained through this assessment will be used to characterise the soils and the groundwater on the site in terms of contamination issues and risks to human health and the environment. The decision rule in characterising the site will be as follows:

- Laboratory test results will be measured against the criteria provided within this report
- The site will be deemed suitable for the proposed use if the following criteria are fulfilled:

- Soil and groundwater concentrations are within background levels
- QA/QC shows data can be relied upon
- Results generally meet regulatory criteria
- Results are from NATA accredited laboratories
- Detection limits are below assessment criteria
- Results can be shown to be of minimal concern

9.6 Specify Limits on Decision Errors

The limits on decision errors for this assessment are as follows:

- The assessment criteria adopted from the guidelines within this report have risk probabilities already incorporated.
- The acceptable limits for inter/intra laboratory duplicate sample comparisons are laid out within our protocols.
- The acceptable limits for laboratory QA/QC parameters are based upon the laboratory reported acceptable limits and those stated within the NEPM 1999 Guidelines (2013 Amendment)

9.7 Optimise the Design for Obtaining Data

A resource-effective sampling and analysis design was undertaken for data collection that satisfies the DQO's. The sampling and analytical plan is designed to avoid Type 1 and Type 2 errors and includes defining minimum sample numbers required to detect contamination as determined with procedures provided in the NSW EPA 1995 Sampling Design Guidelines and AS 4482.1 - 2005 and appropriate quality control procedures.

Furthermore, only laboratories accredited by NATA for the analysis undertaken were used. The laboratory data was assessed from quality data calculated during this assessment. Field QA/QC protocols adopted and incorporate traceable documentation of procedures used in the sampling and analytical program and in data verification procedures.

10.0 SAMPLING PLAN AND FIELD SAMPLING QA/QC

During the supplementary contamination assessment the integrity of data collected is considered vital. With the assessment of the site, a number of measures were taken to ensure the quality of the data. These are as follows:

10.1 Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

10.2 Decontamination

All equipment used in the sampling program which includes a hand auger, spades and mixing bowl was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90;
- Rinsing in clean demineralised water then wiping with clean lint free cloths;

Water sampling equipment consisted of single use disposable bailer and Low Flow Peristaltic pump with replaceable Teflon tubing.

Benviron Group also adopted a sampling gradient of lowest to highest potential contamination to minimise the impact of cross contamination. This gradient was determined from the historical review and the on-site inspection that was carried out prior to sampling.

Although Benviron Group maintains consistent sampling procedures, a rinsate sample is obtained to ensure false positive samples are not generated and that decontamination procedures are effective in preventing cross contamination. The Rinsate water is collected after being in contact generally with the trowel used for sampling. Analytical results that target the contaminants of concern are compared to a blank sample, which is taken directly from the rinsate water container supplied by the laboratory.

A rinsate sample was not collected as the samples were taken from each borehole using a push tube sampler which were replaced at each sample location and therefore the chance for cross-contamination was minimal.

10.3 Sample Tracking, Identification and Holding Times

All samples were forwarded to Eurofins MGT and Envirolab under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

10.4 Sample Transport

All samples were packed into an esky with ice from the time of collection. A trip blank and trip spike are collected where appropriate. These were transported under chain of

custody from the site to Eurofins MGT Pty Ltd a NATA registered laboratory located in Lane Cove. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes.

Samples were kept below 4°C at all times, soil samples submitted for asbestos analysis are not required to be kept below 4°C.

10.5 Trip Spike

Trip Spike samples were obtained from the laboratory prior to conducting field sampling where volatile substances are suspected. Benviron Group QA/QC procedures for the collection of environmental samples involves the collection of trip blanks, trip spikes and duplicate samples both intra and inter laboratory.

Trip Spike samples were not collected as part of this investigation. Results indicate that no volatile hydrocarbons were present within the samples and therefore losses most likely would not have occurred.

10.6 Trip Blank

A trip blank accompanied the sampling for the sampling process and is not separated from the sample collection and transportation process. The purpose of the trip blank is to identify whether cross-contamination is occurring during the sample collection and transport process.

Trip Blank samples were not collected as part of this investigation. Results indicate that no volatile hydrocarbons were present within the samples and therefore cross contamination most likely would not have occurred.

10.7 Field Duplicate Samples

Field duplicate samples for soil were prepared in the field through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication.
- The sample is placed in a decontaminated stainless bowl and mixed as thoroughly as practicable before being divided into equal parts.
- Two Portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample.
- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Intra-Laboratory duplicate samples were not collected as part of this assessment due to damage to the samples during transport.

Intra Laboratory Duplicate

One intra-laboratory duplicate sample (1 soil) was collected and analysed in order to assess the variation in analyte concentration between samples collected from the same sampling point. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment.

The duplicate sample frequencies computed are presented in the following table.

Table 7: Intra Laboratory Duplicate Frequencies

Analyte – Discrete Soil	Samples Analysed	Duplicate Samples	Frequency
Heavy Metals	13	1	7.7%
TPH/BTEX	13	1	7.7%
PAH	13	1	7.7%
OCP/PCB	13	1	7.7%

The duplicate frequency for the analytical suite adopted complies with the NEPM, which recommends a duplicate frequency of at least 5%.

It is considered that the number of duplicate samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables.

Inter Laboratory Duplicate

One inter-laboratory duplicate sample (1 soil) was collected and analysed in order to assess the variation in analyte concentration between laboratories in samples collected from the same sampling point. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment.

The duplicate sample frequencies computed are presented in the following table.

Table 8: Inter Laboratory Duplicate Frequencies

Analyte – Discrete Soil	Samples Analysed	Duplicate Samples	Frequency
Heavy Metals	13	1	7.7%
TPH/BTEX	13	1	7.7%
PAH	13	1	7.7%
OCP/PCB	13	1	7.7%

The duplicate frequency for the analytical suite adopted complies with the NEPM, which recommends a duplicate frequency of at least 5%.

It is considered that the number of split samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables.

The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- less than 30% for inorganics and 50% for organics
- greater than five (5) times the laboratory limit of recording (LOR)
- greater than 5% of the relevant health investigation level (HIL) concentration.

The tables, below, give details of intra laboratory and inter laboratory duplicates.

Table 9: Intralab Soil Sample D1 RPDs

ANALYTE	BH3 0.5 mg/kg	INTERLAB SS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	10	10	0
Cadmium	< 0.4	< 0.4	-
Chromium	15	13	14
Copper	17	54	**104**
Lead	57	38	40
Mercury	0.06	< 0.05	-
Nickel	5.6	6.6	16
Zinc	35	31	12
TPH			
C6-C9	<20	<20	-
C10-C14	<20	<20	-
C15-C28	<50	<50	-
C29-C36	<50	<50	-
BTEX			
Benzene	<0.1	<0.1	-
Toulene	<0.1	<0.1	-
Ethylbenzene	<0.1	<0.1	-
Xylenes - Total	<0.3	<0.3	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.05	-
Total PAH	<1	<1	-
ORGANOCHLORINE PESTICIDES (OCP)			
Total OCP	<1	<1	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<1	-

Table 10: Interlab Soil Sample SS1 RPDs

ANALYTE	BH3 0.5 mg/kg	INTERLAB SS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	10	<4	-
Cadmium	< 0.4	<0.4	-
Chromium	15	9	50
Copper	17	15	13
Lead	57	22	89
Mercury	0.06	<0.1	-
Nickel	5.6	<1	-
Zinc	35	3	-
TPH			
C6-C9	<20	<20	-
C10-C14	<20	<20	-
C15-C28	<50	<50	-
C29-C36	<50	<50	-
BTEX			
Benzene	<0.1	<0.1	-
Toulene	<0.1	<0.1	-
Ethylbenzene	<0.1	<0.1	-
Xylenes - Total	<0.3	<0.3	-
POLYCYCLIC HYDROCARBONS (PAH)			
Benzo(a)pyrene	<0.05	<0.05	-
Total PAH	<1	<1	-
ORGANOCHLORINE PESTICIDES (OCP)			
Total OCP	<1	<1	-
POLYCHLORINATED BIPHENYLS (PCB)			
Total PCB	<1	<1	-

The comparisons between the inter-laboratory duplicates and corresponding original samples for soil indicated generally acceptable RPD overall, with the exception of concentrations of Chromium, Lead and Copper which exceed the DQOs for this project, however this exceedance is not considered significant because the concentrations are low and most likely due to the heterogeneous soils which were sampled.

Field duplicates provide an indication of the whole investigation process, including the sampling process, sample preparation and analysis. The accuracy of the data is considered to be adequate due to the effect on confidence intervals with low concentrations in the samples and their duplicates.

11.0 LABORATORY QA/QC

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by Benviron Group are based upon techniques published by the US EPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM, 2013.

Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Refer to **Appendix C**- *NATA Accredited Analytical Results*

11.1 Blanks

Blanks were used for the identification of false positive data. Laboratory blank samples were analysed.

No cross contamination of samples is said to have occurred as a result of laboratory techniques provided all blanks show concentrations below the levels of detection. No results on blank samples were above the level of reporting for any determination during the project.

11.2 Spikes and Control Samples

Control sample spikes were utilised for determination of matrix recovery analysis. This involves analysis of spiked control samples and their duplicates, spiked with a known concentration of relative analyte.

Accuracy was assessed by calculation of the percent recovery (%R). The duplicate sample spikes were used to assess the precision of the methods used. The recoveries for all matrix spike analysis were within the acceptance criteria of 60-140%.

11.3 Duplicates

Laboratory Duplicates are tested to ensure the results meet the requirements of QA/QC. The samples from the Site showed a percent recovery for all analytes not exceeding the respective laboratory criteria.

11.4 Surrogates

To assess the performance of individual organic analysis the laboratory used surrogates. Recoveries were calculated for each surrogate providing an indication of analytical accuracy. Surrogate recoveries for soil samples were all within recommended control limits, indicating that there was an acceptable degree of accuracy in analysing for organic compounds.

11.5 Laboratory Detection Limits

Laboratory detection limits for soil and water analyses by Eurofins MGT are outlined in the results table in section 13 below.

12.0 SITE ASSESSMENT CRITERIA

12.1 Health Investigation Levels (HIL)s and Health Screening Levels (HSLs)

To assess the contamination status of soils at a site, the NSW EPA refers to the document entitled National Environmental Protection Council (1999) *National Environmental Protection (Assessment of Site Contamination) Measure* (NEPM) (Amendment 2013).

The site is to be redeveloped for a residential unit/townhouse development, so the site will be assessed against the NEPM exposure scenario 'Residential B' health investigation levels (HIL) of the above mentioned guidelines for *'residential land use with minimal soil access*.

For assessing TRH and BTEX contamination at sites used for sensitive land use, such as residential, the NEPM refers to the Health Screening Levels (HSLs) "*HSL A and HSLB*".

For standard residential sites, the NSW DEC (2006) "*Guidelines for the NSW Site Auditor Scheme*" notes that concentrations at the site should also be assessed against the ecological investigation levels (EIL) if some parts of the site are used for growing plants or grass.

The soil regulatory guidelines are presented in the Table below.

Table 11: Health Investigation Levels (HIL) Criteria for Soil Contaminants

	Residential B	Reference
Heavy Metals		
Arsenic	500	NEPM 2013 - Table 1(A)1 HILs
Beryllium	90	NEPM 2013 - Table 1(A)1 HILs
Boron	40000	NEPM 2013 - Table 1(A)1 HILs
Cadmium	150	NEPM 2013 - Table 1(A)1 HILs
Chromium (VI)	500	NEPM 2013 - Table 1(A)1 HILs
Cobalt	600	NEPM 2013 - Table 1(A)1 HILs
Copper	30000	NEPM 2013 - Table 1(A)1 HILs
Lead	1200	NEPM 2013 - Table 1(A)1 HILs
Manganese	14000	NEPM 2013 - Table 1(A)1 HILs
Mercury (Inorganic)	120	NEPM 2013 - Table 1(A)1 HILs
Methyl Mercury	30	NEPM 2013 - Table 1(A)1 HILs
Nickel	1200	NEPM 2013 - Table 1(A)1 HILs
Selenium	1400	NEPM 2013 - Table 1(A)1 HILs
Zinc	60000	NEPM 2013 - Table 1(A)1 HILs
Cyanide (Free)	300	NEPM 2013 - Table 1(A)1 HILs
Polycyclic Aromatic Hydrocarbons (PAHs)		
Carcinogenic PAHs (as Bap TEQ)	4	NEPM 2013 - Table 1(A)1 HILs
Total PAHs	400	NEPM 2013 - Table 1(A)1 HILs
Organochlorine Pesticides		
DDT + DDE + DDD	600	NEPM 2013 - Table 1(A)1 HILs
Aldrin + Dieldrin	10	NEPM 2013 - Table 1(A)1 HILs
Chlordane	90	NEPM 2013 - Table 1(A)1 HILs
Endosulfan	400	NEPM 2013 - Table 1(A)1 HILs
Heptachlor	10	NEPM 2013 - Table 1(A)1 HILs
HCB	15	NEPM 2013 - Table 1(A)1 HILs
Phenols		
Phenols	45000	NEPM 2013 - Table 1(A)1 HILs
Pentachlorophenol	130	NEPM 2013 - Table 1(A)1 HILs
Cresols	4700	NEPM 2013 - Table 1(A)1 HILs
Polychlorinated Biphenyls (PCBs)		
PCBs	1200	NEPM 2013 - Table 1(A)1 HILs
Other Pesticides		
Atrazine	470	NEPM 2013 - Table 1(A)1 HILs
Chlorpyrifos	340	NEPM 2013 - Table 1(A)1 HILs
Bifenthrin	840	NEPM 2013 - Table 1(A)1 HILs
Herbicides		
2,4,5-T	900	NEPM 2013 - Table 1(A)1 HILs
2,4-D	1600	NEPM 2013 - Table 1(A)1 HILs
MCPA	900	NEPM 2013 - Table 1(A)1 HILs
MCPB	900	NEPM 2013 - Table 1(A)1 HILs
Mecoprop	900	NEPM 2013 - Table 1(A)1 HILs
Picloram	6600	NEPM 2013 - Table 1(A)1 HILs
Other Organics		
PDBE (Br1-Br9)	2	NEPM 2013 - Table 1(A)1 HILs

Note - All values are in mg/kg

For selection of the health screening criteria an assessment of the in-situ soil profile should be undertaken. The soil criteria indicates that the upper soil profile is more consistent with clay.

Table 12: Health Screening Levels (HSL) Criteria

	HSL A & HSL B	HSL A & HSL B	HSL A & HSL B	HSL A & HSL B	Soil Saturation Concentration (Csat)	Reference
	0m to <1m	1m to <2m	2m to <4m	4m+		
CLAY						
Toluene	480	NL	NL	NL	630	NEPM 2013 - Table 1(A) 3 HSLs
Ethylbenzene	NL	NL	NL	NL	68	NEPM 2013 - Table 1(A) 3 HSLs
Xylenes	110	310	NL	NL	330	NEPM 2013 - Table 1(A) 3 HSLs
Naphthalene	5	NL	NL	NL	10	NEPM 2013 - Table 1(A) 3 HSLs
Benzene	0.7	1	2	3	430	NEPM 2013 - Table 1(A) 3 HSLs
F1	50	90	150	290	850	NEPM 2013 - Table 1(A) 3 HSLs
F2	280	NL	NL	NL	560	NEPM 2013 - Table 1(A) 3 HSLs

Note - All values are in mg/kg

The EPA guidelines indicate that the assessment of soil test results and comparison with defined soil criteria should include consideration of a number of factors such as:

1. Land uses, e.g. residential, agricultural/horticultural, recreation or commercial/industrial.
2. Potential child occupancy.
3. Potential environmental effects including leaching into groundwater.
4. Single or multiple contaminants.
5. Depth of contamination.
6. Level and distribution of contamination.
7. Bioavailability of contaminant(s), e.g. Related to speciation, route of exposure.

8. Toxicological assessment of the contaminant(s), e.g. Toxicokinetics, carcinogenicity, acute and chronic toxicity.
9. Physico-chemical properties of the contaminant(s).
10. State of the site surface, e.g. paved or grassed exposed.
11. Potential exposure pathways.
12. Uncertainties with the sampling methodology and toxicological assessment.

12.2 Ecological Investigation Levels (EIL)s and Ecological Screening Levels (ESLs)

Ecological Investigation Levels (EILs) -

The NEPM 2013 states that "Ecological investigation levels (EILs) for the protection of terrestrial ecosystems have been derived for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions. EILs have been derived for As, Cu, CrIII, DDT, naphthalene, Ni, Pb and Zn

Insufficient data was available to derive ACLs for arsenic (As), DDT, lead (Pb) and naphthalene. As a result, the derived EILs are generic to all soils and are presented as total soil contaminant concentrations in Tables 1B(4) and 1B(5) within the NEPM 2013.

For the purposes of EIL derivation, a contaminant incorporated in soil for at least two years is considered to be aged for the purpose of EIL derivation. The majority of contaminated sites are likely to be affected by aged contamination. Fresh contamination is usually associated with current industrial activity and chemical spills".

The following process describes the method for calculation of site specific EILs.

A. EILs for Ni, Cr III, Cu, Zn and Pb aged contamination (>2 years)

Steps 1–4 below describe the process for deriving site-specific EILs for the above elements using Tables 1B(1) – 1B(4), which can be found at the end of the NEPM 2013.

1. Measure or analyse the soil properties relevant to the potential contaminant of concern (pH, CEC, organic carbon, clay content). Sufficient samples need to be taken for these determinations to obtain representative values for each soil type in which the contaminant occurs.

2. Establish the sample ACL for the appropriate land use and with consideration of the soil-specific pH, clay content or CEC. The ACL for Cu may be determined by pH or CEC and the lower of the determined values should be selected for EIL calculation. Note that the ACL for Pb is taken directly from Table 1(B)4.

3. Calculate the contaminant ABC in soil for the particular contaminant and location from a suitable reference site measurement or other appropriate method.

4. Calculate the EIL by summing the ACL and ABC:

$$EIL = ABC + ACL$$

B. EILs for As, DDT and naphthalene

EILs for aged contamination for DDT and naphthalene are not available and the adopted EIL is based on fresh contamination taken directly from Table 1B(5). The EILs for As, DDT and naphthalene are generic i.e. they are not dependent on soil type and are taken

directly from Table 1B(5). Only EILs for fresh contamination are available for As, DDT and naphthalene due to the absence of suitable data for aged contaminants.

Ecological Screening Levels (ESLs) -

Ecological screening levels (ESLs) are presented based on a review of Canadian guidance for petroleum hydrocarbons in soil and application of the Australian methodology (Schedule B5b) to derive Tier 1 ESLs for BTEX, benzo(a)pyrene and F1 and F2 (Warne 2010a, 2010b)

The Canadian Council of the Ministers of the Environment (CCME) has adopted risk-based TPH standards for human health and ecological aspects for various land uses in the *Canada-wide standard for petroleum hydrocarbons (PHC) in soil* (CCME 2008) (CWS PHC). The standards established soil values including ecologically based criteria for sites affected by TPH contamination for coarse- and fine-grained soil types

Table 13: Ecological Investigation Levels (EIL) and Ecological Screening Levels (ESL) Criteria

Benviron group	Contaminant Age/Soil Texture	National parks and areas of high conservation value	Urban residential and open public spaces	Commercial and industrial	Reference
Ecological Investigation Levels (EILs)					
Heavy Metals					
Arsenic	**Fresh**	20	50	80	NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	40	100	160	NEPM 2013 - Table 1(B) 1-5 EILs
Chromium (III)	**Fresh**	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				NEPM 2013 - Table 1(B) 1-5 EILs
Copper	**Fresh**	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				NEPM 2013 - Table 1(B) 1-5 EILs
Lead	**Fresh**	110	270	440	NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	470	1100	1800	NEPM 2013 - Table 1(B) 1-5 EILs
Nickel	**Fresh**	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				NEPM 2013 - Table 1(B) 1-5 EILs
Zinc	**Fresh**	Site Specific Calculation Required			NEPM 2013 - Table 1(B) 1-5 EILs
	Aged				NEPM 2013 - Table 1(B) 1-5 EILs
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	**Fresh**	10	170	370	NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	10	170	370	NEPM 2013 - Table 1(B) 1-5 EILs
Organochlorine Pesticides					
DDT	**Fresh**	3	180	640	NEPM 2013 - Table 1(B) 1-5 EILs
	Aged	3	180	640	NEPM 2013 - Table 1(B) 1-5 EILs
Ecological Screening Levels (ESLs) and Management Limits					
F1 (C_6-C_{10})	**Coarse**				NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	125*	180*	215*	NEPM 2013 - Table 1(B) 6-7 EILs
F1 (C_6-C_{10})	**Coarse**		700	700	NEPM 2013 - Table 1(B) 6-7 EILs
(Management Limits)	**Fine**	-	800	800	NEPM 2013 - Table 1(B) 6-7 EILs
F2 (>C_{10}-C_{16})	**Coarse**				NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	25*	120*	170*	NEPM 2013 - Table 1(B) 6-7 EILs
F2 (>C_{10}-C_{16})	**Coarse**		1000	1000	NEPM 2013 - Table 1(B) 6-7 EILs
(Management Limits)	**Fine**	-	1000	1000	NEPM 2013 - Table 1(B) 6-7 EILs
F3 (>C_{16}-C_{34})	**Coarse**	-	300	1700	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	-	1300	2500	NEPM 2013 - Table 1(B) 6-7 EILs
F3 (>C_{16}-C_{34})	**Coarse**		2500	3500	NEPM 2013 - Table 1(B) 6-7 EILs
(Management Limits)	**Fine**	-	3500	5000	NEPM 2013 - Table 1(B) 6-7 EILs
F4 (>C_{34}-C_{40})	**Coarse**	-	2800	3300	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	-	5600	6600	NEPM 2013 - Table 1(B) 6-7 EILs
F4 (>C_{34}-C_{40})	**Coarse**		10000	10000	NEPM 2013 - Table 1(B) 6-7 EILs
(Management Limits)	**Fine**	-	10000	10000	NEPM 2013 - Table 1(B) 6-7 EILs
Benzene	**Coarse**	10	50	75	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	10	65	95	NEPM 2013 - Table 1(B) 6-7 EILs
Toluene	**Coarse**	10	85	135	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	65	105	135	NEPM 2013 - Table 1(B) 6-7 EILs
Ethylbenzene	**Coarse**	1.5	70	165	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	40	125	185	NEPM 2013 - Table 1(B) 6-7 EILs
Xylenes	**Coarse**	10	105	180	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	1.6	45	95	NEPM 2013 - Table 1(B) 6-7 EILs
Benzo(a)pyrene	**Coarse**	0.7	0.7	0.7	NEPM 2013 - Table 1(B) 6-7 EILs
	Fine	0.7	0.7	0.7	NEPM 2013 - Table 1(B) 6-7 EILs

Notes

1 Urban residential/public open space is broadly equivalent to the HIL-A, HIL-B and HIL-C land use scenarios in Table 1A(1) Footnote 1 and as described in Schedule B7.

2 Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to Schedule B5c.

3 Insufficient data was available to calculate aged values for DDT and naphthalene, consequently the values for fresh contamination should be used.

4 Insufficient data was available to calculate ACLs for As, DDT and naphthalene. The EIL should be taken directly from Table 1B(5).

5 ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.

6 '-' indicates that insufficient data was available to derive a value.

7 To obtain F1, subtract the sum of BTEX concentrations from C6-C10 fraction and subtract naphthalene from >C10-C16 to obtain F2.

8 Management limits are applied after consideration of relevant ESLs and HSLs

9 Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

Based on the proposed development the bulk of site soils >2m in depth are likely to be excavated and removed offsite. It is therefore unlikely that ecological receptors will be impacted and therefore no calculation of EILs or ESLs is required. It is also noted that future plans may change and that some soils may remain. If this is the case then further investigation for EIL and ESLs should be undertaken once design is completed.

12.3 Groundwater

The NSW DECC has endorsed the use of the Groundwater Investigation Levels (GILs) given in the 1999 NEPM '*Schedule B(1) Guideline on the Investigation Levels for Soil and Groundwater*' (Amendment 2013) and the water quality trigger levels given in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). These Guidelines provide criteria for:

- Aquatic ecosystems – both marine and fresh waters

The NEPM advises that '*when assessing groundwater contamination, the GILs are to be applied at the point of extraction and as response levels at the point of use, or where there is a likelihood of an adverse environmental effect at the point of discharge*'.

For assessing groundwater quality, it is first necessary to assess the potential uses of groundwater downgradient of the site being assessed.

Potential uses of groundwater downgradient of the site include:

- Discharge to water bodies sustaining aquatic ecosystems particularly Haslams Creek.

The threshold concentrations presented in the ANZECC (2000) Fresh and Marine Waters Quality Guidelines are considered applicable for the protection of aquatic ecosystems of the receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater discharging to receiving waters. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded, rather, if the trigger values are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is an actual problem or management / remedial action should be undertaken.

It is considered that fresh water trigger values are applicable for investigating chemical concentrations in groundwater at the site, as the receiving body, Haslams Creek is a Estuarine water body .It is understood that the NSW EPA policy is that the trigger values for the protection of 95% of aquatic ecosystems should be used as groundwater assessment criteria when considering moderately or highly disturbed receiving environments. The receiving waters for groundwater at the site are considered to be moderately disturbed ecosystems and the ANZECC (2000) 95% protection values are therefore considered appropriate groundwater assessment criteria for the site.

13.0 SITE ASSESSMENT

Samples were recovered from seven (7) locations across the site and were labelled BH1-BH7. These locations were selected to detect any contamination that may have originated from past and present activities, and due to potential excavation and future development in these areas.

Table 14: Sampling Information - Soil

Analyte / Analyte Group / Sample	Depth (m)	SAMPLING DATE	DUPLICATE & SPLIT	HEAVY METALS	TRH	BTEX	PAH	OCP	PCB
BH1	0.6	11/04/2016		✔	✔	✔	✔	✔	✔
BH1	1	11/04/2016		✔	✔	✔	✔		
BH2	0.2	11/04/2016		✔	✔	✔	✔	✔	✔
BH2	0.9	11/04/2016		✔	✔	✔	✔		
BH3	0.5	11/04/2016	D1 & SS1	✔	✔	✔	✔	✔	✔
BH3	1	11/04/2016		✔	✔	✔	✔		
BH4	0.6	11/04/2016		✔	✔	✔	✔	✔	✔
BH4	1.2	11/04/2016		✔	✔	✔	✔		
BH5	0.3	11/04/2016		✔	✔	✔	✔	✔	✔
BH5	0.7	11/04/2016		✔	✔	✔	✔		
BH6	0.3	11/04/2016		✔	✔	✔	✔	✔	✔
BH6	0.8	11/04/2016		✔	✔	✔	✔		
BH7	0.3	11/04/2016		✔	✔	✔	✔		

The locations of the boreholes and samples are shown in **Figure 2** –Site Plans and details of the boreholes are presented in **Appendix E** – Borehole Logs.

Based on information from all boreholes, the surface and sub-surface profile across the site is generalised as follows:

- Fill Silty Sand, medium to fine grained, brown with some inert building materials
- Natural, Silty Clay, high plasticity, red/brown, moist.

14.0 RESULTS

14.1 Soils

The original laboratory test results certificates are presented in **Appendix C** – NATA Laboratory Test Results. A summary of the test results together with the assessment criteria adopted are discussed below.

Table 15: Heavy Metals Results

			Heavy Metals (mg/kg)							
			ARSENIC[2]	CADMIUM	CHROMIUM (VI)	COPPER	LEAD[3]	MERCURY (Inorganic)[5]	NICKEL	ZINC
Health Investigation Levels (HIL)										
Residential B[1]			500	150	500	30000	1200	120	1200	60000
Limit of Resolution (LOR)			2	0.4	5	5	5	0.05	5	5
Sample ID	**Date Sampled**	**Depth**								
BH1	11/04/2016	0.6	<2	<0.4	5.4	82	<5	<0.05	28	19
BH1	11/04/2016	1	4.9	<0.4	8.9	22	21	<0.05	<5	30
BH2	11/04/2016	0.2	5.7	<0.4	9	41	41	0.06	33	120
BH2	11/04/2016	0.9	8.1	<0.4	13	21	23	<0.05	<5	27
BH3	11/04/2016	0.5	10	<0.4	15	17	57	0.06	5.6	35
BH3	11/04/2016	1	8.2	<0.4	13	22	16	<0.05	7.9	39
BH4	11/04/2016	0.6	29	1.9	18	330	660	<0.05	26	480
BH4	11/04/2016	1.2	5.8	<0.4	7.3	19	10	<0.05	<5	26
BH5	11/04/2016	0.3	50	0.8	18	100	**1900**	0.05	16	590
BH5	11/04/2016	0.7	4.9	<0.4	6.5	31	170	<0.05	<5	110
BH6	11/04/2016	0.3	15	<0.4	19	15	30	<0.05	5.6	56
BH6	11/04/2016	0.8	6.8	<0.4	11	18	15	0.06	<5	26
BH7	11/04/2016	0.3	3.8	0.5	11	46	32	0.05	6.8	1100
95% UCL			-	-	-	-	501.7	-	-	-

Notes

1 **HIL A** - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools

HIL B - Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments

HIL C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more appropriate

HIL D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

2 Arsenic: HIL assumes 70% oral bioavailability. Site specific bioavailability may be important and should be considered where appropriate (refer Schedule 7b)

3 Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.

4 Methyl mercury: assessment of methyl mercury should only occur where there is evidence of its potential source. It may be associated with inorganic mercury and anaerobic microorganism activity in aquatic environments. In addition the reliability and quality of sampling/analysis should be considered

5 Elemental mercury: HIL does not address elemental mercury. A site-specific assessment should be considered if elemental mercury is present, or suspected to be present,

* Concentrations in **YELLOW** exceed the "Residential B" Criteria

* NA = Not Applicable

* " - " Not Tested

Thirteen (13) samples were analysed for the Priority Heavy Metals and no samples were found to exceed the relevant guidelines with the exception of lead in sample BH5.

Table 16: BTEX and TRH Results

	Soil HSLs for Vapour Intrusion (mg/kg)							Management Limits (Urban and Recreational)			
	TOLUENE	ETHYLBENZENE	XYLENES	NAPHTHALENE	BENZENE	F1[9]	F2[10]	F1	F2	F3	F4
Health Screening Levels (HSL)	**SOIL PROFILE - CLAY (FINE SOILS)**										
HSL A & HSL B - 0m to <1m	480	NL	110	5	0.7	50	280				
HSL A & HSL B - 1m to <2m	NL	NL	310	NL	1	90	NL				
HSL A & HSL B - 2m to <4m	NL	NL	NL	NL	2	150	NL				
HSL A & HSL B - 4m+	NL	NL	NL	NL	3	290	NL	800	1000	3500	10000
Soil Saturation Concentration (Csat)	630	68	330	10	430	850	560				
Limit of Resolution (LOR)	0.5	1	3	0.5	0.2	25	50				
Sample ID **Date Sampled** **Depth**											
BH1 11/04/2016 0.6	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH1 11/04/2016 1	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH2 11/04/2016 0.2	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	240
BH2 11/04/2016 0.9	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH3 11/04/2016 0.5	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH3 11/04/2016 1	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH4 11/04/2016 0.6	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH4 11/04/2016 1.2	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH5 11/04/2016 0.3	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH5 11/04/2016 0.7	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH6 11/04/2016 0.3	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH6 11/04/2016 0.8	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100
BH7 11/04/2016 0.3	<0.5	<1	<3	<0.5	<0.2	<20	<50	<20	<50	<100	<100

Notes

1 Land use settings are equivalent to those described in Table 1A(1) Footnote 1 and Schedule B7. HSLs for vapour intrusion for high density residential assume residential occupation of the ground floor. If communal car parks or commercial properties occupy the ground floor, HSL D should be used,

2 The key limitations of the HSLs should be referred to prior to application and are presented in Friebel and Nadebaum (2011b and 2011d).

3 Detailed assumptions in the derivation of the HSLs and information on how to apply the HSLs are presented in Friebel and Nadebaum (2011a and 2011b).

4 Soil HSLs for vapour inhalation incorporate an adjustment factor of 10 applied to the vapour phase partitioning to reflect the differences observed between theoretical estimates of soil vapour partitioning and field measurements. Refer Friebel & Nadebaum (2011a) for further information.

5 The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

6 The HSLs for TPH C6-C10 in sandy soil are based on a finite source that depletes in less than seven years, and therefore consideration has been given to use of sub-chronic toxicity values. The >C8-C10 aliphatic toxicity has been adjusted to represent sub-chronic exposure, resulting in higher HSLs than if based on chronic toxicity. For further information refer to Section 8.2 and Appendix J in Friebel and Nadebaum (2011a).

7 The figures in the above table may be multiplied by a factor to account for biodegradation of vapour. A factor of 10 may apply for source depths from 2 m to <4 m or a factor of 100 for source depths of 4 m and deeper. To apply the attenuation factor for vapour degradation, a number of conditions must be satisfied. Firstly the maximum length of the shorter side of the concrete slab and surrounding pavement cannot exceed 15 m, as this would prevent oxygen penetrating to the centre of the slab. Secondly, measurement of oxygen in the subsurface is required to determine the potential for biodegradation. Oxygen must be confirmed to be present at >5% to use these factors.

8 For soil texture classification undertaken in accord with AS 1726, the classifications of sand, silt and clay may be applied as coarse, fine with liquid limit <50% and fine with liquid limit>50% respectively, as the underlying properties to develop the HSLs may reasonably be selected to be similar. Where there is uncertainty, either a conservative approach may be adopted or laboratory analysis should be carried out

9 To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction

10 To obtain F2 subtract naphthalene from the >C10-C16 fraction

* Concentrations in **GREEN** exceed the "HSL A & HSL B" Criteria

* NA = Not Applicable

* "-" Not Tested

Thirteen (13) samples were analysed for Monocyclic Aromatic Hydrocarbons (BTEX fractions), associated with petrol contamination and Total Recoverable Hydrocarbons (TRH). There were no concentrations of BTEX fractions or TRH recorded above the relevant assessment criteria.

Table 17: PAH, OCP & PCB Results

			PAH (mg/kg)		OCP (mg/kg)									PCB (mg/kg)
			CARINOGENIC PAHs (as Bap TEQ)[6]	TOTAL PAHs[7]	DDT + DDE + DDD	ALDRIN + DIELDRIN	CHLORDANE	ENDOSULFAN	HEPTACHLOR	HCB	METHOXYCHLOR	MIREX	TOXAPHENE	PCBs[8]
Health Investigation Levels (HIL)														
Residential B[1]			4	400	600	10	90	400	10	15	500	20	30	1200
Limit of Resolution (LOR)			-	NA	0.05	0.05	0.1	0.05	0.05	0.05	0.2	-	1	0.5
Sample ID	**Date Sampled**	**Depth**												
BH1	11/04/2016	0.6	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH1	11/04/2016	1	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH2	11/04/2016	0.2	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH2	11/04/2016	0.9	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH3	11/04/2016	0.5	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH3	11/04/2016	1	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH4	11/04/2016	0.6	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH4	11/04/2016	1.2	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH5	11/04/2016	0.3	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH5	11/04/2016	0.7	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH6	11/04/2016	0.3	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH6	11/04/2016	0.8	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
BH7	11/04/2016	0.3	0.6	<0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5

Notes

1 **HIL A** - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools

HIL B - Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments

HIL C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where the potential for exposure is lower and where a site-specific assessment may be more

HIL D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

6 Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their TEFs (potency relative to B(a)P) adopted by CCME 2008 (refer Schedule B7). The B(a)P TEQ is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF, and summing these products (Refer to comment 6 in Table 1A(1) in schedule B1 p49).

7 Total PAHs: HIL is based on the sum of the 16 PAHs most commonly reported for contaminated sites (WHO 1998). The application of the total PAH HIL should consider the presence of carcinogenic PAHs and naphthalene (the most volatile PAH). Carcinogenic PAHs reported in the total PAHs should meet the B(a)P TEQ HIL. Naphthalene reported in the total PAHs should meet the relevant HSL.

8 PCBs: HIL relates to non-dioxin-like PCBs only. Where a PCB source is known, or suspected, to be present at a site, a site-specific assessment of exposure to all PCBs (including dioxin-like PCBs) should be undertaken

* Concentrations in **YELLOW** exceed the "Residential B" Criteria

* NA = Not Applicable

* " - " Not Tested

Thirteen (13) samples were analysed for PAH. There were no concentrations of PAH, above the relevant assessment criteria.

14.2 Groundwater

Groundwater was not detected within the installed groundwater wells during the investigation and therefore no assessment groundwater could be undertaken.

15.0 DISCUSSION

A number of potential areas of environmental concerns were identified at the site, particularly:

- Historical uses;
- Carpark areas / driveways where leaks and spills from cars may have occurred;
- Vicinity of degrading building features

Laboratory Results for the soil samples were below detection limits or the relevant guideline criteria with the exception of lead in sample BH5 0.3. An assessment of the 95% UCL of the data was undertaken and indicated that the result was below the relevant guideline criteria.

Laboratory Results for the groundwater samples could not be collected as no groundwater was detected during the investigation within the site. It is possible that groundwater may exist at a deeper depth than drilled, however, it is unlikely that this has been impacted from the site as all soil analytes were below there respective guideline criteria. It is also noted that the bulk of the soils will be removed for the proposed development.

Off-site impacts of contaminants in soil are generally governed by the transport media available and likely receptor(s). The most common transport medium is water, whilst receptors include uncontaminated soils, groundwater, surface water bodies, humans, flora & fauna.

Surface water run-off from within the site would generally be deposited in the stormwater drainage pits and the potential for migration of contamination is low and any infiltration of contaminants is also expected to be low-moderate based on the underlying geology. The potential for significant impact of site soils, if contaminated, on the water bodies collecting surface water run-off from the region is considered low.

16.0 CONCLUSION AND RECOMENDATION

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil contamination at the site are low in the context of the proposed use of the site. The site therefore ***is suitable*** for the proposed development, subject to the following recommendations:

- Any soils proposed for removal from the site should initially be classified in accordance with the "*Waste Classification Guidelines, Part 1: Classifying Waste"* NSW DECC (2014).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence.

Thank you for the opportunity of undertaking this work. We would be pleased to provide further information on any aspects of this report.

17.0 LIMITATIONS

To the best of our knowledge information contained in this report is accurate at the date of issue, however, subsurface conditions, including groundwater levels and contaminant concentrations, can change in a limited time. This should be borne in mind if the report is used after a protracted delay.

There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site.

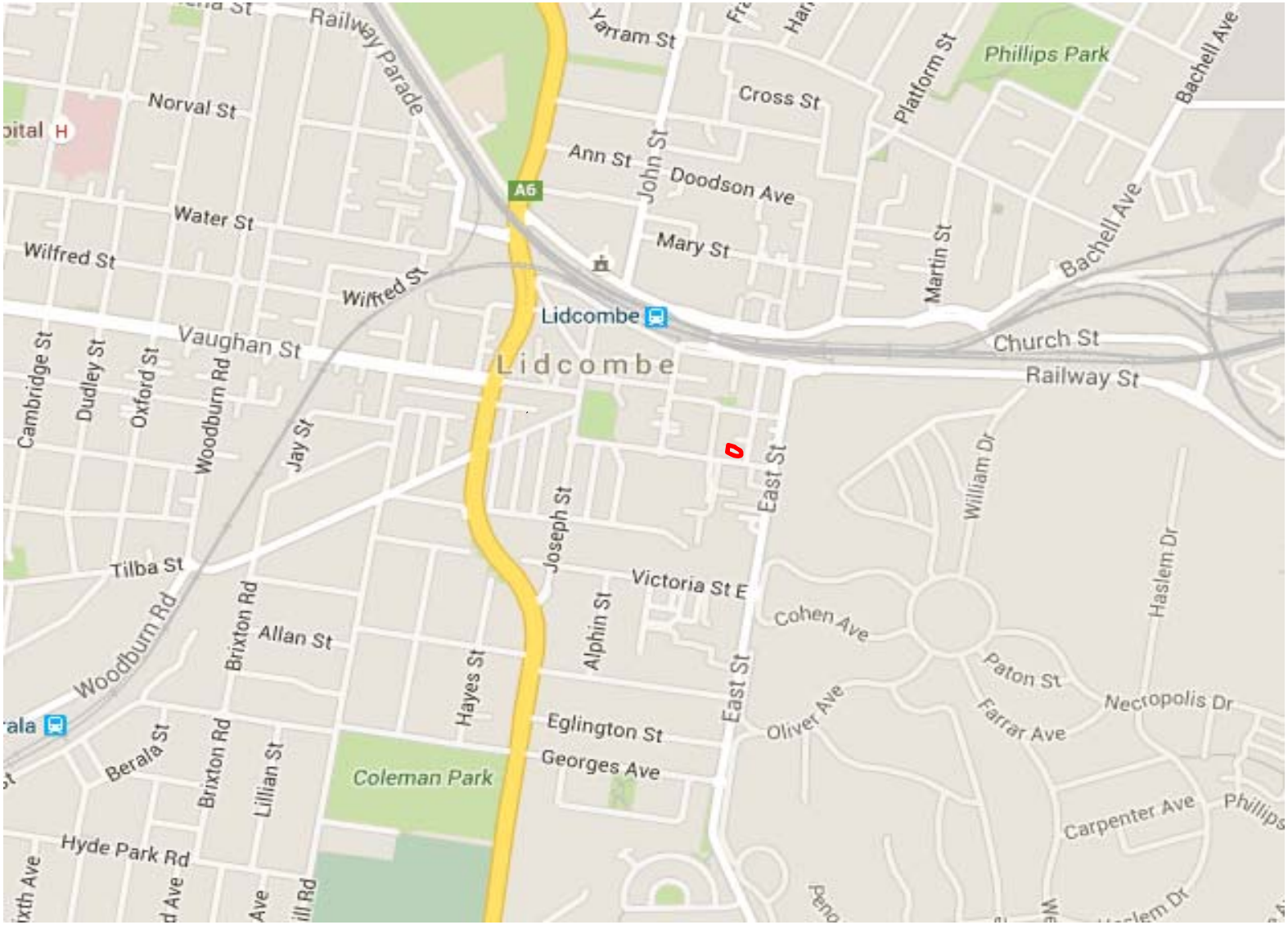
There is no investigation that is thorough enough to preclude the presence of material that presently or in the future, may be considered hazardous at the site. Since regulatory criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under different regulatory standards that require remediation.

Opinions expressed herein are judgements and are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

REFERENCES

- Australian and New Zealand Environment and Conservation Council (ANZECC) (1996) – *Drinking Water Guidelines*.
- Australian and New Zealand Environment and Conservation Council (ANZECC) (2000) – *Guidelines for Fresh and Marine Waters*.
- Department of Urban Affairs and Planning – EPA (1998) "*Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land*".
- National Environmental Protection Council (NEPC) (1999) – *National Environmental Protection (Assessment of Site Contamination) Measure. Amendment 2013*
- NSW EPA (2014) "*Technical Note: Investigation of Service Station Sites*".
- NSW EPA (1995) "*Sampling Design Guidelines*".
- NSW EPA (1997) "*Guidelines for Consultants Reporting on Contaminated Sites*".
- NSW DEC (2006) "*Guidelines for the NSW Site Auditor Scheme*".
- NSW EPA (2009) "*Guidelines on Significant Risk of Harm from contaminated land and the duty to report*".
- NSW DECC "Waste Classification Guidelines, Part 1: Classifying Waste" (2014). Department of Environment and Climate Change NSW, Sydney

FIGURE 1 SITE LOCATION



Key

Site Location ——

Benviron group simple sustainable solutions	**DRAWN** BB	SITE LOCATION
	FIGURE 1	James Street Development Unit Pty Ltd
	Job # E845	21-23 James Street, Lidcombe NSW

FIGURE 2: SITE PLAN AND SAMPLING LOCATIONS

Key

Site Area:

Sample Locations

Benviron group
simple sustainable solutions

DRAWN BB	SITE PLAN
FIGURE 2	James Street Development Unit Trust Pty Ltd
Job # E845	21-23 James Street, Lidcombe NSW
Scale: NTS	

APPENDIX A: LAND TITLE INFORMATION

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

HISTORY OF TITLE TRANSACTION

Title Reference: 15/397

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
5/11/2015 4:28PM

FOLIO: 15/397

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 503 FOL 5

Recorded	Number	Type of Instrument	C.T. Issue
2/3/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/2/1995		CONVERTED TO AUTO CONSOL 503-5	CONSOL CREATED CT NOT ISSUED

*** END OF SEARCH ***

PRINTED ON 5/11/2015

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

HISTORY OF TITLE TRANSACTION

Title Reference: 14/397

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
5/11/2015 4:28PM

FOLIO: 14/397

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 10789 FOL 223

Recorded	Number	Type of Instrument	C.T. Issue
21/8/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
27/8/1991		CONVERTED TO AUTO CONSOL 10789-223	CONSOL CREATED CT NOT ISSUED

*** END OF SEARCH ***

PRINTED ON 5/11/2015

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

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27/8/1991		CONVERTED TO AUTO CONSOL 10789-223	CONSOL CREATED CT NOT ISSUED

*** END OF SEARCH ***

PRINTED ON 5/11/2015

CERTIFICATE OF TIT

(c.)

New South Wales.

B

Reference to last Certificate
Vol 1,111 Folio 115

[App[n] No.]

REGISTER BOOK,

VOL. 431 FOLIO 42

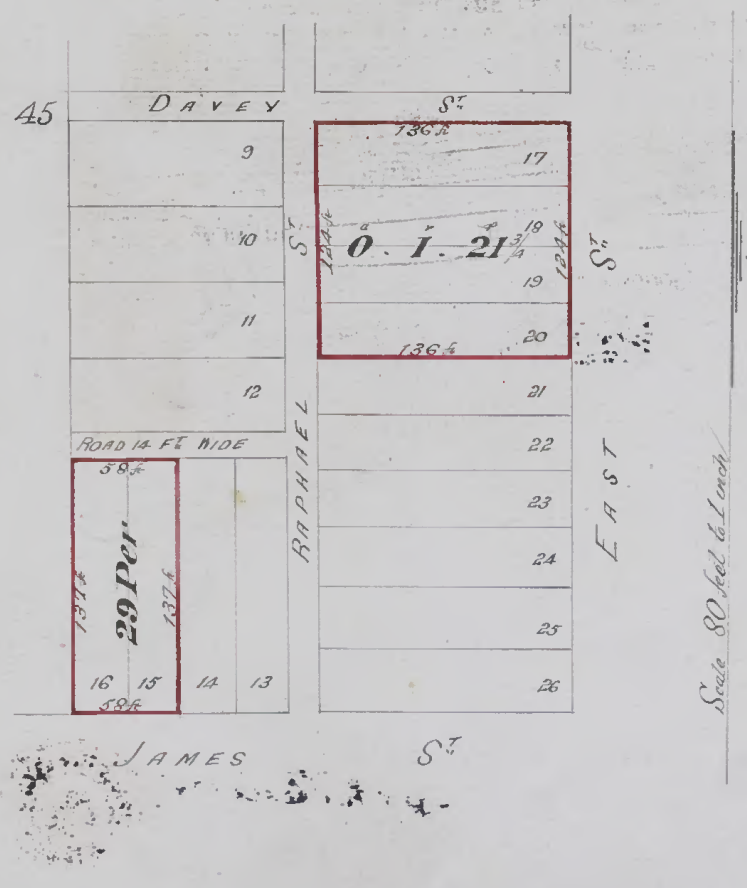
Robert Lancombe of Rockwood, Monumental Mason, Transferee under Instrument of Transfer from Louis Hirsh Levy, numbered 33153 is now the proprietor of an Estate in Fee Simple, subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to and also subject to such encumbrances, liens, and interests, as are notified hereon in Three pieces of Land situated at Rockwood in the Parish of Liberty Plains and County of Cumberland containing Twenty nine perches or thereabouts being lots 15 and 16 and One rood and twenty one and three-quarters perches or thereabouts being Lots 17, 18, 19 and 20 on a plan deposited in the Land Titles Sydney numbered 397, as shown on the plan hereon and thereon edged red, being part of Sixty acres delineated in the parish map of the said Parish deposited in the Office of the Surveyor General originally granted to George Sunderland by Grant Grant dated the Thirtieth day of June one thousand eight hundred and twenty three [illegible]

In witness whereof, I have hereunto signed my name and affixed my Seal, this Eighth day of April One thousand eight hundred and seventy nine

Signed the 8th day of April 1879,
in the presence of
E. S. Deane

G. W. Ward
Registrar General.

REGISTRAR GENERAL'S OFFICE NEW SOUTH WALES



NOTIFICATION REFERRED TO.

No. 41188 TRANSFER DATED 14th June 1882
FROM THE above NAMED Robert Lancombe
TO Job Hansen of lots 17 to 20 on
deposited plan 397 OF THE LAND further DESCRIBED
PRODUCED & ENTERED 26th June 1882 AT
12 O'CLOCK IN THE NOON
G. Allen DEP REG[R] GEN[L]

Cancelled as regards the lands in above Transfer No. 41188
and Certificate of Title Vol 503 Fol. 6
G. Allen
Dep[y] Reg[r] Gen[l]

Cancelled and Certificate of Title issued Vol. 503
Fol. 5 Residue
G. Allen
Dep[y] Reg[r] Gen[l]

Bl. 907

CERTIFICATE OF TI

(C.)

New South Wales.

[Reference to last Certificate]

[Vol. LII Folio 115]

REGISTER BOOK

VOL. 395 FOLIO 228

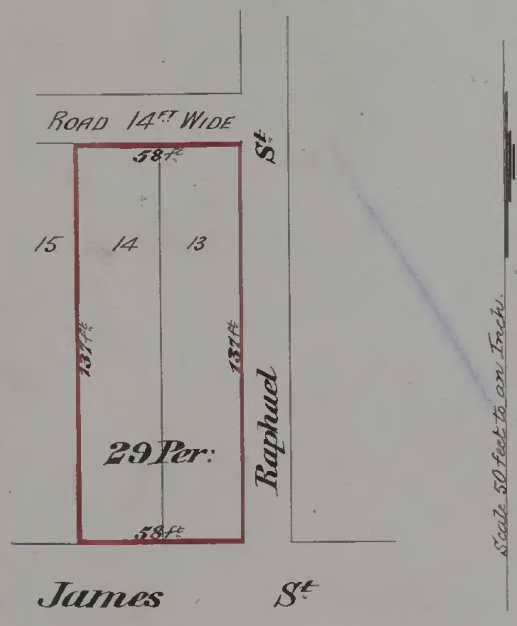
George Barry of the City of Sydney Landowner Transferree under Instrument of Transfer from Joseph George Raphael and Lewis Wolfe Levy numbered 32609 is now the proprietor of an Estate in fee simple Subject nevertheless to the reservations and conditions, if any, contained in the Grant hereinafter referred to; and also Subject to such encumbrances liens and interests as are notified hereon in That Piece of Land situated at Rookwood in the Parish of Liberty Plains and County of Cumberland containing Twenty nine perches or thereabouts as shown on the plan hereon and therein edged red being Lots 13 and 14 on a plan deposited in the Land Titles Office Sydney Numbered 397 and part of Sixty acres delineated in the Public Map of the said Parish deposited in the Office of the Surveyor General originally granted to George Sunderland by Crown Grant dated the thirtieth day of June one thousand eight hundred and twenty three

In witness whereof, I have hereunto signed my name and affixed my Seal, this Fifth day of March one thousand eight hundred and seventy-nine.

Signed the 5th day of March 1879.
in the presence of
Edw. H. Russell

G Murdoch
Dep. Registrar General.

NOTIFICATION REFERRED TO.



No 7840 MORTGAGE DATED 14th July 1880
FROM THE above NAMED George Barry
TO Adolphus Rogalsky of Sydney
PRODUCED & ENTERED 27th March 1884
AT 20 minutes to 11 O'CLOCK IN THE forenoon NOON
by Wason & Co by REGISTRAR

A Provisional Certificate has been issued with the following endorsement
The above is with the consent of the Land Titles Commissioners issued as a Provisional Certificate upon the Statutory Declaration of the above named Adolphus Rogalsky that the original was lost and contains, together with the plan an exact Copy of Register Volume 395 Folio 228
Land Titles Office Sydney
10th June 1889
Dep: Reg[r] Gen[l]

No 154705 Order for Foreclosure of the within Mortgage No 78440, by virtue of which the Estate and interest of the within named George Barry, is Vested in the within named Adolphus Rogalsky, free from all right and Equity of Redemption of the said George Barry or any person claiming under him, Produced and entered the 24th August 1889 at 12 o'clock noon

Dep Regr Genl

No. C438411 TRANSFER dated 15th May 1936
from the said The Australian Bank of Commerce Limited (in liquidation) (mortgagee exercising power of sale) to Richard Walker of Concord Railway Employee
of the land within described
Produced 21st May 1936 and entered 9th June 1936
at 12 o'clock ~~in the~~ noon.

REGISTRAR GENERAL.

No. A 208599 APPLICATION BY TRANSMISSION
Phoebe Rogalsky widow David Mitchell Rogalsky Julian Cecil Rogalsky and Ernest Meyer Mitchell are now the registered Proprietors of the Land within described in pursuance of the above Application. Produced 25th October 1915 and entered 11th November 1915
at 10 o'clock in the fore noon

REGISTRAR GENERAL.

No. A 209534 TRANSFER dated 28th October 1915
from the said Phoebe Rogalsky David Mitchell Rogalsky Julian Cecil Rogalsky and Ernest Meyer Mitchell To Alexander Larcombe of Lidcombe Gentleman of the land within described
Produced and entered 11th November 1915
at 10 o'clock in the fore noon

REGISTRAR GENERAL.

No. A 211162 TRANSFER dated 18th September 1918
from the said Alexander Larcombe to William Henry Toogood of Lidcombe Carter and Edith Mary Toogood his wife as joint tenants of the land within described.
Produced and entered 23rd September 1918
at 2 mts pt 2 o'clock in the after noon.

REGISTRAR GENERAL.

No. A 866313 MORTGAGE dated 7th October 1922
from the said William Henry Toogood and Edith Mary Toogood To Alexander Larcombe of Lidcombe Gentleman and Ada Larcombe his wife
Produced and entered 11th October 1922
at 27 mts pt 2 o'clock in the after noon.

REGISTRAR GENERAL.

No. B314037 DISCHARGE of within Mortgage A866313 dated 28th January 1926.
Produced 4th February 1926 and entered 4th February 1926.
at 8 mts pt 2 o'clock in the after noon.

REGISTRAR GENERAL.

No. B314038 MORTGAGE dated 28th January 1926.
from the said William Henry Toogood and Edith Mary Toogood to The Australian Bank of Commerce Limited
Produced and entered 4th February 1926.
at 8 mts pt 2 o'clock in the after noon.

REGISTRAR GENERAL.

No. D81881 TRANSFER dated 5th February 1948
from the said Richard Walker to Dudley Norman McKay of Burwood, Contractor
of the land within described
Produced and entered 1st March 1948
at 20 mts pt 2 o'clock in the after noon.

REGISTRAR GENERAL.

No. F241349 TRANSFER dated 4th May 1950
from the said Dudley Norman McKay to Bert Compton Sims of Canterbury, Storeman and Packer and Elsie Elizabeth Sims his wife as joint tenants
of the land within described
Produced and entered 6th June 1950
at 2 mts pt 12 o'clock in the after noon.

REGISTRAR GENERAL.

Bert Compton Sims, the surviving joint tenant, is now registered sole proprietor of the land within described.
See Notice of Death (Section 101) No. E571946.
Entered 27th September 1956.

REGISTRAR GENERAL.

Gould Marshall Pty Limited
to
now the registered proprietor of the land within described
See TRANSFER No. H4623 dated 18th July 1958.
Entered 29th July 1958.

REGISTRAR GENERAL.

No. H 28889 MORTGAGE dated 25th July 1958
from the said Gould Marshall Pty Limited to Australia and New Zealand Bank Limited
Entered 29th August 1958

REGISTRAR GENERAL.

This Deed is cancelled and Certificate of Title issued.
Vol. 10789 Fol 223 dated 6.5.1968
Vide O L14315

REGISTRAR GENERAL

D 314037

M 314038

Relay C438411 A

R. 907

CERTIFICATE OF TITLE.

00503005

CANCELLED W

(C.)

B

New South Wales.

Residue after Transfer
11188

REGISTER BOOK
VOL. 503 FOLIO 5

[Reference to last Certificate]
[Vol. 431 Folio 42]

Robert Larcombe of Rookwood Monumental Mason is now the Proprietor of an Estate in fee simple subject nevertheless to the reservations and conditions if any contained in the Grant hereinafter referred to; And also subject to such encumbrances Liens and interests as are notified hereon in That piece of Land situated at Rookwood in the Parish of Liberty Plains and County of Cumberland containing Twenty nine perches or thereabouts, as shown on the Plan hereon and thereon edged red being Lots 15 and 16 on a plan deposited in the Land Titles Office Sydney Number 397 and part of Sixty acres delineated in the Public Map of the said Parish deposited in the Office of the Surveyor General, originally granted to George Sunderland by Crown Grant dated the thirtieth day of June one thousand eight hundred and twenty three 3rd Pt

In witness whereof, I have hereunto signed my name and affixed my Seal, this Sixteenth day of July one thousand eight hundred and ~~seventy~~ Eighty

Signed the 16th day of July 1880.
in the presence of W W Bucknell Junr

G Mudd.
Dep Registrar General.

REGISTRAR GENERAL NEW SOUTH WALES

NOTIFICATION REFERRED TO.

No 113274 MORTGAGE DATED 5th December 1883
FROM THE above NAMED Robert Larcombe
TO The Commercial Banking Company of Sydney
PRODUCED & ENTERED 5th October 1886
AT 11 hrs to 12 O'CLOCK IN THE after NOON
L Mead Com Gen Dep REGISTRAR GENERAL

REGISTRAR GENERAL NEW SOUTH WALES

7

No 614214 TRANSFER DATED 27th June 1911
FROM THE SAID The Commercial Banking Company of Sydney Limited Mortgagee exercising power of sale To
Robert Clark of Rookwood Monumental Mason
OF THE LAND within DESCRIBED
PRODUCED & ENTERED 8th July
1911 AT 11 hrs to 12 O'CLOCK IN THE fore NOON
Dep REGISTRAR GENERAL

REGISTRAR GENERAL NEW SOUTH WALES

Scale 80 Feet to an Inch

25193:6 (43)

No. 618806 TRANSFER DATED 1st August 1911.
FROM THE SAID Robert Clarke To John Robert Beckley of Brookwood Photographer
OF THE LAND within DESCRIBED
PRODUCED & ENTERED 10th August
1911 AT 10 mts/pt 12 O'CLOCK IN THE after NOON
REGISTRAR GENERAL

No. 683740 TRANSFER dated 11th July 1912
from the said John Robert Beckley to Herbert George Webb of Perisher Steward & Catherine Jane Webb his wife as joint tenants of the land within described
Produced and entered 12th July 1912
at 1mt/pt 1 o'clock in the after noon.
REGISTRAR GENERAL

No. B308 225 TRANSFER dated 21st December 1925
from the said Herbert George Webb and Catherine (otherwise Katherine) Jane Webb to Myrtle Blanche Matthews wife of Charlie Matthews of Tidcombe Hotel Manager of the land within described
Produced and entered 18th January 1926
at 3 mts/pt 3 o'clock in the after noon.
REGISTRAR GENERAL.

No. D733915 TRANSFER dated 2nd October 1947
from the said Myrtle Blanche Matthews to Benjamin Gould Marshall of Rose Bay, Furniture Manufacturer of the land within described
Produced and entered 2nd October 1947
at 16 mts/pt 12 o'clock in the after noon.
REGISTRAR GENERAL.

No. D753735 MORTGAGE dated 2nd October 1947
from the said Benjamin Gould Marshall to Bank of New South Wales.
Produced and entered 12th November 1947
at 35 mts/pt 11 o'clock in the fore noon.
REGISTRAR GENERAL.

No. F629659 DISCHARGE of within mortgage
No. D753735 dated 23rd January 1952
Produced and entered 7th March 1952
at Mts/pt 11 o'clock in the fore noon.
REGISTRAR GENERAL

No. F629660 TRANSFER dated 25th April 1950
from the said Benjamin Gould Marshall to Gould Marshall Pty Limited of the land within described
Produced and entered 7th March 1952
at Mts/pt 11 o'clock in the fore noon.
REGISTRAR GENERAL.

No. F629661 MORTGAGE dated 28th January 1952
from the said Gould Marshall Pty Limited of Australia and New Zealand Bank Limited
Produced and entered 7th 1952
at Mts/pt 11 o'clock in the fore noon.
Discharged P88340 4-2-1975
REGISTRAR GENERAL.

No. P88341 Lease dated 1st August 1974
to George Gittoes of Granville Cabinet Maker of premises known as 21 Jones Street Tidcombe
Entered 4th February 1975
Surrendered Incorporated P333660 23-7-1975
REGISTRAR GENERAL

Eric Neville Littlewood Chartered Accountant and George Gengos Solicitor both of Sydney as joint tenants are now the registered proprietors of the land within described
See TRANSFER No. P333661 dated 1st July 1975
Entered 23rd July 1975
REGISTRAR GENERAL

REGISTERED PROPRIETOR G. Paice Pty. Limited
by Transfer S251054 Registered 14-1-1981
REGISTRAR GENERAL

Mortgage S251055 to Eric Neville Littlewood, Chartered Accountant and George Gengos Solicitor both of Sydney as joint tenants Registered 14-1-1981
DISCHARGED X25303 12-8-1981
REGISTRAR GENERAL

S251055 Mortgage T672590 Variation (Blank) registered 8-8-1983 T672590
DISCHARGED X25303 12-8-1981
REGISTRAR GENERAL

FOLIO CANCELLED – NEW FOLIO IS Auto Consol 503-5

P88340 M ? Lease/R
S251054 (T) -S5M/R
T672590 V/M
X25303 2M R

[redacted]

IFICATE OF TITLE

ERTY ACT, 1900, as amended.

10789223

NEW SOUTH WALES

Application No. 1678

Prior Title Vol. 395 Fol. 228

Vol. 10789 Fol. 223

CANCELLED

MF Edition issued 6-5-1968

L14315

SEE AUTO FOLIO

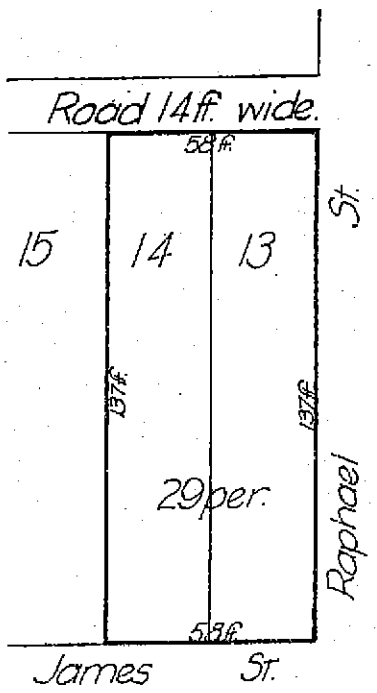
(Page 1) Vol. 10789 Fol. 223

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness

Registrar General.

PLAN SHOWING LOCATION OF LAND



L14315 GH. DL.

Scale 50 feet to one inch.

GRY

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lots 13 and 14 in Deposited Plan 397 at Rookwood in the Municipality of Auburn, Parish of Liberty Plains and County of Cumberland being part of Portion 38 granted to George Sunderland on 30-6-1823.

FIRST SCHEDULE (continued overleaf)

~~GOULD MARSHALL PTY. LIMITED.~~

SECOND SCHEDULE (continuedoverleaf)

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. ~~Mortgage No. H28889 to Australia and New Zealand Bank Limited. Entered 29-8-1958.~~ Discharged K987622

Registrar General.

17 V.C.N. Blight, Government Printer

Vol. 10789 Fol 223

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
~~Benjamin Gould Marshall of Rose Bay, Company Director and Gladys Lee Marshall his wife as joint tenants~~ Benjamin Gould Marshall by Notice of Death Z 12907. Registered 29-5-1990.	Transfer	K987623	9.3.1968	20-5-1968	

CANCELLED

SEE AUTO FOLIO

Exp. Lse No. K987624 effluxion of time

M488384 Lse

T447788

X277165 L R

Z 12907 NA

Z 557846

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
~~Lease~~	~~K987624~~	~~6.2.1968~~	~~To I.B.M. Australia Limited~~	20.5.1968		Expired	9-11-1971	
Lease	M488384	24-9-1971	To Harry Edward Robinson of Castlereagh and Graham Ronald Robinson of Burwood both Company Directors	9.11.1971		Expired	14-3-1983	
~~T447788~~			~~Lease to George Evans and Androula Evans as joint tenants, together with option of renewal. Expires 30-11-1985. Registered 14-3-1983.~~			Expired	9-2-1988	
~~X277165~~			~~Lease to Gosewien Antonius De Bakker. Expires 30-9-1990 with an option of renewal for 3 years. Registered 9-2-1988~~			Z557846	21-3-1991 Z557846.	
Z557846			Lease to Gosewien Antonius De Bakker. Expires 30-9-1993 option of renewal for 3 years. Registered 21-3-1991.					

L

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

Land and Property Information Division

ABN: 84 104 377 806
GPO BOX 15
Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

TITLE SEARCH

Title Reference: 503-5

```
      LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH
      ------------------------------------------------------------


FOLIO: AUTO CONSOL 503-5
------

          SEARCH DATE       TIME              EDITION NO    DATE
          -----------       ----              ----------    ----
          5/11/2015        4:28 PM                3       20/11/2014


LAND
----
LAND DESCRIBED IN SCHEDULE OF PARCELS
   AT ROOKWOOD
   LOCAL GOVERNMENT AREA AUBURN
   PARISH OF LIBERTY PLAINS   COUNTY OF CUMBERLAND
   TITLE DIAGRAM DP397

FIRST SCHEDULE
--------------
JAMES GROUP PROPERTIES PTY LTD                          (T AI981405)

SECOND SCHEDULE (2 NOTIFICATIONS)
---------------
1   RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2   AI981406  MORTGAGE TO AUSTRALIA AND NEW ZEALAND BANKING GROUP
              LIMITED

NOTATIONS
---------
UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS
-------------------
LOTS 15-16 IN DP397.

        ***  END OF SEARCH  ***
```

PRINTED ON 5/11/2015

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TITLE SEARCH

Title Reference: 503-5

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      LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH
      ------------------------------------------------------------


FOLIO: AUTO CONSOL 503-5
------

          SEARCH DATE       TIME              EDITION NO    DATE
          -----------       ----              ----------    ----
          5/11/2015        4:28 PM                3       20/11/2014


LAND
----
LAND DESCRIBED IN SCHEDULE OF PARCELS
   AT ROOKWOOD
   LOCAL GOVERNMENT AREA AUBURN
   PARISH OF LIBERTY PLAINS   COUNTY OF CUMBERLAND
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              LIMITED

NOTATIONS
---------
UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS
-------------------
LOTS 15-16 IN DP397.

        ***  END OF SEARCH  ***
```

PRINTED ON 5/11/2015

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Sydney NSW 2001
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NSW GOVERNMENT Land & Property Information

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TITLE SEARCH

Title Reference: 10789-223

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 10789-223

SEARCH DATE	TIME	EDITION NO	DATE
5/11/2015	4:28 PM	6	20/11/2014

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT ROOKWOOD
LOCAL GOVERNMENT AREA AUBURN
PARISH OF LIBERTY PLAINS COUNTY OF CUMBERLAND
TITLE DIAGRAM DP397

FIRST SCHEDULE

JAMES GROUP PROPERTIES PTY LTD (T AI981403)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AI981406 MORTGAGE TO AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 13-14 IN DP397.

*** END OF SEARCH ***

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Sydney NSW 2001
DX 17 SYDNEY Telephone: 1300 052 637

NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

TITLE SEARCH

Title Reference: 10789-223

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 10789-223

SEARCH DATE	TIME	EDITION NO	DATE
5/11/2015	4:28 PM	6	20/11/2014

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT ROOKWOOD
LOCAL GOVERNMENT AREA AUBURN
PARISH OF LIBERTY PLAINS COUNTY OF CUMBERLAND
TITLE DIAGRAM DP397

FIRST SCHEDULE

JAMES GROUP PROPERTIES PTY LTD (T AI981403)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AI981406 MORTGAGE TO AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 13-14 IN DP397.

*** END OF SEARCH ***

PRINTED ON 5/11/2015

** ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE.*
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

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Sydney NSW 2001
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NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

HISTORY OF TITLE TRANSACTION

Title Reference: 16/397

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
5/11/2015 4:28PM

FOLIO: 16/397

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 503 FOL 5

Recorded	Number	Type of Instrument	C.T. Issue
2/3/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/2/1995		CONVERTED TO AUTO CONSOL 503-5	CONSOL CREATED CT NOT ISSUED

*** END OF SEARCH ***

PRINTED ON 5/11/2015

APPENDIX B: OEH NOTICE SUMMARY

Healthy Environment, Healthy Community, Hea

Home > Contaminated land > Record of notices

Search results

Your search for:Suburb: LIDCOMBE

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

5 November 2015

Connect

APPENDIX C: NATA ACCREDITED LAB RESULTS

eurofins | mgt

Certificate of Analysis

Benviron Group
PO BOX 4405
East Gosford
NSW 2250

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Ben Buckley**

Report **497178-S**
Project name E845
Received Date Apr 18, 2016

Client Sample ID			**BH1_0.6**	**BH1_1.0**	**BH2_0.2**	**BH2_0.9**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15389**	**S16-Ap15390**	**S16-Ap15391**	**S16-Ap15392**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	75	75	72	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH1_0.6	BH1_1.0	BH2_0.2	BH2_0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Ap15389	S16-Ap15390	S16-Ap15391	S16-Ap15392
Date Sampled			Apr 11, 2016	Apr 11, 2016	Apr 11, 2016	Apr 11, 2016
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88	93	93	87
p-Terphenyl-d14 (surr.)	1	%	82	87	88	79
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	116	138	113	127
Tetrachloro-m-xylene (surr.)	1	%	113	132	114	128
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	116	138	113	127
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
% Clay	1	%	-	58	-	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	-	150	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	-	5.9	-	-
% Moisture	1	%	7.6	23	13	20
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	16	-	-

Client Sample ID			BH1_0.6	BH1_1.0	BH2_0.2	BH2_0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Ap15389	S16-Ap15390	S16-Ap15391	S16-Ap15392
Date Sampled			Apr 11, 2016	Apr 11, 2016	Apr 11, 2016	Apr 11, 2016
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.9	5.7	8.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	5.4	8.9	9.0	13
Copper	5	mg/kg	82	22	41	21
Lead	5	mg/kg	< 5	21	41	23
Mercury	0.05	mg/kg	< 0.05	< 0.05	0.06	< 0.05
Nickel	5	mg/kg	28	< 5	33	< 5
Zinc	5	mg/kg	19	30	120	27

Client Sample ID			BH3_0.5	BH3_1.0	BH4_0.6	BH4_1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Ap15393	S16-Ap15394	S16-Ap15395	S16-Ap15396
Date Sampled			Apr 11, 2016	Apr 11, 2016	Apr 11, 2016	Apr 11, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	73	78	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH3_0.5	BH3_1.0	BH4_0.6	BH4_1.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15393**	**S16-Ap15394**	**S16-Ap15395**	**S16-Ap15396**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	93	92	92
p-Terphenyl-d14 (surr.)	1	%	91	88	86	84
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	133	130	128	134
Tetrachloro-m-xylene (surr.)	1	%	130	124	122	124
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	133	130	128	134
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	19	22	21	21

Client Sample ID			BH3_0.5	BH3_1.0	BH4_0.6	BH4_1.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15393**	**S16-Ap15394**	**S16-Ap15395**	**S16-Ap15396**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	10	8.2	29	5.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	1.9	< 0.4
Chromium	5	mg/kg	15	13	18	7.3
Copper	5	mg/kg	17	22	330	19
Lead	5	mg/kg	57	16	660	10
Mercury	0.05	mg/kg	0.06	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	5.6	7.9	26	< 5
Zinc	5	mg/kg	35	39	480	26

Client Sample ID			BH5_0.3	BH5_0.7	BH6_0.3	BH6_0.8
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15397**	**S16-Ap15398**	**S16-Ap15399**	**S16-Ap15400**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	78	77	78
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH5_0.3	BH5_0.7	BH6_0.3	BH6_0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Ap15397	S16-Ap15398	S16-Ap15399	S16-Ap15400
Date Sampled			Apr 11, 2016	Apr 11, 2016	Apr 11, 2016	Apr 11, 2016
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	76	92	93	98
p-Terphenyl-d14 (surr.)	1	%	82	84	93	110
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	131	135	71	67
Tetrachloro-m-xylene (surr.)	1	%	128	127	70	129
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	131	135	71	67
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	25	22	15	12

Client Sample ID			BH5_0.3	BH5_0.7	BH6_0.3	BH6_0.8
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15397**	**S16-Ap15398**	**S16-Ap15399**	**S16-Ap15400**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	50	4.9	15	6.8
Cadmium	0.4	mg/kg	0.8	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	18	6.5	19	11
Copper	5	mg/kg	100	31	15	18
Lead	5	mg/kg	1900	170	30	15
Mercury	0.05	mg/kg	0.05	< 0.05	< 0.05	0.06
Nickel	5	mg/kg	16	< 5	5.6	< 5
Zinc	5	mg/kg	590	110	56	26

Client Sample ID			BH7_0.3	D1
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15401**	**S16-Ap15402**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	74
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			BH7_0.3	D1
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S16-Ap15401	S16-Ap15402
Date Sampled			Apr 11, 2016	Apr 11, 2016
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	89	81
p-Terphenyl-d14 (surr.)	1	%	89	104
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1
Dibutylchlorendate (surr.)	1	%	119	134
Tetrachloro-m-xylene (surr.)	1	%	112	127
Polychlorinated Biphenyls (PCB)				
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	119	134
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
% Moisture	1	%	9.0	15

Client Sample ID			BH7_0.3	D1
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Ap15401**	**S16-Ap15402**
Date Sampled			**Apr 11, 2016**	**Apr 11, 2016**
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	2	mg/kg	3.8	10
Cadmium	0.4	mg/kg	0.5	< 0.4
Chromium	5	mg/kg	11	13
Copper	5	mg/kg	46	54
Lead	5	mg/kg	32	38
Mercury	0.05	mg/kg	0.05	< 0.05
Nickel	5	mg/kg	6.8	6.6
Zinc	5	mg/kg	1100	31

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 (regarding both quality and NATA accreditation).

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	Apr 19, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Apr 19, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Apr 19, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Apr 19, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Apr 19, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Apr 19, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Sydney	Apr 19, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Apr 19, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
% Clay	Brisbane	Apr 20, 2016	6 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract)	Sydney	Apr 20, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C)	Sydney	Apr 20, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	Apr 20, 2016	
% Moisture	Sydney	Apr 18, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Benviron Group
Address: PO BOX 4405
East Gosford
NSW 2250

Project Name: E845

Order No.:
Report #: 497178
Phone:
Fax:

Received: Apr 18, 2016 7:30 AM
Due: Apr 21, 2016
Priority: 3 Day
Contact Name: Ben Buckley

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					% Clay	pH (1:5 Aqueous extract)	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271									X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794					X					
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH1_0.6	Apr 11, 2016		Soil	S16-Ap15389			X	X		X
BH1_1.0	Apr 11, 2016		Soil	S16-Ap15390	X	X	X	X	X	X
BH2_0.2	Apr 11, 2016		Soil	S16-Ap15391			X	X		X
BH2_0.9	Apr 11, 2016		Soil	S16-Ap15392			X	X		X
BH3_0.5	Apr 11, 2016		Soil	S16-Ap15393			X	X		X
BH3_1.0	Apr 11, 2016		Soil	S16-Ap15394			X	X		X
BH4_0.6	Apr 11, 2016		Soil	S16-Ap15395			X	X		X
BH4_1.2	Apr 11, 2016		Soil	S16-Ap15396			X	X		X
BH5_0.3	Apr 11, 2016		Soil	S16-Ap15397			X	X		X
BH5_0.7	Apr 11, 2016		Soil	S16-Ap15398			X	X		X

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Contact Name: Ben Buckley

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					% Clay	pH (1:5 Aqueous extract)	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271									X	
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794					X					
External Laboratory										
BH6_0.3	Apr 11, 2016		Soil	S16-Ap15399			X	X		X
BH6_0.8	Apr 11, 2016		Soil	S16-Ap15400			X	X		X
BH7_0.3	Apr 11, 2016		Soil	S16-Ap15401			X	X		X
D1	Apr 11, 2016		Soil	S16-Ap15402			X	X		X

Internal Quality Control Review and Glossary

General

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

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt 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.

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

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

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. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 50-150% - Phenols 20-130%.

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	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	< 5			5	Pass	
Method Blank							
Ion Exchange Properties							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	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	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	88			70-130	Pass	
TRH C10-C14	%	72			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	91			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	92			70-130	Pass	
TRH C6-C10	%	101			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	84			70-130	Pass	
Anthracene	%	97			70-130	Pass	
Benz(a)anthracene	%	89			70-130	Pass	
Benzo(a)pyrene	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	%	81			70-130	Pass	
Benzo(g.h.i)perylene	%	79			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a.h)anthracene	%	76			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	88			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	77			70-130	Pass	
Naphthalene	%	94			70-130	Pass	
Phenanthrene	%	128			70-130	Pass	
Pyrene	%	76			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	90			70-130	Pass	
4.4'-DDD	%	89			70-130	Pass	
4.4'-DDE	%	91			70-130	Pass	
4.4'-DDT	%	82			70-130	Pass	
a-BHC	%	97			70-130	Pass	
Aldrin	%	94			70-130	Pass	
b-BHC	%	87			70-130	Pass	
d-BHC	%	91			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	92			70-130	Pass	
Endosulfan II	%	85			70-130	Pass	
Endosulfan sulphate	%	90			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	94			70-130	Pass	
Endrin ketone	%	98			70-130	Pass	
g-BHC (Lindane)	%	94			70-130	Pass	
Heptachlor	%	104			70-130	Pass	
Heptachlor epoxide	%	91			70-130	Pass	
Hexachlorobenzene	%	92			70-130	Pass	
Methoxychlor	%	87			70-130	Pass	
Toxaphene	%	87			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	121			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	77			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			70-130	Pass	
Cadmium	%	104			70-130	Pass	
Chromium	%	103			70-130	Pass	
Copper	%	105			70-130	Pass	
Lead	%	103			70-130	Pass	
Mercury	%	105			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel			%	105			70-130	Pass	
Zinc			%	105			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Ap17125	NCP	%	88			70-130	Pass	
Acenaphthylene	S16-Ap17125	NCP	%	88			70-130	Pass	
Anthracene	S16-Ap17125	NCP	%	96			70-130	Pass	
Benz(a)anthracene	S16-Ap17125	NCP	%	78			70-130	Pass	
Benzo(a)pyrene	S16-Ap17125	NCP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Ap17125	NCP	%	87			70-130	Pass	
Benzo(g.h.i)perylene	S16-Ap17125	NCP	%	75			70-130	Pass	
Benzo(k)fluoranthene	S16-Ap17125	NCP	%	88			70-130	Pass	
Chrysene	S16-Ap17125	NCP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	S16-Ap17125	NCP	%	76			70-130	Pass	
Fluoranthene	S16-Ap17125	NCP	%	78			70-130	Pass	
Fluorene	S16-Ap17125	NCP	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Ap17125	NCP	%	76			70-130	Pass	
Naphthalene	S16-Ap17125	NCP	%	91			70-130	Pass	
Phenanthrene	S16-Ap17125	NCP	%	123			70-130	Pass	
Pyrene	S16-Ap17125	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S16-Ap15390	CP	%	85			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-Ap15390	CP	%	121			70-130	Pass	
4.4'-DDE	S16-Ap15390	CP	%	127			70-130	Pass	
4.4'-DDT	S16-Ap15390	CP	%	89			70-130	Pass	
a-BHC	S16-Ap15390	CP	%	116			70-130	Pass	
Aldrin	S16-Ap15390	CP	%	119			70-130	Pass	
b-BHC	S16-Ap15390	CP	%	109			70-130	Pass	
d-BHC	S16-Ap15390	CP	%	123			70-130	Pass	
Dieldrin	S16-Ap15390	CP	%	123			70-130	Pass	
Endosulfan I	S16-Ap15390	CP	%	121			70-130	Pass	
Endosulfan II	S16-Ap15390	CP	%	116			70-130	Pass	
Endosulfan sulphate	S16-Ap15390	CP	%	112			70-130	Pass	
Endrin	S16-Ap15390	CP	%	107			70-130	Pass	
Endrin aldehyde	S16-Ap15390	CP	%	124			70-130	Pass	
Endrin ketone	S16-Ap15390	CP	%	118			70-130	Pass	
g-BHC (Lindane)	S16-Ap15390	CP	%	114			70-130	Pass	
Heptachlor	S16-Ap15390	CP	%	109			70-130	Pass	
Heptachlor epoxide	S16-Ap15390	CP	%	118			70-130	Pass	
Hexachlorobenzene	S16-Ap15390	CP	%	108			70-130	Pass	
Methoxychlor	S16-Ap15390	CP	%	98			70-130	Pass	
Toxaphene	S16-Ap15390	CP	%	113			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Ap15390	CP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Ap15390	CP	%	87			70-130	Pass	
Cadmium	S16-Ap15390	CP	%	94			70-130	Pass	
Chromium	S16-Ap15390	CP	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper	S16-Ap15390	CP	%	103			70-130	Pass	
Mercury	S16-Ap15390	CP	%	99			70-130	Pass	
Nickel	S16-Ap15390	CP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Ap15400	CP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Ap15400	CP	%	95			70-130	Pass	
Toluene	S16-Ap15400	CP	%	85			70-130	Pass	
Ethylbenzene	S16-Ap15400	CP	%	84			70-130	Pass	
m&p-Xylenes	S16-Ap15400	CP	%	87			70-130	Pass	
o-Xylene	S16-Ap15400	CP	%	87			70-130	Pass	
Xylenes - Total	S16-Ap15400	CP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Ap15400	CP	%	83			70-130	Pass	
TRH C6-C10	S16-Ap15400	CP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-Ap15400	CP	%	108			70-130	Pass	
4.4'-DDD	S16-Ap15400	CP	%	123			70-130	Pass	
4.4'-DDE	S16-Ap15400	CP	%	111			70-130	Pass	
4.4'-DDT	S16-Ap15400	CP	%	72			70-130	Pass	
a-BHC	S16-Ap15400	CP	%	105			70-130	Pass	
Aldrin	S16-Ap15400	CP	%	108			70-130	Pass	
b-BHC	S16-Ap15400	CP	%	101			70-130	Pass	
d-BHC	S16-Ap15400	CP	%	111			70-130	Pass	
Dieldrin	S16-Ap15400	CP	%	110			70-130	Pass	
Endosulfan I	S16-Ap15400	CP	%	109			70-130	Pass	
Endosulfan II	S16-Ap15400	CP	%	105			70-130	Pass	
Endosulfan sulphate	S16-Ap15400	CP	%	103			70-130	Pass	
Endrin	S16-Ap15400	CP	%	92			70-130	Pass	
Endrin aldehyde	S16-Ap15400	CP	%	118			70-130	Pass	
Endrin ketone	S16-Ap15400	CP	%	108			70-130	Pass	
g-BHC (Lindane)	S16-Ap15400	CP	%	103			70-130	Pass	
Heptachlor	S16-Ap15400	CP	%	97			70-130	Pass	
Heptachlor epoxide	S16-Ap15400	CP	%	107			70-130	Pass	
Hexachlorobenzene	S16-Ap15400	CP	%	94			70-130	Pass	
Methoxychlor	S16-Ap15400	CP	%	93			70-130	Pass	
Toxaphene	S16-Ap15400	CP	%	80			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S16-Ap15400	CP	%	126			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Ap15400	CP	%	81			70-130	Pass	
Cadmium	S16-Ap15400	CP	%	92			70-130	Pass	
Chromium	S16-Ap15400	CP	%	85			70-130	Pass	
Copper	S16-Ap15400	CP	%	96			70-130	Pass	
Lead	S16-Ap15400	CP	%	90			70-130	Pass	
Mercury	S16-Ap15400	CP	%	100			70-130	Pass	
Nickel	S16-Ap15400	CP	%	91			70-130	Pass	
Zinc	S16-Ap15400	CP	%	91			70-130	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 C6-C9	S16-Ap15389	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-Ap15389	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Ap15389	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Ap15389	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Ap15389	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-Ap15389	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-Ap15389	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-Ap15389	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-Ap15389	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-Ap15389	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-Ap15389	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-Ap15389	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Heptachlor	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-Ap15389	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-Ap15389	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-Ap15389	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Ap15389	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Ap15389	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Ap15389	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Ap15389	CP	%	7.6	6.3	19	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Ap15389	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S16-Ap15389	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Ap15389	CP	mg/kg	5.4	< 5	8.0	30%	Pass	
Copper	S16-Ap15389	CP	mg/kg	82	79	4.0	30%	Pass	
Lead	S16-Ap15389	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	S16-Ap15389	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-Ap15389	CP	mg/kg	28	27	5.0	30%	Pass	
Zinc	S16-Ap15389	CP	mg/kg	19	20	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M15-Jn21902	NCP	%	33	33	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C)	S16-Ap15390	CP	uS/cm	150	150	2.0	30%	Pass	
pH (1:5 Aqueous extract)	S16-Ap15390	CP	pH Units	5.9	6.0	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Ap15399	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Ap15399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-Ap15399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-Ap15399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-Ap15399	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-Ap15399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-Ap15399	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-Ap15399	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-Ap15399	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-Ap15399	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-Ap15399	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-Ap15399	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Ap15399	CP	%	15	16	5.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Ap15399	CP	mg/kg	15	13	15	30%	Pass	
Cadmium	S16-Ap15399	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Ap15399	CP	mg/kg	19	16	14	30%	Pass	
Copper	S16-Ap15399	CP	mg/kg	15	15	2.0	30%	Pass	
Lead	S16-Ap15399	CP	mg/kg	30	25	20	30%	Pass	
Mercury	S16-Ap15399	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-Ap15399	CP	mg/kg	5.6	< 5	34	30%	Fail	Q15
Zinc	S16-Ap15399	CP	mg/kg	56	51	10	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
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 | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)
Richard Corner	Senior Analyst-Inorganic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

APPENDIX D PROPOSED DEVELOPMENT PLANS

SITE
1:300

UNIT CALCULATIONS

LEVEL	UNIT NO	NO OF BEDS	FLOOR AREA	Balcony		PARKING SPACES	STORAGE UNIT	STORAGE BASEMENT	SOLAR ACCESS	CROSS FLOW	SINGLE ORIENT	ADAPTABLE
GROUND FLOOR	G.1	1	46	23	69	1	4	4	YES	NO		
	G.2	1	75	21.5	96.5	2	4	4	YES	NO		
	G.3	1	75	22	97	1	4	4	YES	YES		
	G.4	1	76	8	84	1	4	4	NO	YES		
	G.5	2	52.5	10.5	63	1	4	4	NO	YES		
	G.6	1	76.5	10	86.5	1	4	4	NO	NO		
	G.7	2	64.5	10	74.5	1	4	4	NO	NO		
	G.8	1	75	9.5	84.5	1	4	4	YES	YES		
LEVEL 1	L.1	1	75	14.5	89.5	1	4	4	YES	YES		
	L.2	1	75	14.5	89.5	1	4	4	YES	NO		
	L.3	1	75	14.5	89.5	1	4	4	YES	NO		
	L.4	2	59.5	17.5	77	1	4	4	YES	YES		
	L.5	2	54.5	13.5	68	1	4	4	YES	YES		
	L.6	1	76	20.5	96.5	1	4	4	YES	NO		
	L.7	2	52.5	9.5	62	1	4	4	NO	YES		
	L.8	1	76.5	10	86.5	1	4	4	NO	YES		
	L.9	1	75	10	85	1	4	4	NO	NO		
	L.10	1	75	9.5	84.5	1	4	4	YES	YES		
LEVEL 2-5	L5.1	1	76.1	14.5	90.6	1	4	4	YES	YES		
	L5.2	1	74.9	14.6	89.5	1	4	4	YES	NO		
	L5.3	1	74.9	14.6	89.5	1	4	4	YES	NO		
	L5.4	2	62.9	18.9	81.8	1	4	4	YES	YES		
	L5.5	2	58	9.4	67.4	1	4	4	YES	YES		
	L5.6	1	75.3	9.4	84.7	1	4	4	YES	NO		
	L5.7	1	75.5	9.4	84.9	1	4	4	NO	YES		
	L5.8	1	76.5	10.1	86.6	1	4	4	NO	NO		
	L5.9	1	74.8	10.1	84.9	1	4	4	NO	NO		
	L5.10	1	74.8	9.5	84.3	1	4	4	YES	YES		
LEVEL6	L.1	1	76	14.5	90.5	1	4	4	YES	YES		
	L.2	1	75	14.5	89.5	1	4	4	YES	NO		
	L.3	1	75	14.5	89.5	1	4	4	YES	NO		
	L.4	2	63	19	82	1	4	4	YES	YES		
	L.5	2	58.5	9.5	68	1	4	4	YES	YES		
	L.6	1	75.5	9.5	85	1	4	4	YES	NO		
	L.7	1	75.5	9.5	85	1	4	4	NO	YES		
	L.8	1	85.6	10	95.6	1	4	4	NO	YES		
	L.9	2	55	10	65	1	4	4	NO	NO		
	L.10		96.5	9.5	106	2	4	4	YES	YES		
LEVEL7	L.1	1	76	14.5	90.5	1	4	4	YES	NO		
	L.2	1	75	14.5	89.5	1	4	4	YES	NO		
	L.3	1	75	14.5	89.5	1	4	4	YES	NO		
	L.4	2	63	19	82	1	4	4	YES	YES		
	L.5	2	58.5	9.5	68	1	4	4	YES	YES		
	L.6	1	75.5	9.5	85	1	4	4	YES	NO		
	L.7	1	75.5	9.5	85	1	4	4	NO	YES		
	L.8	1	76.5	10	86.5	1	4	4	NO	YES		
	L.9	1	75.5	9	84.5	1	4	4	NO	NO		
	L.10	1	75	9.5	84.5	1	4	4	YES	YES		
LEVEL8	L.1	1	75	14.5	89.5	1	4	4	YES	YES		
	L.2	1	75	14.5	89.5	1	4	4	YES	NO		
	L.3	1	75	14.5	89.5	1	4	4	YES	NO		
	L.4	2	63	18	81	1	4	4	YES	YES		
	L.5	2	58.5	9	67.5	1	4	4	YES	YES		
	L.6	1	75	9	84	1	4	4	YES	NO		
	L.7	1	75.5	9.5	85	1	4	4	NO	YES		
	L.9	1	75	9	84	1	4	4	YES	NO		
	L.10	1	75	9	84	1	4	4	YES	YES		
LEVEL9	L.1	1	75	14.5	89.5	1	4	4	YES	YES		
	L.2	1	75	14.6	89.6	1	4	4	YES	YES		
	L.3	1	75	14.6	89.6	1	4	4	YES	YES		
	L.4	2	63	17.4	80.4	1	4	4	YES	YES		
	L.5	2	58.5	9	67.5	1	4	4	YES	YES		
	L.6	1	75.5	9	84.5	1	4	4	YES	YES		
	L.7	1	75.5	9	84.5	1	4	4	YES	YES		

UNIT MIX

LEVEL		1 BED	2 BED	3 BED	TOTAL
Ground		2	6	0	8
1		3	7	0	10
2		2	8	0	10
3		2	8	0	10
4		2	8	0	10
5		2	8	0	10
6		3	6	1	10
7		2	8	0	10
8		2	7	0	9
9		2	5	0	7
TOTAL		22	71	1	94
PERCENT		19%	76%	1%	100%

GFA CALC

GFA TOTAL		
GROUND		719
1		744.5
2		744.5
3		744.5
4		744.5
5		744.5
6		744.5
7		744.5
8		668.5
9		514
TOTAL		7113
SITE AREA		1477

CALCULATION TABLE

TOTAL SITE AREA 1477 m²

CONTROL	MAX ALLOWABLE	PROPOSED
GROSS FLOOR AREA (GFA)	7385	7113
FLOOR SPACE RATIO (FSR)	5 : 1	5
BUILDING HEIGHT	32m	<32m

CONTROL	MIN. REQUIRED		PROPOSED
SOLAR ACCESS	70%	66 UNITS	70 UNITS
CROSS VENTILATION	60%	56 UNITS	58 UNITS
SINGLE ORIENTED SOUTH FACING UNITS	10%	9 UNITS	0 UNITS
COMUNAL OPEN SPACE	25%	369 m2	510m2

CAR PARKING

CONTROL	m2	UNITS	MIN REQUIRED	PROPOSED
*1 - 1 SPACES / **1 AND 2 BED UNIT***		93	93	93
*2 - SPACES / **3 BED UNIT***		1	2	2
***VISITOR** = 1 SPACE / 5 UNITS*		94	18.8	19
Total Residential			**113.8**	114
Car Wash			**1**	1
Total			**114.8**	115

WASTE	MIN. REQUIRED			PROPOSED
*240L BIN / 2 **UNITS***	*94*	UNITS	47	
*240L BIN / 2 **UNITS***	*94*	UNITS	47	
TOTAL			94 BINS	94

Issue	Amendment	Date
A	COORDINATION	19/10/15

Do not scale drawings. Verify all dimensions on site

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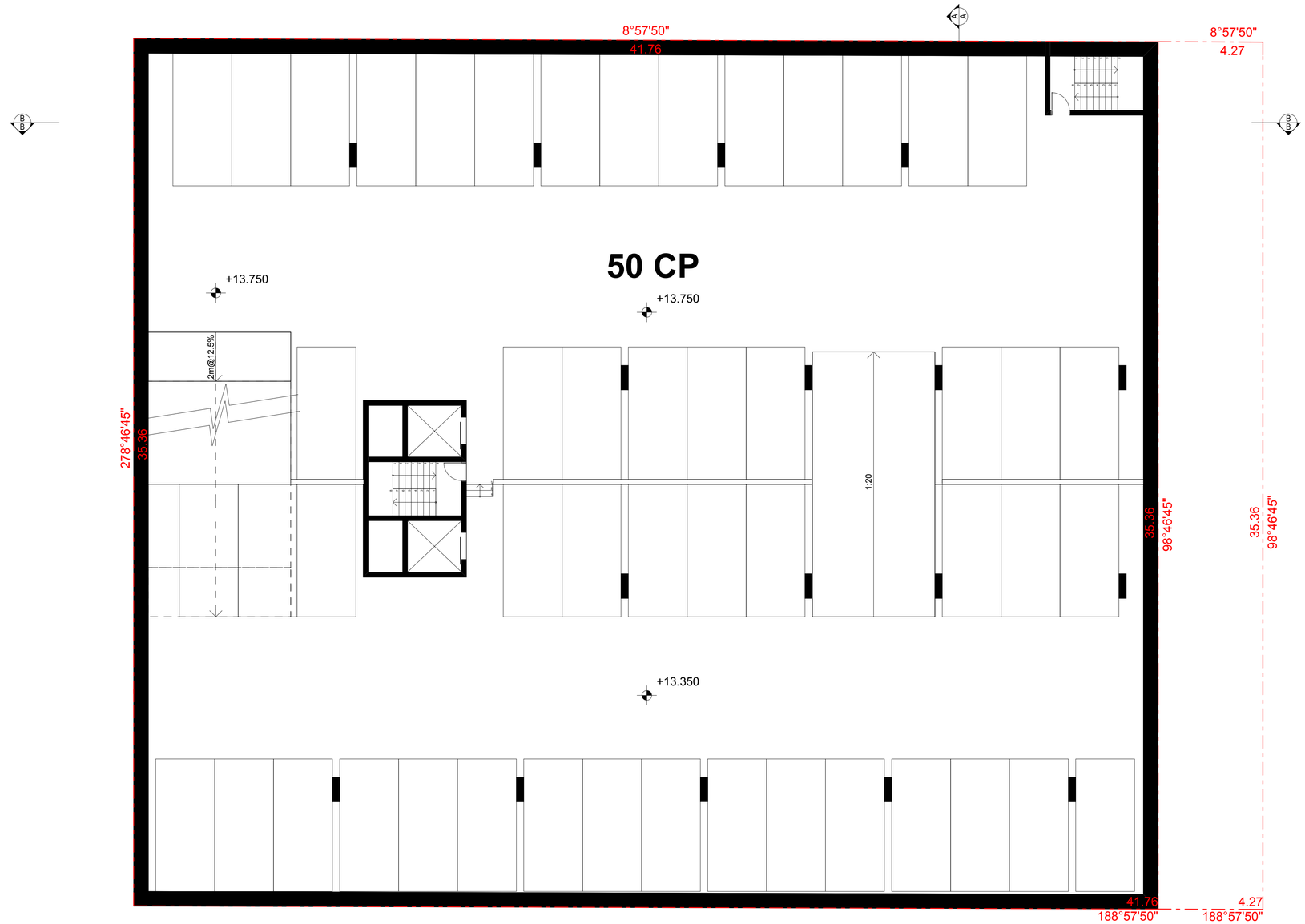
DEVELOPMENT APPLICATION

project: 21-23 JAMES STREET, LIDCOMBE
project no: 15-046
client: JAMES STREET DEVELOPMENT UNIT TRUST
scale: as shown@ A1
date: 19/10/15
drawing: SITE & ROOF
drawn: TV
checked: ZB
drawing no: DA- 001
Issue: A



BASEMENT 3
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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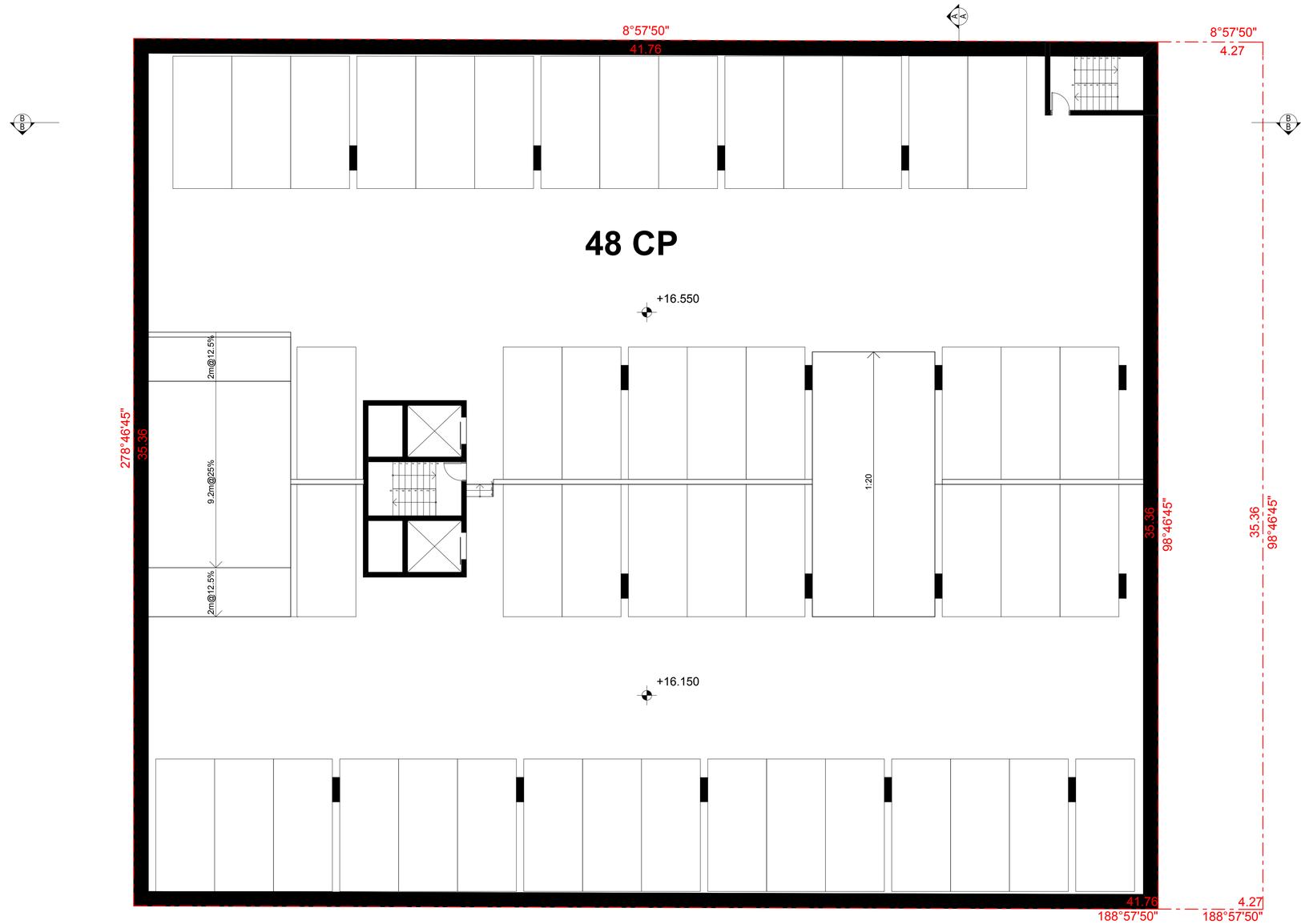
DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**BASEMENT 3**	drawn	TV
		checked	ZB

drawing no **DA- 101**

Issue A



BASEMENT 2
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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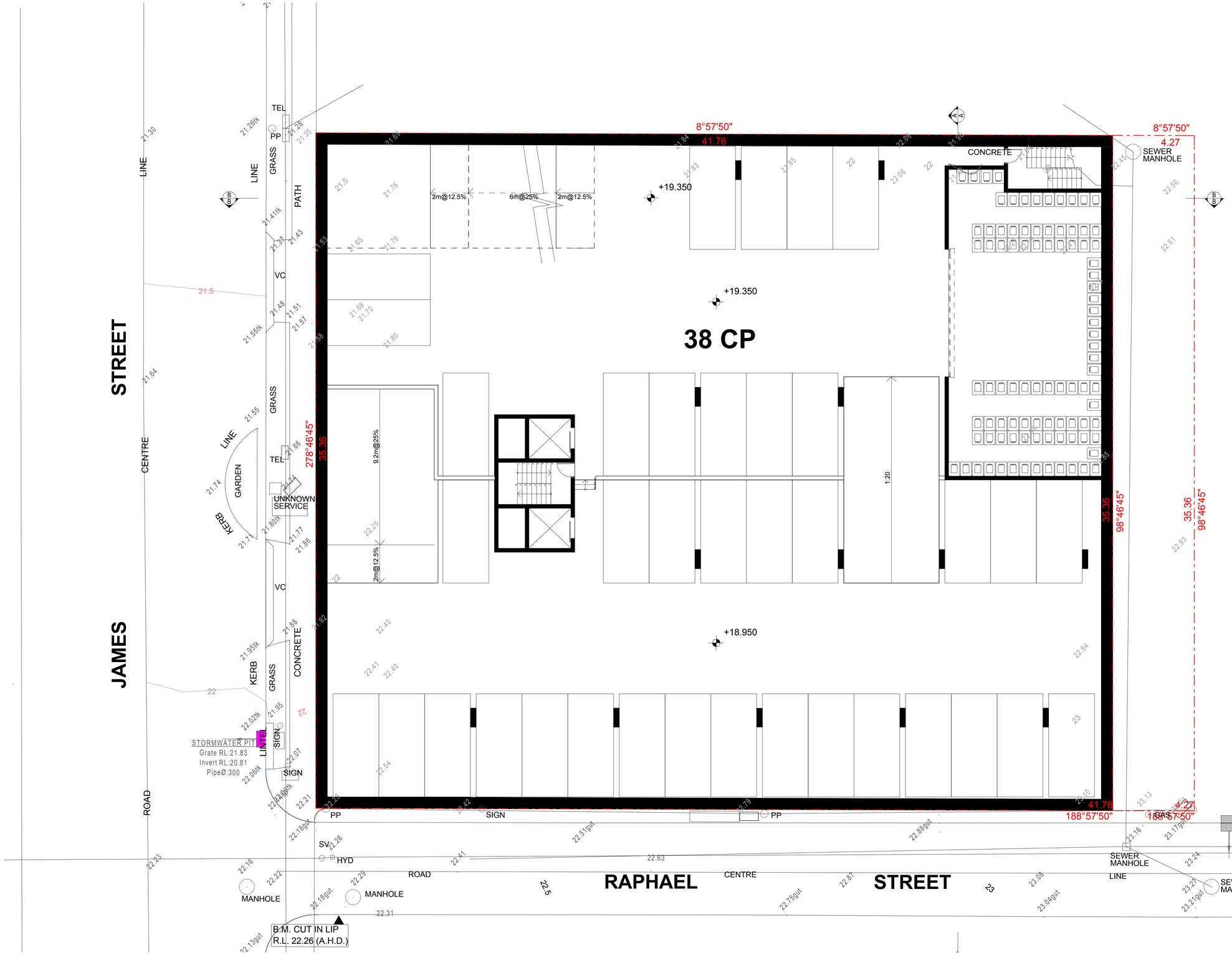
DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**BASEMENT 2**	drawn	TV
		checked	ZB

drawing no **DA- 102**

Issue A



BASEMENT 1
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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DEVELOPMENT APPLICATION

project: 21-23 JAMES STREET, LIDCOMBE
project no: 15-046
client: JAMES STREET DEVELOPMENT UNIT TRUST
scale: as shown@ A1
date: 19/10/15
drawing: **BASEMENT FLOOR**
drawn: TV
checked: ZB

drawing no **DA- 103**
Issue A

GROUND FLOOR
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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LEGEND	
CROSS VENTIALTION	
SOLAR ACCESS	

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**GROUND FLOOR**	drawn	TV
		checked	ZB

drawing no **DA- 104**

Issue A

LEVEL 1
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

Do not scale drawings. Verify all dimensions on site

LEGEND	
CROSS VENTIALTION	
SOLAR ACCESS	

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 1**	drawn	TV
		checked	ZB

drawing no **DA- 105**

Issue A

LEVEL 2
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 2- LEVEL 5**	drawn	TV
		checked	ZB

drawing no **DA-106**

Issue A

LEVEL 6
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 6**	drawn	TV
		checked	ZB

drawing no **DA- 107**

Issue A

LEVEL 7
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 7**	drawn	TV
		checked	ZB

drawing no **DA- 108**

Issue A

LEVEL 8
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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LEGEND	
CROSS VENTIALTION	
SOLAR ACCESS	

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DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 8**	drawn	TV
		checked	ZB

drawing no **DA- 109**

Issue A

LEVEL 9
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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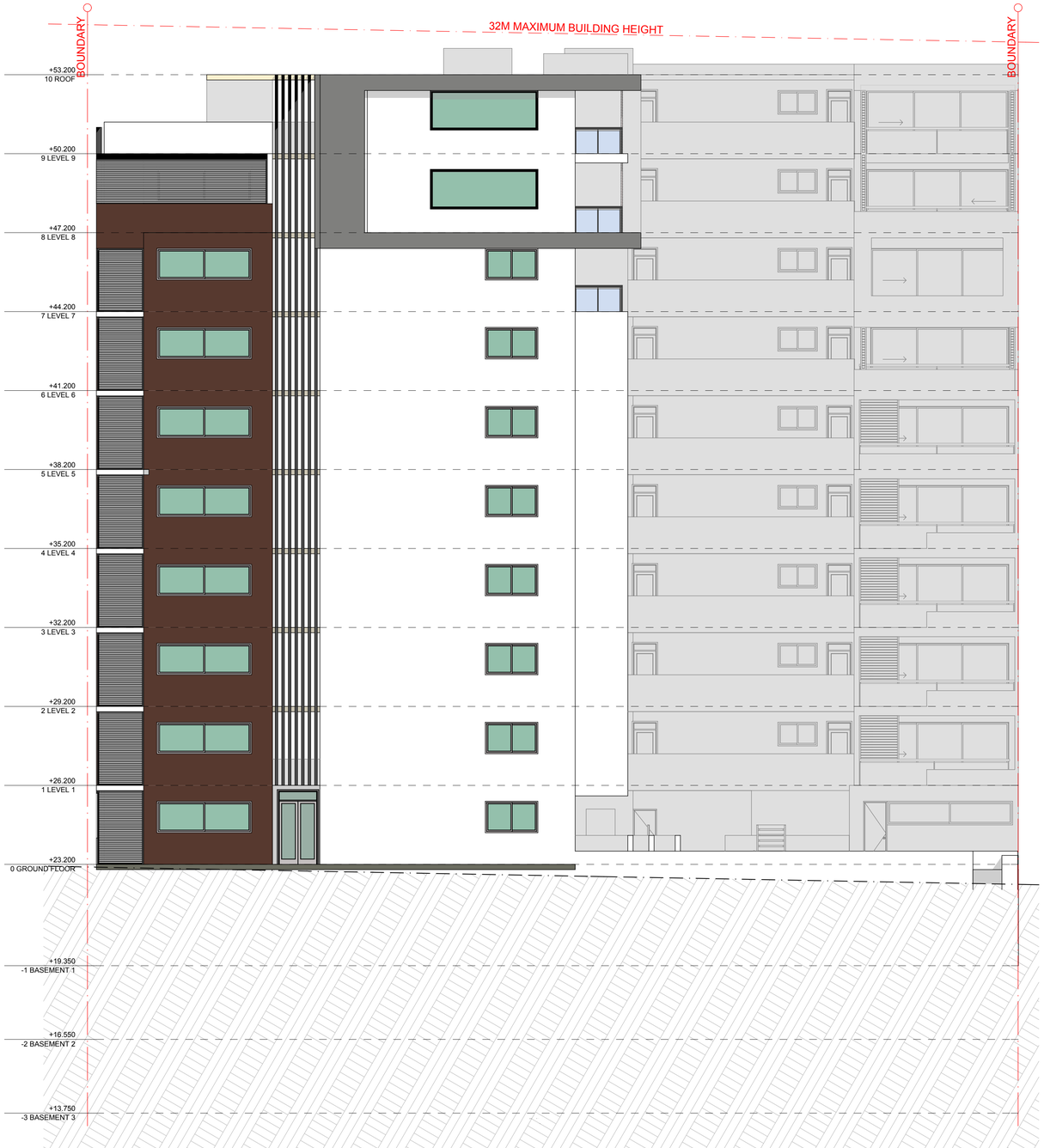
DEVELOPMENT APPLICATION

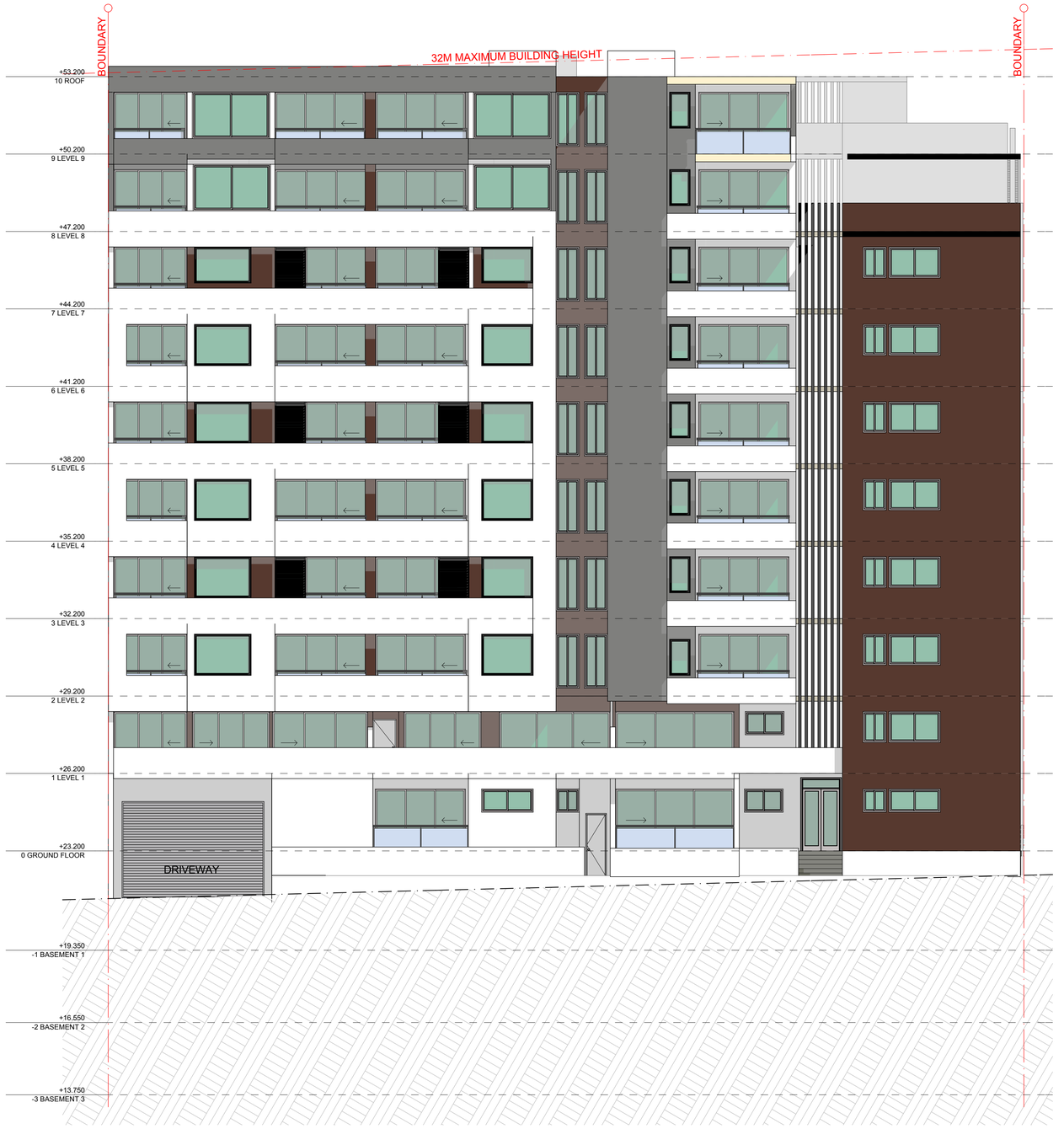
project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**LEVEL 9**	drawn	TV
		checked	ZB

drawing no **DA- 110**

Issue A



NORTH ELEVATION
1:100



SOUTH ELEVATION
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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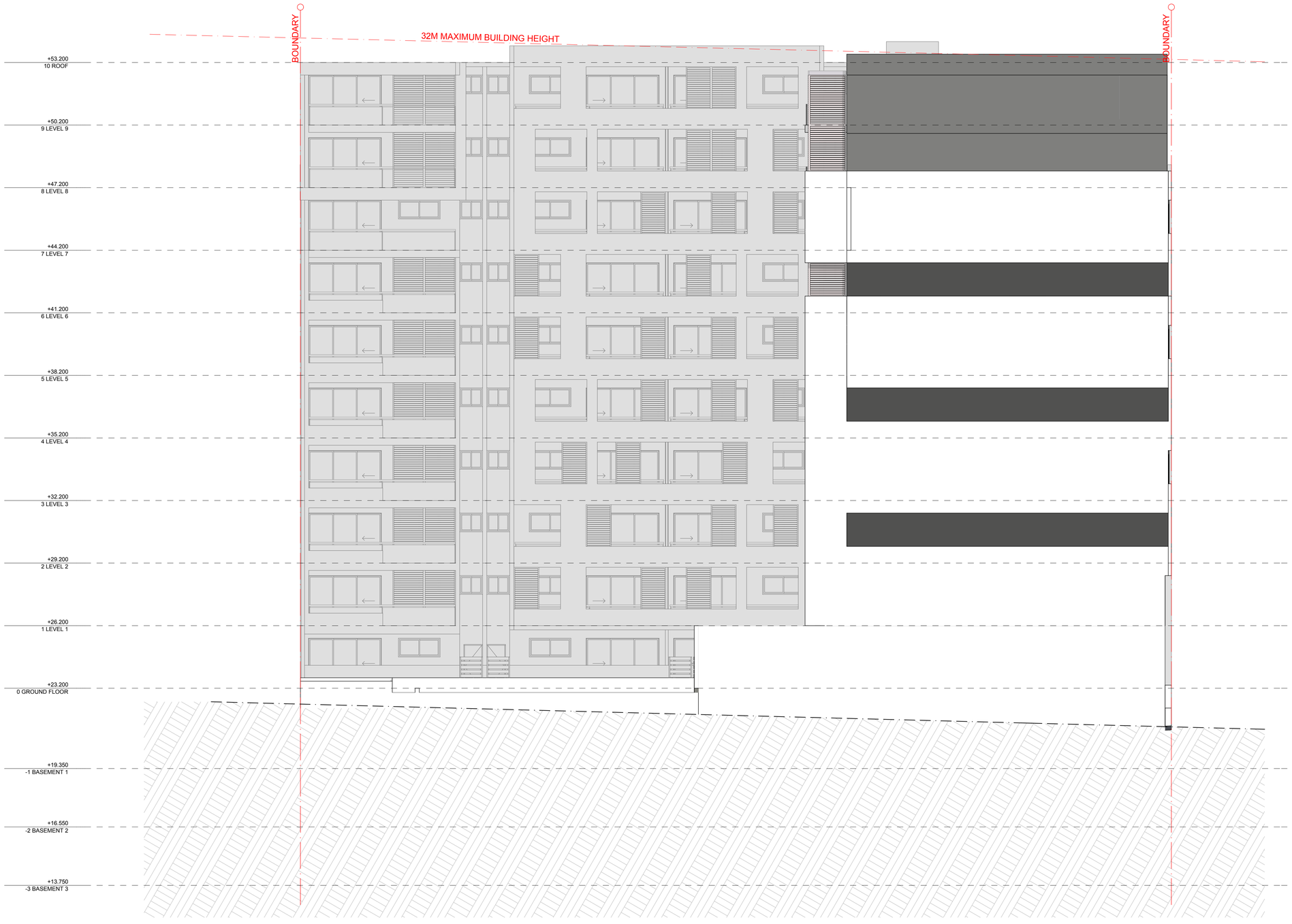
DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**NORTH & SOUTH**	drawn	TV
		checked	ZB

drawing no **DA- 201**

Issue A



WEST ELEVATION
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

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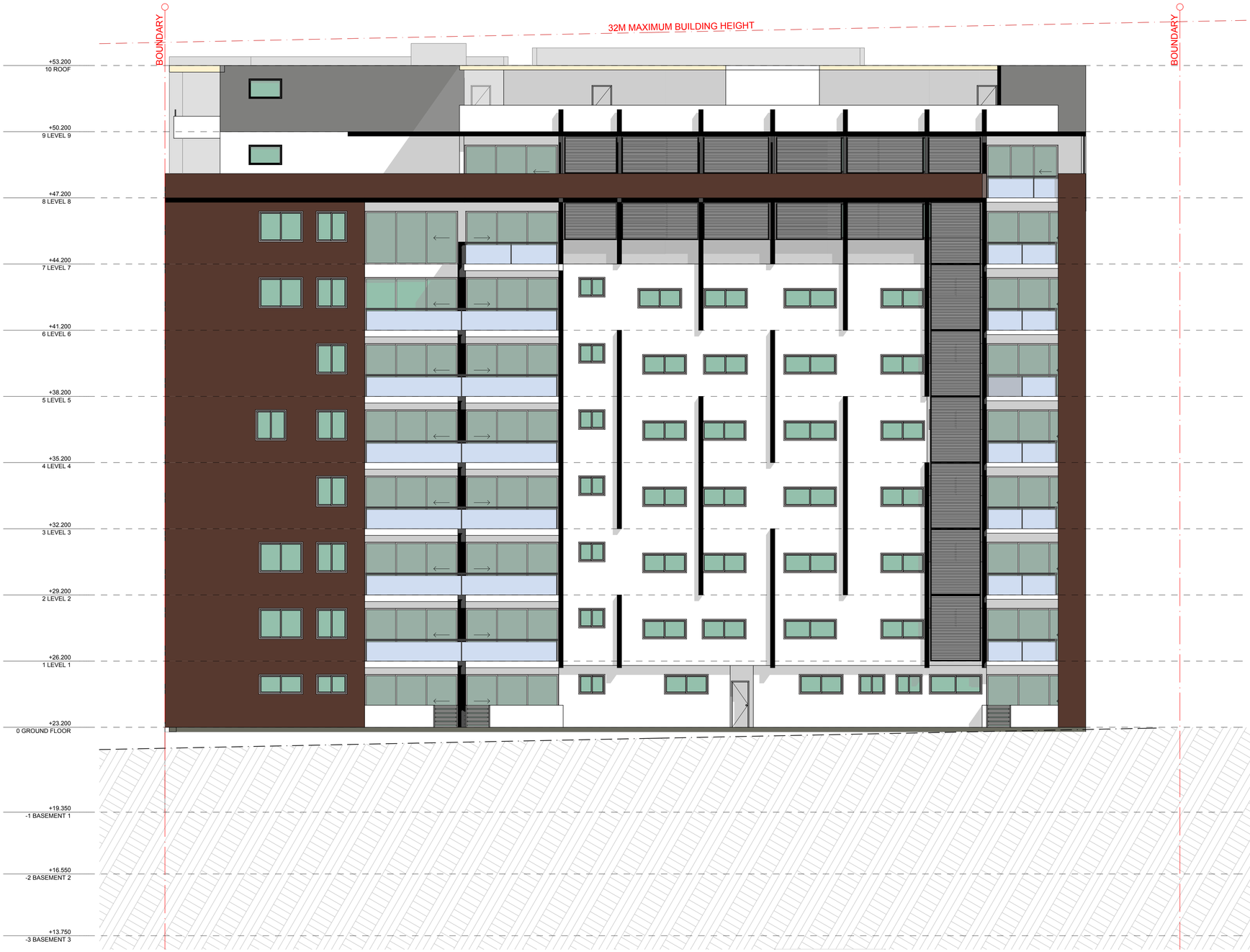
DEVELOPMENT APPLICATION

project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**WEST ELEVATION**	drawn	TV
		checked	ZB

drawing no **DA- 202**

Issue A



EAST ELEVATION
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

Do not scale drawings. Verify all dimensions on site

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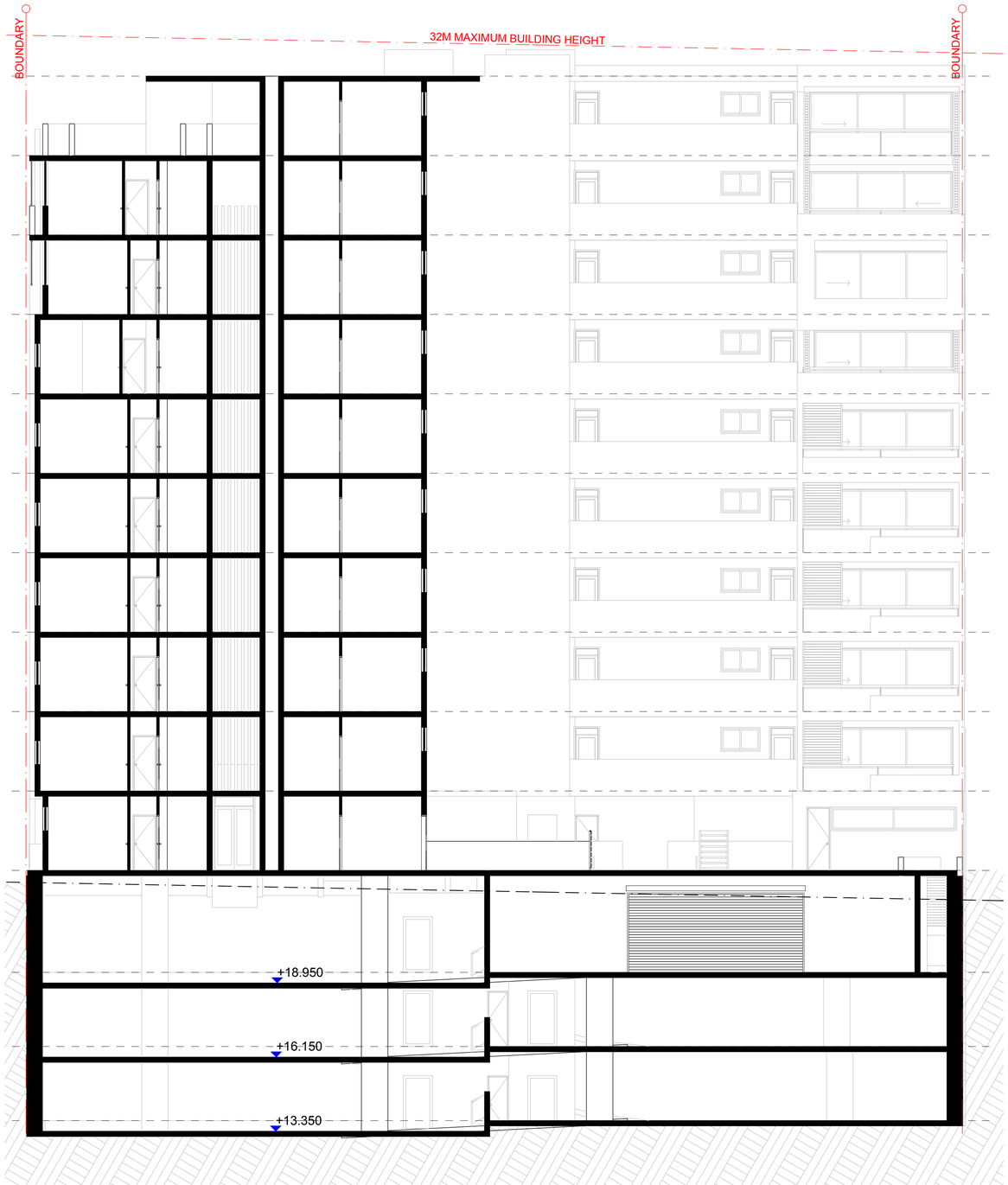
DEVELOPMENT APPLICATION

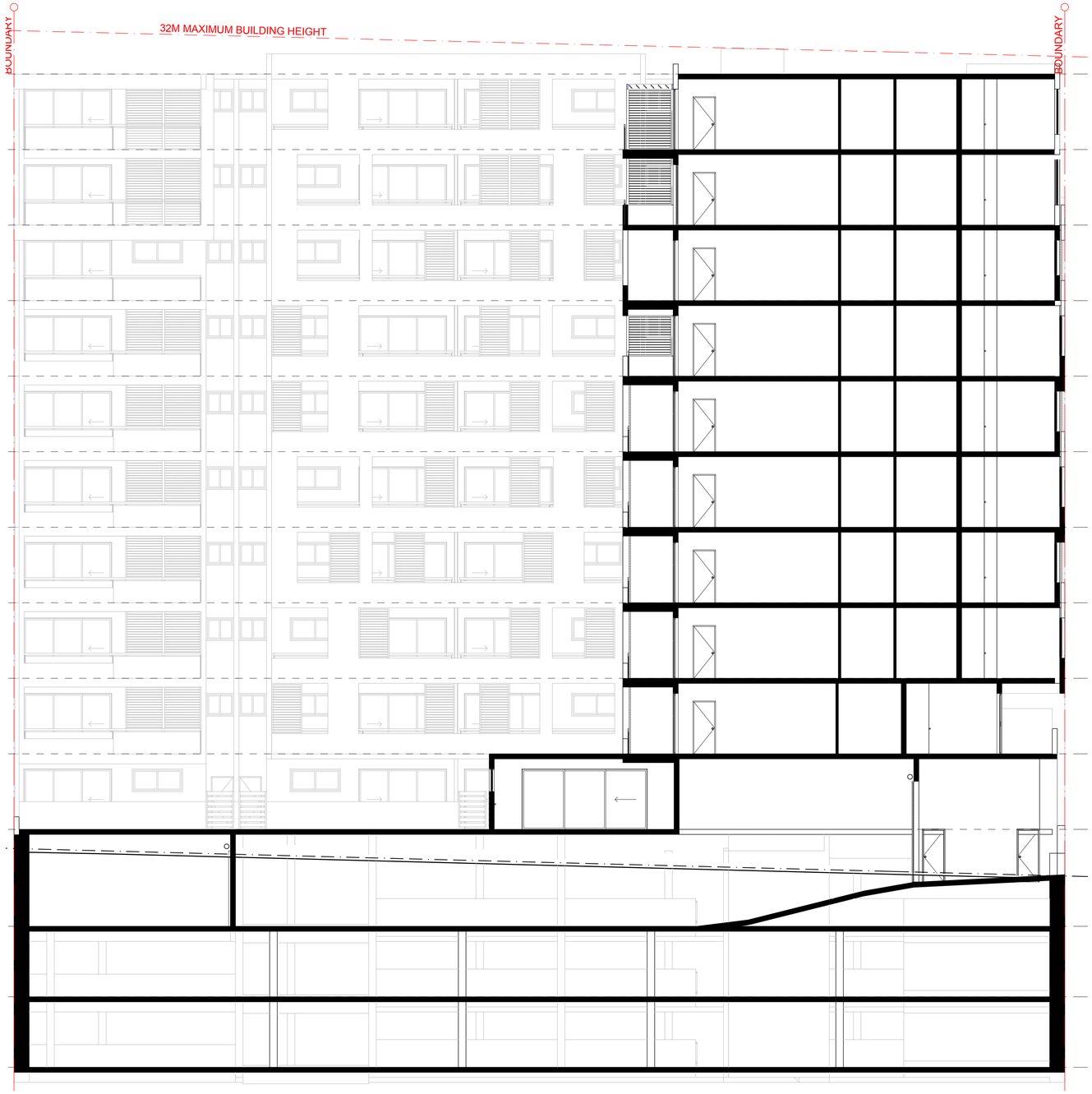
project	21-23 JAMES STREET, LIDCOMBE	project no	15-046
client	JAMES STREET DEVELOPMENT UNIT TRUST	scale	as shown@ A1
		date	19/10/15
drawing	**EAST ELEVATION**	drawn	TV
		checked	ZB

drawing no **DA- 203**

Issue A



SECTION A
1:100



SECTION B
1:100

Issue	Amendment	Date
A	COORDINATION	19/10/15

Do not scale drawings. Verify all dimensions on site

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DEVELOPMENT APPLICATION

project: 21-23 JAMES STREET, LIDCOMBE
project no: 15-046
client: JAMES STREET DEVELOPMENT UNIT TRUST
scale: as shown@ A1
date: 19/10/15
drawing: **SECTIONS &**
drawn: TV
checked: ZB

drawing no **DA- 301**
Issue A