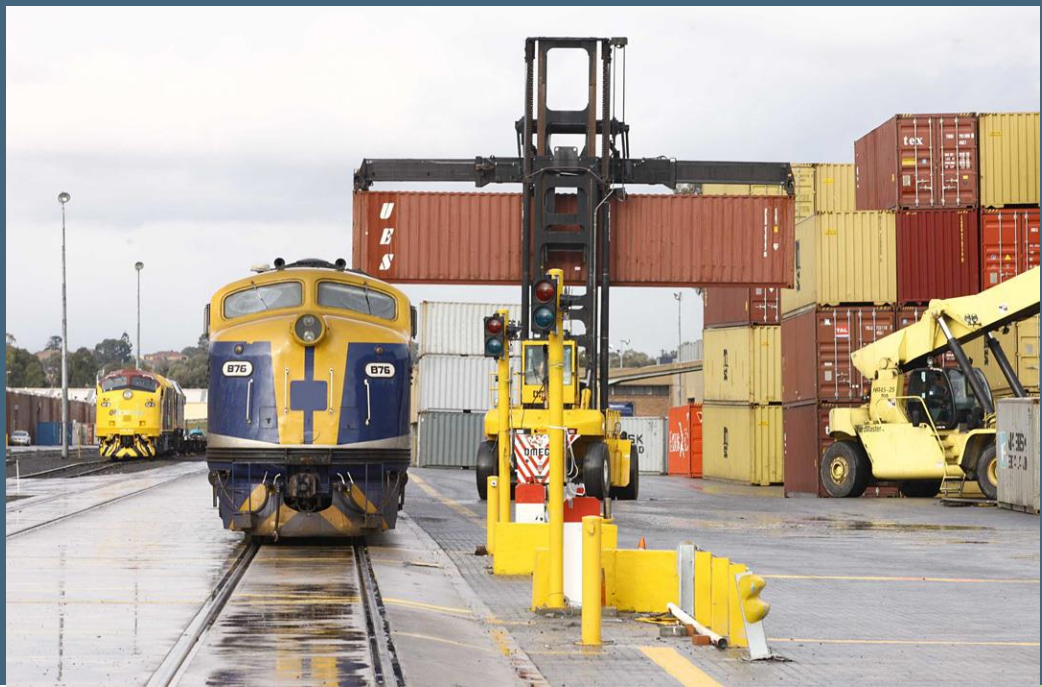


SIMTA Intermodal Terminal Facility - Stage 1

Phase 2 Environmental Site Assessment



SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

Part 4, Division 4.1, State Significant Development



Qube Property Management Services Pty Ltd
c/o Tactical Group

Phase 2 Environmental Site Assessment
SIMTA Intermodal Terminal Facility - Stage 1

Moorebank Avenue
Moorebank, NSW

26 May 2015
50342-60868 (Rev 3)
JBS&G

Qube Property Management Services Pty Ltd
c/o Tactical Group

Phase 2 Environmental Site Assessment
SIMTA Intermodal Terminal Facility - Stage 1

Moorebank Avenue
Moorebank, NSW

26 May 2015
50342-60868 (Rev 3)
JBS&G

Table of Contents

List of Abbreviations and Key Terms.....	vi
Executive Summary.....	ix
1. Introduction.....	1
1.1 Background.....	1
1.2 Objectives.....	3
1.3 Scope of Works.....	3
1.4 Referenced Reports.....	4
2. Site Condition and Surrounding Environment.....	6
2.1 Site Identification	6
2.2 Site Description	7
2.2.1 Stage 1 Site of the Former DNSDC.....	8
2.2.2 Former DNSDC South.....	10
2.2.3 Commonwealth Land South.....	10
2.2.4 RailCorp Land	10
2.2.5 Glenfield Waste Facility	11
2.3 Surrounding Land-use	12
2.4 Topography and Drainage	13
2.5 Geology.....	14
2.6 Hydrogeology	14
2.7 Acid Sulfate Soils	14
3. Site History.....	15
3.1 Stage 1 and DNSDC South Area.....	15
3.2 Southern Commonwealth and Rail Lands	15
3.3 Glenfield Facility	16
4. Previous Investigations.....	17
4.1 Egis (2000) Preliminary Site Investigation (PSI) of DNSDC	17
4.2 URS (2002a) Assessment of DNSDC Buildings.....	17
4.3 HLA (2002a) Soil and Groundwater Investigation, Precinct H DNSDC	17
4.4 URS (2002b) Investigation Review Report DNSDC	18
4.5 CM (2002a and 2002b) Site Audit, DNSDC	19
4.6 EES (2002a and 2002b) Memorandums, DNSDC.....	19

4.7	Milsearch (2002) Ordnance Investigation	19
4.8	DP (2009a) Summary Environmental Conditions, DNSDC.....	19
4.9	Golder (2010) Phase 1 ESA, Stage 1A	20
4.10	Golder (2011a) Phase 1 ESA, SIMTA Rail Corridor Land	21
4.11	Golder (2011b) Preliminary ESA, SIMTA Site and Rail Corridor	22
4.12	PB (2014) Phase 2 ESA, Moorebank Intermodal Terminal	22
5.	Conceptual Site Model	24
5.1	Comparison of Historical Data to NEPC 2013.....	24
5.2	Potential Areas and Substances of Environmental Concern	25
5.3	Potentially Contaminated Media	26
5.4	Potential for Migration.....	27
5.5	Potential Exposure Pathways	27
6.	Sampling and Analysis Plan	29
6.1	Data Quality Objectives.....	29
6.1.1	State the Problem	29
6.1.2	Identify the Decision	29
6.1.3	Identify Inputs to the Decision.....	29
6.1.4	Define the Study Boundaries	30
6.1.5	Develop a Decision Rule.....	30
6.1.6	Specify Limits of Decision Error	31
6.1.7	Optimise the Design for Obtaining Data	32
6.2	Soil Investigation Methodology.....	33
6.3	Investigation Methodology – Groundwater.....	34
6.3.1	Groundwater Sampling Method	35
6.4	Duplicate and Triplicate Sample Preparation.....	35
6.4.1	Laboratory Analyses.....	35
7.	Assessment Criteria	37
7.1	Regulatory and Technical Guidelines	37
7.2	Soil Criteria	37
7.2.1	Health Investigation Levels	37
7.2.2	Health Screening Levels	37
7.2.3	Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs)	37

7.2.4	Petroleum Hydrocarbon Management Limits	37
7.2.5	Selected Criteria – Soil	38
7.3	Groundwater Criteria	39
7.3.1	Environmental Guidelines.....	39
7.3.2	Human Health Guidelines	39
8.	Quality Assurance / Quality Control	41
8.1	QA / QC Results	41
8.2	QA/QC Discussion.....	41
8.2.1	Precision.....	41
8.2.2	Accuracy.....	42
8.2.3	Representativeness.....	42
8.2.4	Comparability.....	43
8.2.5	Completeness.....	43
8.2.6	Sensitivity.....	43
8.3	QA/QC Assessment.....	43
9.	Investigation Results.....	44
9.1	Field Observations.....	44
9.2	Analytical Results.....	44
10.	Site Characterisation.....	46
10.1	Potential Risks to Future On-site Receptors.....	46
10.2	Background Soil Concentrations	46
10.3	Chemical Mixtures.....	47
10.4	Aesthetic Issues	47
10.5	Potential Migration of Contaminants.....	47
10.6	Site Management	47
10.7	Investigation Data Gaps	47
11.	Conclusions and Recommendations.....	48
11.1	Conclusions.....	48
11.2	Recommendations	48
12.	Limitations	49
13.	References	50

Tables

Table 2.1: Summary SIMTA Site Details	7
Table 2.2: Summary Area of Investigation Details.....	7
Table 5.1: Comparison of Historical Analytical Results (Stage 1 Site) Against the Updated NEPM (NEPC, 2013)	24
Table 5.2: Areas of Environmental Concern and Associated Contaminants of Potential Concern	25
Table 6.1: Summary of Decision Rules	30
Table 6.2: Summary of Quality Assurance / Quality Control Program	32
Table 6.3: Analytical Schedule	35
Table 7.1: Soil Criteria (all units in mg/kg)	38
Table 7.1 Data Quality Indicator Assessment	41
Table 9.1: Summary of Geological Conditions	44

Figures

Figure 1: Stage 1 Location Plan and Key Areas
Figure 2: Cadastral Boundaries
Figure 3: Stage 1 Site Layout and Building Identification Numbers
Figure 4: Southern Commonwealth and Rail Land Site Layout
Figure 5: Glenfield Waste Facility and Western Rail Land Site Layout
Figure 6A: Stage 1 Site Historical Sample Locations – North
Figure 6B: Stage 1 Site Historical Sample Locations – South
Figure 7: Previous Areas of Interest (Golder 2011)
Figure 8: Current Investigation Locations Stage 1 Site
Figure 9: Current Investigation Locations Southern Commonwealth and Rail Land
Figure 10: Current Investigation Locations Glenfield Waste Facility and Western Rail Land
Figure 11A: Stage 1 Site – Historical Exceedances – North
Figure 11B: Stage 1 Site – Historical Exceedances – South
Figure 12: Soil Analytical Exceedances
Figure 13: Groundwater Analytical Exceedances

Appendices

Appendix A: Terminal Site Plan

Appendix B: Acid Sulphate Search Records

Appendix C: Conceptual Site Model (URS, 2002)

Appendix D: UXO Clearance (Milsearch, 2014)

Appendix E: Bore Logs

Appendix F: Field Notes

Appendix G: Laboratory Documentation

Appendix H: QA/QC Summary Sheets

List of Abbreviations and Key Terms

ACM	Asbestos Containing Material
AHD	Australian Height Datum
As	Arsenic
bgs	below ground surface
Cd	Cadmium
Concept Plan Approval	Concept Plan Approval (MP 10_0193) granted on 29 September 2014 for the development of the SIMTA Moorebank Intermodal Terminal Facility at Moorebank. This reference includes the associated Conditions of Approval (CoA) and Statement of Commitments (SoC) which form the approval documentation for the Concept Plan Approval.
CSM	Conceptual site model
Cr	Chromium
Cu	Copper
BTEX	Benzene, toluene, ethylbenzene and xylenes
B(a)P	Benzo(a)pyrene
DEC	NSW Department of Environment and Conservation
DECCW	NSW Department of Environment, Climate Change and Water
DNSDC	Defence National Storage and Distribution Centre
DQI	Data quality indicator
DQOs	Data Quality Objectives
DWE	NSW Department of Water and Energy
EPA	NSW Environment Protection Authority
EPBC Approval	Approval (No. 2011/6229) granted under the EPBC Act in March 2014 by the Commonwealth Department of Environment for the development of the SIMTA Moorebank Intermodal Terminal Facility at Moorebank.
ESA	Environmental Site Assessment
Former DNSDC South	The land to the south of the operational footprint of the Intermodal Terminal, to the boundary fence of the former DNSDC
GME	Groundwater monitoring event
GPR	Ground Penetrating Radar
ha	Hectare
Hg	Mercury
HIL	Health based investigation level
Construction area	Extent of construction works, namely areas to be disturbed during construction of the Stage 1 Proposal (refer to Figure 1).
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting

MIC Proposal	The development of an intermodal facility, associated commercial infrastructure (warehousing) and a rail link (3 options have been provided) to be located on the MIC site, for which an approval, under Part 4, Division 4.1 of the <i>Environmental Planning and Assessment Act 1979</i> . This proposal is currently under assessment by the Department of Planning and Environment.
MIC site	The former School of Military Engineering site to the immediate west of the SIMTA site, across Moorebank Avenue.
Ni	Nickel
OEHL	Office of Environment and Heritage
Operational area	Extent of operational activities for the operation of the Proposal (refer to Figure 1).
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PQL	Practical Quantitation Limit
Project site	Includes the SIMTA site and the Rail Corridor, i.e. the entire site area which was approved under the Concept Plan Approval (refer to Figure 1).
Proposal site	Includes the Stage 1 site and the Rail Corridor, i.e. the area for which approval (construction and operation) is sought within the EIS.
PSH	Phase Separated Hydrocarbon
QA/QC	Quality Assurance/Quality Control
RailCorp Land	Lot 1 DP 825352 (part of the Rail Corridor) and owned by RailCorp
Rail Corridor	Area defined as the 'Rail Corridor' within the Concept Plan Approval. The rail link is also included within this area (refer to Figure 1).
Rail link	The rail link including the area on either side to be impacted by the construction works included in the Stage 1 Proposal.
RPD	Relative Percentage Difference
SAQP	Sampling, Analysis and Quality Plan
SIMTA	Sydney Intermodal Terminal Alliance
SIMTA Project	The SIMTA Moorebank Intermodal Terminal Facility at Moorebank as approved by the Concept Plan (MP_10_0913).
SIMTA site	Includes the former Defence National Storage and Distribution Centre (DNSDC) site, the land owned by SIMTA which is subject to the Concept Plan Approval (refer to Figure 1).
Southern Boot Land	Commonwealth owned land to the south of the Former DNSDC South, and to the north of the RailCorp Land (part of the Boot Land in the MIC proposal)
SSFL	Southern Sydney Freight Line
Stage 1 site	The subject of the EIS, the western part of the SIMTA site which includes all areas to be disturbed by the Stage 1 Proposal (including the Operational area and Construction area) (refer to Figure 1). This area does not include the Rail Corridor.
The Proposal	Stage 1 of the SIMTA Moorebank Intermodal Terminal Facility including construction and operation of the intermodal terminal facility and rail link,

i.e. all works and built form for which approval is sought in this Technical Report.

TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST	Underground storage tank
Zn	Zinc

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Tactical Group (Tactical) on behalf of Qube Property Management Services Pty Ltd (the client) to conduct a supplementary Phase 2 Environmental Site Assessment (ESA) within the Stage 1 site and Rail Corridor (the Proposal site) of the proposed Sydney Intermodal Terminal Alliance (SIMTA) Intermodal Terminal facility at Moorebank, NSW (the Stage 1 Proposal).

The Stage 1 Proposal comprises the development of part of the SIMTA site as an intermodal freight terminal including a terminal area and a rail link connecting the terminal to the Southern Sydney Freight Line (SSFL).

The SIMTA site is to be located on approximately 83 hectares of historical Defence land previously occupied by the Defence National Storage and Distribution Centre (former DNSDC). The Rail Corridor, covering approximately 65 hectares, will pass through Commonwealth land formerly used for Defence-related training and potential waste burial, RailCorp-owned land including portions of the East Hills rail corridor and land north of the corridor and east of Moorebank Avenue, and the privately-owned Glenfield Waste Facility and quarry to the west of the Georges River and east of the SSFL. The investigation area includes Commonwealth land currently occupied by part of the Royal Australian Engineers (RAE) golf course, north of the East Hills rail corridor.

The site is to be developed in stages, commencing with Stage 1 that involves the construction and operation of the necessary infrastructure to support a container freight volume of 250,000 TEU (twenty-foot equivalent units) throughput per annum.

As a result of the staging, the ESA covered under this document relates to the Stage 1 site and the Rail Corridor (the Proposal site).

Based on information provided by the client, and from the Environmental Assessment (EA) for the Part 3A Concept Application (MP 10_1093) prepared by Urbis in March 2012, a number of previous environmental investigations and related documents have been prepared dating back to at least 1980, with more recent investigations and summary documents prepared between 2000 and 2011.

A non-statutory site audit and site audit report was completed in 2002, for the former DNSDC site (i.e. the SIMTA site), with the Site Auditor certifying the SIMTA site as suitable for ongoing commercial/industrial use subject to implementation of a Site Management Plan (SMP), which was to include a range of actions relating to further investigation, remediation, groundwater monitoring and management controls. It is not known whether a SMP was prepared or implemented, or whether any recommended actions were undertaken. The Audit did not cover other areas of the Project site including rail land.

The Secretary's Environmental Assessment Requirements (SEARs) dated December 2014, state that an Environmental Impact Statement (EIS) must be developed for the SIMTA Intermodal Terminal Facility – Stage 1 (250,000 TEUs) State Significant Development (SSD). The EIS must meet the minimum form and consent requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. In relation to the assessment of soil and water impacts for Proposal site, the assessment shall:

- *Identify and assess the soil characteristics and properties that may impact or be impacted by the project, including acid sulfate soils;*
- *Include a contamination assessment in accordance with the guidelines made under the Contaminated Land Management Act 1997 (CLM Act) and in consultation with the EPA for the subject site including the Glenfield Waste Facility. The assessment shall include:*

- *the potential environmental and human health risks of site contamination on the project site;*
- *a Remediation Action Plan (RAP);*
- *consideration of implications of proposed remediation actions on the project design and timing; and*
- *a Phase 2 environmental site assessment of the project site including rail corridor.*

The overarching objective of the works is to assess potential human health and environmental risks from contamination at the Proposal site to enable development of a RAP and a CMP to aid in management of contaminated material during the staged site development, such that on-site management of contaminated material is maximised within the development layout.

The scope of work undertaken in this ESA comprised:

- Review existing site investigation information including previous investigation reports (**Section 4**);
- Review of available background information pertaining to the environmental setting;
- Site inspection to provide information on current site conditions to assist in understanding previous investigations, environmental setting and to aid in development of an appropriate investigation program;
- Preparation of a site-specific Sampling Analysis and Quality Plan (SAQP) focused on the operational area of the Stage 1 site and the Rail Corridor for the proposed environmental investigation (JBS&G, 2014);
- Execution of the sampling program as per the requirements of the SAQP (JBS&G, 2014) and discussed in **Section 6**, consisting of:
- An intrusive soil investigation with sample locations skewed towards identified AECs or data gaps.
- Analysis of selected soil samples for the following contaminants of potential concern (COPCs) heavy metals, total petroleum or recoverable hydrocarbons (TPH / TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs), herbicides, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosive residues and asbestos.
- The installation of four groundwater monitoring wells and collection of groundwater wells from serviceable existing wells and the newly installed monitoring wells.
- Analysis of groundwater samples for COPCs including heavy metals, TPH / TRH, BTEX, PAHs, VOCs, SVOCs, cations / anions and explosive residues.
 - Assessment of data against the data quality objectives (DQOs) developed in the SAQP (JBS&G, 2014) in accordance with relevant EPA guidelines;
 - Comparison of collected data against relevant EPA endorsed criteria in relation to the overall project objective; and
 - Preparation of an ESA report in general accordance with relevant EPA Guidelines.

A review of the Australian Soil Resource Information System (ACLEP, 2015) indicates that there is an extremely low to low probability of the presence of acid sulfate soil materials at or in the vicinity

of the Proposal site (refer to **Appendix B**). No indications of acid sulphate soils or potential acid sulfate soils were encountered during the soil sampling event.

Representative soil samples were analysed for COPCs identified at the Proposal site (as listed in **Table 6.3**, excluding RailCorp-owned land)). Most of the reported concentrations of the COPCs for soil samples from previous and current investigations were below the adopted NEPC (2013) human health commercial / industrial criteria. Only one soil sample had a concentration above the human health criteria. This sample was collected from the western portion of the Glenfield Waste Facility site. This area will require further management to mitigate potential risks to future workers during the development of this area of the Proposal site.

Notably, asbestos containing materials (ACM) were positively identified on the surface at the north-western corner of building B11 (Stage 1 site), and in fill at 0.3-0.4 mbgs at a test pit on the north of the East Hills rail corridor (golf course) (see **Figures 11a** and **12**). The ACM find adjacent building B11 may be related to degrading or historical building infrastructure. The ACM find at the golf course may be related to historic burials or filling activities. The ACM finds have the potential to pose a risk to future workers at the site should the ACM be disturbed. In line with the mitigation of this risk, it is assumed that the removal and/or appropriate management of surface ACM would be conducted in parallel with the hazardous materials removal work prior to the demolition of existing buildings. The characterisation / delineation, excavation and disposal of potential bonded ACM impacted fill from the golf course should be conducted prior to the commencement of the planned development works in this area. Any asbestos impacted material exceeding NEPC (2013) land use criteria will need to be managed and/or disposed of as 'Special (asbestos) Waste'.

Selected soil samples taken from within the Stage 1 site and to the north of the East Hills rail corridor (on the golf course) have concentrations exceeding the adopted heavy metal ecological criteria for commercial / industrial land. However, given that the Proposal site will remain as a commercial / industrial site and is assumed to include large building structure and extensive hardstand areas with limited areas of (environmental) concern, the exceedance of ecological criteria is not considered to pose an unacceptable risk to the environment nor necessitate further remediation. Similarly, the ecological heavy metal exceedances reported in groundwater is not considered to pose an unacceptable risk to environmental receptors as the heavy metal concentrations are considered to be representative of background concentrations in groundwater in urban areas of Sydney.

The refuelling area within the Stage 1 site is noted to have significant contamination in the form of LNAPL. This may have resulted from historical leaks from the underground storage tanks. Impacts in this area of the site may pose a potential risk to future workers at the site. It is proposed that this area be remediated to the extent practicable prior to or in parallel with the planned development work. This should include the decommissioning of all above and underground petroleum distribution and storage infrastructure.

Impacts reported for the Proposal site (excluding RailCorp-owned land) that will require management include the ACM finds at the golf course and at the Stage 1 site, the lead soil concentrations reported from one location at the Glenfield Waste Facility, and the petroleum related impacts at the refuelling area within the Stage 1 site. These notable impacts will need to be managed prior to or parallel with the commencement of development works at the site.

Based on the findings and Limitations in **Section 11**, the site is considered suitable for ongoing commercial / industrial use subject to the limitations and management of the impacts discussed above. There is no gross or widespread contamination that would unreasonably restrict development and use of the site.

It is recommended that a Remediation Action Plan (RAP) be developed to address the aforementioned impacted areas to minimise the risk to future workers at the Proposal site. As a

precautionary measure, it is also recommended that an unexpected finds protocol be incorporated in future site management plans to ensure the protection of future onsite workers.

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Tactical Group (Tactical) on behalf of Qube Property Management Services Pty Ltd (the client) to conduct a supplementary Phase 2 Environmental Site Assessment (ESA) within the Stage 1 site and Rail Corridor (the Proposal site) of the proposed Sydney Intermodal Terminal Alliance (SIMTA) Intermodal Terminal facility at Moorebank, NSW (the Stage 1 Proposal).

The Stage 1 Proposal comprises development of the SIMTA site as an intermodal freight terminal including a terminal area, warehousing and distribution facilities, freight village of support services, and a rail link connecting the terminal to the Southern Sydney Freight Line (SSFL) (refer to **Appendix A**).

The SIMTA site is to be located on approximately 83 hectares of historical Defence land previously occupied by the Defence National Storage and Distribution Centre (former DNSDC). The Rail Corridor, covering approximately 65 hectares, will pass through Commonwealth land formerly used for Defence-related training and potential waste burial, RailCorp-owned land including portions of the East Hills rail corridor and land north of the corridor and east of Moorebank Avenue, and the privately-owned Glenfield Waste Facility and quarry to the west of the Georges River and east of the SSFL. The investigation area includes Commonwealth land currently occupied by part of the Royal Australian Engineers (RAE) golf course, north of the East Hills rail corridor.

The site is to be developed in stages, commencing with Stage 1 that involves the construction and operation of the necessary infrastructure to support a container freight volume of 250,000 TEU (twenty-foot equivalent units) throughput per annum. Specifically, the Stage 1 Proposal includes the following key components, which together comprise the intermodal terminal facility (IMT):

- Truck processing, holding and loading areas – entrance and exit from Moorebank Avenue;
- Rail loading and container storage areas – installation of four rail sidings with adjacent container storage area services by manual handling equipment initially and overhead gantry cranes progressively;
- Administration facility and associated car parking – light vehicle access from Moorebank Avenue;
- The Rail Link – located within the Rail Corridor, including a connection to the intermodal terminal facility, traversing of Moorebank Avenue, Anzac Creek and Georges River and connecting on to the SSFL; and
- Ancillary works – vegetation clearing, remediation, earthworks, utilities installation / connection, signage and landscaping.

As a result of the staging, the ESA covered under this document relates to the Stage 1 site and the Rail Corridor (the Proposal site).

A number of previous environmental investigations and related documents have been prepared for the SIMTA site dating back to at least 1980, with more recent investigations and summary documents prepared between 2000 and 2011.

A non-statutory site audit and site audit report was completed in 2002, for the former DNSDC site (i.e. the SIMTA site), with the Site Auditor certifying the SIMTA site as suitable for ongoing commercial/industrial use subject to implementation of a Site Management Plan (SMP), which was to include a range of actions relating to further investigation, remediation, groundwater monitoring and management controls. It is not known whether a SMP was prepared or implemented, or

whether any recommended actions were undertaken. The Audit did not cover other areas of the Project site including Rail Link.

The Secretary's Environmental Assessment Requirements (SEARs) (ref: SSD 14-6766 and dated December 2014) states that an Environmental Impact Statement (EIS) must be developed for the SIMTA Intermodal Terminal Facility – Stage 1 (250,000 TEUs) State Significant Development (SSD). The EIS must meet the minimum form and consent requirements in clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. In relation to the assessment of soil and water impacts for Proposal site, the assessment shall:

- *Identify and assess the soil characteristics and properties that may impact or be impacted by the project, including acid sulfate soils;*
- *Include a contamination assessment in accordance with the guidelines made under the Contaminated Land Management Act 1997 (CLM Act) and in consultation with the EPA for the subject site including the Glenfield Waste Facility. The assessment shall include:*
 - *the potential environmental and human health risks of site contamination on the project site;*
 - *a Remediation Action Plan (RAP);*
 - *consideration of implications of proposed remediation actions on the project design and timing; and*
 - *a Phase 2 environmental site assessment of the project site including rail corridor.*

The Revised Statement of Commitments, with regards to Contamination, require the following to be provided with planning applications for the three major stages of the Concept Plan:

- *Confirming what, if any, actions were taken in regards to the Milsearch (2002) [Ordnance Investigation] recommendations and the associated low risk ordnance issues; and*
- *Undertaking further investigations in the areas of environmental concern likely to be impacted upon by the proposed development. These investigations will be based on the detailed design of the proposed development to identify the extent of contamination, and what, if any, remediation activities are needed. The remediation of areas of the site (if any) would be best matched to the development of the site and considered as part of the future design.*

With regards to the planning application for the first stage of works including the rail link, the Revised Statement of Commitments requires the following:

- *Undertaking a Phase 2 intrusive environmental site assessment of the proposed rail corridor lands, with an objective to assess the risk posed to the detailed design and construction of the rail corridor by the areas of environmental concern identified within this report. The Phase 2 intrusive investigation would include a program of soil and groundwater sampling completed in accordance with the guidelines made or approved by the EPA under s 105 of the CLM Act.*

Prior to construction of the three major stages of the Concept Plan, the Revised Statement of Commitments requires the following:

- *Developing and implementing a Contamination Management Plan (CMP) as part of the project Construction Environmental Management Plan (CEMP) for managing contaminated materials either expected or unexpectedly encountered during the construction. The contamination management plan would include detailed procedures on:*

- *Handling, stockpiling and assessing potentially contaminated materials encountered during the development works;*
- *Landfill gas management during the excavation, handling, and stockpiling of waste materials, if excavation is required during the development, in the area of the Glenfield Quarry and Landfill;*
- *Assessment, classification and disposal of waste in accordance with relevant legislation; and*
- *A contingency plan for unexpected contaminated materials, such as materials that is odorous, stained or containing anthropogenic materials that may be encountered during site works.*

The intrusive works described in this report were tailored to address only those aspects and areas of environmental concern (AECs) relevant to the Proposal site as described above.

The investigation was conducted in general accordance with relevant NSW Environment Protection Authority (EPA) guidelines (**Section 7**).

1.2 Objectives

The overarching objective of the works is to assess potential human health and environmental risks from contamination at the Proposal site to enable development of a RAP and a CMP to aid in management of contaminated material during the staged site development, such that on-site management of contaminated material is maximised within the development layout.

1.3 Scope of Works

The scope of work undertaken in this ESA comprised:

- Review existing site investigation information including previous investigation reports (**Section 4**);
- Review of available background information pertaining to the environmental setting;
- Site inspection to provide information on current site conditions to assist in understanding previous investigations, environmental setting and to aid in development of an appropriate investigation program;
- Preparation of a site-specific Sampling Analysis and Quality Plan (SAQP) focused on the Operational area of the Stage 1 site and the Rail Corridor for the proposed environmental investigation (JBS&G, 2014);
- Execution of the sampling program as per the requirements of the SAQP (JBS&G, 2014) and discussed in **Section 6**, consisting of:
 - An intrusive soil investigation with sample locations skewed towards identified AECs or data gaps.
 - Analysis of selected soil samples for the following contaminants of potential concern (COPCs) heavy metals, total petroleum or recoverable hydrocarbons (TPH / TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs), herbicides, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosive residues and asbestos.
 - The installation of four groundwater monitoring wells and collection of groundwater wells from serviceable existing wells and the newly installed monitoring wells.

- Analysis of groundwater samples for COPCs including heavy metals, TPH / TRH, BTEX, PAHs, VOCs, SVOCs, cations / anions and explosive residues.
- Assessment of data against the data quality objectives (DQOs) developed in the SAQP (JBS&G, 2014) in accordance with relevant EPA guidelines;
- Comparison of collected data against relevant EPA endorsed criteria in relation to the overall project objective; and
- Preparation of an ESA report in general accordance with relevant EPA Guidelines.

1.4 Referenced Reports

A number of investigation and related reports have been prepared for works previously conducted within the Proposal site. The following reports were reviewed in the development of the SAQP and prior to the commencement of intrusive work:

- Egis (2000) *Preliminary Site Investigation at the Defence National Supply and Distribution Centre*, Moorebank Defence Lands, dated September 2000;
- URS (2002a) *Assessment of DNSDC Buildings – Supplement to Egis 2000 Stage 1 Preliminary Site Investigation of Areas A1 to A6*, dated March 2002;
- HLA (2002a) *Soil and Groundwater Investigation, Precinct H (DNSDC)*, Moorebank Defence Lands, dated November 2002, including HLA (2002b) *Work Plan Soil and Groundwater Investigation Moorebank Defence Land*, dated 17 September 2002;
- URS (2002b) *Investigation Review Report DNSDC*, Moorebank Defence Lands, dated 10 December 2002;
- Contamination Management (CM 2002a) *Summary Site Audit Report*, DNSDC Site, Moorebank, dated December 2002;
- CM (2002b) *Site Audit Statement*, Defence National Storage and Distribution Centre, Moorebank Avenue, Moorebank, dated December 2002;
- Brooks & Associates (Brooks 2002) *Heritage Assessment of the Moorebank Defence site at Moorebank*, dated October 2002;
- Environmental and Earth Sciences (EES 2002a) *Memorandum: Review of Reports Pertinent to Environmental Investigations Conducted at DNSDC*, Moorebank, NSW, dated 12 December 2002;
- EES (2002a) *Memorandum: Review of Investigation Review Report DNSDC*, Moorebank Defence Lands (URS) and *Site Audit Statement WRR118* (Dr William Ryall), dated 16 December 2002;
- Milsearch (2002) *Ordnance Investigation*, 2002;
- ARUP (2008) *Stockland Moorebank Intermodal Terminal Geotechnical Desk Study Report*, dated December 2008
- Douglas Partners (DP 2009a) *Summary Environmental Conditions, Proposed Intermodal Freight Terminal*, DNSDC Site – Moorebank Avenue, Moorebank, dated December 2009;
- Douglas Partners (DP 2009b) *Summary Geotechnical Site Conditions, Proposed Intermodal Freight Terminal*, DNSDC Site – Moorebank Avenue, Moorebank, dated December 2009;
- Golder Associates (Golder 2010) *Phase 1 Environmental Site Assessment, Stage 1A of Moorebank Intermodal Freight Terminal Development*, dated December 2010;

- Golder (2011a) *Phase 1 Environmental Site Assessment, SIMTA Rail Corridor Land*, dated November 2011;
- Golder (2011b) *Preliminary Environmental Site Assessment – SIMTA Site and Associated Rail Corridor*, dated 16 November 2011; and
- Toxikos (2011) *Preliminary screening health risk assessment and literature review*, Moorebank Intermodal Freight Terminal, Moorebank NSW, dated August 2011 (Appendix I of the Urbis 2012 EA).

Subsequent to the intrusive investigation, the following report was reviewed:

- Parsons Brinkerhoff (PB) (2014), *Phase 2 Environmental Site Assessment Moorebank Intermodal Terminal*, 28 May 2014.

2. Site Condition and Surrounding Environment

The site condition information provided in this section has generally been summarised from the previous investigation reports listed in **Section 1.4**, for the Proposal site. Where appropriate, JBS&G has independently verified the accuracy of the information provided in the previous reports through site inspection.

2.1 Site Identification

The SIMTA site, including the Stage 1 site, is located approximately 27 kilometres south-west of the Sydney Central Business District (CBD) and approximately 26 kilometres west of Port Botany. The SIMTA site is situated within the Liverpool Local Government Area (LGA), in Sydney's South West Sub-Region, approximately 2.5 kilometres from the Liverpool City Centre.

The SIMTA site is located approximately 800 metres south of the intersection of Moorebank Avenue and the M5 Motorway. The M5 Motorway provides the main road link between the SIMTA site and the key employment and industrial areas within the West and South Western Sydney Sub-Regions. The M5 Motorway connects with the M7 Motorway to the west, providing access to the Greater Sydney Metropolitan Region and NSW road network. Similarly the M5 Motorway is the principal connection to Sydney's north and north-east via the Hume Highway.

The SSFL is located 1 kilometre to the west of the proposed SIMTA site. The SSFL is a 36 kilometre dedicated freight line between Macarthur and Chullora.

The SIMTA site was recently operating as the DNSDC however, Defence has recently relocated this operation and vacated the SIMTA site. The majority of land immediately surrounding the SIMTA site is owned and operated by the Commonwealth and comprises:

- School of Military Engineering (SME), on the western side of Moorebank Avenue directly adjacent to the SIMTA site;
- Holsworthy Military Reserve, to the south of the site on the southern side of the East Hills Passenger Railway Line; and
- Commonwealth Residual Land, to the east between the SIMTA site and the Wattle Grove residential area.

The site to immediate west of the SIMTA site which currently includes the SME is the subject of a Development Application (DA) (SSD-5066), under Part 4, Division 4.1 of the EP&A Act, for the development of an intermodal facility known as the Moorebank Intermodal Terminal Project (MIC Proposal). The EIS for the MIC Proposal has recently been prepared a Preferred Project Report (PPR) to respond to submissions received during public exhibition. The MIC Proposal has yet to be determined by the Department of Planning and Environment (DP&E).

A number of residential suburbs are located in proximity to the SIMTA site, including:

- Wattle Grove, located approximately 500 metres from the SIMTA site and 700 metres from the Rail Corridor to the east;
- Moorebank, located approximately 500 metres from the SIMTA site and more than 1,700 metres from the Rail Corridor to the north;
- Casula, located approximately 900 metres from the SIMTA site and 400 metres from the Rail Corridor to the west; and
- Glenfield, located over 1,600 metres from the SIMTA site and 700 metres from the Rail Corridor to the south-west.

The location of the SIMTA site including the Stage 1 site as well as the Rail Corridor is shown in **Figure 1**. It is understood that the rail corridor will include an area approximately 20 m either side of proposed rail lines, as shown on **Figure 1**.

Details relating to the SIMTA site are summarised in **Table 2.1** below.

Table 2.1: Summary SIMTA Site Details

Site Details	
Lot/DP	Lot 1 in DP 1048263
Address	Moorebank Avenue, Moorebank, NSW
Local Government Authority	Liverpool City Council
Current Use	Defence-related uses
Current Zoning	Industrial
Proposed Use	Intermodal Terminal Facility
Site Area	Approximately 82 ha
MGA Coordinates (Zone 56)	E: 308120.81; N: 6241120.15 – approximate NE corner of Stage 1

Details for the area of investigation are summarised in **Table 2.2** below.

Table 2.2: Summary Area of Investigation Details

Stage 1	
Lot/DP	Stage 1 forms part of Lot 1 in DP 1048263 (Sydney Intermodal Terminal Alliance); Rail Corridor lands include Lot 4 in DP 1197707, Lot 1 in DP 825352, Lot 2 in DP 825348, Lot 1 in DP 1061150, Lot 2 in DP 1061150 (private, RailCorp and Crown Land); The MIC site comprises Lots 1 and 2 in DP 1197707; The Glenfield Waste Facility comprises Lot 1 in DP 712701, Lot 91 in DP 1155962, Lots 5 and 7 in DP 833516, Lot 52 in DP 517310, Lot 101 in DP 1143827, Lot 4 in DP 1130937, Lot 5 in DP 833516, Lot 51 in DP 515696 and Lots 102, 103 and 104 in DP 1143827; and Lot 1 in DP 1130937 and Lot 4 in DP 1186349 are associated with the SSFL.
Address	Moorebank Avenue, Moorebank, NSW Glenfield Waste Facility located north of Cambridge Avenue, Glenfield
Local Government Authority	Liverpool City Council
Current Use	Commonwealth land for current/former Defence-related uses; RailCorp land for Rail-related uses; Glenfield Waste Facility for quarry and waste disposal purposes.
Proposed Use	Intermodal Terminal Facility and associated Rail corridor
Site Area	Stage 1 site: Approximately 310,568 m ² , or 31.05 ha Rail Corridor lands: Approximately 65 ha (Golder 2011a)
MGA Coordinates (Zone 56)	E: 308120.81; N: 6241120.15 – approximate NE corner of Stage 1

Cadastral boundaries are shown in **Figure 2**.

2.2 Site Description

Preliminary site inspections were conducted between September 2012 and December 2014 by JBS&G to provide information on current site conditions to assist in the understanding of previous investigations, the site's environmental setting and to aid in development of an appropriate investigation program. The investigation program was conducted between 15 December 2014 and 22 January 2015. During the investigation program, certain areas of the Proposal site were not able to be accessed including the RailCorp-owned land located east of Moorebank Avenue (refer to **Figure 2**).

2.2.1 Stage 1 Site of the Former DNSDC

The Stage 1 site within the former DNSDC (includes the Operational and Construction areas as shown on **Figure 1**) is characterised by concrete and bituminous concrete access roads providing access to a number of enclosed warehouse/storage structures, buildings and open storage/parking areas bordered by various open grassed areas. A concrete-lined drainage channel runs north-south through the Stage 1 site, west of a main concreted access road that runs along the centre of the area. Building numbers and descriptions for structures within and adjacent the Stage 1 site are shown on **Figure 3**, with descriptions taken from URS (2002) and Golder (2010). It is noted that the Stage 1 site has been expanded to include the Construction area. The Operational area of the Stage 1 site aligns with the area identified in the Golder 2010 report. The new Stage 1 site boundary (including the Construction area) is presented in **Figure 3**.

The northern portion of the Stage 1 site includes palletised stores used to store larger pieces of equipment. It is noted that B7 was reported by URS (2002) to have been potentially used as a warehouse.

The southwest of the Stage 1 site includes fuel storage and dispensing facilities, including a separately fenced area only accessible from Moorebank Avenue comprising a fuel dispensing 'service station' (building B163, **Figure 3**), and five underground storage tanks (USTs) within the former DNSDC area (structure B21, **Figure 3**) immediately east of the fenced 'service station' area. Egis (2000) reported these USTs each have a capacity of 58,000 litres. The 'service station' is predominantly surfaced with hardstand (concrete and bituminous concrete), with some grass areas along the eastern and western boundaries. There are several fuel bowsers beneath a canopy, presumably linked to the USTs east of the area by underground fuel transfer lines. A brick office adjoins the western edge of the canopy area, with a sign indicating building number "21" on the north wall. There are two bowsers on the western boundary north of the canopy area, and a separate vent stack and UST is located adjacent these bowsers. There is a series of remote fill points in a 'fill box' for the five USTs located east of the 'service station' area. North of this fill box is what appears to be an oil-water separator system with separator and drum sitting in a small concrete bund. The five USTs located east of the 'service station' sit within a grassed area with a concrete pad to the east between the USTs and the associated vent stacks. The USTs themselves are beneath a concrete pad with raised bund around the edges, which is surrounded by steel protection rails. The USTs are used for storage of diesel and unleaded petrol (ULP) fuels. Egis (2000) reports one tank was used for storage of leaded petrol.

The southern portion of the Stage 1 site includes Dangerous Goods stores, noted on **Figure 3** as buildings B22, B23, B24, B25 and B26. B22 is an open-sided steel structure with steel roof. A small section in the north of the store is enclosed. The floor of the store area is concrete and there is a raised concrete bund around the floor's extent. Drums of oil and other liquid dangerous goods in steel drums are stored on wooden pallets predominantly within the western half, while racks storing boxed and packaged goods are located in the central/east portion. New and used batteries were stored on wooden pallets in the northeast corner, and a ranged of drummed, boxed and packaged goods were stored on pallets along the eastern edge of the store. Adjacent the northeast of the store is a concrete-covered pit of unknown purpose. A low grassed drainage swale was located immediately east of the store, at the eastern edge of the Stage 1 area, which appeared to drain north into the drainage system. A similar drainage swale is located west of the store, between the store and the USTs. Drainage from the store's roof is directed via downpipes to the concrete pad around the store's perimeter from where it runs over grass to the drainage swales. B23 was reported to have been used for the storage of large containers (>20 L) of Class 3 flammable liquids including solvents and fuels. Some staining was noted by URS (2002) in the centre of the DGS. B24 was reported to have been used as a temporary store used to pack items for distribution as well as a store for combustible solids, miscellaneous dangerous goods (e.g. batteries) and smaller

quantities (<20L) of flammable liquids (e.g. paints). Buildings B25 and B26 are large open warehouses that are used to store dangerous goods including solvents, fuels, lubricants and compressed gas. The warehouse floors are concrete lined and bunded.

The southern-most portion of the Stage 1 site extends south of the Dangerous Goods stores and USTs to a boundary line extending approximately east from the southern egress point of the 'service station' area. This is an open grassed area with sparse trees. This open area is reported to provide a fire-break between the Dangerous Goods store and bushland to the south of the former DNSDC.

On eastern portion of the Stage 1 site lies a raised, grassed area east of B40 and B45. These buildings were used for warehousing and this open area the site is considered to be the most upgradient area of the Stage 1 site. Egis (2000) mentions that a portion of this open, grassed area was used as a magnetism storage yard.

North of the B22 DGS is a building (**Figure 3**) that was described on site as a former meat store (B20), which is no longer in use. The building is constructed of brick and concrete panels, and appears to have a steel roof. The building sits on ground raised approximately 1 to 1.5 m above the surrounding ground levels, with grassed slopes on east, south, north and northwest of the building footprint and concrete loading platform at southwest. The area to the west of this store comprised a vehicle parking/turning/loading area surfaced with bituminous concrete which also contained a number of shipping containers. To the east of building B20 is a grassed area within which is the concrete-lined open drainage channel and then concreted site access road.

A portion of B16, located at the centre of the Stage 1 site, was reported to have been used as a treatment and preservation (T&P) area. This building was noted to have solvent dipping and water rinsing tanks for cleaning equipment as well as solvent tanks that drained into above ground storage tanks. Two underground oil/water separator or interceptor pits were reported to be observed near the entrance of the T&P area.

North of the former meat Store and the Dangerous Goods store B24 are large rectangular steel warehouses or store building (buildings B10, B11, B17, B18 and B19, **Figure 3**) referred to by Golder (2010) as Bulk Pallet Silos. URS (2002) reports that these buildings were used for sorting and packaging materials and equipment.

The concrete-lined drainage channel leads north along the eastern sides of the former meat store (B20) and the Bulk Pallet Silo (B19), before turning west around the northern end of building B19 and then turning north again in a straight line towards the Canteen (building B4, **Figure 3**), north of the Stage 1 area.

An open storage area storing mainly shipping containers at the time of inspection was located north of building B19, between the concrete-lined drainage channel and the western boundary. This area was surfaced with bituminous concrete. To the east of this area and the drainage channel was a concreted access road and parking area for the large store and office building (B16).

North of the open storage area is a fenced grassed recreational area with some trees to the north where there is a car parking area and office-style (former Defence Bank and Defcredit) building and further north the former Duty Office (B5 and B3 respectively, **Figure 3**). The northern portion of Stage 1 of the former DNSDC comprises two narrow portions separated by the Canteen (building B4, **Figure 3**).

An open, grassed elevated area is located on the eastern boundary of the Stage 1 site. This area lies east of warehouses B40 and B45 and was once used as a magnetic store.

2.2.2 Former DNSDC South

This area comprises open grassed area south of the Stage 1 site that extends to the southern boundary fence of the former DNSDC site. There are sparse mature trees in this area, approximately half way between the Dangerous Goods store and southern boundary of the former DNSDC, with one smaller tree that appeared dead. The area was relatively level, with no obvious features other than the trees and wire mesh security fence along the western and southern boundaries. This area is shown on **Figure 4** and as Area 1 on **Figure 7**.

2.2.3 Commonwealth Land South

The Commonwealth land south of the former DNSDC is largely bushland, with a cleared area with narrow fire-trail and overhead power line corridor along the northern boundary, immediately south of the former DNSDC southern boundary fence, accessed via a locked gate from Moorebank Avenue. This area is shown on **Figure 4** and as Area 2a on **Figure 7**. The bushland is quite dense and apart from the northern access track there was only one other possible vehicular access track accessible from a locked gate along the western Moorebank Avenue boundary, south of a low drainage channel. Anzac Creek runs east to west across the northern portion of this land.

A rail siding runs north-south along the western edge leading from the former DNSDC site to the rail corridor to the south. The siding appears unused.

During the preliminary site inspection, it was noted that there was evidence of minor waste materials including rusted drum in the northwest corner, just inside the fenceline. The southern portion of this area appeared slightly less dense, but was not accessible from RailCorp land to the south due to the presence of a wire mesh security fence along the southern boundary.

2.2.4 RailCorp Land

The RailCorp land (shown on **Figure 4** and as Area 3 on **Figure 7**) is accessible via a gravel access track from Moorebank Avenue, just north of the railway overpass. It includes an approximately trapezoidal parcel with the southern boundary aligned to the East Hills rail corridor south of the land. The southwest corner is separately fenced and comprises a roughly square and predominantly grass-covered area that forms an irregular mound that is approximately 2 to 3 m high along the northern fenceline of this area, and higher towards the central-southern area. The mound appears to slope up to the southeast from a set of locked gates in the northwest corner. Access to this area was not possible due to security fencing around its perimeter. There are few trees on this mounded area with the exception of the southern boundary and southwest corner. A shipping container and abandoned demountable office were present in the southwest corner of the RailCorp land.

The northern, triangular portion of this area comprised patches of grassed areas, dense scrub and open bushland areas. There were numerous areas of disturbed, hummocky ground including low mounds of soil mixed with building rubble and or metal, and a number of shallow pits indicative of small excavations, as well as what appeared to be parallel wheel/track ruts leading to one area of apparent spoil. At least one fragment of suspected asbestos containing material (ACM) was observed in this area.

A number of piles of household wastes were noted towards the eastern boundary of this area, close to the access track from Moorebank Avenue.

Anecdotal information provided by Defence's Regional Environmental Officer (Robert Kolano, pers. comm. 25 September 2012), suggests this mounded portion of the rail land may have historically been used for dumping and burning of wooden railway sleepers. No other information has been obtained to confirm historical activities in this area.

To the west of Moorebank Avenue, a portion of the proposed rail corridor follows the northern side of the existing East Hills rail corridor, passing south of the southern extent of the golf course on Commonwealth (Defence) land, before crossing the Georges River immediately north of the existing rail bridge where the corridor enters the Glenfield Waste Facility.

Access to the golf course area was not possible during the site inspection. Observations from the Moorebank Avenue bridge over the rail corridor indicate there is a vehicular access track within the rail corridor on the northern side of the rail lines. A security fence separates the rail corridor from the golf course, which comprises open and relatively flat grassed areas with scattered trees in the area immediately north of the rail corridor. Review of recent aerial photographs showing the western portion of this area, along the eastern river bank, indicates the land along the river is heavily vegetated. This is consistent with observations made from the western river bank during inspection of the Glenfield Waste Facility. There appears to have been some excavation and/or filling adjacent the existing rail bridge supports, presumably associated with construction of the bridge.

2.2.5 Glenfield Waste Facility

The Glenfield Waste Facility is an active landfill and quarry. The Rail Corridor connecting to the SIMTA site enters the Glenfield site at the eastern boundary immediately north of the existing rail corridor bridge crossing the Georges River, which forms the eastern boundary of the Glenfield site. The existing East Hills rail corridor passes through the Glenfield Waste Facility, however the Rail Corridor will only take up land in the portion north of the rail corridor, as shown in **Figure 5** and as Area 5 on **Figure 7**. Within this area the rail corridor separates the suburbs of Glenfield to the south and Casula to the north.

The southeast corner of the Glenfield Waste Facility, where the Rail Corridor enters, includes a rehabilitated area. Black liner material was evident at the top of the sloping bank leading to the river, leading north towards a fenced enclosure used to park excavation and other equipment. A gravel access road passes immediately west of this enclosure, leading to the lower excavated landfill areas towards the centre of the landfill. A smaller track follows the site's fenceline on a constructed levee raised above the river bank to the east, and which is considerably elevated above the excavated landfill base and dam on the eastern boundary. The Rail Corridor follows this boundary track/levee along the site's boundary, and east of the eastern dam, to high ground north of the current landfill floor and quarry area. This high ground appears to be formed of natural in-situ material yet to be excavated, as well as excavated and/or tipped spoil material. The Rail Corridor divides at the highest point of the Glenfield Waste Facility, approximately where a 'dam' of wet 'sloppy' soil is contained within an earth bund. One part of the Rail Corridor swings towards the west and south to connect to the SSFL to the west of the current quarry area, while the other portion of the proposed corridor maintains a northerly direction from the high ground to a lower area where the northern dam of the Glenfield site exists.

A set of monitoring points was observed immediately east of the site fence adjacent the boundary access track at the top of the river bank, to the east of the eastern dam. A second set of monitoring points was observed in the northern corner of the site, immediately north of the access track that leads to the Rail Corridor north of the northern dam. There appeared to be groundwater monitoring wells within each set of monitoring points, present as standpipes. Up to four standpipes of varying construction were present at each location. The purpose of all monitoring points was not clear. Review of Environmental Protection Licence (EPL) 4614 for Glenfield Waste Disposals that there are at least three "concrete leachate risers" for leachate quality monitoring, at least 19 groundwater monitoring bores although some of these appear to be multiple monitoring points at the same location, as well as at least six subsurface landfill gas monitoring wells.

EPL 4614 notes the depth of waste landfill in Cells A1 and A2 must not exceed 30 m including capping material, and includes a condition requiring filling plans to be updated at least annually. Monitoring is required quarterly for some parameters, including methane, and yearly for a full range of parameters. During discharge periods, monthly monitoring is required for a selected range of parameters. A leachate barrier and leachate collection system is required on the eastern wall of Cell A2, with reference to a Leachate Management Plan (LMP) by Consulting Earth Sciences (CES) in February 2007. There is also reference to Cell B1 required to be constructed in accordance with a Cell B1 Design Report prepared in May 2012.

Glenfield Waste Services (GWS) has provided JBS&G with information regarding the groundwater bore and subsurface gas locations at the site. In addition, limited 2013 to 2014 groundwater, leachate and gas data has been made available for review. Majority of the data made available are from locations along the Rail Link which is considered to be part of low operation areas within the waste facility. On review of this data, the following is noted:

- Available standing water levels from the groundwater monitoring wells located along the Rail Link (i.e. BH1A, BH1B, BH4A, BH4D, BH7A, BH7B, BH9A, BH9B, BH10D, BH13D, BH15S, BH17A and BH17B) range between 3.48 to 11.98 metres below top of casing (mbtoc);
- Groundwater pH ranged from 5.18 to 7.86;
- Total dissolved solids (TDS) in groundwater ranged from 6.5 to 13,800 mg/L, with an average of 2,417 mg/L;
- Concentrations of heavy metals in groundwater were either below or marginally above the laboratory's limit of reporting (LOR) except for barium and manganese which have reported maximum concentrations of 14 mg/L (BH4D) and 2.5 mg/L (BH9B), respectively;
- Concentrations of TRH and BTEX in groundwater were either below or marginally above the LOR;
- Leachate sampling locations to do not align with the proposed Rail Link; and
- The average methane concentrations from monitoring points at the facility is 0%. Exceptions to this include the average methane concentrations from LG3 (3%) and at LG5 (43.9%).

The reported methane concentrations at LG3 on the southern corner of the Glenfield Waste Facility (within the Rail Link) has recorded methane concentrations above the nominated levels stated in the *Environmental Guidelines: Solid Waste Landfills* (NSW EPA, 1996) (i.e. 1.25% methane (v/v)) between March and August 2013. Monthly measurements of methane were conducted between March 2013 and February 2014 with the more recent (i.e. between September 2013 and February 2014) methane concentrations reported below the aforementioned guideline levels.

The reported methane concentrations at LG5, located on the western boundary of the Glenfield Waste Facility (outside the Rail Link), were above the Solid Waste Landfill guideline levels between March 2013 and February 2014. It is noted that reported methane concentrations at this location decreased significantly in January and February 2014.

2.3 Surrounding Land-use

The following description of land uses surrounding the Proposal site has been based on information provided in previous investigation reports, review of aerial photographs available from Google Maps and Nearmap, and observations made by JBS&G staff during site inspections. Current land use of adjacent properties or properties across adjacent roads is summarised below.

To the north of Stage 1 site is the main entry and security point for the former DNSDC facility, and the main administrative building. Other former DNSDC areas lie in between and around the

western and eastern portions of the Stage 1 site. Moorebank Avenue is present west of the Stage 1 site, with commonwealth (Defence) land occupying the land west of Moorebank Avenue to the Georges River, and includes the land north of the section of the Rail Corridor that runs along the northern side of the existing East Hills rail corridor. The Georges River forms the eastern boundary of the Glenfield Waste Facility.

To the east of the southern Commonwealth land and the RailCorp-owned site situated between the former DNSDC and the existing rail corridor, lies more Commonwealth land formerly used by Defence, and which is currently heavily vegetated. A transmission line easement passes in a north-south orientation along the eastern boundary of the former DNSDC. A smaller transmission line travels east-west along the southern boundary of the former DNSDC.

The Glenfield area is boarded to the west by the existing South and Cumberland rail corridor, which also forms part of the Proposal site's Rail Corridor, on which works associated with additional rail infrastructure for the SSFL are currently underway. Further west of the rail corridor is Leacock Regional Park and then the residential areas of Casula east of the Hume Highway.

The East Hills rail corridor, which forms part of the Proposal site's Rail Corridor, forms the effective southern boundary for the Proposal site. South of this rail corridor, on the eastern side of Georges River, is Commonwealth land associated with the Defence Holsworthy. On the western side of the river, land south of the East Hills rail corridor forms part of the Glenfield Waste facility.

The nearest sensitive receptors include environment and users of open space land comprising the golf course on Commonwealth land west of Moorebank Avenue, bushland on Commonwealth land within, to the east and to the south of the Proposal site, the Georges River east of the Glenfield area, and Leacock Regional Park to the west of the Glenfield area.

2.4 Topography and Drainage

The Proposal site is generally level with a slight slope to the south and west, away from a slight rise on the eastern side of the SIMTA site. Land immediately along the Georges River banks slopes towards the river.

The topography within the Glenfield Waste Facility has been largely modified by quarrying and landfilling activities. The access track along the eastern boundary of the Glenfield facility, which the Rail Corridor loosely follows, slopes up gradually to the north from just north of the fenced equipment enclosure to the formed high ground north of the current quarry face. From the northern side of the high ground there is a steep (formed) embankment down to a lower level occupied by the northern dam.

Within the Stage 1 site, open concrete-lined channels and box culverts ultimately drain to the Georges River, via the site's stormwater system or infiltrate unsealed ground surfaces. Commonwealth land south of the former DNSDC includes Anzac Creek, an east-west aligned low-lying area across the Commonwealth land south of the former DNSDC flows in a northeast and north direction to the Georges River approximately 5 km north of the site. The western extent of this feature appears to exist in the RAE Golf Course on the western side of Moorebank Avenue, where the creek appears to have been modified into a series of water features (dams/ponds), as shown on **Figure 4**.

Drainage within the Glenfield facility is either captured within two dams on site and presumably reused on site for activities such as dust control and possibly irrigation, or runs off following ground surfaces to low points such as Georges River. Review of EPL 4614 for Glenfield Waste Disposals indicates that stormwater overflow discharges from the dams to Glenfield Creek and Georges River

Some level of infiltration and water pooling is expected to occur in unsealed surfaces, consistent with the local soil permeability.

2.5 Geology

The Stage 1 site is reportedly underlain by Tertiary fluvial deposits comprising clayey sand and clay, as well as silty clay with some ironstone, with clay present to depths of at least 10 to 12 metres below ground surface (bgs). Surface cover material overlying the clay includes silty sand topsoil to approximately 0.3 m bgs and clay fill to variable depth between 0.5 m and 1.5 mbgs (HLA 2002a, DP 2009a, DP 2009b).

The fluvial deposits of clayey sand and clay are present beneath the Rail Corridor lands south of the DNSDC and east of the Georges River, while the western area including the Glenfield Waste Facility west of the Georges River, are reported to be underlain by Quaternary fluvial deposits of medium grained sand, clay and silt (Golder 2011a).

Quarrying at the Glenfield facility is reported to have removed a “significant portion” of quaternary sand deposits, which have been replaced by filling with waste materials including “building demolition, shredded car tyres and asbestos waste materials” (Golder 2011a).

Surface material and fluvial deposits are underlain at depth by shale (Golder 2011a) associated with Ashfield Shale deposits (DP 2009a). Registered bores immediately west of the Georges River, associated with the Glenfield Waste Facility, indicate sandy clay and sands to 10 m overlying shale to 20 m overlying sandstone to 30 m depth (Golder 2011a).

URS (2002b) report shale bedrock was encountered in the east of the DNSDC, while sandstone bedrock was report in the southern portion of the DNSDC.

Golder (2011a) have reported there is a low probability of acid sulfate soils beneath the rail corridor lands.

2.6 Hydrogeology

Regional groundwater is understood to flow within shale and alluvial deposits in a north and westerly direction towards the Georges River (Golder 2010). Two aquifers have been reported (DP 2009b and URS 2002a), comprising shallow and deep aquifers with groundwater at depths of approximately 6 to 11 mbgs. Golder (2010) report standing water levels for shallow groundwater in a sandy clay horizon of between 5.5 m and 5.8 m bgs.

On the Glenfield facility, west of the Georges River, it is anticipated that local groundwater flows will be influenced by extraction and filling at the site, with flow generally in an easterly direction towards the river. Licensed bores at the site encountered water at 8 to 10 m depth but are screened between 20 and 30 m depth (Golder 2011a).

URS (2002b) reported deeper groundwater generally exhibiting high salinity and therefore having little or no beneficial use. Shallow groundwater was reported to have lower salinity, potentially as a result of local recharge.

2.7 Acid Sulfate Soils

From a review of the Australian Soil Resource Information System (ACLEP, 2015), there is an extremely low to low probability of the presence of acid sulfate soil materials at or in the vicinity of the site (refer to **Appendix B**), which is consistent with the geological and topographic setting of the site. No indications of acid sulphate soils or potential acid sulfate soils were encountered during the soil sampling event.

3. Site History

The site condition information provided in this section has been summarised from the previous investigation reports listed in **Section 1.4**. The summary below addresses the areas of investigation being targeted in this ESA, and is taken from information reported by Golder (2010 and 2011a) and Egis (2000):

3.1 Stage 1 and DNSDC South Area

- The area was first settled (by Europeans) around 1800, with Thomas Moore receiving a land grant in 1805 and setting up an estate called Moore Bank in 1809;
- In 1840 the property transferred to the Church of England and between 1840 and 1880 the Moore Estate land was cleared for pasture, farming, vineyards and orchards;
- The trustees of the Church of England subdivided the Moore Estate in 1888, and the blocks comprising Stage 1 were sold in the early 1890s, with the Department of Defence acquiring land as part of the Holsworthy complex in the early 1900s. Brooks (2002) reports land including the DNSDC was acquired in 1913 for Defence purposes, with the site reported to have been for military-related storage since 1915, with plans at the time indicating the area as a “Mobilisation Store”;
- Records indicate Defence used the land in the Moorebank/Holsworthy area for Defence-related purposes from at least the late 1800s;
- A storage centre had been established in the 1940s where the former DNSDC is located, with the former DNSDC as such being established in the 1990s, which involved the removal of former structures to slab level and construction of updated storage facilities;
- Aerial photographs confirm development of storage facilities and roads within and adjacent to the Stage 1 site was underway in 1949 with buildings B10 and B11 visible as well as two similar sized structures to the south, and roads formed by 1951. The carpark south of the canteen had been formed by 1974. By 1994 the two buildings south of B10 and B11 had been replaced by a single large structure (possibly B16), and two small structures are present in the south of Stage 1. By 1998 a large building (possible B19) has been constructed south of the car park, with no discernible changes to the land between 1998 and 2008 aerial images;
- The southern portion of the Stage 1 site comprised bushland in 1949 and 1951 aerial photographs, but had been cleared by 1961;
- The southwest corner of the DNSDC was reported as an unauthorised burial ground, designated H30:A2:c-3. Egis (2000) shows this area being within DNSDC South, shown as Area 1 on **Figure 4**. Burial pits in the southern section of the DNSDC were delineated in 1994 immediately south of the petrol, oil and lubricants (POL) store, where building B22 currently houses a dangerous goods store. The burial pit(s) in this area are reported to have potentially contained batteries as an old battery store was located in this area of the site. It is reported that while a large portion of material in burial pits at the DNSDC site was removed in the mid-1990’s for proper disposal, it is understood not all burial pits were remediated at the time.
- The 1998 aerial photograph shows red structures located on the eastern portion of the Stage 1 site. These structures were identified as having magnetic properties during the Egis (2000) site inspection.

3.2 Southern Commonwealth and Rail Lands

- In 1949 and 1961 the area south and south-west of the DNSDC was largely bushland with small access tracks, although some land clearing was evident immediately south of the DNSDC;

- Based on aerial photographs, the RAE Golf Course is reported to have been developed by 1974 to the west of the DNSDC, although Golder (2011a) report it was constructed in the late 1970s;
- The access track within the southern Commonwealth land parallel with Anzac Creek appears to have greater usage in 1994, and the East Hills rail line is now evident, including a rail siding entering the DNSDC. The rail siding is reported to have been added in 1919 (Brooks 2002);
- A cleared area potentially containing rail-related infrastructure is visible south of the DNSDC site, which may correspond with the current filled RailCorp land north of the East Hills rail corridor;
- A portion of the bush area south of the DNSDC area was transferred to RailCorp in the early 1990s and appeared to have been used for stockpiling during construction of the East Hills rail;
- No discernible changes in the land are reported between 1998 and 2011 aerial images;
- Information from online sources indicates the East Hills line terminated at East Hills until it was extended in the 1980's to join the Main South line at Glenfield Junction, which was opened in 1987.

3.3 Glenfield Facility

- The area west of the Georges River is reported to have comprised open farmland with crops and orchards evident in 1949 and 1961;
- Quarrying commenced in the mid-1960s, with extraction on the site initially using dredging to remove sand deposits after which excavations continued with open cut excavations through bedrock materials. Flooded excavations immediately west of the Georges River were evident in 1974 aerial photographs, and excavations well established by 1994 with several pits and processing areas evident;
- Although no changes are evident between 1994 and 1998, by 2011 filling activities have commenced, with several areas rehabilitated and vegetated;
- Golder (2011a) report the Glenfield Waste Disposals site operated under Environmental Protection Licence (EPL) 4614 permitting non-thermal processing of general waste, waste storage and disposal, and material crushing, grinding and separating. Wastes permitted to be disposed at the facility included general solid non-putrescible waste, waste tyres and asbestos waste. EPL 4614 is still in force, following review of the Protection of the Environmental Operations (POEO) Act Public Register of licences maintained online by the EPA.

4. Previous Investigations

A brief summary of the previous investigations listed in **Section 1.4** is provided below for the areas of investigation included in this ESA. It is noted that references to DNSDC in the previous investigations pertain to the former DNSDC site (i.e. the SIMTA site).

4.1 Egis (2000) Preliminary Site Investigation (PSI) of DNSDC

Egis (2000) included the following relevant to the area of investigation:

- Waste materials (unspecified) were reportedly removed from burial pits in the southwest of the DNSDC. There was considered to be a moderate to high risk of occurrence of contaminants in this area. Egis noted that potential contaminants could include unexploded ordnance (UXO) contamination and fragments of exploded ordnance waste (EOW), but considered that UXO contamination at the DNSDC was not an issue based on the age of the DNSDC, “as any UXOs would probably have been removed during the construction of the warehouses”.
- The presence of five USTs identified and the kerbside refuelling area. No reference is made to the additional UST towards the western boundary of the refuelling area. Historical spillages were noted to have occurred in the refuelling area and the main UST area. This area was considered to represent a high risk of hydrocarbon contamination.
- The dangerous goods store (B22) is noted, referred to as a POL, which were reported to drain to an oil-water separator. Risk of contamination associated with this area was considered low.
- The open, grassed area east of B40 and B45 was not considered to be an area of potential concern.

4.2 URS (2002a) Assessment of DNSDC Buildings

The URS (2002a) assessment was reported as being supplementary to an Egis (2000) PSI of Areas A1 to A6 (March 2002), which is different to the abovementioned Egis (2000) PSI of the DNSDC area (September 2000), and which JBS&G has not cited. The Egis (2000) PSI report reviewed above refers to Area A2, the DNSDC area. Relevant information from URS (2002a) is summarised as follows:

- The report reviewed referred to a former DNSDC building layout plan in an appendix, however the plan itself was not included in the report provided to JBS&G. The former building layout plan may have been useful in identifying the former footprint of demolished buildings and the potential for ACM and lead paint impacts.
- The northeast of building B16, reportedly contained a solvent treatment and preservation operation including storage of solvents in above ground storage tanks (ASTs) in an underground basement, with two underground oil-water separators nearby. The concrete floor of the basement was reported to be in good condition.
- Page 6-1 of this report was missing, which is suspected of including a portion of Table 2 containing information relating to potential contamination sources associated with the southern portion of the Stage 1 site referred to as areas of concern Items P33, P34 and P35 relating to the former burial grounds south of DGS B22 that extend into DNSDC South (P33), the DGS at B22 (P35) and the kerbside refuelling area and USTs (P34).

4.3 HLA (2002a) Soil and Groundwater Investigation, Precinct H DNSDC

The results of the HLA (2002a) investigation of the DNSDC site, referred to as Precinct H of the broader Commonwealth land in Moorebank, were utilised in preparation of the URS (2002b) investigation review report summarised below. HLA performed the investigations under the direction of URS. Results are summarised in the following section.

4.4 URS (2002b) Investigation Review Report DNSDC

URS (2002b) utilised the HLA (2002a) and Milsearch (2002) results, with the scope for each developed by URS acting as Principal Environmental Advisor to the Defence Property Disposal Task Force (PDTF). Relevant information is summarised as follows (refer to **Figures 6a** and **6b** for historical site locations):

- The investigation adopted a judgemental strategy targeting areas of potential concern reported previously by Egis (2000) and URS (2002a), as well as a broad assessment of fill, soils, sediment and groundwater, and a UXO hazard analysis and investigation in potential areas impacted by former waste burial.
- The greatest filling was identified in the southern area of the DNSDC, particularly the southeast area. The average depth of fill was reported as approximately 1 m while the greatest fill depth was 2.2 m bgs in test pits excavated in the southeast of the DNSDC, outside the Stage 1 site. The fill material in boreholes within the Stage 1 site generally comprised silty sand with gravel, while fill in the southeast (outside the current investigation area) included various waste materials including ACM.
- The whole of the areas south of the USTs (B21) and the DGS (B22) within the Stage 1 site, extending to the boundary with DNSDC South, was subject to ground-based geophysical survey. Based on Figure 4a in the report, no anomalies were identified within the Stage 1 site. Anomalies elsewhere were subject to intrusive investigation by excavation of test pits and trenches. Further information from Milsearch (2002) is provided below.
- Asbestos fragments were reported in surface soil at BHH004, adjacent the northwest corner of building B11 (**Figure 6a**). Asbestos fibres were not reported in the soil sample, and no other observations regarding asbestos on ground surfaces were reported.
- Monitoring wells were installed in a reported downgradient direction from the refuelling area and USTs where “significant contamination” was observed in soils, at locations BHHP34002 and BHHP34011, as shown on **Figure 6b**. The two wells noted reported elevated TPH, BTEX, PAHs and metals (copper, lead, nickel and zinc) exceeding adopted criteria. Phenols were also reported in groundwater in BHHP34011 within the refuelling area. No PSH was reported.
- Reference to HLA (2002a) indicates that elevated photoionisation detector (PID) readings and hydrocarbon odours were recorded at other locations during soil boring within the refuelling and UST area. The highest PID readings and strong hydrocarbon odours were recorded in BHHP34011 in the south of the refuelling area.
- Drilling logs provided by HLA (2002a) for boreholes drilled into the mounded material which the former meat store sits on, indicates the presence of up to 1.6 m of fill including sandy clay and gravel and some black ash fragments. Refusal on concrete or other obstructions occurred at both locations (BHH033 and BHH034).
- Low level hexachlorobenzene (HCB) (2.26 mg/kg) contamination was noted from soil collected from TPH013, south east of B26.
- Recommendations made by URS that relate to the Stage 1 site include further groundwater monitoring across the DNSDC and further investigation of the refuelling/UST area, and consideration of the Milsearch (2002) ordnance investigation outcomes during future development. These actions were to be incorporated into a Site Management Plan (SMP) for implementation at the site.

4.5 CM (2002a and 2002b) Site Audit, DNSDC

Mr Bill Ryall of CM undertook a Site Audit resulting in preparation of a Summary Site Audit Report (CM 2002a SSAR) and Site Audit Statement (CM 2002b SAS) relating to the DNSDC area. CM (2002a) concurred with the findings and recommendations of URS (2002b), and the SMP requirements as reported by URS (2002b) were noted as a condition of the CM (2002b) SAS certification that the DNSDC site was suitable for commercial/industrial use.

4.6 EES (2002a and 2002b) Memorandums, DNSDC

EES (2002a) prepared a memorandum following review of Egis (2000), Milsearch (2002), HLA (2002a) and URS (2002a). The memorandum presented a summary of key findings and did not make any conclusions with regards to contamination, other than to note that the targeted investigations by HLA (2002a) were appropriate for a “first pass assessment” but that further grid based sampling would be required should the land use change in future.

EES (2002b) prepared another memorandum following review of URS (2002b) and the CM (2002b) SAS. The memorandum provided an outline of key investigation findings including reference to the SMP requirements recommended by URS and included as conditions on the SAS. It was noted that, technically, site audits under the NSW Contaminated Land Management Act (CLM Act) do not have any jurisdiction on Commonwealth land, and that it was unusual for a SAS to have “so many conditions”. EES noted that “a significant amount of work is still required before the magnitude of some of the issues (and how best to address them) is identified”.

4.7 Milsearch (2002) Ordnance Investigation

Milsearch completed an ordnance investigation and hazard analysis of approximately 82 ha of the DNSDC site, including portions of the Stage 1 site. Relevant findings are summarised below:

- No geophysical anomalies were noted south of the USTs. Anomalies noted were south of DGS B22 towards the southeast of the DNSDC. The nearest anomalies, comprised two small pits (6m x 3m x 2m deep) containing building rubble with large sections of reinforced concrete (southeast of B22) and one pit (84m x 6m x 5m deep) containing general stores rubbish including shelving, metal mugs, building tie bars, small arms ammunition boxes (all empty) and remnants of old building material (south and east of B25 and B26).
- During the investigation, apart from a number of small empty arms ammunition boxes (outside the current investigation area), no munitions or munitions related material was encountered.
- A draft aerial photographic analysis prepared by Milsearch in August 2002 noted that some burial pits from the 1950s located south of new POL (DGS) stores probably remain close to and south of the new facilities, reporting “Thiess decided not to remediate beyond the new facility footprint”. The subsequent geophysical assessment suggests that there are no such pits in the southern portion of Stage 1.

4.8 DP (2009a) Summary Environmental Conditions, DNSDC

DP prepared a summary of environmental conditions within the DNSDC for the proposed intermodal freight terminal. The report did not provide any additional information or data in previous investigation reports to that reported herein. DP did not review the HLA or Egis reports. It was noted that DP were not aware whether any identified areas of environmental concern (AECs) from previous investigations had been addressed or whether the previously recommended SMP had been developed.

DP (2009a) recommended addressing outstanding items associated with the identified AECs, and any potential contaminating activities since the 2002 investigations.

4.9 Golder (2010) Phase 1 ESA, Stage 1A

Key historical information from the Golder (2010) assessment of the Stage 1A area has been incorporated into the site history (**Section 3**) herein, and the summary findings from previous investigations incorporated above where appropriate. Stage 1A in this report pertains to the western portion of the Stage 1 site. Additional key information from this report is summarised below:

- As noted in **Section 3**, the southwest corner of the DNSDC was reported as an unauthorised burial ground, with burial pits south of the existing dangerous goods store(s) potentially containing old batteries. As noted above (**Section 4.7**), Milsearch did not identify any such burial pits south of DGS B22, although some substantial burial areas were identified to the south and east of DGS B25 and B26.
- The buildings and structures present in the Stage 1A area had not changed function, type or use since 2000. Building B5 as referred to by Golder as being occupied by Defcredit was subsequently occupied by Defence Bank, following a name change in 2012. This building is constructed of fibre cement potentially comprising ACM.
- The canteen (B4) has a grease trap located outside of the southern end of the building.
- An in-ground fat collection pit is located outside the southern end of the former meat store (B20). The pit is reported to have collected fat and other remains washed from food cutting/preparation benches inside the building. JBS&G noted during site inspection that this building rests on a filled mound raised above the surround ground levels.
- Of the five USTs west of the refuelling area, tanks T1, T4 and T5 store diesel and tanks T3 and T4 store ULP. One of the ULP tanks (T4) is reported to have been re-lined approximately 2007 to 2008 as it was partially rusted. Defence observed fuel losses however the volume of fuel loss is not known.
- Five diesel and six ULP fuel dispensers were noted within the refuelling area, with two diesel dispensers at the western boundary appearing to be served by an additional UST adjacent these two dispensers. An oil-water separator is noted in the northeast of the bowsers with oil being captured in an in-ground tank of unknown volume. The oil is pumped out as required. It is not known where water from the separator discharges. JBS&G notes that an absorbent sock/boom enclosed a surface water drainage pit in the grassed area outside the refuelling area, immediately northeast of the separator.
- Golder identified the following potential areas of contamination:
 - The grease trap south of the canteen;
 - ACM associated with the Defence Bank building;
 - The in-ground fat collection pit south of the former meat store;
 - Leaks and spills within the DGS (B22) which drain to the in-ground collection pit northeast of the store;
 - USTs east of the refuelling area, particularly given the reported ULP fuel loss from T4;
 - Hydrocarbon spillage at the refuelling area and the additional UST in this area; and
 - Potentially buried waste as well as pest and/or weed control in the remaining site areas.

4.10 Golder (2011a) Phase 1 ESA, SIMTA Rail Corridor Land

Key historical information from the Golder (2011a) assessment has been incorporated into the site history (**Section 3**) herein, and the summary findings from previous investigations incorporated above where appropriate. Additional key information is summarised below:

- Council records from Liverpool City Council note that Council have been provided information indicating the presence of contamination on the land, which may restrict development;
- Anecdotal information referred to a diesel spill at the refuelling area (within the Stage 1 site) sometime in 2004 to 2005. The spill was reportedly localised to the area of the USTs and surface impacts were cleaned. Golder noted that there was the potential for underlying soils to be contaminated by the spill. While Golder referred to the spill at the refuelling area, reference to this occurring at the USTs (plural) suggests this relates to the USTs immediately east of the refuelling area.
- No ASTs or USTs were noted at the Glenfield quarry and landfill area.
- Several fragments of potential ACM were identified by Golder on the ground surface in areas immediately west of the current rail spur (siding), although the exact location is not identified. Consequently it is unclear if this relates to land west of the rail siding within the eastern portions of the DNSDC South or southern Commonwealth land areas. JBS&G also identified suspected ACM on the ground surface in the northern bushland portion of RailCorp land, south of the southern Commonwealth land, considered to be in a different location to that described by Golder (2011a).
- Several asbestos containing building were removed from the DNSDC in the early 1990s, however Golder were advised that most of these were located in the centre of the DNSDC site, where the main warehouse is currently located, which is consistent with previous investigation findings for this area of the DNSDC.
- Golder considered that asbestos contamination in the East Hills rail corridor was unlikely given this line was constructed in the late 1980s.
- The Glenfield landfill leachate system directs collected leachate to a dam on the eastern boundary, where it is allowed to evaporate or is re-circulated by irrigation of tip faces or re-injected, or disposed off-site via tanker to licensed facilities.
- There is the potential for UXO and EOW in the bushland south of the DNSDC (Area 2b), given prior observations of grenade fragments, consistent with previous reports, although Golder's figure (used for **Figure 7** of this report) indicates the former grenade range is outside the rail corridor area.
- RailCorp land immediately north of the East Hills rail corridor had been filled to between 2 and 2.5 m above the surrounding ground level, and illegal waste dumping had also occurred in this area, consistent with JBS&G observations.
- Golder report that current operations at Glenfield do not involve large volumes of asbestos waste materials. When received, such materials are placed in the lower levels of the waste cells.
- Golder (2011a) concluded there were five areas of concern, as shown on **Figure 7**:
 - Area 1 – DNSDC South, where partially remediated areas of dumping (filling) may have occurred;

- Area 2 – southern Commonwealth land comprising bushland, where potential UXO and EOW associated with the former grenade range (designated Area 2b by JBS&G, Figure 4), with other bushland areas (designated Area 2a by JBS&G) subject to potential and observed illegal dumping;
- Area 3 – RailCorp land subject to extensive filling, and illegal dumping;
- Area 4 – former mock Viet Cong village used for training, located in the southern portion of the RAE golf course, outside the investigation area and beyond the northern extent of the rail corridor land, as shown on **Figure 7**;
- Area 5 – Glenfield Waste Disposal facility subject to quarrying and landfilling; and
- Potential unidentified waste burial as well as use of pesticides and herbicides for pest and/or weed control across the site.
- Golder recommended Phase 2 intrusive investigation of soil and groundwater in the rail corridor lands, and development and implementation of a contamination management plan (CMP) for the development stage to enable appropriate management of contaminated materials, waste disposal, landfill gas management and management of waste materials in the Glenfield area, and contingencies for unexpected finds.

4.11 Golder (2011b) Preliminary ESA, SIMTA Site and Rail Corridor

This was a brief letter report to address Director General's Requirements (DGRs) for the proposed development in regards to contamination and potential acid sulfate soils (PASS). The report did not present any further Phase 1 investigations; rather it presented a summary of key findings from previous environmental investigations. No new findings in addition to any already note herein were reported.

Golder recommended that confirmation of any actions recommended by Milsearch (2002) regarding low risk ordnance issues be undertaken as part of detailed design development for the project, and that further detailed investigation of identified AECs that are likely to impact on the development. These investigations were recommended to be based on detailed design for the development and aim to identify the extent of contamination and remediation actions required, matching these requirements to the development of the site. The additional investigations would also facilitate preparation of a CMP (previously recommended by Golder (2011a).

It was noted that the review and investigation by Golder (2011b) did not identify "significant environmental issues which would preclude the currently proposed development of the SIMTA site and associated rail corridor".

4.12 PB (2014) Phase 2 ESA, Moorebank Intermodal Terminal

Moorebank Intermodal Company (MIC) commissioned Parsons Brinckerhoff (PB) to undertake a Phase 2 ESA for the proposed Moorebank Intermodal Terminal (IMT). The objectives of the ESA were to assess and characterise the nature and likely extent of contamination at the Moorebank IMT, assess the suitability of the Moorebank IMT for the proposed future land use and provide sufficient information to enable the provision of a remediation action plan (RAP) and construction environment management plan (CEMP) to be prepared.

The MIC site lies west of Moorebank Avenue and the SIMTA site (refer to **Figure 1**). The southern portion of the site is known as Steele Barracks, which houses the School of Military Engineering (SME). This investigation included the assessment of the southern portion of the MIC site that includes the golf course land immediately north of the East Hills Railway line which forms part of the Proposal site's Rail Corridor.

In relation to the Proposal site's Rail Corridor, the following were noted:

- An unexploded ordnance (UXO) assessment was undertaken across the site with UXO artefact finds reported within the Proposal site's Rail Corridor. These finds were considered to contain explosive ordnance waste (EOW), particularly blank ammunition as a result of close training activities. All detected items were confirmed as inert training ordnance with the appearance of UXO/EOW. Based on specialist advice provided by G-Tek, the Moorebank IMT site has a very low potential to contain remnant UXO/EOW containing high explosive or other energetic material other than propellants/primers in unfired/misfired small arms ammunition (SAA) blank cartridge cases. Items of military origin which have the appearance of UXO/EOW may cause concern if encountered during redevelopment works; however the occupational health and safety risk of such items is considered to be perceptual rather than actual;
- The geology at the MIC site consisted of localised fill with variable alluvial deposits. Saturated horizons were encountered between 7 and 15 mbgs within the natural alluvium;
- Sampling within the Proposal site's Rail Corridor and its immediate surrounds was limited to a hand auger location (i.e. PB_HA14) and two test pit locations (i.e. PB_TP35 and an unlabelled location). The three locations were located at the Georges River Compound (refer to **Figure 1**); and
- Based on the figures summarising the findings of this report, the samples collected from within the Proposal site's Rail Corridor did not have COPC concentrations above the adopted commercial/industrial criteria.

5. Conceptual Site Model

The information herein together with figures included with this report aid in presenting a conceptual site model (CSM) for the area of investigation for the Proposal site, based on review of relevant background historical site information and previous site investigation data. Aspects of the CSM are later refined following assessment of current investigation data in the site characterisation in **Section 10**.

5.1 Comparison of Historical Data to NEPC 2013

The revised *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM)* (NEPC, 2013) provides a “nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community which includes regulators, site assessors, environmental auditors, land owners, developers and industry.” The NEPM is protective of human health and the environment and provides investigation and screening levels to aid in the assessment of potentially contaminated sites.

The investigation and screening levels that have been adopted for this investigation are discussed in detail in **Section 7**. In the development of a CSM, a comparison of historical data against the updated NEPC 2013 has been undertaken to aid in the assessment of contamination at the Proposal site.

The following exceedances are listed in **Table 5.1**:

Table 5.1: Comparison of Historical Analytical Results (Stage 1 Site) Against the Updated NEPM (NEPC, 2013)

Area of Concern	Sample Location / ID	Sample Depth	Human Health Criteria Exceedances	Ecological Criteria Exceedances	Management Limit Exceedances
SOIL					
North of B25	BHHP3600101	0.1-0.2	-	Copper (207 mg/kg)	-
East of B26	TPH01403	1-1.1	-	Zinc (784 mg/kg)	-
South of B26	TPI00203	1-1.1	-	Zinc (133 mg/kg)	-
Northwestern corner of B11	BHH004_AS-1	Surface	Asbestos		-
GROUNDWATER					
Northwestern corner of the Stage 1 site	BHH029	-	-	Copper (0.013 mg/l) Lead (0.013 mg/l) Nickel (0.049 mg/l) Zinc (0.286 mg/l)	-
Eastern boundary of the Stage 1 site	BHH031/BHH-1	-	-	Cadmium (0.031 mg/l) Copper (0.011 mg/l) Nickel (0.2 mg/l) Zinc (0.845 mg/l)	-
East of B26	BHH038	-	-	Cadmium (0.006 mg/l) Copper (0.008 mg/l) Nickel (0.195 mg/l) Zinc (0.355 mg/l)	-
Refuelling Area	BHHP34002	-	-	Copper (0.003 mg/l) Zinc (0.021 mg/l)	-
Refuelling Area	BHHP34011	-	-	Copper (0.012 mg/l) Lead (0.01 mg/l) Nickel (0.023 mg/l) Zinc (0.1 mg/l) m-xylene (416 µg/l) ^a	-

Notes:

a=reported as m- and p-xylene

The historical exceedances in soil and groundwater are in relation to the adopted ecological criteria (see **Section 7**). Exceedances were noted in the centre (near building B11), southern (near buildings B25, B26 and within the refuelling area) and north-western portions of the Stage 1 site. In general the exceedances were related to copper, lead, nickel and zinc concentrations. Concentrations of m-xylene (reported as m- and p- xylene) were noted in groundwater at the refuelling area and asbestos from a soil sample was noted on the north-western corner of B11.

Note that historical TPH fractions were compared against the TRH fractions in the updated NEPM (NEPC, 2013) for screening purposes.

5.2 Potential Areas and Substances of Environmental Concern

Based on the site history review, review of previous investigations and JBS&G's understanding of site conditions, potential areas/aspects of environmental concern (AEC) and associated contaminants of potential concern (COPC) have been identified and are presented in **Table 5.2**.

Table 5.2: Areas of Environmental Concern and Associated Contaminants of Potential Concern

Area/Aspect of Environmental Concern	Location	Contaminants of Potential Concern (COPCs)
General site areas where filling and burial of waste material may have occurred, or where pest and weed control may have been undertaken.	General site areas, identified former building areas, fill material.	Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) Asbestos OCPs Herbicides TPH BTEX PAHs
Potential fuel leaks and spills associated with fuel storage and distribution, contamination of soil and groundwater	USTs and Refuelling Area	TPH, BTEX, PAHs Phenols Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) Phase separated hydrocarbons (PSH) on groundwater
Potential soil and groundwater impacts from POL and other dangerous goods storage, drainage collection and treatment areas	Dangerous Goods stores (B22, B23 and B24) including collection pit at north of B22 Treatment and Processing building (B16)	TPH VOCs SVOCs PAHs, Phenols Metals
Fill around building footprint and leakage from waste collection pit, impacting soil and groundwater	Meat store (B20)	TPH VOCs PAHs, Phenols OCPs Polychlorinated biphenyls (PCBs) Asbestos Metals
Waste burial pits, including potential waste batteries, impacts to soil and groundwater	Cleared area south of DGS (B22, B23), in DNSDC south	Metals (extended suite), pH TPH VOCs/SVOCs UXO/EOW, explosive residues
Potential asbestos and lead paint impacts from demolition of former structures. Illegal waste dumping	Stage 1 site, DNSDC South, Commonwealth and RailCorp land south of DNSDC	Asbestos in soil ACM Metals TPH, BTEX, PAH, OCP, PCB
Potential exploded ordnance waste (EOW) from former grenade range	Commonwealth land south of DNSDC	UXO/EOW Explosive residues
Potential filling including dumping and burning of rail sleepers.	RailCorp property north of rail corridor, east of Moorebank Ave	Metals, TPH, BTEX, PAHs, Phenolics, OCP, PCB Asbestos
Impacts from operation of rail corridors, including asbestos in ballast and fill, hydrocarbons from operations	Rail Corridor	TPH, BTEX, PAHs Metals Asbestos

Northern extent of rail alignment, south of the Former Defence mock village training ground	Northern extent of rail alignment, in existing rail corridor	Metals, TPH, VOCs, OCP, herbicides Explosive residues
Glenfield quarry and waste facility, fill material Groundwater not anticipated to impact rail Potential landfill gas migration	Glenfield quarry and waste facility	Metals, pH, TPH, BTEX, PAHs, OCPs, PCBs Asbestos Landfill Gas (LFG), including methane

It is noted that reports relating to investigation and monitoring of the Glenfield Waste Facility have not been provided for review. Several drilling and monitoring locations for groundwater, leachate and landfill gas are understood to exist on site.

5.3 Potentially Contaminated Media

Potentially contaminated media present at the site may include:

- Fill material, including buried wastes;
- Surface soil (potential dust);
- Natural soils;
- Groundwater;
- Stormwater/surface water; and
- Air (vapour/gas).

Filling across areas of the site have been reported in previous investigations, and the potential for unidentified buried wastes has also been reported for various areas at the site. One area of the site is a licensed landfill, however the extent of landfilling of wastes and whether this would impact on the proposed development (from a contamination perspective) is not known. As such, fill material in investigation areas is considered a potentially contaminated medium.

Due to the potential presence of asbestos fibres in ballast/fill in unsealed surfaces in some areas to be investigated or adjacent to areas to be investigated, surface soils which could become wind-blown dust therefore has the potential to be a contaminated media.

Natural soils at the site underlie fill materials, and are also known to have been contaminated by site activities at some locations (e.g. refuelling area, USTs). Given the potential for downward migration of contaminants through fill, particularly in open areas where infiltration is possible, and the identified presence of contaminated soils and groundwater in soils, the natural soils across the site are considered a potentially contaminated medium.

Groundwater systems (both shallow and deep, where distinguishable) have been reported as impacted by various contaminants in locations at the site, where investigation has been undertaken (i.e. refuelling area, USTs). Elsewhere, as noted above, there is the potential for leaching of contaminants vertically from fill into groundwater. While groundwater impacts may not necessarily impact on the development and future use of the site, groundwater is nevertheless considered a potentially contaminated medium.

Due to the reported volatile organic contaminant impact in soil and groundwater at the refuelling and UST area within the Stage 1 site, there is the potential for soil vapour to be a contaminated medium. Landfill gas is also considered a potentially contaminated medium for the Glenfield waste area, unless further information/data is made available to indicate otherwise.

5.4 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 and site inspection are present in solid (e.g. impacted soil or fill, asbestos), liquid (e.g. dissolved in water or as PSH) and gaseous/vapour forms.

The site inspection has indicated that there are unsealed ground surfaces where there is bare or exposed soil/fill. Therefore there is the potential for migration of contaminants via wind-blown dust.

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

Rainfall infiltration at the site is expected to occur in unsealed areas to be investigated. There is therefore the potential to impact shallow groundwater.

Given the presence of soil and groundwater impacts at the refuelling station, there is the potential for petroleum related contaminants to migrate in groundwater.

As a result of the presence of VOCs (BTEX) in soil and groundwater at the refuelling station, which includes a small building between the bowser area and USTs, there is the potential for migration of contaminants in vapour within the sub-slab environment, and potentially through slabs into the building area. However, as buildings in the vicinity of this area are planned to be removed and relocated beyond the Stage 1 works, vapours from volatile organics are not considered further. There is however the potential for contaminants such as methane to migrate within landfill gas through waste and capping material.

Based on historical information and data, there appears to be little likelihood of contaminants migrating to or from the Proposal site to an extent that would prevent development of the Proposal site or other areas of the Project site. The potential for contaminant migration based on current investigation data is discussed in **Section 10.5**.

5.5 Potential Exposure Pathways

Potential exposure pathways include:

- Dermal;
- Ingestion; and
- Inhalation.

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

The potential for ingestion of soil through eating soil is considered relatively low due to the occupational and restricted access environment at the site, however, should dust be generated, ingestion must be considered a potential exposure pathway.

Although groundwater is not used at the site, other than for monitoring purposes, and previous reports indicate groundwater has no beneficial use, there is the potential, albeit low in an occupational environment, for ingestion of contaminants via groundwater or PSH removed from monitoring wells.

As there is the possibility for generation of dust in unsealed areas where potentially impacted soil/fill are present, inhalation is also considered a potential exposure pathway. Additionally, should landfill gas migrate into excavations or other surface emissions, there is the potential for inhalation of gas.

The conceptual model included as **Appendix C** in URS (2002b) is considered to be still applicable at the site, and is consistent with the potential exposure pathways discussed herein.

6. Sampling and Analysis Plan

A Sampling, Analysis and Quality Plan (SAQP) was developed prior to the commencement of the investigation program. The SAQP was prepared in general accordance with the requirements stated in the NEPM (NEPC, 2013) and the *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* (DEC, 2006) and outlined the sampling, analysis and data quality objectives (DQOs) including when, where and how to collect samples or measurements and the acceptance criteria. The investigation detailed in this report was conducted in accordance with the SAQP.

6.1 Data Quality Objectives

Data quality objectives (DQOs) were developed for the investigation, as discussed below.

6.1.1 State the Problem

Previous investigation data indicates potential contamination risks which may impact future development of the land, workers involved in development and use of the site, and environmental receptors. Statements of Commitment (SoCs) within the Concept Plan for the proposed development require the completion of additional investigations and preparation of a CMP to manage identified contamination during development of the site. Additional environmental data needs to be collected to assess the potential extent of contamination risks and to enable appropriate recommendations to be made for further investigation and/or management actions.

6.1.2 Identify the Decision

The decisions below generally follow the DEC (2006) decision making process for assessing urban redevelopment sites:

- Are there any unacceptable risks to likely onsite receptors from soil?
- Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?
- Are there any unacceptable risks to likely onsite receptors from groundwater underlying the site?
- Are there any unacceptable risks to likely onsite receptors from landfill gas or vapours underlying the site?
- Are there any impacts of chemical mixtures?
- Are there any unacceptable odours?
- Is there any evidence of or potential for migration of contaminants from the site?
- Is a site management strategy required?

6.1.3 Identify Inputs to the Decision

Inputs to the decisions are:

- The results of previous investigations relevant to the areas of investigation, including background historical information, site observations, laboratory results and report findings;
- New environmental data collected by sampling and analysis and site observations made during the investigation;
- Assessment criteria to be achieved on the site as based on the intended land use and previous investigations, and project objectives, as defined by assessment criteria nominated in **Section 7**.

- Confirmation that data generated by sampling and analysis are of an acceptable quality to allow reliable comparison to assessment criteria as undertaken by assessment of quality assurance / quality control (QA/QC) as per the data quality indicators (DQIs) established in **Section 6.1.6**.

6.1.4 Define the Study Boundaries

The study boundaries are limited to those areas of the Stage 1 site and Rail Corridor lands described in **Sections 2.1** and **2.2** and shown on **Figure 1**.

The vertical extent of the investigation will be variable, according to the varying project objectives in each area of investigation, and dependent on field observations regarding extent of potential impacts.

Due to the project objectives, it is not proposed at this stage that seasonality will be assessed as part of this investigation.

6.1.5 Develop a Decision Rule

Laboratory analytical data will be assessed against EPA endorsed criteria as identified in **Section 7**. Alternate criteria will be applied with appropriate justification where there are no EPA endorsed criteria.

The decision rules adopted to answer the decisions identified in **Section 6.1.2** are summarised in **Table 6.1**.

Table 6.1: Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite receptors from soils?	Soil analytical data will be compared against EPA endorsed criteria. Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils: Either: the reported concentrations are all below the site criteria; Or: the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and the standard deviation of the results must be less than 50% of the site criteria. And: the 95% upper confidence limit (UCL) 1 of the average concentration for each analyte must be below the adopted site criterion. If the statistical criteria stated above are satisfied, the decision is No. If the statistical criteria are not satisfied, the decision is Yes.
2. Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?	If the 95% UCL of surface soils exceeds published background concentrations (NEPC 1999), the decision is Yes. Otherwise, the decision is No.
3. Are there any unacceptable risks to onsite receptors from groundwater underlying the site?	Are contaminants present in groundwater at concentrations exceeding the adopted criteria and are there any future likely on-site receptors of groundwater that may be at risk during development or future site use? If yes to both, the decision is Yes. Otherwise, the decision is No
4. Are there any unacceptable risks to onsite receptors from landfill gas or vapours underlying the site?	Are there contaminants in landfill gas or potentially in soil vapour beneath the site that may migrate to surface and accumulate in confined areas during development or future use of the site, based on consideration of appropriate guidance and qualitative assessment of risks?

¹ Sampling Design Guidelines. (NSW EPA,1995)

	If yes to gas and/or vapours, the decision is Yes. Otherwise, the decision is No
5. Are there any chemical mixtures?	Are there more than one group of contaminants present which increase the risk of harm? If there is, the decision is Yes. Otherwise, the decision is No.
6. Are there any unacceptable odours?	If there are any unacceptable odours, the decision is Yes. Otherwise, the decision is No.
7. Is there any evidence of, or potential for, migration of contaminants from the site?	Were contaminants present in soils at concentrations exceeding the adopted criteria? If yes, the decision is Yes. Otherwise, the decision is No.
8. Is a site management strategy required?	Was the answer to any of the above decisions Yes? If yes, a site management strategy is required. If no, a site management strategy is not required.

6.1.6 Specify Limits of Decision Error

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

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), ANZECC (2000), DEC (2007), appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined Data Quality Indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy. The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in **Table 6.2**.

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

- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted criteria.

If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data. Corrective actions may include requesting further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Table 6.2: Summary of Quality Assurance / Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<50% RPD
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	-	-
Samples extracted and analysed within holding times.	-	organics (14 days), inorganics (6 months)
Trip spike	1 per sampling event	70-130% recovery
Trip blank	1 per sampling event	<LOR
Method blank	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria		

6.1.7 Optimise the Design for Obtaining Data

Various strategies for developing a statistically based sampling plan are identified in EPA (1995), including judgemental, random, systematic and stratified sampling patterns.

The sampling design basis is different for each area of investigation, based on the previous investigation data, site observations, future use and current data gaps. A combination of grid-based (systematic) and targeted approaches was proposed. Targeted (judgemental) investigation was proposed to target previously identified AECs and contaminated areas and media, and to address

identified data gaps and provide new data for locations where previous data is suspect or monitoring wells no longer accessible. Systematic investigation was proposed in some areas to obtain general site environmental data to assist in site management during development, or in areas where no data exists and a preliminary assessment is required. Systematic investigations were generally based on a broad grid with some variations due to site structures or identified/potential access difficulties.

Investigation locations were proposed in the heavily vegetated southern Commonwealth land east of Moorebank Avenue, between the DNSDC and RailCorp land, at a reduced density in locations along accessible boundary areas, access tracks and drainage lines where access is not as restricted by thick vegetation, focussing on the proposed rail alignment. Investigation in this area was subject to Commonwealth approval, and required prior assessment and clearance for UXO/EOW, even though the risk is previously reported to be low. Further investigation of this area could be undertaken, if necessary, during future development stages following any associated vegetation clearance.

Investigation was also proposed in the Glenfield Waste Disposal facility, although it is preferred that existing site data relating to installation of monitoring points and recent monitoring reports be reviewed beforehand to better assess the potential contamination risks and the need for any further investigation. A number of soil investigation locations were included targeting the proposed rail alignment to obtain environmental data until further information and data relating to the site becomes available. These locations required approval from the current Glenfield site owners/operators to ensure there is no detrimental impact to landfill design elements including liners, leachate/water transfer and capping materials.

The investigation locations are shown on **Figures 8, 9 and 10**.

6.2 Soil Investigation Methodology

Prior to the intrusive investigation on the Stage 1 site, a review of the ordnance investigation report (Milsearch, 2002, described in **Section 4.7**) by Milsearch. It was considered that the risk of explosive ordnance contamination in the investigation areas was low. Nevertheless, safeguarding and pathfinding services were used to clear the investigation locations in parallel with the standard clearance for underground services. No unexploded ordnances were located during the search. The UXO clearance certificate is presented in **Appendix D**.

Test pits were placed where indicated to a depth of at least 0.5 m into underlying natural materials at most locations. The test pits were generally less than 2 to 3 m deep. Test pit and borehole locations at the Stage 1 site and the southern Commonwealth lands, were cleared for the potential presence of UXO/EOW prior to the commencement of intrusive activities (refer to **Appendix D**). Subsequently, borehole locations were cleared via hand augering to approximately 1 mbgs and were installed using push tube coring or solid or hollow flight augers with split spoon sampling. Boreholes were typically proposed where identified contamination extends into natural soils and/or where monitoring wells are required to be installed, such as in the refuelling and UST area of the Stage 1 site. Boreholes were also proposed in the Stage 1 site where investigation beneath hardstand was required.

Soil vapours were assessed during sampling using a photoionisation detector (PID) to assess the potential for volatile organics to be present in vapour phase in the soil. This largely applied to investigations at the refuelling and UST areas.

Landfill gases were proposed to be assessed by review of any existing landfill gas data for that site, where available. However, landfill gas data has not been made available for this report.

Representative samples from surface fill/soil were collected from each investigation location, with subsequent soil samples collected at 0.3 m bgs, 0.5 m bgs and then at regular intervals or at

changes in material encountered, to the extent of excavation. A sample of natural soil was collected from each test pit where practicable.

The investigation sampling and analysis regime is detailed in **Table 6.3**.

Field documentation was completed in accordance with JBS&G's field procedures manual requirements. This included the completion of detailed lithological logs for each sampling location (refer to **Appendix E**).

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination was noted on field sheets (refer to **Appendix F**). Collected soil samples were immediately transferred to laboratory supplied sample jars, or ziplock bags as required for asbestos analysis. The sample containers were labelled, sealed and transferred to an esky for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory.

Not all soil samples collected were analysed. Samples were analysed in general accordance with the analytical schedule (**Table 6.3**). All samples will remain at the primary laboratory for a period of three months if future analysis is required following the receipt of sample results, provided analytes are within holding times.

It is noted that this investigation focussed on the operational area of the Stage 1 site and the Rail Corridor. For the other areas within the Stage 1 site but outside the operational area, previous investigation results were relied on. These previous results are further discussed in **Section 5.1**.

It is noted that access to RailCorp land was not granted in time for this investigation, thus the intrusive investigations proposed in this area were not completed. In addition, the two proposed locations along the drainage line were inaccessible due to the significant amount of construction waste and heavy vegetation surrounding the proposed locations. As such, samples were not able to be collected from these locations (i.e. proposed test pits TP27 and TP28, refer to **Figure 9**). The potential risks associated with the limited investigations at inaccessible areas are discussed in **Section 10**.

6.3 Investigation Methodology – Groundwater

One existing groundwater monitoring well within the Stage 1 site (i.e. BHHP34011) within the refuelling area was noted to be serviceable during the site walkover. The well at BHHP34002 south of the USTs could not be located.

Three additional groundwater monitoring wells at the Stage 1 site and one monitoring well in the rail alignment in the East Hills rail corridor were installed. The well locations are shown on **Figures 8 and 9**.

Groundwater monitoring wells were screened across the water bearing zone within the natural soils, and generally placed to a depth of 2m below the encountered depth of groundwater. The maximum depth of the newly installed wells is 10.5 mbgs.

All monitoring wells were constructed with solid or hollow flight augers. Monitoring wells were constructed out of class 18 UPVC slotted screen and casing. '8/16 graded sand' was used adjoining screened sections. A bentonite plug of a minimum height of 0.5m was placed above the gravel. It was ensured that the sand pack surrounding the screened section was appropriately settled prior to placement of the bentonite plug by bailing and surging of the monitoring well. Wells were finished flush with surface using gatic covers.

Wells were developed after construction using a stainless steel bailer to remove turbidity created by the drilling and construction process. A minimum of 3 well volumes was removed from the well during development. The monitoring wells was then allowed to stabilise for a minimum of 5 days after development prior to sampling.

6.3.1 Groundwater Sampling Method

After stabilisation, the one existing and three new monitoring wells were gauged using an interface probe. Gauging included assessment for presence of light non aqueous phase liquids (NAPL), as well as dense NAPLs by extending to the depth of the well. Prior to sampling, the wells were purged to remove standing water. Field parameters of pH, conductivity, redox and temperature were taken and samples obtained once the parameters stabilise to within approximately 10% or purged dry. Groundwater samples were obtained through the use of a low flow micropurge pump and flow cell. Groundwater samples were transferred directly to laboratory supplied sample bottles. Sample bottles were clearly marked with sample identification details, sealed and then transferred to a chilled esky with ice. Samples were then analysed in accordance with the analytical schedule (Table 6.3).

6.4 Duplicate and Triplicate Sample Preparation

Field duplicate and triplicate samples were obtained using the above sampling methods. The collected samples were placed into three sets of clean bottles as appropriate. Each sample set was then labelled with a primary, duplicate or triplicate sample identification before being placed in the same chilled esky for laboratory transport.

6.4.1 Laboratory Analyses

JBS&G contracted Eurofins MGT (Eurofins) as the primary laboratory, with Envirolab Services (Envirolab) as the secondary laboratory asbestos and chemical analyses. All laboratories are NATA registered for the required analyses. In addition, the laboratories will be required to meet JBS&G's internal QA/QC requirements.

Table 6.3: Analytical Schedule

Area of Environmental Concern (AEC)	Media	Sampling Locations (Soil)	Number of Analyses (excluding QA/QC)
Stage 1 of the DNSDC	Soil/Fill	28	Heavy metals (8) – 28 samples TPH – 28 samples BTEX – 28 samples OCPs/OPPs/PCBs – 14 samples Herbicides – 8 samples PAHs – 20 samples VOCs/SVOCs – 8 samples Asbestos – 25 samples
	Groundwater	4	Heavy metals – 4 samples TPH/BTEX – 4 samples PAHs – 4 samples VOCs/SVOCs – 1 sample Cations/anions – 4 samples
DNSDC South	Soil	4	Heavy metals (8) – 4 samples TPH – 4 samples BTEX – 4 samples OCPs/PCBs – 2 samples PAHs – 4 samples Asbestos – 4 samples Explosive residues – 4 samples
	Groundwater	Nil	N/A
Southern Commonwealth Land (east of Moorebank Ave)	Soil	7	Heavy metals (8) – 7 samples TPH – 7 samples BTEX – 7 samples OCPs/OPPs/PCBs – 3 samples PAHs – 7 samples Asbestos – 7 samples Explosive residues – 7 samples
	Groundwater	Nil	N/A

RailCorp Land (east of Moorebank Ave)	Soil	10	Heavy metals (8) – 20 samples TPH – 10 samples BTEX – 10 samples OCPs/OPPs/PCBs – 7 samples PAHs/Phenols – 20 samples Asbestos – 20 samples
	Groundwater	2	Heavy metals (8) – 2 samples TPH – 2 samples BTEX – 2 samples OCPs – 2 samples PAHs/Phenols – 2 samples
Rail land (southern boundary of golf course)	Soil	7	Heavy metals (8) – 7 samples TPH – 7 samples BTEX – 7 samples OCPs/OPPs/PCBs – 7 samples PAHs – 7 samples Asbestos – 7 samples Explosive residues – 6 samples
	Groundwater	1	Heavy metals (8) – 1 sample TPH – 1 sample BTEX – 1 sample OCPs – 1 sample PAHs – 1 sample Explosive residues – 1 sample Cations/anions – 1 sample
Glenfield	Soil		Heavy metals (8) – 6 samples TPH – 6 samples BTEX – 6 samples OCPs/OPPs/PCBs – 6 samples PAHs – 6 samples Asbestos – 6 samples
	Groundwater	Nil	N/A

In addition to the above analyses, for QA/QC purposes field duplicates and triplicates of soil and groundwater samples were analysed at a rate of 1/20 primary samples. Rinsate samples were obtained from all reusable sampling equipment on the day of sampling, and trip spike and trip blank samples will accompany the soil and groundwater samples for each batch of samples submitted to the laboratory.

7. Assessment Criteria

7.1 Regulatory and Technical Guidelines

The investigation will be undertaken with consideration to aspects of the following guidelines and technical documents, as relevant:

- *National Environment Protection (Assessment of Site Contamination) Measure*, National Environment Protection Council, 1999 (NEPC 2013);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW OEH, 2011 (OEH 2011));
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme*, 2nd Edition, NSW EPA, 2006 (DEC 2006); and

7.2 Contaminated Sites: Sampling Design Guidelines, NSW EPA, 1995 (EPA 1995).Soil Criteria

The soil and groundwater criteria considered to be appropriate for the proposed investigation program is based on investigation and screening levels presented in the revised NEPC (1999) *National Environmental Protection (Assessment of Site Contamination) Measure* (NEPM) (2013).

7.2.1 Health Investigation Levels

The NEPC (1999) NEPM provides risk-based Health Investigation Levels (HIL) for selected organic and inorganic chemicals in soils. Different levels are provided for a variety of exposure settings including residential, open-space / parks / recreational and commercial / industrial land uses. The NEPM HILs have been developed to be protective of human health and do not take into account environmental concerns.

The NEPM was revised in 2013 and based on the proposed future land use of the site, it is considered the NEPM HIL Level D values (for commercial / industrial use, including premises such as shops, offices, factories and industrial sites) are the appropriate health based investigation levels for the soil analytical results.

7.2.2 Health Screening Levels

The NEPM HILs do not provide investigation levels for benzene, toluene, ethylbenzene, total xylene and unspciated TPH. However, HSLs are provided in the NEPM (NEPC, 2013) for these analytes. The HSLs are applicable to assessing human health risk via the inhalation pathway. They apply to different soil types and depths. The applicable HSLs for the remediation program is considered to be the HSL D for commercial / industrial use.

7.2.3 Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs)

The revised NEPM (NEPC, 2013) requires that ecological assessment be considered on all sites, even those with no significant ecological environments. Ecological Investigation Levels (EILs) and the Ecological Screening Levels (ESLs) are applicable for assessing risk to terrestrial ecosystems. ESLs in particular, are provided for several land use scenarios and soil types. The EILs and the ESLs for the commercial / industrial land use is considered relevant for the site.

Both the EILs and the ESLs are relevant for the root zone in soil which corresponds to the top 2 m of the finished level of the site.

7.2.4 Petroleum Hydrocarbon Management Limits

‘Management Limits’ have been provided in the revised NEPM (NEPC 2013) to avoid or minimise the potential for the following:

- Formation of observable LNAPL;

- Fire and explosive hazards; and
- Effects on buried infrastructure.

The application of the management limits require consideration of the depth of building basements, services and depth to groundwater. It is considered that any future developments at the site will not include the construction of a basement. As such, it is considered relevant that the 'Management Limits' will only apply to the first 2 m of the site to ensure that buried infrastructure is taken into account.

7.2.5 Selected Criteria – Soil

A summary of the selected remediation criteria for soil is shown in **Table 7.1** below.

Table 7.1: Soil Criteria (all units in mg/kg)

	Limit of Reporting	Laboratory Method	HIL D	HSL D ^d	EIL and ESL Commercial and Industrial	Management Limits Commercial and Industrial
METALS						
Arsenic	2.0	ICP-AES (USEPA 200.7)	3 000	-	160	-
Cadmium	0.4		900	-	-	-
Chromium (VI)	5.0		3 600	-	323 ^{g,h}	-
Copper	5.0		240 000	-	113 ^h	-
Nickel	5.0		6 000	-	60 ^h	-
Lead	5.0		1 500	-	1 963 ^h	-
Zinc	5.0		400 000	-	132 ^h	-
Mercury (inorganic)	0.05	Cold vapour ASS (USEPA 7471A)	730	-	-	-
PETROLEUM HYDROCARBONS						
F1 ^a	10	Purge Trap-GCMS (USEPA8260)		260	215 ^{c,e}	700 ^e
F2 ^b	50			NL	215 ^{c,e}	1 000 ^e
F3	100			-	1 700 ^e	3 500 ^e
F4	100			-	3 300 ^e	10 000 ^e
BTEX						
Toluene	1.0	Purge Trap-GCMS (USEPA8260)		NL	135 ^e	-
Ethylbenzene	1.0			NL	165 ^e	-
Xylenes	3.0			230	180 ^e	-
Naphthalene	1.0	GCMS (USEPA8270)		NL	370	-
Benzene	1.0	Purge Trap-GCMS (USEPA8260)		3	75 ^e	-
POLYCYCLIC AROMATIC HYDROCARBONS						
Benzo(a)pyrene	0.05	GCMS (USEPA8270)	40	-	1.4 ^e	-
Total PAHs	1.55		4 000	-	-	-
PHENOLS and CRESOLS						
Phenol	1.0	GCMS (USEPA8170)	240 000	-	-	-
Pentachlorophenol	1.0		660	-	-	-
Cresols	1.0		25 000	-	-	-
ORGANOCHLORINE PESTICIDES						
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	45	-	-	-
Chlordane	0.2		530	-	-	-
DDT + DDD + DDE	0.2		3 600	-	640 ^f	-
Endosulfan	0.2		2 000	-	-	-
Endrin	0.2		100	-	-	-
Heptachlor	0.2		50	-	-	-
HCB	0.2		80	-	-	-
Methoxychlor	0.2		2 500	-	-	-
Mirex	0.2		100	-	-	-
Toxaphene	0.2		160	-	-	-
ORGANOPHOSPHORUS PESTICIDES						

Atrazine	0.2	GCMS (USEPA8141,8270)	2 500	-	-	-
Chlorpyrifos	0.2		2 000	-	-	-
Bifenthrin	0.2		4 500	-	-	-
HERBICIDES						
2,4,5-T			5 000	-	-	-
2,4-D			9 000	-	-	-
MCPA			5 000	-	-	-
MCPB			5 000	-	-	-
Mecoprop			5 000	-	-	-
Picloram			35 000	-	-	-
PCBs						
PCBs (total)	0.9	GCECD (USEPA8140,8080)	7	-	-	-
OTHER						
Asbestos	0.1g/kg	PLM / Dispersion Staining	No asbestos on ground surface. ACM must be less than 0.05% w/w. Asbestos fibres / fibrous asbestos must be less than 0.001% w/w.			

Notes:

a = C6-C10 minus BTEX

b = >C10-C16 minus naphthalene

c = ESLs are of low reliability except where indicated by 'c', which indicates that the ESL is of moderate reliability

d = HIL D, sand 0m to <1m. For other soil types and depths, refer to Table 1A(3) of Schedule B1 in NEPC (2013)

e = values for coarse soil texture used

f = Guideline for DDT only

g = Guideline for Chromium

h = Calculated using the ambient background concentration (ABC) from the 25th percentile of background concentrations for NSW Urban Soils (old suburbs, high traffic) in Olszowy, et.al (1995) + the most conservative added contaminant limits (ACL) from Schedule B1 in NEPC (2013).

NL = Not limiting

ESL = Ecological Screening Level provided in NEPM (2013)

HIL D = Health Investigation Levels (HILs) for petroleum hydrocarbons for commercial/industrial land use provided in NEPM (2013)

HSL D = Health Screening Levels (HSLs) provided in NEPM (2013) for petroleum hydrocarbons for commercial/industrial land use.

The results of asbestos observations and analysis will be assessed by visual presence or absence of visible fragments, or laboratory detection of fibres or fragments in soil.

7.3 Groundwater Criteria

Groundwater impact has been identified based on investigation levels selected from environmental and human health based guidelines, as described below:

7.3.1 Environmental Guidelines

Investigation levels have been adopted from the Australian and New Zealand Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* to evaluate the site groundwater analytical results. These guidelines provide environmental based trigger values for concentrations of organic and inorganic chemicals in freshwater and marine aquatic environments.

As the nearest surface water body to the site is the Georges River, the trigger levels for freshwater aquatic ecosystems have been adopted. It is considered that ecosystems with high conservation value are not present in the investigation area and therefore the 95% level of protection has been adopted.

7.3.2 Human Health Guidelines

The revised NEPM (NEPC, 2013) provides Tier 1 groundwater HSLs for vapour intrusion of petroleum hydrocarbons and have been developed for the protection of site users from vapours released from the impacted groundwater. The HSLs take into consideration the of exposure settings including residential, open-space / parks / recreational and commercial / industrial land

uses, the depth to groundwater intersection (2 m to <4 m, 4 m to <8 m and 8 m+) and the dominant soil type (sand, silt or clay) overlying the groundwater intersection depth.

Based on the commercial / industrial zoning of the site and the average depths to groundwater being greater than 4 mbgs, the HSL D for sand soils at depths ranging between 4m and >8m will apply to the site. It is noted that the modelling used to derive the groundwater vapour intrusion values is not strictly compatible with the presence of PSH on the site.

It is noted that the drinking water guidelines are not considered to be relevant to the site given its commercial / industrial use.

8. Quality Assurance / Quality Control

8.1 QA / QC Results

The QA/QC results for soil and groundwater samples collected at the site are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included in the laboratory reports in **Appendix G** and QA/QC summary sheets are attached as **Appendix H**.

Table 7.1 Data Quality Indicator Assessment

Data Quality Indicator	Results	DQO met?
Precision		
Blind duplicates (intra laboratory)	0-71% RPD (soil) No RPD (water) Intra laboratory samples were analysed at a rate greater than 1 in 20 samples.	Yes
Blind duplicates (inter laboratory)	0-57% RPD Inter laboratory samples were analysed at a rate greater than 1 in 20 samples.	Yes
Laboratory Duplicates	<30% RPD	Yes
Accuracy		
Surrogate spikes	19 - 145 % recovery	Yes
Laboratory control samples	38 – 127 % recovery	Yes
Matrix spikes	65 - 130 % recovery	Partial
Representativeness		
Samples extracted and analysed within holding times.	All primary and duplicate samples were extracted within 14 days of sampling.	Partial
Trip spike	87 – 112 %	Yes
Storage blank	<LOR	Yes
Rinsate blank	<LOR	Yes
Method blank	<LOR	Yes
Standard operating procedures for sample collection & handling	Field scientists used the same standard operating procedures throughout works.	Yes
Comparability		
Standard analytical methods used for all analyses	Standard analytical methods used as listed in Table 7.2 .	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by the same field scientists. Standard operating procedures were conducted throughout the works. Field conditions remained the same throughout the works. The primary and secondary labs remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate.	Partial
Completeness		
Soil description and COCs completed and appropriate	All bore logs and COCs were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation is included in the Appendices.	Yes
Satisfactory frequency and result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes
Data from critical samples	Samples were analysed at locations where potential for contamination was observed.	Yes
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Analytical methods and limits of recovery were considered appropriate for media and adopted site assessment criteria.	Partial

8.2 QA/QC Discussion

8.2.1 Precision

Soil Duplicate (intra-laboratory) and Triplicate (inter-laboratory)

Soil field blind duplicate (intra-laboratory) and triplicate (inter-laboratory) samples for soil were collected at a rate of 1 per 19 primary samples analysed, meeting the 1/20 DQI frequency.

Soil RPDs were calculated according to the NEPC (2013) guidelines and most results were reported within the JBS&G acceptable limits (0-50%). RPD for zinc (71%) for intra-laboratory duplicate pair TP46 0-0.1 and QC01 and for arsenic (57%) for inter-laboratory duplicate pair MW01 0-0.1 and QC04A were outside the acceptable limits. The RPD exceedances may have been due to sample heterogeneity and as a conservative measure, the highest values will be used in the interpretation of results.

Water Duplicate (intra-laboratory) and Triplicate (inter-laboratory)

One intra-laboratory and one inter-laboratory sample were collected during the groundwater monitoring event. The primary, secondary and triplicate samples comprised petroleum product. As such, there are no RPD calculations for this set of samples. This is not considered to compromise the overall quality of the groundwater data.

8.2.2 Accuracy

Soil Surrogate Spikes

All surrogate samples analysed reported recoveries within the JBS&G or laboratory acceptable range. Surrogate spikes were conducted for all organic samples.

Water Surrogate Spikes

All surrogate samples analysed reported recoveries within the JBS&G or laboratory acceptable range. Surrogate spikes were conducted for all organic samples.

Laboratory Control Samples

Laboratory control samples analysed in the soil and groundwater batches had reported recoveries within the acceptable range.

Matrix Spikes

Matrix spike samples analysed in the soil and groundwater batches reported recoveries within the acceptable range except for the spike recovery for atril (67%) from batch 443486. This spike recovery is below the acceptable range determined by the laboratory. However, it is considered not to affect the overall data quality of this batch as the spike recoveries for majority of the acid herbicides (4 of 5) were within the acceptable range.

8.2.3 Representativeness

Sampling appropriate for media and analytes

All soil sampling works completed during the investigation were conducted in accordance with JBS&G standard operating procedures. Soil sampling was conducted as described in **Section 5.3**.

Holding Times

The extraction and analysis of selected soil samples was completed within the recommended holding times for all analytes except for select volatile samples from batch 443486. Samples were received in the laboratory 2 days after sampling. However, the samples were not extracted until 14 days after the sampling date (recommended extraction time is 7 days for select volatile compounds (i.e. vinyl chloride, styrene and 2-chloroethyl vinyl ether)). However, the samples were kept at optimum conditions at the laboratory and thus it is considered unlikely that the delayed extraction of samples significantly affects the overall data quality of this batch.

Rinsate Blank

Three rinsate blanks were collected following decontamination of non-disposable sampling equipment. All analyte concentrations in the rinsate blank were below the laboratory LOR.

Trip Spike

Three trip spikes were submitted with the soil and groundwater samples collected during the assessment. Trip spike recoveries were within the acceptable limit of 70-130%.

Storage Blank

Three storage blanks were submitted with the soil and groundwater samples collected during the assessment. There were no reported concentrations of BTEX compounds above the laboratory LOR.

Decontamination and Calibration

All field equipment was decontaminated and calibrated appropriately as per the procedure identified in **Section 5.3.2**.

8.2.4 Comparability

Experienced JBS&G field scientists undertook sampling in accordance with standard JBS&G sampling methods. Field works and sampling were undertaken by the same JBS&G field scientist throughout the works.

All field documentation was appropriately completed. The nominated laboratories undertook all analysis in accordance with the relevant National Association of Testing Authorities (NATA) accredited methods.

8.2.5 Completeness

Samples were transported under full chain of custody (COC) documentation. The COC documentation was completed correctly and the selected analyses were correctly conducted.

All field documentation was completed appropriately including borehole logs, calibration and decontamination sheets, COCs and daily field logs presented in **Appendix F**.

The frequency of analysis and result for all QC samples were appropriate.

8.2.6 Sensitivity

In general, laboratory analysis methods for all contaminants in soil and groundwater adopted during the investigation used limits of reporting significantly less than the site assessment criteria to ensure the contaminant concentrations could be confidently identified as being less than the adopted assessment criteria. Some LORs used in the analysis of OCPs, OPPs and mercury in groundwater were above the adopted ecological criteria. However, as OCPs, OPPs and mercury impacts were not noted in the soil samples, it is considered unlikely that this will affect the findings of this assessment.

8.3 QA/QC Assessment

The field sampling and handling procedures produced QA/QC results which indicate that the soil and groundwater data are of an acceptable quality and suitable for use in site characterisation.

The NATA certified laboratory results sheets indicate that the project laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples of this program were analysed.

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

9. Investigation Results

9.1 Field Observations

The lithology encountered at the site during the field works is summarised below. Borehole logs are included in **Appendix E**. A total of 41 test pits, 5 soil bores and the installation of 4 groundwater wells were completed by JBS&G on between the 16th and 23rd of December 2014 for the current investigation.

A summary of encountered geological conditions is presented in **Table 9.1**.

Table 9.1: Summary of Geological Conditions

Area of Concern	Encountered Geology	Depths Encountered
Stage 1 site	In general the locations in this area were characterised by the following: FILL: yellow / brown / grey sandy clay to sandy gravel with igneous inclusions and sandstone cobbles	Surface to 1.1 mbgs
	NATURAL: Silty CLAY, brown / orange / red, low to medium plasticity with sandstone inclusions	Surface (at some locations) to 10 mbgs.
	It is noted that location SB03 (on the northern portion of the refuelling area) had silty, sandy clay FILL from the surface to the maximum investigation depth of 3.2 mbgs.	
DNSDC South	FILL: Clayey sand, yellow to orange, medium to coarse grains	0.01 to 0.4 mbgs
	NATURAL: CLAY, orange / grey / red, medium plasticity	0.2 to 0.8 mbgs
Commonwealth land east of Moorebank Avenue	FILL: Sand, light brown, fine, with inclusions of gravels and rootlets	0 to 0.2 mbgs
	NATURAL: SAND, yellow, medium to coarse grained and CLAY, orange to grey, very stiff	0 to 0.9 mbgs
North of East Hills Rail Corridor (Golf Course)	FILL: Sand, grey to brown, heterogeneous, damp, firm with rootlets	0 to 1 mbgs
	NATURAL: Silty Sandy CLAY, orange / brown / grey, red mottling, heterogeneous, fine, medium plasticity	0.4 to 9 mbgs
Glenfield Waste Facility	FILL: Sandy gravel, yellow / grey, low to medium plasticity	0 to 3.1 mbgs
	NATURAL: Silty CLAY to SAND, grey / brown heterogeneous, medium plasticity	0.6 to 3 mbgs

No staining, odours or asbestos was observed throughout the fill profile. No groundwater seepage was observed within any of the test pit or soil bore locations except at the monitoring well locations.

9.2 Analytical Results

Soil and groundwater samples were analysed for the COPCs listed in **Table 6.3** except at the locations that were inaccessible during the field program (refer to **Section 6.2** and **Figure 9**). Analytical results for samples of soil and groundwater were generally less than the LOR or below the adopted human health and / or ecological criteria (refer to **Section 7**) with the exception of the following listed in **Table 9.2** below.

Table 9.2: Summary of Analytical Exceedances

Area of Concern	Sample Location / ID	Sample Depth	Human Health Criteria Exceedances	Ecological Criteria Exceedances
SOIL				
Glenfield Waste Facility	TP49	2.8-3.0	Lead (2 000 mg/kg)	Zinc (290 mg/kg)
North of the East Hills Rail Corridor (Golf Course)	AHMS01-SIMTA	0.3-0.4	Bonded asbestos	-
GROUNDWATER				
North eastern corner of Stage 1 site	MW01	-	-	Copper (2 µg/l) Nickel (43 µg/l) Zinc (92 µg/l)
North of B16, Stage 1 site	MW02	-	-	Cadmium (0.5 µg/l) Chromium (1 µg/l) Copper (2 µg/l) Nickel (220 µg/l) Zinc (280 µg/l)
Refuelling area, Stage 1 site	MW03	-	LNAPL (2.865 m)	
Refuelling area, Stage 1 site	BHHP34011	-	LNAPL (0.684 m)	
North of the East Hills Rail Corridor (Golf Course)	MW06	-	-	Zinc (17 µg/l)

Detailed laboratory reports and chain of custody documentation are provided in **Appendix G**.

10. Site Characterisation

Based on the decision making process for assessing urban redevelopment sites detailed in DEC (2006) and discussed in **Section 5.1.5**, the decisions required to be made are detailed below.

10.1 Potential Risks to Future On-site Receptors

Representative soil samples were analysed for COPCs identified at the Proposal site (as listed in **Table 6.3**, excluding RailCorp-owned land). Most of the reported concentrations of the COPCs for soil samples from previous and current investigations were below the adopted NEPC (2013) human health commercial / industrial criteria. Only one soil sample had a concentration above the human health criteria. This sample was collected from the western portion of the Glenfield Waste Facility site. This area will require further management to mitigate potential risks to future workers during the development of this area of the Proposal site.

Notably, asbestos containing materials (ACM) were positively identified on the surface at the north-western corner of building B11 (Stage 1 site), and in fill at 0.3-0.4 mbgs at a test pit on the north of the East Hills rail corridor (golf course) (see **Figures 11a** and **12**). The ACM find adjacent building B11 may be related to degrading or historical building infrastructure. The ACM find at the golf course may be related to historic burials or filling activities. The ACM finds have the potential to pose a risk to future workers at the site should the ACM be disturbed. In line with the mitigation of this risk, it is assumed that the removal and/or appropriate management of surface ACM would be conducted in parallel with the hazardous materials removal work prior to the demolition of existing buildings. The characterisation / delineation, excavation and disposal of potential bonded ACM impacted fill from the golf course should be conducted prior to the commencement of the planned development works in this area. Any asbestos impacted material exceeding NEPC (2013) land use criteria will need to be managed and/or disposed of as 'Special (asbestos) Waste'.

Selected soil samples taken from within the Stage 1 site and on the north of the East Hills rail corridor (on the golf course) have concentrations exceeding the adopted heavy metal ecological criteria for commercial / industrial land. However, given that the Proposal site will remain as a commercial / industrial site and is assumed to include large building structure and extensive hardstand areas with limited areas of (environmental) concern, the exceedance of ecological criteria is not considered to pose an unacceptable risk to the environment nor necessitate further remediation. Similarly, the ecological heavy metal exceedances reported in groundwater is not considered to pose an unacceptable risk to environmental receptors as the heavy metal concentrations are considered to be representative of background concentrations in groundwater in urban areas of Sydney.

The refuelling area within the Stage 1 site is noted to have contamination in the form of LNAPL. This may have resulted from historical leaks from the underground storage tanks. Impacts in this area of the site may pose a potential risk to future workers at the site. It is proposed that this area be remediated to the extent practicable prior to or in parallel with the planned development work. This should include the decommissioning of all above and underground petroleum distribution and storage infrastructure.

10.2 Background Soil Concentrations

In-situ natural soils were encountered from depths between 0.15 and 2.7 m bgs. The soil samples collected from the natural material had heavy metal concentrations (in the analysed samples) below the adopted assessment criteria. As such, further assessment of natural soils at the Proposal site is considered not to be required.

10.3 Chemical Mixtures

There were no potential chemical mixtures identified during the investigation that may pose a management issue at the site.

10.4 Aesthetic Issues

ACM was identified on the ground surface at one location within the Stage 1 site (i.e. BHH004) during the 2002 HLA investigation and at one location at the golf course (i.e. AHMS01). In addition, hydrocarbon odours were noted in the refuelling area of the Stage 1 site.

With the exception of the ACM and odours reported at the Proposal site, there were no other significant aesthetic issues noted in areas assessed during the current ESA work.

10.5 Potential Migration of Contaminants

Fragments of ACM were reported in some areas of the Proposal site (as discussed in **Section 10.1**). The risk of migration offsite is considered to be low given the inert and isolated nature of the bonded asbestos finds. Similarly, the lead detection in soils at TP49 at the Glenfield Waste Facility is unlikely to migrate offsite given the nature and depth of the lead impacts. The LNAPL reported on groundwater in the refuelling area of the Stage 1 site has the potential to migrate offsite towards Moorebank Avenue and the MIC site. Management of these impacts is required.

Based on historical information and data, and current investigation data, there does not appear to be any risk of contaminant migration to or from the Proposal site to an extent that would prevent development.

10.6 Site Management

Results of the current investigation did not identify any impacts that indicate widespread or gross contamination of the land that would unreasonably restrict development and use. It is noted however, that fragments of ACM reported will require management and/or removal and the lead impacts at the Glenfield Waste Facility and the petroleum related impacts at the refuelling area of the Stage 1 site will need to be managed.

10.7 Investigation Data Gaps

It is noted that parts of the Proposal site were inaccessible and as such, intrusive investigations could not be conducted in these areas. The inaccessible areas included the RailCorp-owned land that is traversed by the south-eastern portion of the Rail Corridor and along a drainage line within the Commonwealth land south of DNSDC South (refer to **Figure 9**).

JBS&G considers the northern Rail Corridor lands through Commonwealth land, south of DNSDC South, including the drainage line, to be adequately characterised by the sampling locations north and south of the drainage lines (i.e. sampling locations TP25, TP26, TP29 and TP30).

However, there may be potential unidentified contamination risks within the RailCorp-owned land associated with the anecdotal but as yet unconfirmed disposal of waste and burning of wooden railway sleepers. Typical rail-related COPC in fill materials include heavy metals, asbestos, TPH, PAHs, phenols and OCPs, and are readily able to be managed through standard industry approaches including off-site disposal and on-site reuse or containment/management. There are general waste immobilisation approvals for copper-chrome-arsenate (CCA) and creosote treated timber wastes. Further intrusive investigations can be conducted prior to the implementation of the remediation program as discussed in **Section 10.1**.

11. Conclusions and Recommendations

11.1 Conclusions

Chemical soil analytical results at the Proposal site (excluding RailCorp-owned land) were reported below the adopted human health and ecological criteria except for select heavy metals. The heavy metal concentrations of note are those that exceed the ecological criteria. However, as the Proposal site will remain as a commercial / industrial site with limited areas of (environmental) concern, the exceedance of ecological criteria is not considered to pose an unacceptable risk to the environment nor necessitate further remediation. Similarly, the ecological heavy metal exceedances reported in groundwater are not considered to pose an unacceptable risk to environmental receptors as the heavy metal concentrations are considered to be representative of background concentrations in groundwater in urban areas of Sydney.

Impacts reported for the Proposal site that will require management include the ACM finds at the golf course and at the Stage 1 site, the lead soil concentrations reported from one location at the Glenfield Waste Facility, and the petroleum related impacts at the refuelling area within the Stage 1 site. These notable impacts will need to be managed prior to or parallel with the commencement of development works at the site. This would include the decommissioning of all above and underground petroleum distribution and storage infrastructure at the refuelling area within the Stage 1 site.

Based on the findings and Limitations in **Section 11**, the site is considered suitable for ongoing commercial / industrial use subject to the limitations and management of the impacts discussed above. There is no gross or widespread contamination that would unreasonably restrict development and use of the site.

11.2 Recommendations

It is recommended that a Remediation Action Plan (RAP) be developed to address the aforementioned impacted areas to minimise the risk to future workers at the Proposal site. As a precautionary measure, it is also recommended that an unexpected finds protocol be incorporated in future site management plans to ensure the protection of future onsite workers.

12. Limitations

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

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

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

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

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

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

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

13. References

- ARUP (2008) *Stockland Moorebank Intermodal Terminal Geotechnical Desk Study Report*, dated December 2008
- Australian Collaborative Land Evaluation Program (ACLEP) (2015), *Australia Soil Resource Information System*, <http://www.asris.csiro.au/mapping/viewer.htm>, viewed 29 January 2015
- Brooks & Associates (Brooks) (2002) *Heritage Assessment of the Moorebank Defence site at Moorebank*, dated October 2002
- CM (2002b) *Site Audit Statement*, Defence National Storage and Distribution Centre, Moorebank Avenue, Moorebank, dated December 2002
- Department of Environment and Conservation NSW (DEC) (2007), *Contaminated Sites Guidelines for the Assessment and Management of Groundwater Contamination*, 2007
- Department of Health (2009), *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009
- Douglas Partners (DP) (2009a) *Summary Environmental Conditions, Proposed Intermodal Freight Terminal*, DNSDC Site – Moorebank Avenue, Moorebank, dated December 2009
- Douglas Partners (2009b) *Summary Geotechnical Site Conditions, Proposed Intermodal Freight Terminal*, DNSDC Site – Moorebank Avenue, Moorebank, dated December 2009
- EES (2002a) *Memorandum: Review of Investigation Review Report DNSDC*, Moorebank Defence Lands (URS) and Site Audit Statement WRR118 (Dr William Ryall), dated 16 December 2002
- Egis (2000) *Preliminary Site Investigation at the Defence National Supply and Distribution Centre*, Moorebank Defence Lands, dated September 2000
- Environmental and Earth Sciences (EES) (2002a) *Memorandum: Review of Reports Pertinent to Environmental Investigations Conducted at DNSDC*, Moorebank, NSW, dated 12 December 2002
- Golder Associates (Golder) (2010) *Phase 1 Environmental Site Assessment, Stage 1A of Moorebank Intermodal Freight Terminal Development*, dated December 2010
- Golder (2011a) *Phase 1 Environmental Site Assessment, SIMTA Rail Corridor Land*, dated November 2011
- Golder (2011b) *Preliminary Environmental Site Assessment – SIMTA Site and Associated Rail Corridor*, dated 16 November 2011
- HLA (2002a) *Soil and Groundwater Investigation, Precinct H (DNSDC)*, Moorebank Defence Lands, dated November 2002, including HLA (2002b) *Work Plan Soil and Groundwater Investigation Moorebank Defence Land*, dated 17 September 2002
- JBS&G (2014), *Sampling, Analysis and Quality Plan Supplementary Contamination Investigations SIMTA Stage 1 Development*, Draft, 2 December 2014, 50342/60216
- Milsearch (2002) *Ordnance Investigation*, 2002;
- National Environmental Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure 1999*, National Environmental Protection Council, April 2013;
- Minister for the Environment (2013), *NSW Contaminated Land Management Act 1997*, 11 January 2013

NSW Department of Environment and Climate Change (DECC) (2009), *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contaminated Land Management Act 1997*, June 2009 (DECC 2009)

NSW Department of Environment and Conservation (DEC) (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme*, 2nd Edition, NSW Environmental Protection Authority, April 2006

NSW Environmental Protection Authority (EPA) (1995), *Contaminated Sites: Sampling Design Guidelines*, September 1995

NSW EPA (1996), *Environmental Guidelines: Solid Waste Landfills*, January 1996

OEH 2011, *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW Office of the Environment and Heritage, August 2011

Olszowy, H. Torr, P. and Imray, P. (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia*, *Contaminated Sites Monograph Series No. 4* 1995

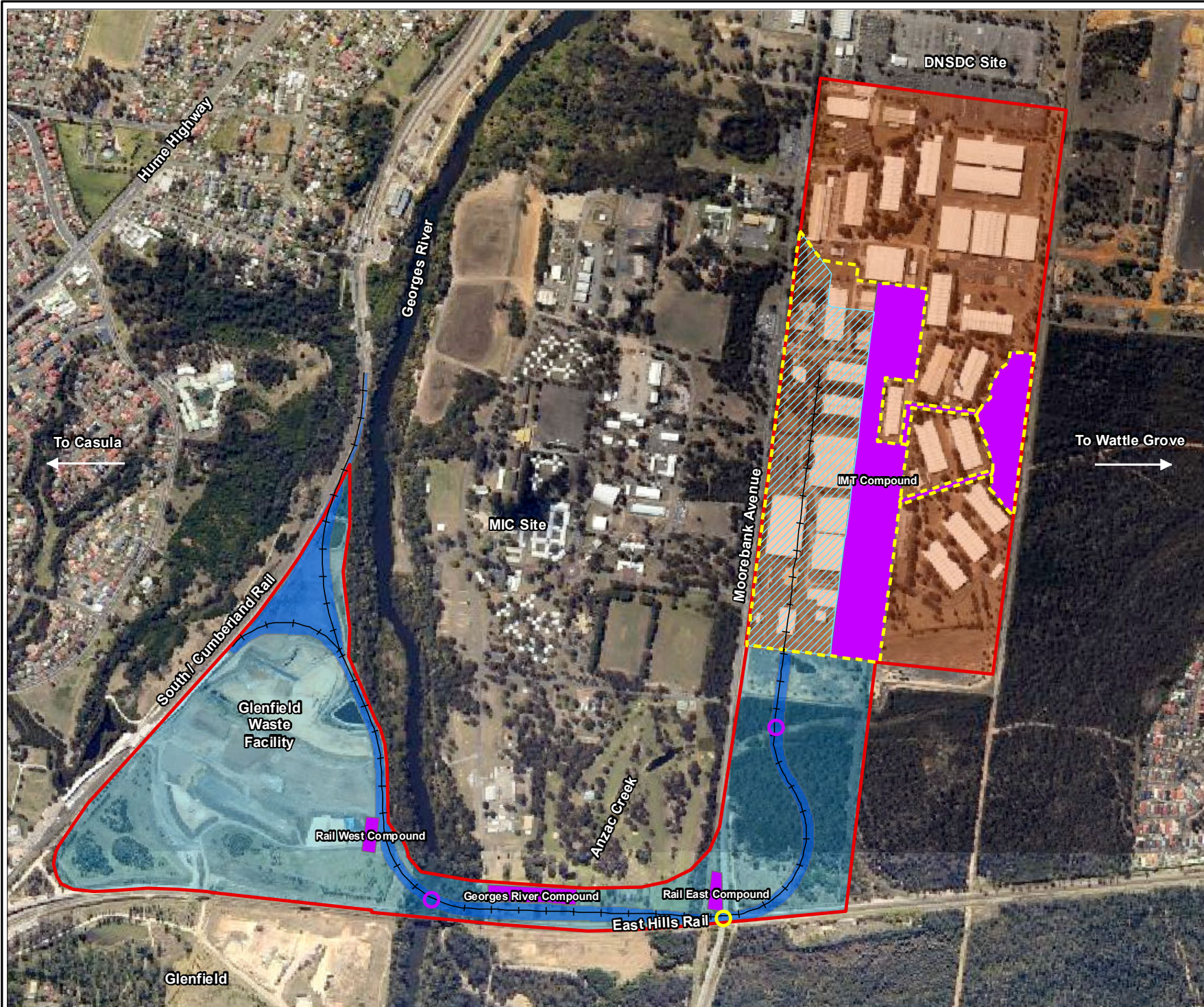
Parsons Brinkerhoff (PB) (2014), *Phase 2 Environmental Site Assessment Moorebank Intermodal Terminal*, 28 May 2014 Tactical Group (2014), *Stage 1 Site Plan*, 16 October 2014

Toxikos (2011) *Preliminary screening health risk assessment and literature review*, Moorebank Intermodal Freight Terminal, Moorebank NSW, dated August 2011 (Appendix I of the Urbis 2012 EA).

URS (2002a) *Assessment of DNSDC Buildings – Supplement to Egis 2000 Stage 1 Preliminary Site Investigation of Areas A1 to A6*, dated March 2002;

URS (2002b) *Investigation Review Report DNSDC*, Moorebank Defence Lands, dated 10 December 2002;

Figures



Legend:

- Project Site
- Stage 1 Site and Construction Area
- Operational Area
- Compound Sites
- SIMTA Site
- Rail Corridor
- Rail Link (including 20m width and variable buffer) and Construction Area
- Proposed Rail Alignment
- Road Crossing
- Creek/River Crossing

All locations approximate



Job No: 50342

Client: Qube Property Management

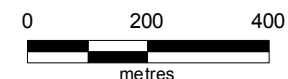
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:12,500



Coor. Sys. GDA 1994 MGA Zone 56

SIMTA Intermodal Terminal Facility - Stage 1

STAGE 1 LOCATION PLAN AND KEY AREAS

FIGURE 1



Legend:

□ Cadastral Boundary



Job No: 50342

Client: Qube Property Management

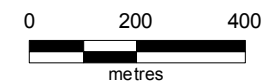
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:14,000

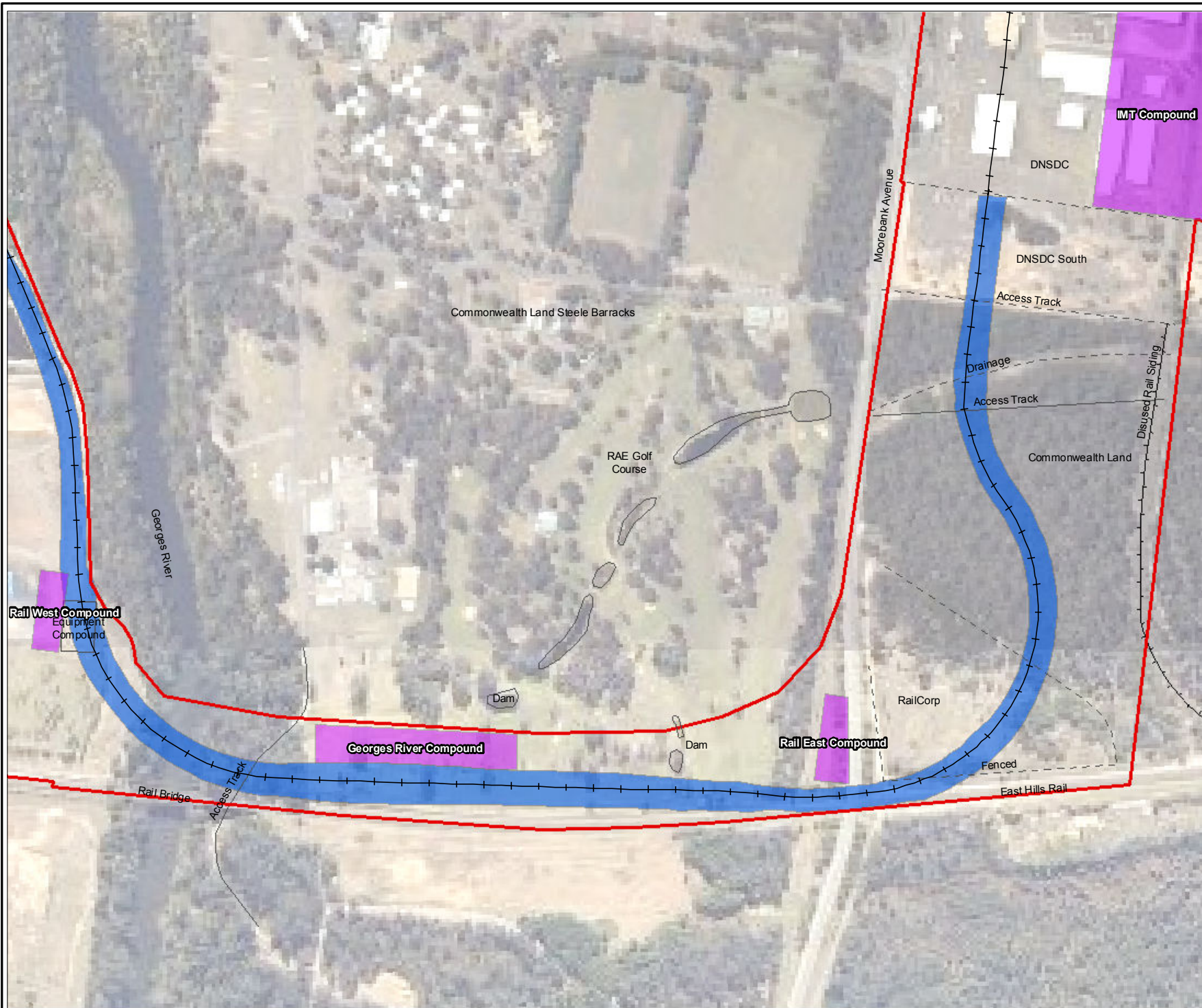


Coor. Sys. GDA 1994 MGA Zone 56

**SIMTA Intermodal Terminal
Facility - Stage 1**

CADASTRAL BOUNDARIES

FIGURE 2



Legend:

- Project Site
- Compound Sites
- Rail Link (including 20m width and variable buffer)
- +— Proposed Rail Alignment

All locations approximate



Job No: 50342

Client: Qube Property Management

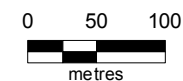
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:5,500

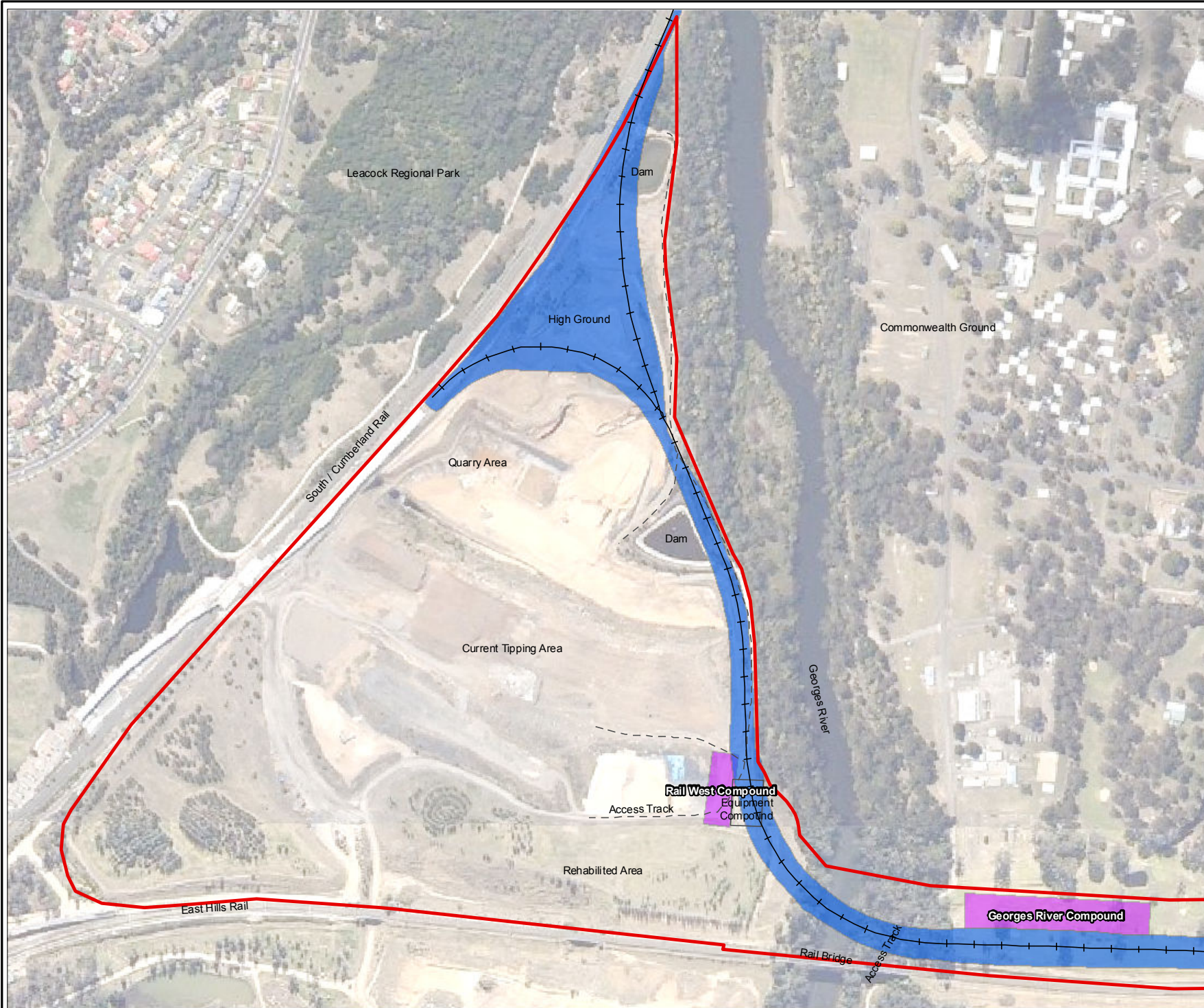


Coor. Sys. GDA 1994 MGA Zone 56

**SIMTA Intermodal Terminal
Facility - Stage 1**

**SOUTHERN COMMONWEALTH
AND RAIL LAND SITE LAYOUT**

FIGURE 4



Legend:

- Project Site
- Rail Link (including 20m width and variable buffer)
- Compound Sites
- Proposed Rail

All locations approximate



Job No: 50342

Client: Qube Property Management

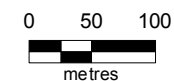
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:6,000



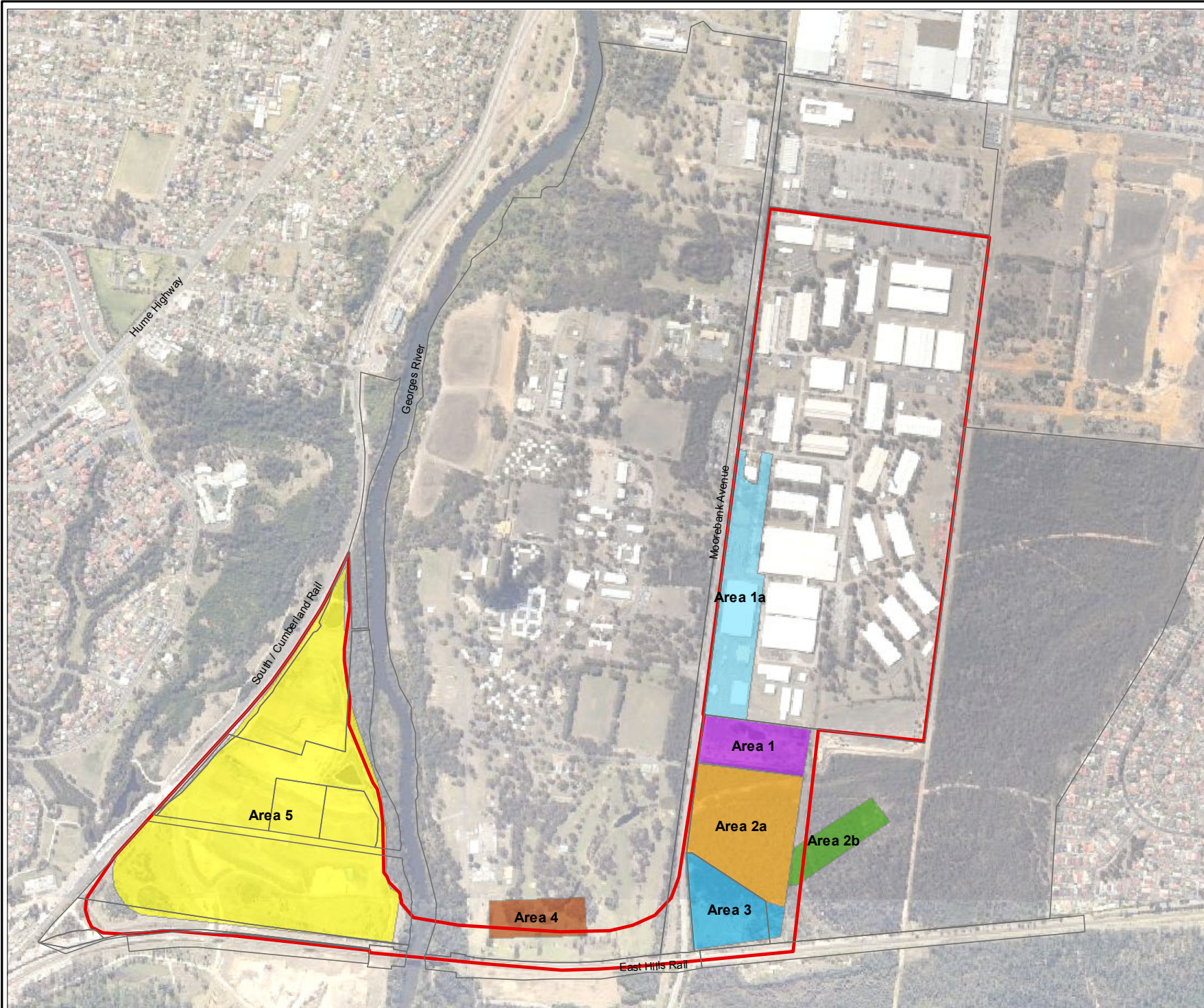
Coor. Sys. GDA 1994 MGA Zone 56

**SIMTA Intermodal Terminal
Facility - Stage 1**

**GLENFIELD WASTE FACILITY AND
WESTERN RAIL LAND SITE LAYOUT**

FIGURE 5





Legend:

- Project Site
- Cadastral Boundary
- Area 1a
- Area 1 - Unauthorised Dumping
- Area 2a - Illegal Dumping Identified
- Area 2b - Former Grenade Range
- Area 3 - Area of Land Filling
- Area 4 - Former Mock Viet Cong Village
- Area 5 - Glenfield Quarry and Waste Disposal Facility

All locations approximate



Job No: 50342

Client: Qube Property Management

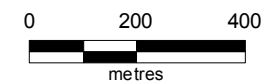
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:14,000

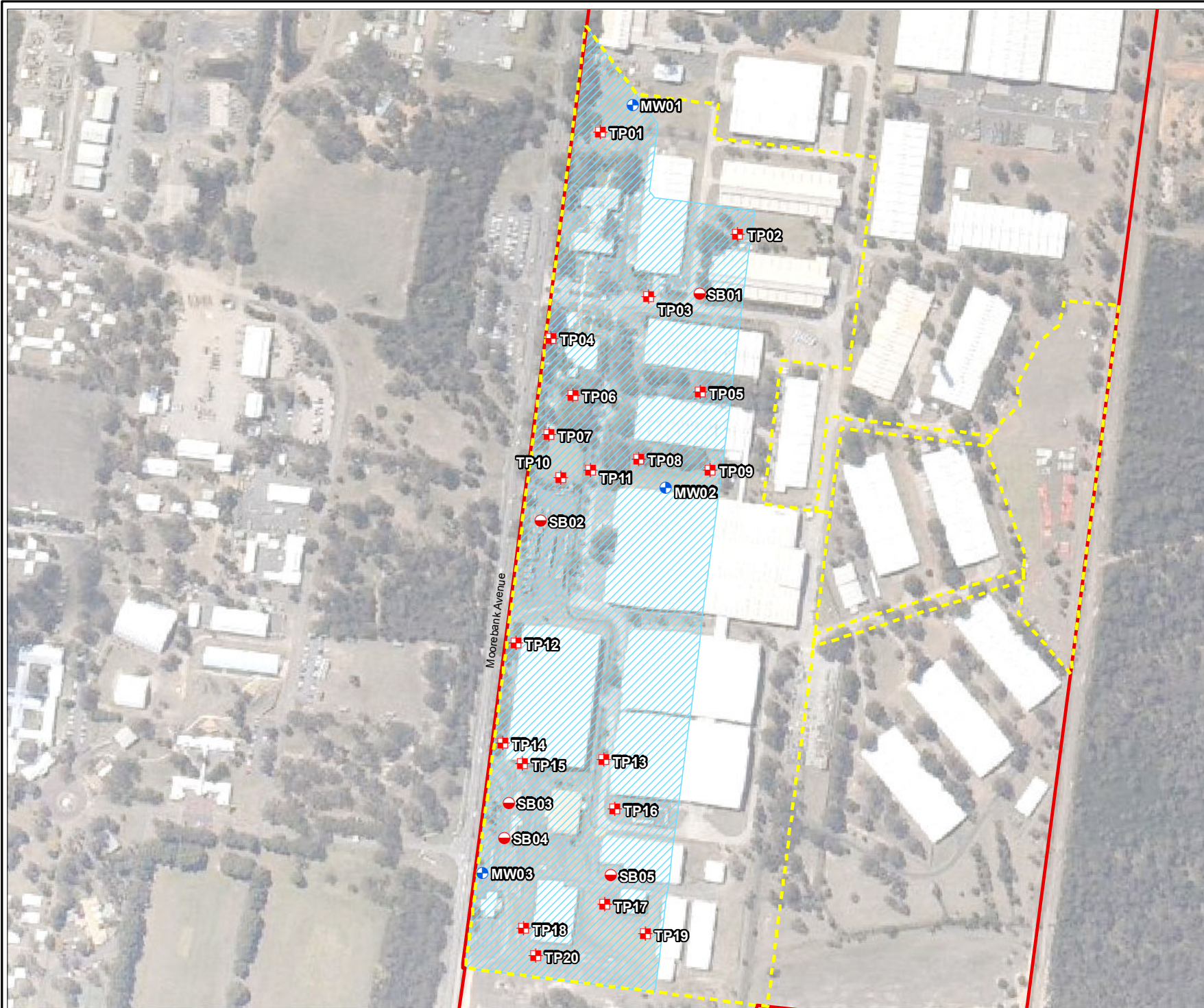


Coor. Sys. GDA 1994 MGA Zone 56

**SIMTA Intermodal Terminal
Facility - Stage 1**

**PREVIOUS AREAS OF INTEREST
(GOLDER 2011)**

FIGURE 7



Legend:

- Project Site
- Stage 1 Site
- Operational Area
- Borehole Location
- Monitoring Well Location
- Test Pit Location



Job No: 50342

Client: Qube Property Management

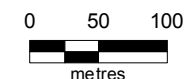
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:5,500

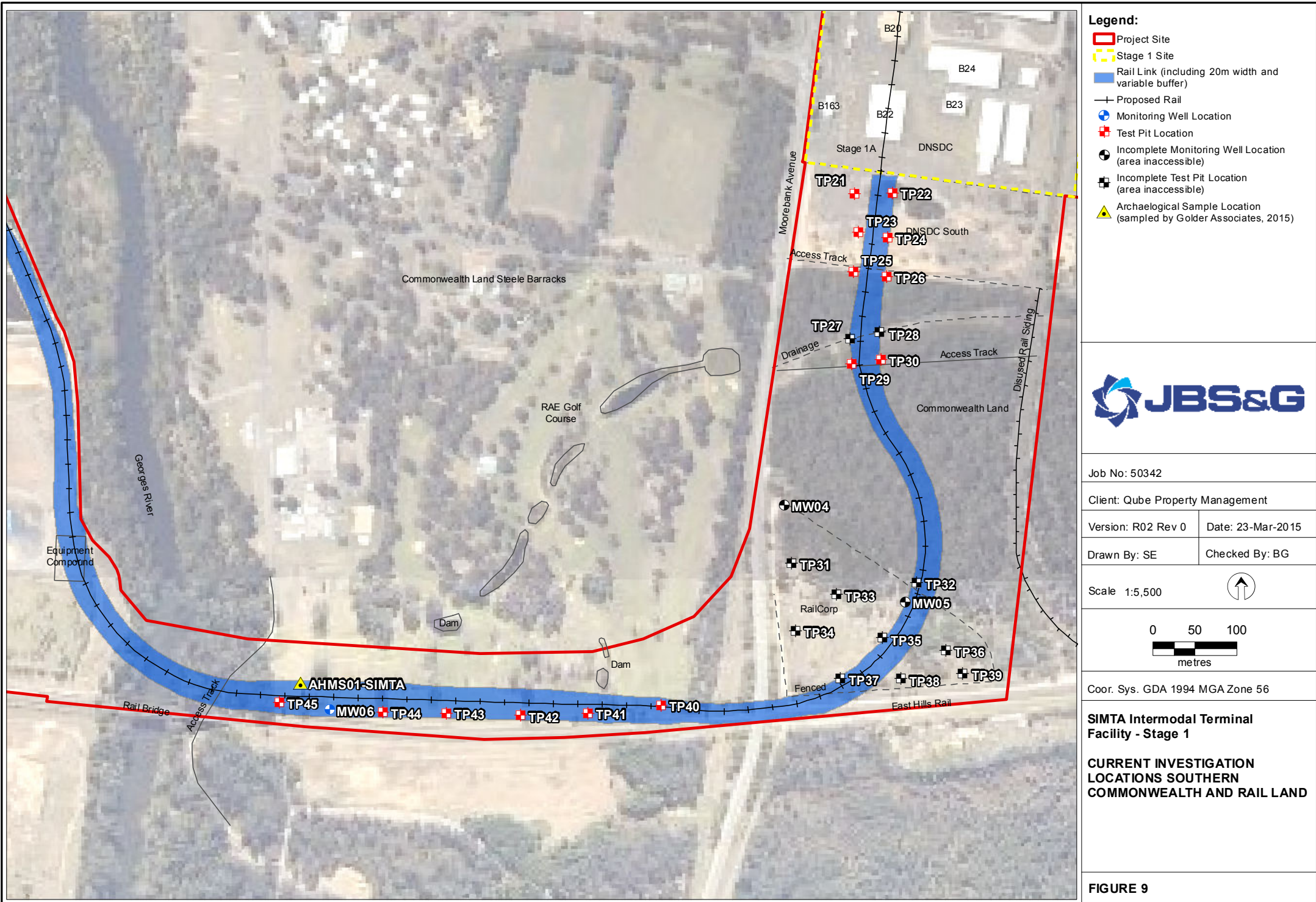


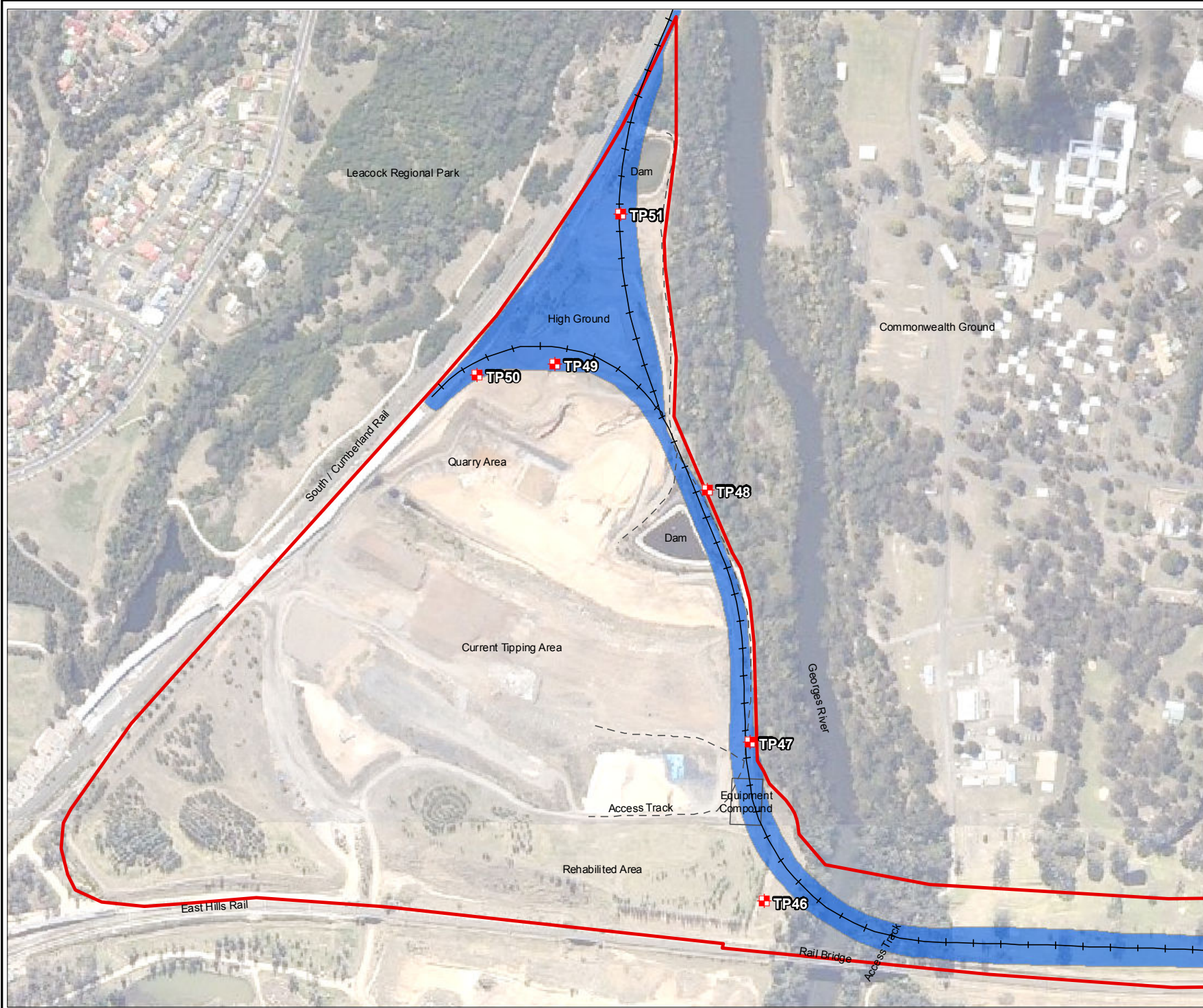
Coor. Sys. GDA 1994 MGA Zone 56

**SIMTA Intermodal Terminal
Facility - Stage 1**

**CURRENT INVESTIGATION
LOCATIONS STAGE 1 SITE**

FIGURE 8





Legend:

- Project Site
- Rail Link (including 20m width and variable buffer)
- Proposed Rail Alignment
- + Test Pit Location

TP47 and TP48 were shared test pits with Golder Associates



Job No: 50342

Client: Qube Property Management

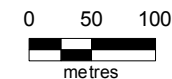
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:6,000



Coor. Sys. GDA 1994 MGA Zone 56

SIMTA Intermodal Terminal Facility - Stage 1

CURRENT INVESTIGATION LOCATIONS GLENFIELD WASTE FACILITY AND WESTERN RAIL LAND

FIGURE 10

BHH004_AS-1	Depth
Asbestos	Surface

BHH031/BHH-1	Concentration
Cadmium	0.031 mg/L
Copper	0.011 mg/L
Nickel	0.2 mg/L
Zinc	0.845 mg/L

BHHP3600101	Depth	Concentration
Copper	0.1-0.2m	207 mg/kg

BHHP34002	Concentration
Copper	0.003 mg/L
Zinc	0.021 mg/L

BHHP34011	Concentration
Copper	0.012 mg/L
Lead	0.01 mg/L
Nickel	0.023 mg/L
Zinc	0.1 mg/L
m-xylene	416 ug/L

TPH0403	Depth	Concentration
Zinc	10-1.1m	784 mg/kg

TPH00203	Depth	Concentration
Zinc	10-1.1m	133 mg/kg

BHH038	Concentration
Cadmium	0.006 mg/L
Copper	0.008 mg/L
Nickel	0.195 mg/L
Zinc	0.355 mg/L

Legend:

- Project Site
- Stage 1 Site
- Operational Area
- Borehole Location (HLA 2002)
- Monitoring Well Location (HLA 2002)
- Sediment Sample Location (HLA 2002)
- ▲ Surface Soil Sample Location (HLA 2002)
- ▼ Surface Water Sample Location (HLA 2002)
- + Test Pit Sample Location (HLA 2002)

All locations approximate



Job No: 50342

Client: Qube Property Management

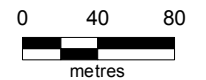
Version: R02 Rev 0

Date: 23-Mar-2015

Drawn By: SE

Checked By: BG

Scale 1:4,000

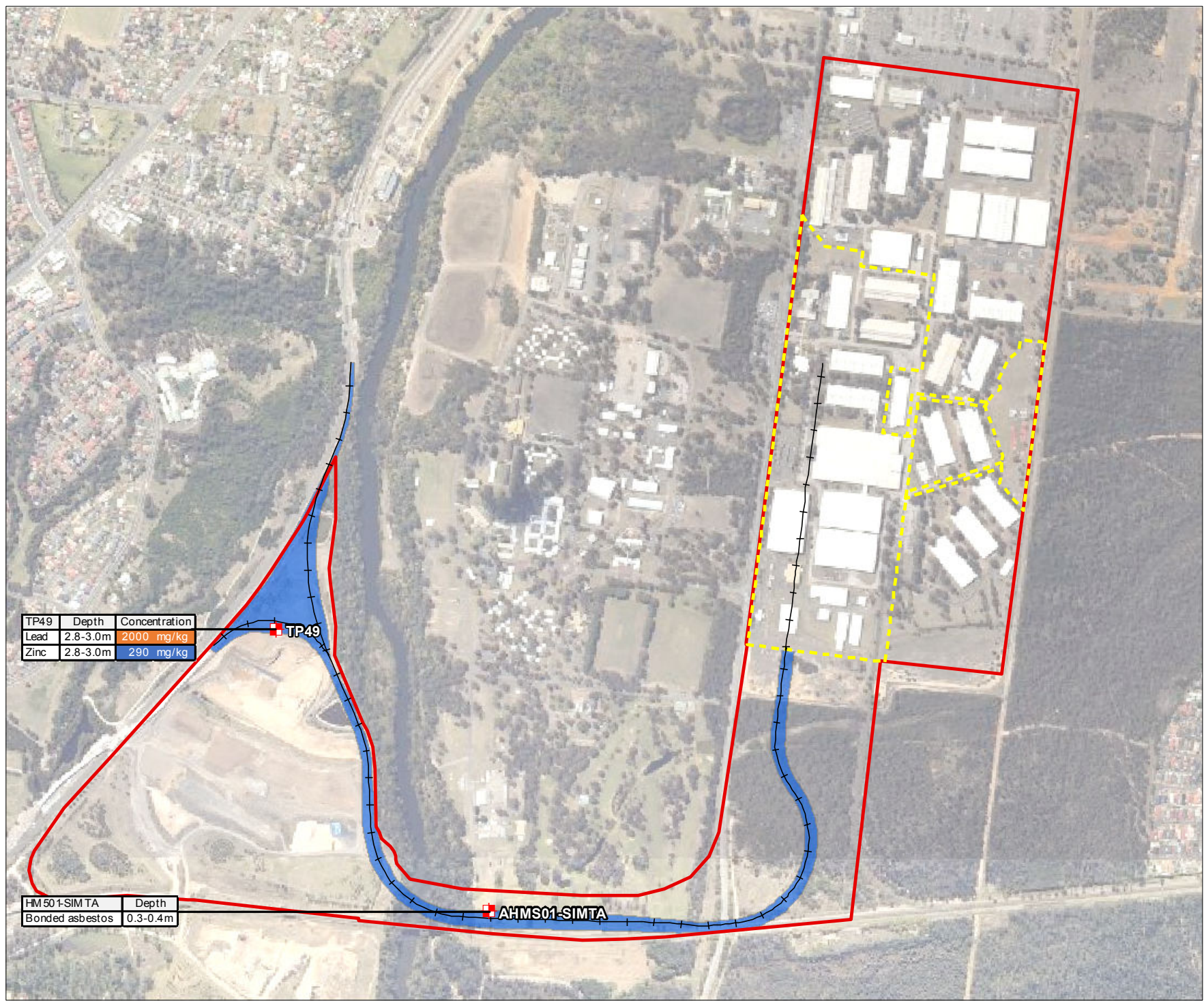


Coord. Sys. GDA 1994 MGA Zone 56

SIMTA Intermodal Terminal Facility - Stage 1

STAGE 1 SITE - HISTORICAL EXCEEDANCES - SOUTH

FIGURE 11B



TP49	Depth	Concentration
Lead	2.8-3.0m	2000 mg/kg
Zinc	2.8-3.0m	290 mg/kg

HM 501-SIMTA	Depth
Bonded asbestos	0.3-0.4m

Legend:

- Project Site
- Stage 1 Site
- Rail Link (including 20m width and variable buffer)
- Proposed Rail Alignment
- Sample Location - Soil Analytical Exceedance

Exceeds Human Health Criteria

Exceeds Ecological Criteria



Job No: 50342	
Client: Qube Property Management	
Version: R02 Rev 0	Date: 23-Mar-2015
Drawn By: SE	Checked By: BG

Scale 1:12,000

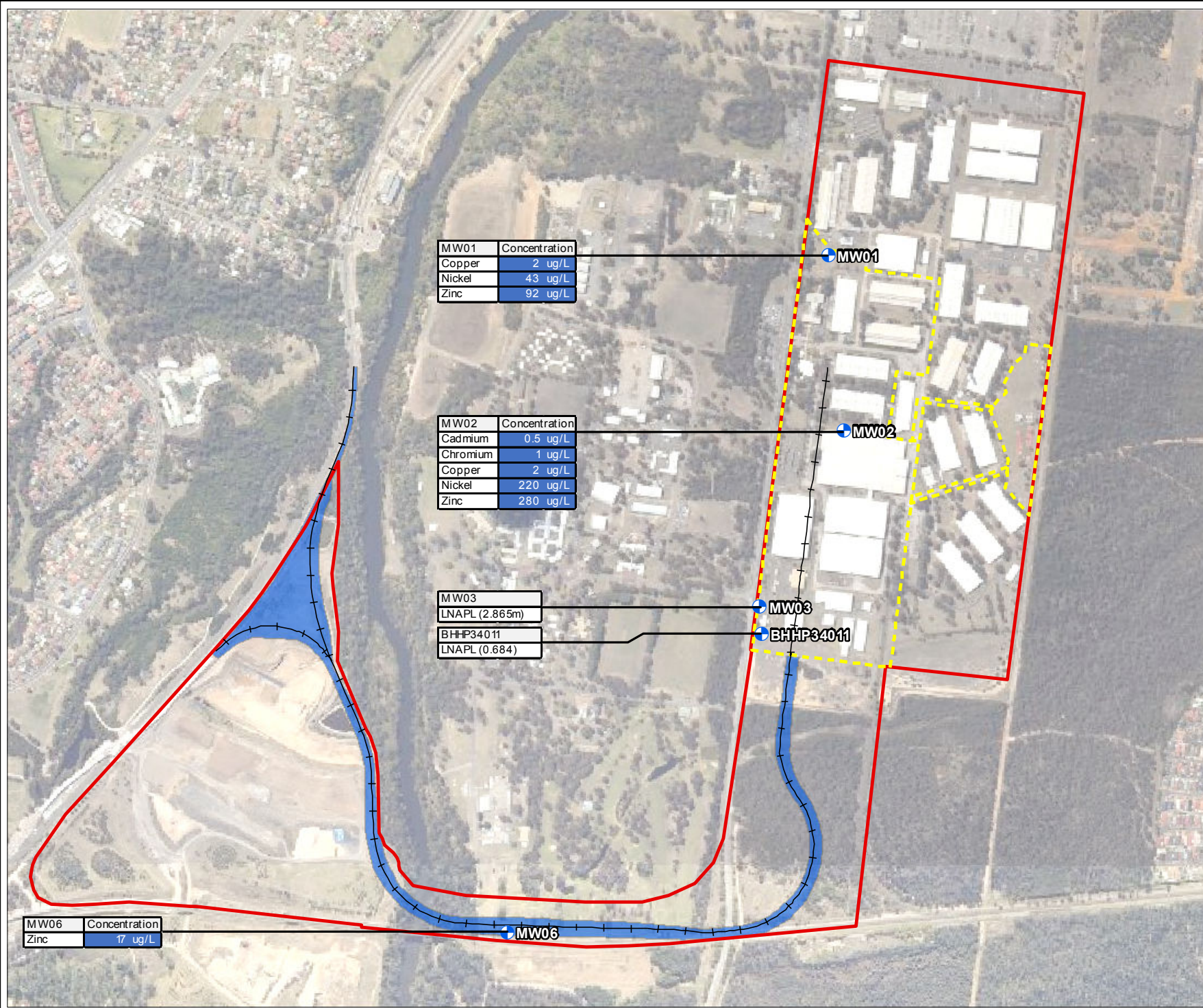
0 200 400 metres

Coor. Sys. GDA 1994 MGA Zone 56

SIMTA Intermodal Terminal Facility - Stage 1

SOIL ANALYTICAL EXCEEDANCES

FIGURE 12



MW01	Concentration
Copper	2 ug/L
Nickel	43 ug/L
Zinc	92 ug/L

MW02	Concentration
Cadmium	0.5 ug/L
Chromium	1 ug/L
Copper	2 ug/L
Nickel	220 ug/L
Zinc	280 ug/L

MW03	
LNAPL (2.865m)	
BHHP34011	
LNAPL (0.684)	

MW06	Concentration
Zinc	17 ug/L

Legend:

- Project Site
- Stage 1 Site
- Rail Link (including 20m width and variable buffer)
- Proposed Rail Alignment
- Sample Location - Groundwater Analytical Exceedance

Exceeds Human Health Criteria

Exceeds Ecological Criteria

Job No: 50342

Client: Qube Property Management

Version: R02 Rev 0	Date: 23-Mar-2015
Drawn By: SE	Checked By: BG

Scale 1:12,000

Coor. Sys. GDA 1994 MGA Zone 56

SIMTA Intermodal Terminal Facility - Stage 1

GROUND WATER ANALYTICAL EXCEEDANCES

FIGURE 13

Tables

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		TPHs (NEPC 1999)						TRHs (NEPC 2013)						BTEX										
		>C10-C36 (Sum of Total)	G6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10 - C16 less Naphthalene (F2)	>C10-C40 (Sum of Total)	G6-C10 Fraction	G6 - C10 less BTEX (F1)	Benzene	Ethylbenzene	BTEX (Sum of Total)	Toluene	Xylene (m & p)	Xylene (o)	Xylene (Total)	Xylene (Sum of Total)		
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQL			20	20	50	50	50	50	100	100	50		20	20	0.10	0.10		0.10	0.20	0.10	0.30			
NEPC 2013 EIL, EILs Aged Sediment																								
NEPC 2013 ESL Commercial and Industrial, Coarse Soil									1700	3300	215			215	75	165		135			180			
NEPC 2013 Management Limits - Commercial and Industrial, Coarse									3500	10000	1000			700										
NEPC 2013 Soil HIL D																								
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m											NL			260	3	NL		NL			230			
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m											NL			370	3	NL		NL			NL			
Location Area	Sample	Location	Depth Range																					
Stage 1 DNSDC	MW01 0-0.1	MW01	0-0.1	101	<20	<20	<50	66	66	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	QC04	MW01	0-0.1	131	<20	<20	<50	96	96	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	MW02 0-0.1	MW02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	MW02 1.6-1.8	MW02	1.6-1.8	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	MW03 0.1-0.2	MW03	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	MW03 0.8-1.0	MW03	0.8-1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	S801 0.4-0.6	S801	0.4-0.6	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	S801 0-0.1	S801	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S802 0.2-0.3	S802	0.2-0.3	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	S802 0-0.1	S802	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S803 0-0.1	S803	0-0.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	S804 0.5-0.7	S804	0.5-0.7	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	S804 0-0.1	S804	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S805 0-0.1	S805	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S805 1.0-1.1	S805	1-1.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP01 0-0.1	TP01	0-0.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP02 0.3-0.4	TP02	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP02 0-0.15	TP02	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP03 0.3-0.4	TP03	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP03 0-0.15 (LIGHT BROWN)	TP03	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP04 0-0.1	TP04	0-0.1	85	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP05 0.3-0.4	TP05	0.3-0.4	99	<20	<20	<64	<50	<64	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP05 0-0.15	TP05	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP06 0-0.15	TP06	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP06 1.0-1.1	TP06	1-1.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP07 0.2-0.3	TP07	0.2-0.3	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP07 0-0.1	TP07	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP08 0.3-0.4	TP08	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP09 0.4-0.5	TP09	0.4-0.5	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP09 0-0.15	TP09	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP10 1.0-1.1	TP10	1-1.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP11 0.3-0.4	TP11	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP11 0-0.15	TP11	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP12 0.3-0.4	TP12	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.35	0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP12 0-0.15	TP12	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP13 0.3-0.4	TP13	0.3-0.4	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP13 0-0.15	TP13	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP14 0.6-0.7	TP14	0.6-0.7	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP14 0-0.15	TP14	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP15 0-0.1	TP15	0-0.1	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP16 0.2-0.3	TP16	0.2-0.3	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP16 0-0.15	TP16	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP17 0.2-0.3	TP17	0.2-0.3	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP17 0-0.15	TP17	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP18 0.2-0.3	TP18	0.2-0.3	60	<20	<20	<50	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15
Stage 1 DNSDC	TP18 0-0.15	TP18	0-0.15	60	<20	<20	<50	<50	<50	<50	<100	<												

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



			TPHs (NEPC 1999)								TRHs (NEPC 2013)								BTEX							
			>C10-C16 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10 - C16 less Naphthalene (F2)	>C10-C40 (Sum of Total)	C6-C10 Fraction	C6 - C10 less BTEX (F1)	Benzene	Ethylbenzene	BTEX (Sum of Total)	Toluene	Xylene (m & p)	Xylene (o)	Xylene (Total)	Xylene (Sum of Total)			
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			
FOL				20	20	50	50	50	50	100	100	50		20	20	0.10	0.10		0.10	0.20	0.10	0.30				
NEPC 2013 EIL, EILs Aged Sediment																										
NEPC 2013 ESL Commercial and Industrial, Coarse Soil									1700	3300	215			215	75	165		135				180				
NEPC 2013 Management Limits - Commercial and Industrial, Coarse									3500	10000	1000			700												
NEPC 2013 Soil HIL D																										
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m												NL		260	3	NL		NL				230				
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m												NL		370	3	NL		NL				NL				
Location Area	Sample	Location	Depth Range	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
DNSSDC South	TP23 0.0-15	TP23	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
DNSSDC South	TP24 0.3-0.4	TP24	0.3-0.4	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
DNSSDC South	TP24 0.0-15	TP24	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Southern Commonwealth	TP25 0.0-1	TP25	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Southern Commonwealth	TP29 0.0-15	TP29	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Southern Commonwealth	TP30 0.0-15	TP30	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Glenfield	TP46 0.0-1	TP46	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	QC01	TP46	0.0-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	TP47 0.8-1.0	TP47	0.8-1	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	TP49 2.8-3.0	TP49	2.8-3	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	TP50 1.0-1.2	TP50	1-1.2	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			
Glenfield	TP51 1.8-2.0	TP51	1.8-2	60	<20	<20	<50	<50	<50	<100	<100	<50	125	<20	<20	<0.1	<0.1	0.3	<0.1	<0.2	<0.1	<0.3	0.15			

* Value for Chromium VI used

Page 3 of 20

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Chlorinated Alkanes																Chlorinated Alkenes												
		1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	bromedichloromethane	Carbon tetrachloride	Chloroform	Chloroethane	Chloromethane	dibromochloromethane	Dichlorodifluoromethane	Dichloromethane	Hexachloroethane	Trichlorofluoromethane	1,1,2,2-tetrachloroethylene	1,1-Dichloroethene	1,1-Dichloroethene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride
FOL		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPC 2013 EIL, EILs Aged Sediment		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPC 2013 ESI Commercial and Industrial, Coarse Soil																														
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																														
NEPC 2013 Soil HIL D																														
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																														
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																														
Location Area	Sample	Location	Depth Range																											
DNDC South	TP23 0.0-15	TP23	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNDC South	TP24 0.0-15	TP24	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP25 0.0-1	TP25	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.0-15	TP29	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.0-15	TP30	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP46 0.0-1	TP46	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	QC01	TP46	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP47 0.8-1.0	TP47	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP49 2.8-3.0	TP49	2.8-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP50 1.0-1.2	TP50	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP51 1.8-2.0	TP51	1.8-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Value for Chromium VI used

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



				Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons							
				1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	styrene	1,2-dibromomethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromoform	Bromomethane	Dibromomethane	Iodomethane	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL				0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
NEPC 2013 EIL, EILs Aged Sediment																
NEPC 2013 EIL Commercial and Industrial, Coarse Soil																
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																
NEPC 2013 Soil HIL D																
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																
Location Area	Sample	Location	Depth Range													
Stage 1 DNSDC	MW01 0-0.1	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	QC04	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	MW02 0-0.1	MW02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	MW02 1.6-1.8	MW02	1.6-1.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	MW03 0.1-0.2	MW03	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	MW03 0.8-1.0	MW03	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S801 0.4-0.6	S801	0.4-0.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	S801 0-0.1	S801	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S802 0.2-0.3	S802	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S802 0-0.1	S802	0-0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	S803 0-0.1	S803	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S804 0.5-0.7	S804	0.5-0.7	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S804 0-0.1	S804	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S805 0-0.1	S805	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	S805 1.0-1.1	S805	1-1.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	TP01 0-0.1	TP01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP02 0.3-0.4	TP02	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP02 0-0.15	TP02	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP03 0.3-0.4	TP03	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP03 0-0.15 (LIGHT BROWN)	TP03	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP04 0-0.1	TP04	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP05 0.3-0.4	TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP05 0-0.15	TP05	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP06 0-0.15	TP06	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP06 1.0-1.1	TP06	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP07 0.2-0.3	TP07	0.2-0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	TP07 0-0.1	TP07	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP08 0.3-0.4	TP08	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP09 0.4-0.5	TP09	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP09 0-0.15	TP09	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP10 1.0-1.1	TP10	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP11 0.3-0.4	TP11	0.3-0.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	TP11 0-0.15	TP11	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP12 0.3-0.4	TP12	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP12 0-0.15	TP12	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP13 0.3-0.4	TP13	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP13 0-0.15	TP13	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP14 0.6-0.7	TP14	0.6-0.7	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP14 0-0.15	TP14	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP15 0-0.1	TP15	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP16 0.2-0.3	TP16	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP16 0-0.15	TP16	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP17 0.2-0.3	TP17	0.2-0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	TP17 0-0.15	TP17	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP18 0.2-0.3	TP18	0.2-0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Stage 1 DNSDC	TP18 0-0.15	TP18	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP19 0.4-0.5	TP19	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP19 0-0.15	TP19	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	TP20 0-0.15	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 1 DNSDC	QC03	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
DNSDC South	TP21 0.2-0.3	TP21	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	
DNSDC South	TP21 0-0.15	TP21	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
DNSDC South	TP22 0.5-0.6	TP22	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	
DNSDC South	TP22 0-0.15	TP22	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	
DNSDC South	TP23 0.5-0.6	TP23	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						
		1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	isopropylbenzene	styrene	1,2-dibromomethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromodorm	Bromomethane	Dibromomethane	iodomethane
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
[QL]		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPC 2013 EIL, EILs Aged Sediment													
NEPC 2013 ESL Commercial and Industrial, Coarse Soil													
NEPC 2013 Management Limits - Commercial and Industrial, Coarse													
NEPC 2013 Soil HIL D													
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m													
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m													
Location Area	Sample	Location	Depth Range	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP23 0-0.15	TP23	0-0.15	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0-0.15	TP24	0-0.15	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP25 0-0.1	TP25	0-0.1	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0-0.15	TP29	0-0.15	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0-0.15	TP30	0-0.15	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP40 0-0.1	TP40	0-0.1	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP42 0-0.1	TP42	0-0.1	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0-0.1	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP44 0-0.1	TP44	0-0.1	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-
Glenfield	TP46 0-0.1	TP46	0-0.1	-	-	-	-	-	-	-	-	-	-
Glenfield	QC01	TP46	0-0.1	-	-	-	-	-	-	-	-	-	-
Glenfield	TP47 0.8-1.0	TP47	0.8-1	-	-	-	-	-	-	-	-	-	-
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	-	-	-	-	-	-	-	-	-	-
Glenfield	TP49 2.8-3.0	TP49	2.8-3	-	-	-	-	-	-	-	-	-	-
Glenfield	TP50 1.0-1.2	TP50	1-1.2	-	-	-	-	-	-	-	-	-	-
Glenfield	TP51 1.8-2.0	TP51	1.8-2	-	-	-	-	-	-	-	-	-	-

* Value for Chromium VI used

Page 7 of 20



* Value for Chromium VI used

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Organochlorine Pesticides																					
		Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	delta-BHC	Chlordane	DDD	DDE	DDT	DDT + DDE + DDD (Sum of Total)	Dieldrin	Endosulfan alpha	Endosulfan beta	Endosulfan Sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	o-cuprene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOI		0.05		0.05	0.05	0.05	0.10	0.05	0.05	0.05	640	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1
NEPC 2013 EIL, EILs Aged Sediment																							
NEPC 2013 EIL Commercial and Industrial, Coarse Soil																							
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																							
NEPC 2013 Soil HIL D			45				530				3600		2000			100			50			2500	160
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																							
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																							
Location Area	Sample	Location	Depth Range																				
Stage 1 DNSDC	MW01 0-0.1	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	QC04	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 0-0.1	MW02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 1.6-1.8	MW02	1.6-1.8	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	MW03 0.1-0.2	MW03	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW03 0.8-1.0	MW03	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB01 0.4-0.6	SB01	0.4-0.6	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	SB01 0-0.1	SB01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB02 0.2-0.3	SB02	0.2-0.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	SB02 0-0.1	SB02	0-0.1	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.75	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
Stage 1 DNSDC	SB03 0-0.1	SB03	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB04 0.5-0.7	SB04	0.5-0.7	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	SB04 0-0.1	SB04	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 0-0.1	SB05	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 1.0-1.1	SB05	1-1.1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP01 0-0.1	TP01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP02 0.3-0.4	TP02	0.3-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP02 0-0.15	TP02	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0.3-0.4	TP03	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0-0.15 (LIGHT BROWN)	TP03	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP04 0-0.1	TP04	0-0.1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP05 0.3-0.4	TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP05 0-0.15	TP05	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 0-0.15	TP06	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 1.0-1.1	TP06	1-1.1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP07 0.2-0.3	TP07	0.2-0.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP07 0-0.1	TP07	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP08 0.3-0.4	TP08	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP09 0.4-0.5	TP09	0.4-0.5	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP09 0-0.15	TP09	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP10 1.0-1.1	TP10	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP11 0.3-0.4	TP11	0.3-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP11 0-0.15	TP11	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0.3-0.4	TP12	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0-0.15	TP12	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP13 0.3-0.4	TP13	0.3-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP13 0-0.15	TP13	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0.6-0.7	TP14	0.6-0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0-0.15	TP14	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP15 0-0.1	TP15	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0.2-0.3	TP16	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0-0.15	TP16	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP17 0.2-0.3	TP17	0.2-0.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP17 0-0.15	TP17	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP18 0.2-0.3	TP18	0.2-0.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP18 0-0.15	TP18	0-0.15	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
Stage 1 DNSDC	TP19 0.4-0.5	TP19	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP19 0-0.15	TP19	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP20 0-0.15	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP20 0-0.15	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP21 0.2-0.3	TP21	0.2-0.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1
ONSDC South	TP21 0-0.15	TP21	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP22 0.5-0.6	TP22	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP22 0-0.15	TP22	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP23 0.5-0.6	TP23	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1: Soil Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment



		Organochlorine Pesticides																						
		Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	delta-BHC	Chlordane	DDD	DDE	DDT	DDT +DDE +DDD (Sum of Total)	Dieldrin	Endosulfan alpha	Endosulfan beta	Endosulfan Sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
ECL		0.05		0.05	0.05	0.05	0.10	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	
NEPC 2013 EIL, EILs Aged Sediment											640													
NEPC 2013 ESL Commercial and Industrial, Coarse Soil																								
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																								
NEPC 2013 Soil HIL D			45				530				3600		2000			100			50			2500	160	
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																								
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																								
Location Area	Sample	Location	Depth Range	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DNSSC South	TP23 0.0-15	TP23	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DNSSC South	TP24 0.3-0.4	TP24	0.3-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	
DNSSC South	TP24 0.0-15	TP24	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP25 0.0-1	TP25	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	
Southern Commonwealth	TP29 0.0-15	TP29	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP30 0.0-15	TP30	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golden TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP46 0.0-1	TP46	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	QC01	TP46	0.0-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	TP47 0.8-1.0	TP47	0.8-1	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	TP49 2.8-3.0	TP49	2.8-3	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	TP50 1.0-1.2	TP50	1-1.2	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	
Glenfield	TP51 1.8-2.0	TP51	1.8-2	<0.05	0.05	<0.05	<0.05	<0.1	<0.05	<0.05	0.075	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	

* Value for Chromium VI used

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Organophosphorus Pesticides																											
		Azinphos methyl	Chlorpyrifos	Gomphosphos	Demeton	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethionphos	Fenitrothion	Fensulfothion	Fenitrothion	Malathion	Mevinphos	Monocrotophos	Parathion	Parathion methyl	Phorate	Profenofos	Prothiofos	Romel	Stirophos	Salpicrofos	Trichloronate	Mephos	Tokuthion	Naled
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.20	0.20	0.50	1	0.20	0.20	0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.50	0.20	10	0.50	0.20	0.20	0.50	0.50	0.20	0.50	0.20	0.20	0.20	0.20	0.50
NEPC 2013 EIL, EILs Aged Sediment																													
NEPC 2013 ESL Commercial and Industrial, Coarse Soil																													
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																													
NEPC 2013 Soil HIL D			2000																										
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																													
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																													
Location Area	Sample	Location	Depth Range																										
Stage 1 DNSDC	MW01 0-0.1	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	QC04	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 0-0.1	MW02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 1.6-1.8	MW02	1.6-1.8	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	MW03 0.1-0.2	MW03	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW03 0.8-1.0	MW03	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB01 0.4-0.6	SB01	0.4-0.6	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	SB01 0-0.1	SB01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB02 0.2-0.3	SB02	0.2-0.3	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	SB02 0-0.1	SB02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB03 0-0.1	SB03	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB04 0.5-0.7	SB04	0.5-0.7	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	SB04 0-0.1	SB04	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 0-0.1	SB05	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 1.0-1.1	SB05	1-1.1	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP01 0-0.1	TP01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP02 0.3-0.4	TP02	0.3-0.4	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP02 0-0.15	TP02	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0.3-0.4	TP03	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0-0.15 (LIGHT BROWN)	TP03	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP04 0-0.1	TP04	0-0.1	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP05 0.3-0.4	TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP05 0-0.15	TP05	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 0-0.15	TP06	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 1.0-1.1	TP06	1-1.1	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP07 0.2-0.3	TP07	0.2-0.3	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP07 0-0.1	TP07	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP08 0.3-0.4	TP08	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP09 0.4-0.5	TP09	0.4-0.5	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP09 0-0.15	TP09	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP10 1.0-1.1	TP10	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP11 0.3-0.4	TP11	0.3-0.4	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP11 0-0.15	TP11	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0.3-0.4	TP12	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0-0.15	TP12	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP13 0.3-0.4	TP13	0.3-0.4	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP13 0-0.15	TP13	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0.6-0.7	TP14	0.6-0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0-0.15	TP14	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP15 0-0.1	TP15	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0.2-0.3	TP16	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0-0.15	TP16	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP17 0.2-0.3	TP17	0.2-0.3	<0.2	<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.5
Stage 1 DNSDC	TP17 0-0.15	TP17	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-</						

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Organophosphorus Pesticides																												
		Azinphos methyl	Chlorpyrifos	Glyphophos	Demeton	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Ethoprophos	Fenitrothion	Fensulfathion	Fenthion	Malathion	Mevinphos	Monocrotophos	Parathion	Parathion methyl	Phorate	Profenofos	Prothiotos	Romel	Strophos	Sulprafos	Trichloromate	Morphos	Tekathon	Naled	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
FOI		0.20	0.20	0.50	1	0.20	0.20	0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.50	0.20	10	0.50	0.20	0.20	0.50	0.50	0.20	0.50	0.20	0.20	0.20	0.20	0.50	
NEPC 2013 EIL, EILs Aged Sediment																														
NEPC 2013 ESL Commercial and Industrial, Coarse Soil																														
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																														
NEPC 2013 Soil HIL D			2000																											
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																														
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																														
Location Area	Sample	Location	Depth Range																											
DNDC South	TP23 0.0-15	TP23	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DNDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DNDC South	TP24 0.0-15	TP24	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP25 0.0-1	TP25	0-0.1	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	
Southern Commonwealth	TP29 0.0-15	TP29	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP30 0.0-15	TP30	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golden TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP46 0.0-1	TP46	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	QC01	TP46	0-0.1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	TP47 0.8-1.0	TP47	0.8-1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	TP49 2.8-3.0	TP49	2.8-3	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	TP50 1.0-1.2	TP50	1-1.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	
Glenfield	TP51 1.8-2.0	TP51	1.8-2	<0.5	<0.5	<0.5	<1	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	

* Value for Chromium VI used

Page 13 of 20

Table 1: Soil Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment



	Chlorinated Benzenes										Phthalates					Ethers		Anilines		Amines										
	1,2,3,4-tetrachlorobenzene	1,2,3,5-tetrachlorobenzene	1,2,3-trichlorobenzene	1,2,4,5-tetrachlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3,5-trichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Hexachlorobenzene	Pentachlorobenzene	Di(2-ethylhexyl) phthalate	Dibutyl phthalate	Diethyl phthalate	Dimethyl phthalate	Di-n-octyl phthalate	Butyl benzyl phthalate	Bis(2-chloroisopropyl)ether	4-Chlorophenyl phenyl ether	4-Bromophenyl phenyl ether	2-Nitroaniline	Aniline	1-Naphthylamine	2-Naphthylamine	Diphenylamine	N-Nitrosodibutylamine	N-Nitrosodipropylamine	N-Nitrosopiperidine		
ECL	0.50	0.50	0.50	0.50	0.50	0.05	0.50	0.05	0.05	0.05	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		
NEPC 2013 EIL, EILs Aged Sediment																														
NEPC 2013 EIL Commercial and Industrial, Coarse Soil																														
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																														
NEPC 2013 Soil HIL D																														
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																														
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																														
Location Area	Sample	Location	Depth Range																											
DNDC South	TP23 0-0.15	TP23	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
DNDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
DNDC South	TP24 0-0.15	TP24	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP25 0-0.1	TP25	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP29 0-0.15	TP29	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Southern Commonwealth	TP30 0-0.15	TP30	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP40 0-0.1	TP40	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP42 0-0.1	TP42	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP44 0-0.1	TP44	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP46 0-0.1	TP46	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	QC03	TP46	0-0.1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP47 0.8-1.0	TP47	0.8-1	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP49 2.8-3.0	TP49	2.8-3	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP50 1.0-1.2	TP50	1-1.2	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Glenfield	TP51 1.8-2.0	TP51	1.8-2	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

* Value for Chromium VI used

Page 15 of 20

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



		Herbicides & Fungicides														Phenols													
		2,4,5-T	2,4-D	2,4-DB	Dicamba	Dichloroprop	Dinitro-o-cresol	Dinoseb	Fenoprop	MCPA	MCPB	Mecoprop	Propyzamide	Trifluralin	2,3,4,6-tetrachlorophenol	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,4-dimethylphenol	2,4-dinitrophenol	2,6-dichlorophenol	2-chlorophenol	2-Methylphenol	2-nitrophenol	3- & 4-methylphenol	4-Chloro-3-Methylphenol	4-nitrophenol	Pentachlorophenol	Phenol
FOL		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPC 2013 EIL, EILs Aged Sediment		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1	1	0.50	0.50	5.00	0.50	0.50	0.20	1	0.40	1	5	1	0.50
NEPC 2013 EIL Commercial and Industrial, Coarse Soil																													
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																													
NEPC 2013 Soil HIL D		5000	9000							5000	5000	5000																660	240000
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																													
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																													
Location Area	Sample	Location	Depth Range																										
DNSSDC South	TP23 0.0-15	TP23	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0.0-15	TP24	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP25 0.0-1	TP25	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.0-15	TP29	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.0-15	TP30	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP46 0.0-1	TP46	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	QC01	TP46	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP47 0.8-1.0	TP47	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP49 2.8-3.0	TP49	2.8-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP50 1.0-1.2	TP50	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP51 1.8-2.0	TP51	1.8-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Value for Chromium VI used

Page 17 of 20

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment





	Metals & Metalloids								Asbestos			Polychlorinated Biphenyls										Explosives		Nitrobenzenes				Nitrotoluenes				
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	Asbestos - WA guidelines	Asbestos - ID	Asbestos - Type	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	PCBs (Sum of Total)	2,4- & 2,6-Dinitrotoluene	4-Nitrotoluene (4-NT)	Hexahydro-1,5-dinitro-1,3,5-triazine (RDX)	1,3,5-trinitrobenzene	1,3-dinitrobenzene	Nitrobenzene	pentachloronitrobenzene	2,4,6-trinitrobenzene	2,4-dinitrotoluene	2-nitrotoluene	3-nitrotoluene	
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	% W/W	ID	Type	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQ1	2	0.40	5	5	5	0.05	5	5	0.001	-	-	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		1.00	0.50	0.50	1	0.50	0.50	0.50	1	0.50	0.50	0.50	
NEPC 2013 EIL, EILs Aged Sediment																																
	160		323	113	1963		60	132																								
NEPC 2013 EIL Commercial and Industrial, Coarse Soil																																
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																																
NEPC 2013 Soil HIL D	3000	900	3600*	240000	1500	730	6000	400000											7	7												
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																																
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																																
Location Area	Sample	Location	Depth Range																													
DNQDC South	TP23 0.0-15	TP23	0.0-15	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DNQDC South	TP24 0.3-0.4	TP24	0.3-0.4	5.7	<0.4	25	<5	15	<0.1	<5	<5	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5	
DNQDC South	TP24 0.0-15	TP24	0.0-15	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP25 0.0-1	TP25	0.0-1	<2	<0.4	26	16	5.9	<0.05	58	35	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5	
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	3.1	<0.4	20	<5	20	<0.05	<5	<5	-	-	-	-	-	-	-	-	-	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5	
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	<2	<0.4	<5	<5	<5	<0.1	<5	<5	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5	
Southern Commonwealth	TP29 0.0-15	TP29	0.0-15	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	3.2	<0.4	9.1	<5	10	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5	
Southern Commonwealth	TP30 0.0-15	TP30	0.0-15	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0.0-1	<2	<0.4	<5	6.3	11	0.06	<5	21	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	14	<0.4	45	<5	15	<0.05	<5	<5	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0.0-1	2.4	<0.4	<5	<5	13	<0.05	<5	13	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0.0-1	2.2	<0.4	<5	<5	13	<0.05	<5	9.9	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	<2	<0.4	<5	<5	6.4	<0.05	<5	<5	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0.0-1	<2	<0.4	<5	9.3	11	<0.05	<5	21	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	<2	<0.4	5.8	<5	<5	<0.05	22	<5	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<1	<0.5	<0.5	<1	<0.5	<0.5	-	<1	-	<0.5	<0.5
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	3.6	<0.4	17	<5	17	<0.05	<5	6.3	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4	-	-	-	-	-	-	Yes	CHR																					
Glenfield	TP46 0.0-1	TP46	0.0-1	5.8	<0.4	13	12	13	<0.05	9.6	38	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	QC01	TP46	0.0-1	2.5	<0.4	5.9	7.7	9.7	<0.05	<5	18	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP47 0.8-1.0	TP47	0.8-1	<2	<0.4	6.9	14	5.2	<0.05	6.9	20	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	<2	<0.4	<5	<5	<5	<0.05	<5	<5	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP49 2.8-3.0	TP49	2.8-3	54	16	14	100	2000	<0.05	16	290	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP50 1.0-1.2	TP50	1.1-2	8.6	<0.4	11	17	20	<0.05	11	45	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	
Glenfield	TP51 1.8-2.0	TP51	1.8-2	15	2.5	19	29	130	<0.05	16	85	-	-	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	-	-	-	-	-	-	-	-	-	-	

* Value for Chromium VI used

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



[C]	Semi-volatile Organic Compounds														Other VOCs		
	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Benzyl chloride	Bis(2-chloroethoxy)methane	Dibenz(a,h)peridine	Dibenzofuran	Dimethylaminobenzene	2-Picoline	Acetophenone	4-Aminobiphenyl	1-Chloronaphthalene	3,3-Dichlorobenzidine	2-Chloronaphthalene	2-Propanone (Acetone)	Carbon disulfide	Chlorobenzene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPC 2013 EIL, EILs Aged Sediment	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.05	0.05	
NEPC 2013 ESL Commercial and Industrial, Coarse Soil																	
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																	
NEPC 2013 Soil HIL D	80																
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																	
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																	

Location Area	Sample	Location	Depth Range														
Stage 1 DNSDC	MW01 0-0.1	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	QC04	MW01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 0-0.1	MW02	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW02 1.6-1.8	MW02	1.6-1.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05
Stage 1 DNSDC	MW03 0.1-0.2	MW03	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	MW03 0.8-1.0	MW03	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB01 0.4-0.6	SB01	0.4-0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	SB01 0-0.1	SB01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB02 0.2-0.3	SB02	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB02 0-0.1	SB02	0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	SB03 0-0.1	SB03	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB04 0.5-0.7	SB04	0.5-0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB04 0-0.1	SB04	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 0-0.1	SB05	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	SB05 1.0-1.1	SB05	1-1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	TP01 0-0.1	TP01	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP02 0.3-0.4	TP02	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP02 0-0.15	TP02	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0.3-0.4	TP03	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP03 0-0.15 (LIGHT BROWN)	TP03	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP04 0-0.1	TP04	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP05 0.3-0.4	TP05	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP05 0-0.15	TP05	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 0-0.15	TP06	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP06 1.0-1.1	TP06	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP07 0.2-0.3	TP07	0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	TP07 0-0.1	TP07	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP08 0.3-0.4	TP08	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP09 0.4-0.5	TP09	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP09 0-0.15	TP09	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP10 1.0-1.1	TP10	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP11 0.3-0.4	TP11	0.3-0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	TP11 0-0.15	TP11	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0.3-0.4	TP12	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP12 0-0.15	TP12	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP13 0.3-0.4	TP13	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP13 0-0.15	TP13	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0.6-0.7	TP14	0.6-0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP14 0-0.15	TP14	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP15 0-0.1	TP15	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0.2-0.3	TP16	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP16 0-0.15	TP16	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP17 0.2-0.3	TP17	0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	TP17 0-0.15	TP17	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP18 0.2-0.3	TP18	0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05
Stage 1 DNSDC	TP18 0-0.15	TP18	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP19 0.4-0.5	TP19	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP19 0-0.15	TP19	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	TP20 0-0.15	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1 DNSDC	QC03	TP20	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP21 0.2-0.3	TP21	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP21 0-0.15	TP21	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP22 0.5-0.6	TP22	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP22 0-0.15	TP22	0-0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ONSDC South	TP23 0.5-0.6	TP23	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1: Soil Analytical Results
Project Number: 50342
Project Name: SIMTA Stage 1 Moorebank Assessment



	Semi-volatile Organic Compounds														Other VOCs		
	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Benzyl chloride	Bis(2-chloroethoxy)methane	Dibenz(a,h)pyrene	Dibenzofuran	Dimethylaminobenzene	2-Picoline	Acetophenone	4-Aminobiphenyl	1-Chloronaphthalene	3,3-Dichlorobenzidine	2-Chloronaphthalene	2-Propanone (Acetone)	Carbon disulfide	Chlorobenzene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.05	0.05	
NEPC 2013 EIL, EILs Aged Sediment																	
NEPC 2013 ESL Commercial and Industrial, Coarse Soil																	
NEPC 2013 Management Limits - Commercial and Industrial, Coarse																	
NEPC 2013 Soil HIL D	80																
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 0 to <1m																	
NEPC 2013 Soil HSL D for Vapour Intrusion - Sand 1 to <2m																	
Location Area	Sample	Location	Depth Range														
DNSSDC South	TP23 0.0-15	TP23	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0.3-0.4	TP24	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DNSSDC South	TP24 0.0-15	TP24	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP25 0.0-1	TP25	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP26 0.3-0.5	TP26	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.3-0.4	TP29	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP29 0.0-15	TP29	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.5-0.6	TP30	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southern Commonwealth	TP30 0.0-15	TP30	0.0-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP40 0.0-1	TP40	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP41 0.2-0.4	TP41	0.2-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP42 0.0-1	TP42	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	QC02	TP42	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP43 0.4-0.5	TP43	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP44 0.0-1	TP44	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	TP45 1.1-1.3	TP45	1.1-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	MW06 1.2-1.4	MW06	1.2-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North of East Hills Rail Corridor (Golf Course)	AHMS01 - SIMTA 0.3-0.4	Golder TP05	0.3-0.4														
Glenfield	TP46 0.0-1	TP46	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	QC01	TP46	0.0-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP47 0.8-1.0	TP47	0.8-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP48 0.6-0.8	TP48	0.6-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP49 2.8-3.0	TP49	2.8-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP50 1.0-1.2	TP50	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glenfield	TP51 1.8-2.0	TP51	1.8-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Value for Chromium VI used

Project Name: SIMTA Moorebank Assessment
Job Number: 50342
Client: Tactical Group
Table 2: Groundwater Parameters



Well ID	Date Gauged and Purged	Top of Casing Elevation	Depth to water (mbTOC)	Depth to LNAPL (mbTOC)	Groundwater Elevation (AHD)	Bottom of Screen (mbTOC)	Volume Removed (L)	Physical Parameters					Comments
								Dissolved Oxygen (mg/L)	Electrical Conductivity (uS/cm)	pH	Redox (mV)	Temperature (°C)	
MW01*	12/23/2014	-	7.935	-	-	10.500	12	-	-	-	-	-	Purged Dry
MW02*	12/23/2014	-	10.000	-	-	10.101	0	-	-	-	-	-	Dry
MW03*	12/23/2014	-	-	9.123	-	9.123	5	-	-	-	-	-	Purged dry, strong hydrocarbon odour, yellow colour
MW06*	12/23/2014	-	10.000	-	-	9.000	0	-	-	-	-	-	Dry
MW01 ¹	1/12/2015	-	8.538	-	-	10.500	2.4	0.22	7.29 mS/cm	4.80	124.0	22.5	No odour, grey, turbid, no sheen
MW02 ¹	1/12/2015	-	8.640	-	-	10.101	2	1.23	18.81 mS/cm	5.09	97.0	22.8	No odour, slight grey, very low turbidity, no sheen
MW03 ¹	1/12/2015	-	-	6.163	-	9.123	2.4	-	-	-	-	-	Strong hydrocarbon odour (diesel)
BHHP34011 ¹	1/12/2015	-	-	6.335	-	10.540	1.5	-	-	-	-	-	Hydrocarbon odour (diesel)
MW06 ¹	1/12/2015	-	6.602	-	-	9.000	2.1	1.81	671	5.67	25.0	20.4	No odour, no colour, non-turbid, no sheen
MW01 ²	1/22/2015	-	8.563	-	-	-	-	-	-	-	-	-	-
MW02 ²	1/22/2015	-	8.653	-	-	-	-	-	-	-	-	-	-
MW03 ²	1/22/2015	-	9.020	6.155	-	-	-	-	-	-	-	-	-
BHHP34011 ²	1/22/2015	-	7.111	6.427	-	-	-	-	-	-	-	-	-
MW06 ²	1/22/2015	-	7.354	-	-	-	-	-	-	-	-	-	-

Comment

bTOC = Below top of casing

* Initial Purge post-installation 23/12/2014

1 Water levels and Field parameters during Groundwater monitoring Event on 12/01/2015

2 Groundwater levels during Groundwater Gauging event on 22/01/2015

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





Product ID	BTEX						TPHs (NEPC 1999)					TRHs (NEPC 2013)					
	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene (Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10 - C16 less Naphthalene (F2)	C6-C10 Fraction	C6 - C10 less BTEX (F1)
EQL	1	1	1	2	1	3	20	50	100	100	100	50	100	100	50	20	20
NEPC 2013 Groundwater Investigation Levels - Fresh Waters	950			200	350												
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m	5000	NL	NL			NL									NL		600
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+	5000	NL	NL			NL									NL		700

Sample ID	Location	Sample Date		<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100	<50	<100	<100	<50	<20	<20
MW01	MW01	1/12/2015	-	<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100	<50	<100	<100	<50	<20	<20
MW02	MW02	1/12/2015	-	<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100	<50	<100	<100	<50	<20	<20
MW03	MW03	1/12/2015	Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	Diesel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	-	<1	<1	<1	<2	<1	<3	<20	<50	<100	<100	<100	<50	<100	<100	<50	<20	<20

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment



	Chlorinated Alkanes																Chlorinated Alkenes							
	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	bromodichloromethane	Carbon tetrachloride	Chloroform	Chloroethane	Chloromethane	1,1,1,2-tetrachloroethane	1,1,2-trichloroethane	1,1-Dichloroethene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	1	5	1	1	1	1	1	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1
NEPC 2013 Groundwater Investigation Levels - Fresh Waters				6500												290								
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																								
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																								

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	1/12/2015	<1	<1	<5	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





			Miscellaneous Hydrocarbons								Monocyclic Aromatic Hydrocarbons					Polycyclic Aromatic Hydrocarbons																		
			1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromoform	Bromomethane	Dibromomethane	Iodomethane	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	styrene	2-Methylnaphthalene	3-Methylcholanthrene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	PAHs (Total)	Pyrene	
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	ug/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
EQL			1	1	1	1	1	5	1	1	1	1	1	1	2	2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.01	0.01	0.01
NEPC 2013 Groundwater Investigation Levels - Fresh Waters																															16			
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																															NL			
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																															NL			

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	<0.01	<0.01	<20 - 0.1	<0.01	0.2	<0.01
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<20 - 0.1	<0.01	0.2	<0.01	
MW02	MW02	1/12/2015	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1	<1	<2	<2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	0.1	<0.01
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





		Organochlorine Pesticides																			
		Aldrin	alpha-BHC	beta-BHC	delta-BHC	Chlordane	DDD	DDE	DDT	Dieldrin	Endosulfan alpha	Endosulfan beta	Endosulfan Sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.10	0.10	0.10	0.10	1.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	10
NEPC 2013 Groundwater Investigation Levels - Fresh Waters						0.03			0.006		0.03			0.01			0.01		0.2		0.1
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																					
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																					

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	1/12/2015	<2	-	-	<2	-	<2	<4	<2	-	-	<2	<2	<2	<2	<2	<2	<2	<1	-
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





	Organophosphorus Pesticides																								Chlorinated Benzenes					
	Azinphos methyl µg/L	Chlorpyrifos µg/L	Counaphos µg/L	Demeton µg/L	Diazinon µg/L	Dichlorvos µg/L	Dimethoate µg/L	Disulfoton µg/L	Ethion µg/L	Ethoprophos µg/L	Fenitrothion µg/L	Fensulfthion µg/L	Fenthion µg/L	Malathion µg/L	Mevinphos µg/L	Monocrotophos µg/L	Parathion µg/L	Parathion methyl µg/L	Phorate µg/L	Profenofos µg/L	Prothiotos µg/L	Ronnel µg/L	Stirophos µg/L	Sulprofos µg/L	Trichloronate µg/L	1,2-Dichlorobenzene µg/L	1,3-dichlorobenzene µg/L	1,4-dichlorobenzene µg/L	Hexachlorobenzene µg/L	Pentachlorobenzene µg/L
EQL	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	20	2	2	2	2	2	2	2	2	2	1	1	1	0.10	2
NEPC 2013 Groundwater Investigation Levels - Fresh Waters		0.01			0.01		0.15				0.2			0.05			0.004									160	260	60		
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																														
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																														

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW02	MW02	1/12/2015	<2	<2	<2	-	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<1	<1	<2	<2	
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





	Polychlorinated Biphenyls							Phenols								Heavy Metals							Non-Metallic Inorganics			Anilines			
	Aroclor 1016	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	2-chlorophenol	2-Methylphenol	2-nitrophenol	3- & 4-Methylphenol	4-Chloro-3-Methylphenol	4-nitrophenol	Pentachlorophenol	Phenol	Phenols (Total)	Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Ammonia	Sulfate (as S)	Nitrate (as N)	2-Nitroaniline	Aniline
EQL	1	1	1	1	1	1	1	2	2	2	4	2	2	10	2	10	1	0.10	1	1	1	0.10	1	1	10	2	10	4	2
NEPC 2013 Groundwater Investigation Levels - Fresh Waters			0.3		0.01			340						3.6	320		13*	0.2	1	1.4	3.4	0.06	11	8	900				8
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																													
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																													

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	<1	0.2	<1	2	<1	<0.1	43	92	40	88	2	-	-		
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	<2	<2	<2	<4	<2	<2	<10	<2	<10	1	0.5	1	2	<1	<0.1	220	280	170	410	2	<4	<2
MW02	MW02	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
MW06	MW06	1/14/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<1	<0.2	<1	<1	<1	<0.1	4	17	20	<5	11,000	-	-		

*Value for Arsenic V used

Table 2: Groundwater Analytical Results
 Project Number: 50342
 Project Name: SIMTA Stage 1 Moorebank Assessment





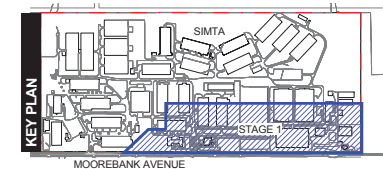
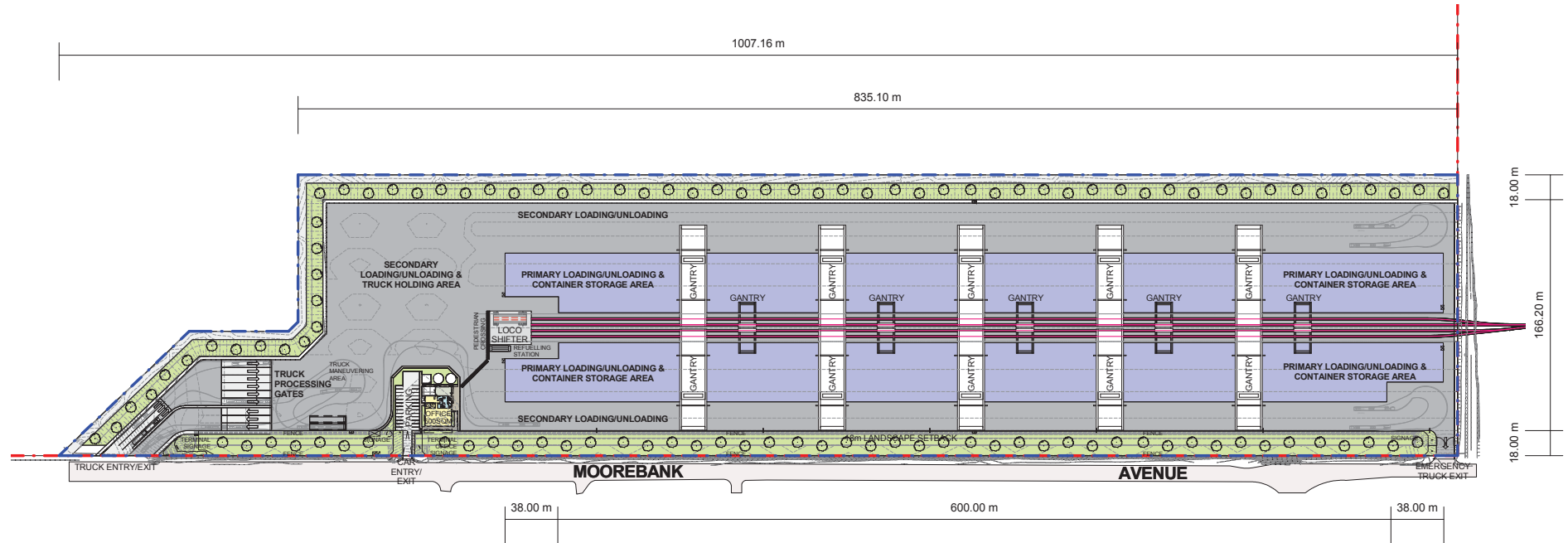
	Nitrobenzenes				Nitrotoluenes				Phthalates				Miscellaneous Chemicals				Major Cations				Major Anions			
	1,3,5-trinitrobenzene µg/L	1,3-dinitrobenzene µg/L	Nitrobenzene µg/L	pentachloronitrobenzene µg/L	2,4,6-trinitrotoluene µg/L	2-nitrotoluene µg/L	2,4 & 2,6 -Dinitrotoluene µg/L	3-nitrotoluene µg/L	Di(2-ethylhexy) phthalate µg/L	Dibutyl phthalate µg/L	Diethyl phthalate µg/L	Dimethyl phthalate µg/L	di-n-octylphthalate µg/L	Hexachlorobutadiene µg/L	Carbon disulfide µg/L	RDX µg/L	Hexachlorocyclopentadiene µg/L	Calcium mg/L	Magnesium mg/L	Sodium mg/L	Potassium - Dissolved mg/L	Bicarbonate Alkalinity as CaCO3 mg/L	Chloride mg/L	Carbonate Alkalinity as CaCO3 mg/L
EQL	50	50	2	2	50	50	100	50	20	2	2	2	2	2	1	50	4	0.50	0.50	0.50	0.50	5	1	5
NEPC 2013 Groundwater Investigation Levels - Fresh Waters			550		140					10	1000	3700												
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 4 to <8m																								
NEPC 2013 Groundwater HSL D for Vapour Intrusion - Sand 8m+																								

Sample ID	Location	Sample Date	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	110	1500	<10	18	2900	<5
MW01	MW01	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	110	1500	<10	18	2900	<5
MW02	MW02	1/12/2015	-	-	<2	<2	-	-	-	<20	<10	<2	<2	<2	<2	<1	<50	50	730	4500	<10	43	9900	<5
MW03	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01A	MW03	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BHHP34011	BHHP34011	1/12/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06	MW06	1/14/2015	<50	<50	<50	-	<50	<50	<100	<50	-	-	-	-	-	-	-	14	10	110	1.4	45	170	<10

*Value for Arsenic V used

Appendix A: Terminal Site Plan

TERMINAL - SITE PLAN



LEGEND			
 SIMTA SITE BOUNDARY			
 STAGE 1 BOUNDARY			
NOTES: 1. ALL LEVELS ARE INDICATIVE & SHOULD BE READ IN CONJUNCTION WITH CIVIL ENG. DIMS FOR FINAL LEVELS OF ALL EARTH WORKS 2. ALL SERVICES RELOCATION TO BE CONFIRMED BY ENG.			
Drawn:	Print Date:	Scale: @ A1	
JJ	6/02/2015 7:28:41 PM	As indicated	
Project Number: 112110			
Drawing Number: _____			
A1101			Sheet: _____ C



This drawing and design is subject to that contained within the relevant planning and/or environmental approval. It is the responsibility of the applicant to ensure that all necessary approvals are obtained prior to construction. The design is for information only and is not to be used for any other purpose without the written consent of the relevant authority.

Item	Description	Date	By	Appr
1	Issue for information	01/02/2015	JJ	
2	Issue for information	01/02/2015	JJ	
3	Issue for information	01/02/2015	JJ	
4	Issue for information	01/02/2015	JJ	
5	Issue for information	01/02/2015	JJ	
6	Issue for information	01/02/2015	JJ	
7	Issue for information	01/02/2015	JJ	
8	Issue for information	01/02/2015	JJ	
9	Issue for information	01/02/2015	JJ	
10	Issue for information	01/02/2015	JJ	



Notes:
ALL DIMENSIONS ARE APPROXIMATE AND ARE TO BE VERIFIED BY A REGISTERED LAND SURVEYOR.

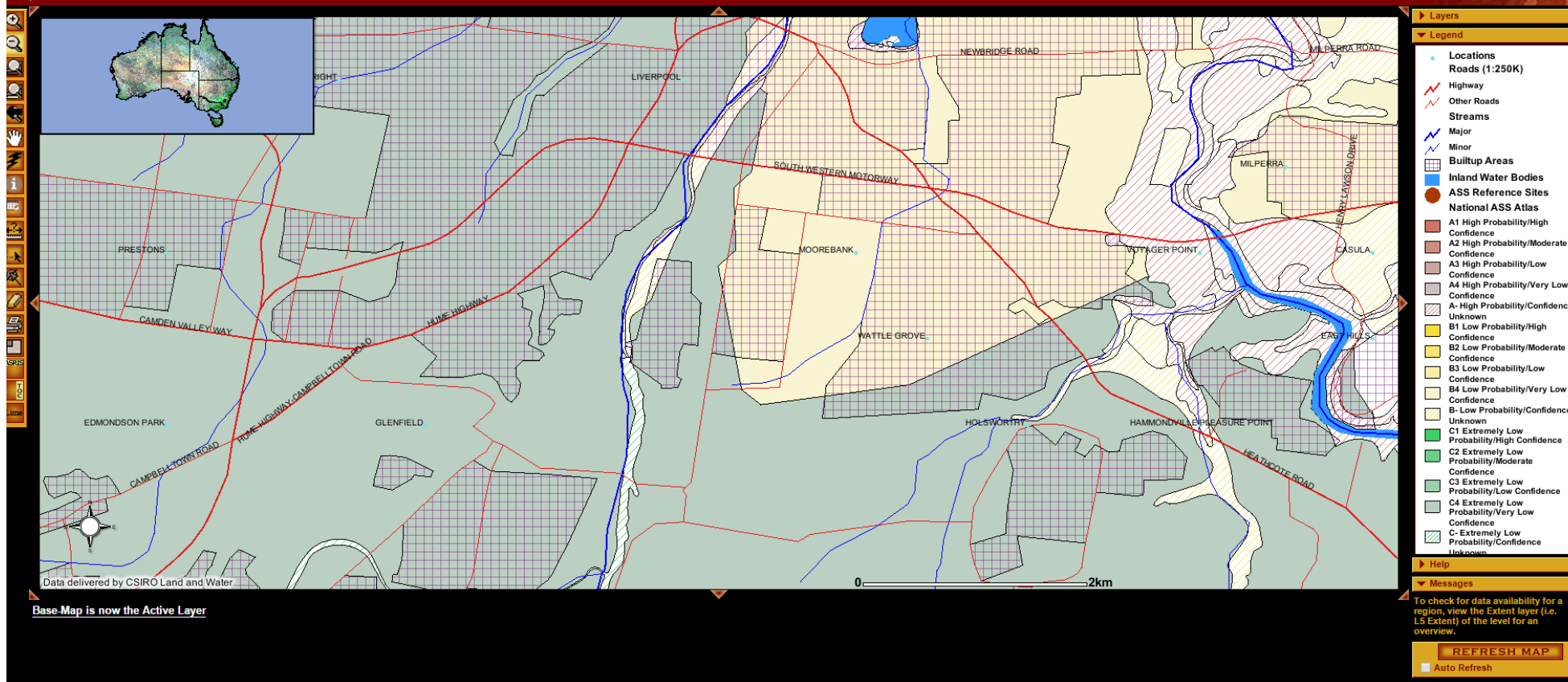
Project	SIMTA INTERMODAL TERMINAL FACILITY (STAGE 1)
Project Address	MOOREBANK AVENUE, MOOREBANK, NSW



Architect	REID CAMPBELL
Architecture, Interiors, Planning	
ACH 002 033 601	ACH 20 217 005 075
Level 15, 124 Walker Street	North Sydney NSW 2060 Australia
Tel: 61 02 9554 5011	Email: reidcampbell.com
Fax: 61 02 9554 4046	Web: www.reidcampbell.com

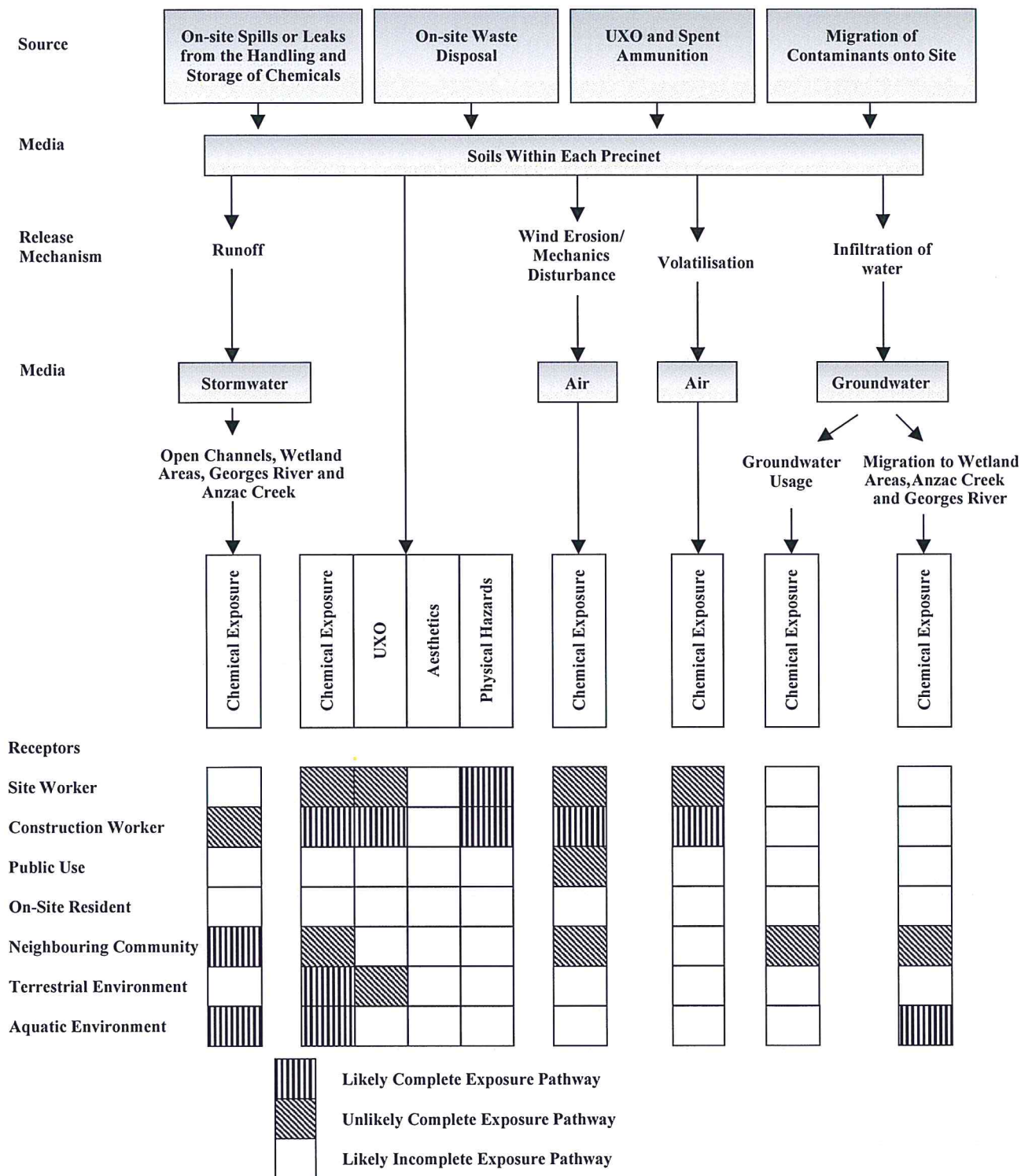
Drawing Title	TERMINAL - SITE PLAN
---------------	----------------------

Appendix B: Acid Sulphate Search Records



Appendix C: Conceptual Site Model (URS, 2002)

Figure 2
Conceptual Model



Appendix D: UXO Clearance (Milsearch, 2014)

Head Office Address
Level 1, Units 4 and 5
30 Mawson Place, Mawson, ACT, Australia
Postal Address:
PO Box 687, MAWSON, ACT
AUSTRALIA, 2607
ABN: 44 007 106 881

Lao PDR Vientiane Office
Tel: +856-21-351608
Fax: +856-21-351609
Mobile: +856-20-512051
Unit 9, Ban Sapanphong
(PO Box 1321) Vientiane, Lao PDR
Email: info@milsearchlao.com

Australian Head Office
Tel: 02-62868299 (Int: 61-2)
Fax: 02-62868266 (Int: 61-2-)
Email: headoffice@milsearch.com.au
www.milsearch.com.au

**UXO CLEARANCE CERTIFICATE (F-241)
NSW 45614 MOOREBANK UXO SAFEGUARDING
MOOREBANK, NEW SOUTH WALES**

**MOOREBANK GEOTECHNICAL INVESTIGATIONS
UNEXPLODED ORDNANCE (UXO) ANALOGUE SEARCH
JBS&G PTY LTD, NEW SOUTH WALES**

This is to certify that forty three Test Pit (TP), Monitoring Well (MW) and Soil Bore (SB) locations, as part of the Moorebank Intermodal Terminal Site and surrounds have been subjected to an Unexploded Ordnance (UXO) analogue search in accordance with the methodology described in the Milsearch Task Proposal and the Milsearch Project Task Summary. The specified locations were subjected to an analogue search using the Foerster 4.032 magnetometer and the Minelab F3 mine detector as analogue survey tools.

This UXO Clearance Certificate is designed to allow the hand-over of the specified locations to enable planned soil sampling works to proceed.

No UXO were located during the search.

SAFE ENGINEERING WORKING DEPTH

It is the opinion of Milsearch Pty Ltd that, within the limitation of the UXO search equipment and methodology applied, that the Moorebank Intermodal Terminal Site, within the specified locations is free of Unexploded Ordnance and Explosive Ordnance of a size equal to or greater than:

- 75mm projectiles to a maximum depth of 2 m and in a radius of 2 m from the centre of each trench.



* Military Land Decontamination, * Unexploded Ordnance Disposal,
* De-mining, * Sub-Surface Detection of Metallic Items,
* De-militarization of Munitions, * Rehabilitation of Active Defence Live-Firing Ranges,
* Geophysical Surveys on Land and Underwater

The specified TP, SB and MW locations are identified within Figure 1 and Table 1.

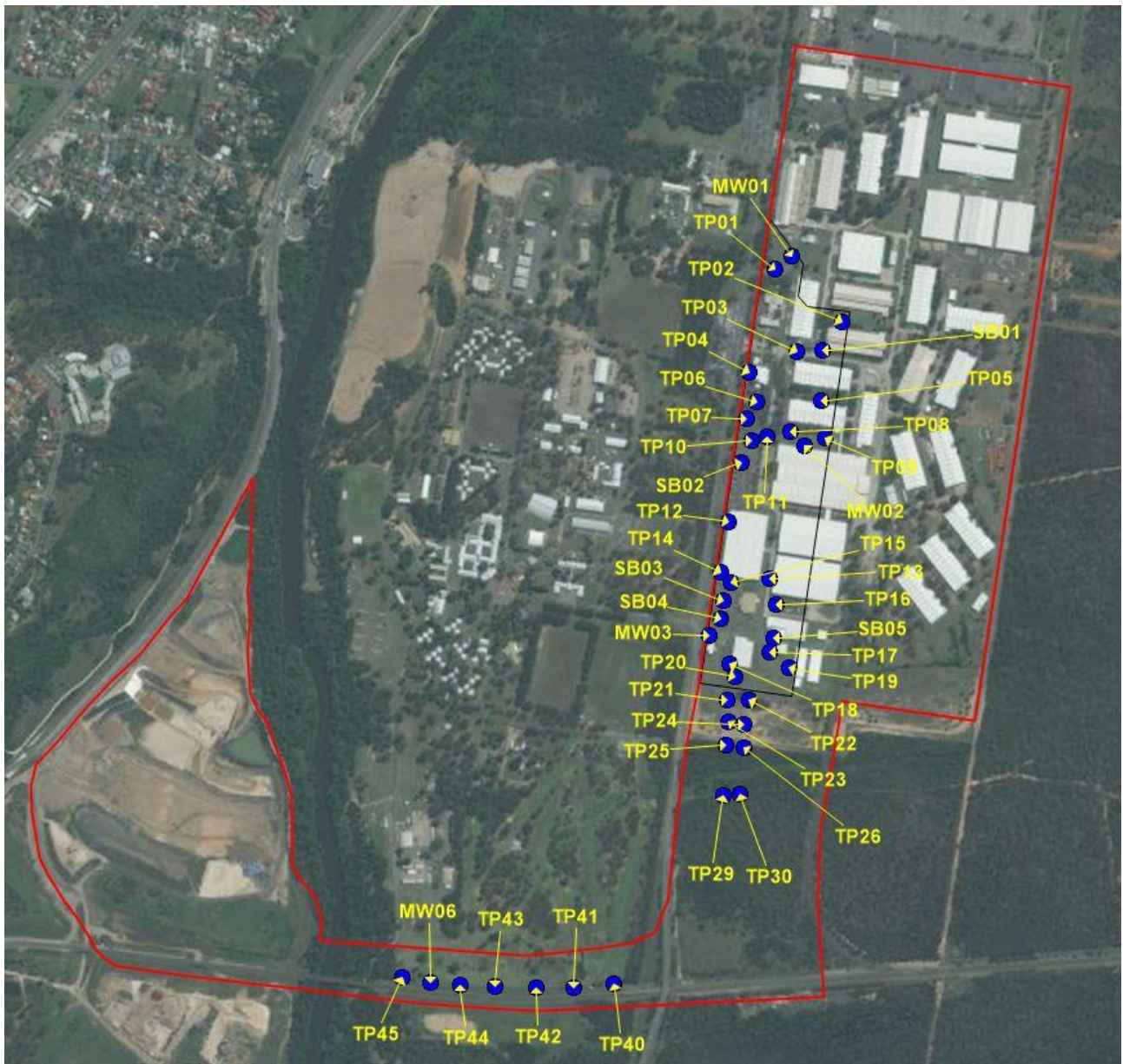


Figure 1: TP, SB and MW Locations

ID	Easting	Northing	ID	Easting	Northing
MW01	308139.8702	6241329.419	TP14	308002.2723	6240651.115
MW02	308176.2269	6240922.958	TP15	308024.4428	6240628.351
MW03	307981.4675	6240515.131	TP16	308122.5849	6240583.544
MW06	307396.6359	6239760.258	TP17	308110.1623	6240481.654
SB01	308211.6465	6241128.486	TP18	308024.802	6240454.881
SB02	308043.0057	6240887.071	TP19	308154.5406	6240449.745
SB03	308008.0234	6240589.092	TP20	308038.2631	6240427.175
SB04	308004.8821	6240551.674	TP21	308021.4109	6240376.272
SB05	308118.2399	6240512.795	TP22	308067.762	6240377.394
TP01	308105.2806	6241301.423	TP23	308025.2131	6240330.476
TP02	308252.356	6241190.195	TP24	308059.6608	6240324.685
TP03	308157.1633	6241125.12	TP25	308020.3976	6240281.455
TP04	308053.5357	6241078.615	TP26	308059.45	6240275.69
TP05	308211.5022	6241022.32	TP29	308017.9911	6240172.991
TP06	308073.3835	6241016.189	TP30	308052.2414	6240176.958
TP07	308051.7079	6240979.074	TP40	307790.6553	6239765.667
TP08	308147.1813	6240954.378	TP41	307703.8434	6239755.946
TP09	308222.2536	6240941.549	TP42	307623.73	6239753.24
TP10	308063.4452	6240932.201	TP43	307534.7031	6239755.821
TP11	308096.2119	6240942.86	TP44	307459.96	6239756.81
TP12	308015.7472	6240756.907	TP45	307335.6916	6239769.441
TP13	308108.3533	6240637.932			

Table 1: TP, SB and MW Locations
(UTM-WGS-84, Zone 56S)

I certify that this is a true and accurate record:

A handwritten signature in black ink, appearing to read 'Paul Wheeler', with a small '2014' written to the right.

Paul Wheeler
Project Manager
Milsearch Pty Ltd

Dated: 24 Dec 2014

Approved for Release To Client

A handwritten signature in black ink, appearing to read 'Michael Ransom', with a small '2014' written to the right.

Michael Ransom
Project Director
Milsearch Pty Ltd

Dated: 24 Dec 2014

Appendix E: Bore Logs



Well No: MW01

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW

Date: 22/12/14	Eastings (MGA): 308140.7	Water Level Initial (mbgs):
Contractor: Matrix	Northings (MGA): 6241329	Water Level Static (mbgs):
Drill Rig: Geoprobe	Reference Level:	Casing Type/Surface Finish: Class 18 UPVC / RB
Method: 0.9 (HA), 3.0 (PT), 10.0 (SFA)	Elevation: Surface (m) 0 TOC (m):	Screen Diameter (mm): 50 Screen Length (m): 4.5
Total Hole Depth (mbgs): 10.0	Bore Diameter (mm):	Casing Diameter (mm): 50 Casing Length (m): 5.5

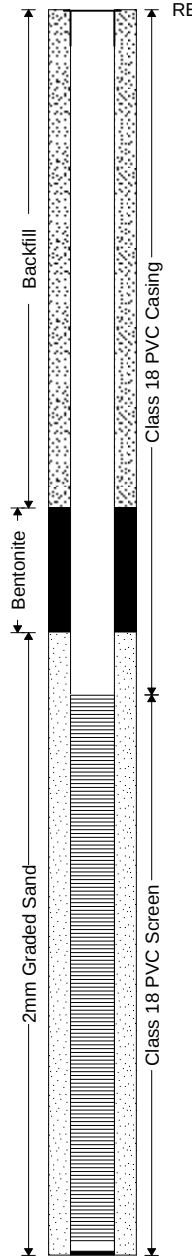
SUBSURFACE PROFILE			SAMPLE				
Depth (m)	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.0		Ground Surface					
		Surface Description: Grass	MW01_0-0.1	4.5	D	No Staining, Odours or ACM observed	Backfill Bentonite 2mm Graded Sand Class 18 PVC Casing Class 18 PVC Screen RB
		Fill Silty Sand, brown, heterogeneous, dry, dense, fine including igneous gravel.	MW01_0.2-0.3	7	D	QC04/ QC04A taken on MW01_0-0.1	
			MW01_0.5-0.7	5.3	D		
1.0		Fill Silty Clay, pale brown, heterogeneous, dry, dense, low plasticity.					
		Natural Silty Clay, orange-yellow, heterogeneous, dry-damp, firm, medium plasticity.	MW01_1.5-1.7	6.3	U	No Staining, Odours or ACM observed	
		As above					
2.0							
		Becomes red with shale inclusions.	MW01_2.8-3.0	6.1	U	No Staining, Odours or ACM observed	
3.0							
		Natural Silty Clay rey-red, heterogeneous, damp, fine, medium plasticity.					
4.0		Increasing moisture at 4.0 m bgs.					
5.0							
6.0							
7.0		Natural Silty Clay red with grey mottles, dry, heterogeneous, moist, firm, low plasticity.					
8.0							
9.0							
10.0		EOH End of Hole at 10 m bgs - Program Depth.					

Method	Sample Type	Reference Level	Casing Type/Surface Finish	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	PVC 18 - Class 18 PVC	Logged By: RH/GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	MT - Monument	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample	TOC - Top of Casing	RB - Roadbox	
PT - Push Tube			SP - Stickup/Standpipe	
AH - Air Hammer				

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

© JBS&G

	Well No: MW02	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW
Date: 22/12/14 Contractor: Matrix Drill Rig: Geoprobe Method: 1.1 (HA), 3.2 (PT), 10.0 (SFA) Total Hole Depth (mbgs): 10.0	Eastings (MGA): 308176.3 Northings (MGA): 6240922 Reference Level: Elevation: Surface (m) 0 TOC (m): Bore Diameter (mm):	Water Level Initial (mbgs): Water Level Static (mbgs): Casing Type/Surface Finish: Class 18 UPVC / RB Screen Diameter (mm): 50 Screen Length (m): 4.5 Casing Diameter (mm): 50 Casing Length (m): 5.5

SUBSURFACE PROFILE			SAMPLE				
Depth (m)	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.0		Ground Surface					
		Surface Description: Grass	MW02 0-0.1	0.9	D		
		Fill Silty Sand, dark brown, heterogeneous, dry, dense, fine.	MW02 0.2-0.3	1.9	D	No Staining, Odours or ACM observed	
		Fill Silty Sand, dark brown, heterogeneous, dry, dense, fine.	MW02 0.4-0.6	2.5	D		
1.0		Fill Sandy Clay, brown, heterogeneous, firm, medium plasticity.	MW02 0.8-1.0	2.6	D	No Staining, Odours or ACM observed	
		Fill Silty Sand, brown, heterogeneous, damp, fine, low plasticity including igneous gravels,					
2.0		Natural Silty Clay, yellow-brown, heterogeneous, dry-damp, stiff, low plasticity.	MW02 1.6-1.8	3.0	U	No Staining, Odours or ACM observed	
		As above.					
3.0		Natural Silty Clay grey-red, heterogeneous, dry, dense, very stiff with occasional shale.	MW02 3.0-3.2	3.2	U	No Staining, Odours or ACM observed	
4.0		As above with increasing moisture and increasing red mottles.					
5.0							
6.0							
7.0							
8.0							
		EOH End of Hole at 8.3 m bgs.					
9.0							
10.0							

Method	Sample Type	Reference Level	Casing Type/Surface Finish	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	PVC 18 - Class 18 PVC	Logged By: RH/GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	MT - Monument	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample	TOC - Top of Casing	RB - Roadbox	
PT - Push Tube			SP - Stickup/Standpipe	
AH - Air Hammer				

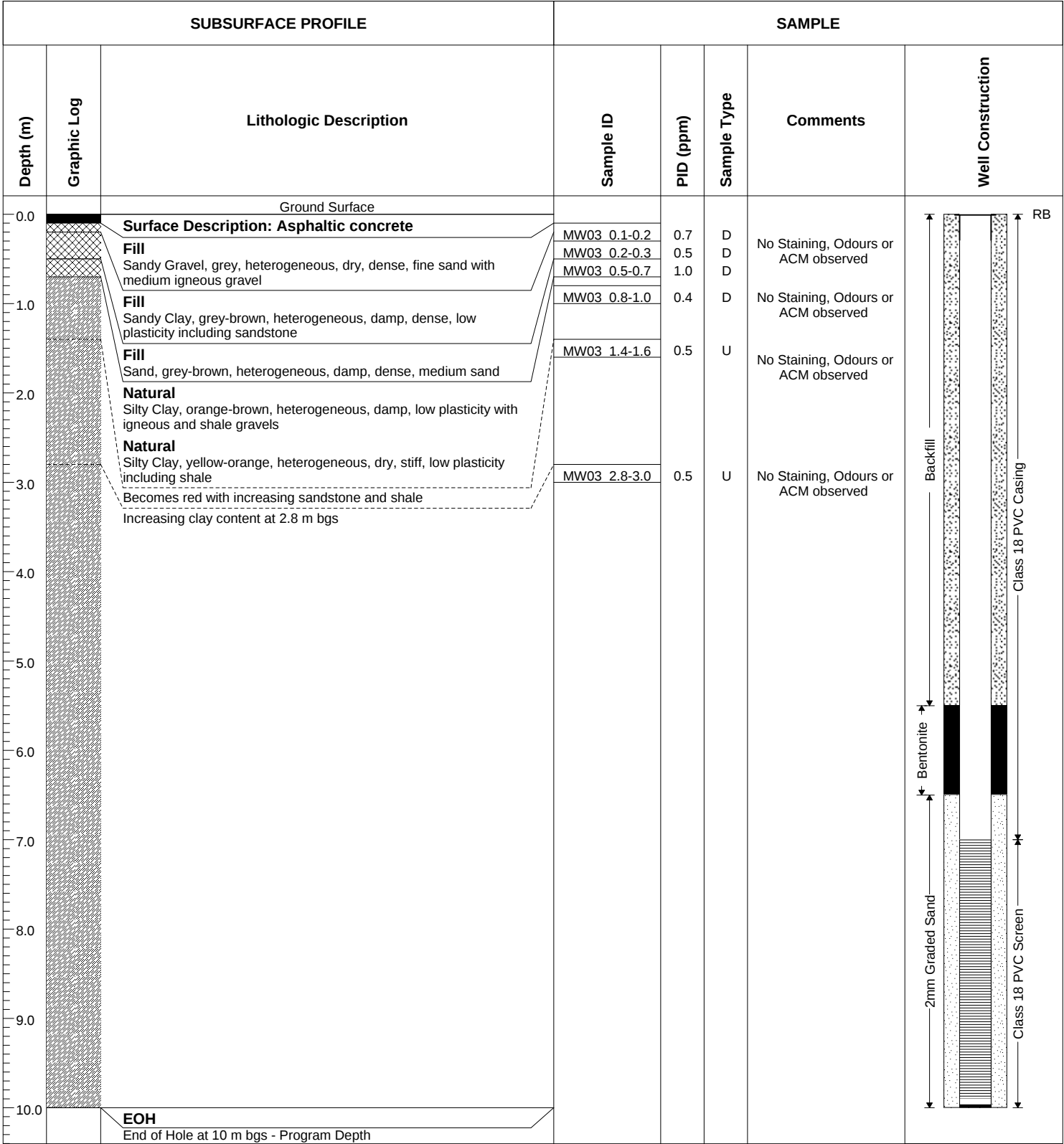
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information



Well No: MW03

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW

Date: 23/12/14	Eastings (MGA): 307981	Water Level Initial (mbgs):
Contractor: Matrix	Northings (MGA): 6240514	Water Level Static (mbgs):
Drill Rig: Geoprobe	Reference Level:	Casing Type/Surface Finish: Class 18 UPVC / RB
Method: 1.0 (HA), 3.0 (PT), 10.0 (SFA)	Elevation: Surface (m) 0 TOC (m):	Screen Diameter (mm): 50 Screen Length (m): 3
Total Hole Depth (mbgs): 10.0	Bore Diameter (mm):	Casing Diameter (mm): 50 Casing Length (m): 7



Method	Sample Type	Reference Level	Casing Type/Surface Finish	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	PVC 18 - Class 18 PVC	Logged By: RH/GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	MT - Monument	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample	TOC - Top of Casing	RB - Roadbox	
PT - Push Tube			SP - Stickup/Standpipe	
AH - Air Hammer				

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



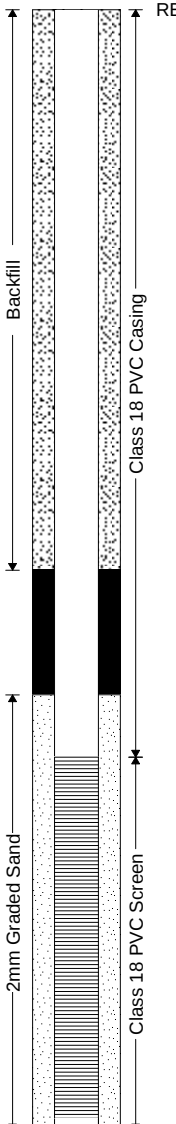
Well No: MW06

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW.

Date: 16/12/14 / 22/12/14
Contractor: Ken Coles/Matrix
Drill Rig: Geoprobe/Excavtor
Method: SFA
Total Hole Depth (mbgs): 9.0

Eastings (MGA): 307396.6
Northings (MGA): 6239760
Reference Level:
Elevation: Surface (m) 0 TOC (m):
Bore Diameter (mm):

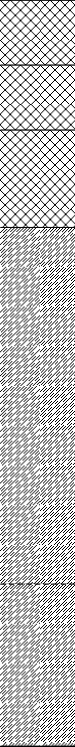
Water Level Initial (mbgs):
Water Level Static (mbgs):
Casing Type/Surface Finish: Class 18 UPVC / RB
Screen Diameter (mm): 50 Screen Length (m): 3
Casing Diameter (mm): 50 Casing Length (m): 6

SUBSURFACE PROFILE			SAMPLE				
Depth (m)	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.0		Ground Surface					
		Surface Description: Grass	MW06 0-0.1	-	D	No Staining, Odours or ACM observed	
		Fill Sand, grey-brown, heterogeneous, damp, firm including rootlets.	MW06 0.3-0.4	-	D	No Staining, Odours or ACM observed	
1.0		Sand Yellow, homogeneous, damp, dense, fine,					
		Natural Silty Clay, red-grey-yellow, heterogeneous, damp, firm, medium plasticity with sandstone inclusions.	MW06 1.2-1.4	-	D	No Staining, Odours or ACM observed	
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							
8.0							
9.0		EOH End of Hole at 9.0 m bgs - Program Depth.					
10.0							

Method	Sample Type	Reference Level	Casing Type/Surface Finish	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	PVC 18 - Class 18 PVC	Logged By: RH/GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	MT - Monument	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample	TOC - Top of Casing	RB - Roadbox	
PT - Push Tube			SP - Stickup/Standpipe	
AH - Air Hammer				

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: SB01	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Eastings (MGA): 308211.3 Contractor: Matrix Northings (MGA): 6241129 Drill Rig: Geoprobe Reference Level: Method: 1.2 (HA), 2.3 (PT) Elevation - Surface (m): 0 Total Hole Depth (mbgs): 2.3 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Fill Silty Gravel, grey-brown, heterogeneous, dry including rootlets.	SB01_0-0.1	3.1	D	No Staining, Odours or ACM observed
		Fill Sandy Gravel, yellow, heterogeneous, dry, dense.	SB01_0.2-0.3	7.4	D	No Staining, Odours or ACM observed
		Fill Gravelly Sand, grey, heterogeneous, damp, dense, low plasticity.	SB01_0.4-0.6	8.1	D	No Staining, Odours or ACM observed
1.0		Natural Silty Clay, red-brown, heterogeneous, damp, firm, medium plasticity.	SB01_1-1.2	7.5	D	No Staining, Odours or ACM observed
2.0		As above with red shale inclusions.	SB01_1.8-2.0	8.3	U	No Staining, Odours or ACM observed
3.0		EOH EOH at 2.3 m bgs - Program depth.				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

	Borehole No: SB02	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Contractor: Matrix Drill Rig: Geoprobe Method: 1.2 (HA), 3.2 (PT) Total Hole Depth (mbgs): 3.2	
Eastings (MGA): 308043 Northings (MGA): 6240887 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Asphalt	SB02_0-0.1	33.5	D	No Staining, Odours or ACM observed
		Fill Sandstone, yellow, heterogeneous, very dense, gravels. As above with boulders.	SB02_0.2-0.3	12	D	No Staining, Odours or ACM observed
		Fill Silty Clay, brown, heterogeneous, damp, stiff, medium plasticity.	SB02_0.5-0.7	6.0	D	No Staining, Odours or ACM observed
1.0		Natural Silty Clay brown-grey, heterogeneous, damp, stiff, medium plasticity including sandstone gravels.	SB02_1-1.2	0.7	D	No Staining, Odours or ACM observed
		As above with shale, sandstone and red mottles.	SB02_1.8-2.0	0.0	U	No Staining, Odours or ACM observed
2.0						
			SB02_2.6-2.8	0.0	U	No Staining, Odours or ACM observed
3.0						
		EOH End of Hole at 3.2 m bgs - Program Depth				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
 © JBS&G

	Borehole No: SB03	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 23/12/14 Eastings (MGA): 308009.1 Contractor: Ken Coles Northings (MGA): 6240588 Drill Rig: Excavator Reference Level: Method: 1.2 (HA), 3.2 (PT) Elevation - Surface (m): 0 Total Hole Depth (mbgs): 3.2 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass Fill Silty Sand, dark brown, heterogeneous, damp, fine, low plasticity, with inclusions of rootlets.	SB03_0-0.1	0.0	D	No Staining, Odours or ACM observed
		Fill Silty Clay, brown, heterogeneous, dry-damp, firm, low plasticity including sandstone gravels.	SB03_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Fill Sand, brown, homogeneous, damp, dense, fine.	SB03_0.5-0.7	-	D	No Staining, Odours or ACM observed
1.0		Fill Silty Sandy Clay, red to grey, heterogeneous, damp, fine, low plasticity.	SB03_1-1.2	-	D	No Staining, Odours or ACM observed
			SB03_1.4-1.6	-	D	No Staining, Odours or ACM observed
2.0			SB03_2.4-2.6	-	D	No Staining, Odours or ACM observed
3.0						
4.0		EOH End of Hole at 3.2 m bgs - program depth.				

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

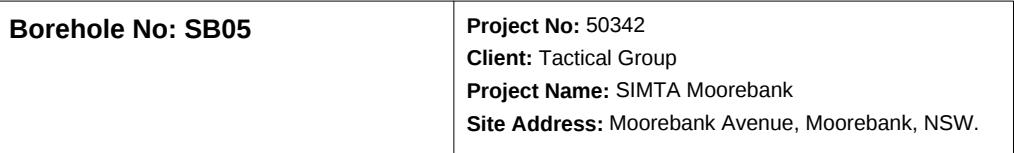
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
 © JBS&G

	Borehole No: SB04	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 23/12/14 Contractor: Matrix Drill Rig: Geoprobe Method: 1.2 (HA), 3.1 (PT) Total Hole Depth (mbgs): 3.1 Eastings (MGA): 308004.5 Northings (MGA): 6240551 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	SB04_0-0.1	0.1	D	No Staining, Odours or ACM observed
		Fill Silty Sand, brown, heterogeneous, dry, firm, low plasticity.	SB04_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Reworked Natural Silty Clay, grey to red, heterogeneous, low plasticity.				
		Natural Sand, brown, heterogenous, damp, firm, fine.	SB04_0.5-0.7	-	D	No Staining, Odours or ACM observed
1.0		Natural Silty Clay, orange to brown, firm, low plasticity, with inclusions of shale and sandstone.	SB04_1-1.2	-	D	No Staining, Odours or ACM observed
			SB04_1.8-2.0	-	U	No Staining, Odours or ACM observed
2.0						
			SB04_2.4-2.6	-	U	No Staining, Odours or ACM observed
3.0		EOH End of hole at 3.1 m bgs - program depth				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

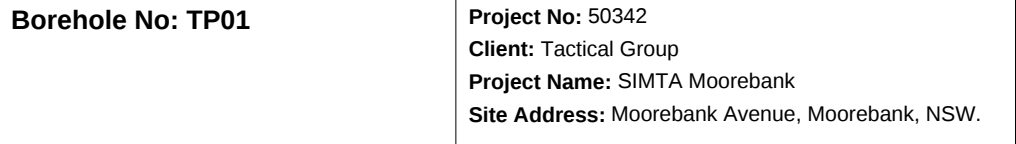
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



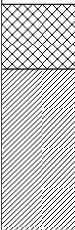
Eastings (MGA): 308118
Northings (MGA): 6240511
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



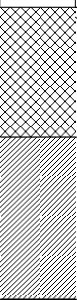
Date: 22/12/14	Eastings (MGA): 308105.8
Contractor: Ken Coles	Northings (MGA): 6241299
Drill Rig: Excavator	Reference Level:
Method:	Elevation - Surface (m): 0
Total Hole Depth (mbgs): 0.7	Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP01_0-0.15	0.1	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, heterogeneous, medium grain, very dense, dry.		-	D	No Staining, Odours or ACM observed
		Natural Clay, orange with grey mottle, homogeneous, very stiff, low plasticity, dry.	TP01_0.3-0.4	-	D	No Staining, Odours or ACM observed
			TP01_0.5-0.6	-	D	No Staining, Odours, or ACM observed
1.0		EOH End of Hole at 0.7 m bgs - program depth.				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: RH
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

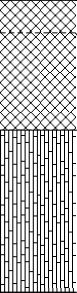
	Borehole No: TP02	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9 Eastings (MGA): 308251.9 Northings (MGA): 6241191 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP02_0-0.15	0.0	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, heterogeneous, medium grain, dense, dry, with inclusions of sandstone cobbles.	TP02_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey, homogeneous, firm, low plasticity, damp.	TP02_0.5-0.6	-	D	No Staining, Odours, or ACM observed
1.0		EOH End of Hole at 0.9 m bgs - program depth.				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP03	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9			Eastings (MGA): 308157 Northings (MGA): 6241124 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass Fill As below, with inclusions of organics (roots & grass). Sand, white to brown, homogeneous, fine to medium grain, poorly graded, dense, damp.	TP03_0-0.15	0.0	D	No Staining, Odours or ACM observed
			TP03_0.3-0.4	0	D	No Staining, Odours or ACM observed
		Natural Silty Sand, orange to grey to brown, homogeneous, soft, medium plasticity, moist.	TP03_0.5-0.6	0	D	No Staining, Odours, or ACM observed
1.0		EOH End of Hole at 0.9 m bgs - program depth.				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP04	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.3 Eastings (MGA): 308053.7 Northings (MGA): 6241080 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP04_0-0.1	0.3	D	No Staining, Odours or ACM observed
		Fill Silty Sand, brown, stiff, low plasticity, dry.				
		Gravelly Sand, grey to brown, heterogeneous, dense, damp, with inclusions of igneous gravel.				
		EOH End of Hole at 0.3 m bgs - refuse in igneous gravel				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP05	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9		
Eastings (MGA): 308211.8 Northings (MGA): 6241023 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP05_0-0.15	1.1	D	No Staining, Odours or ACM observed
		Fill Sand, brown to yellow, heterogeneous, well graded, dense, damp, with inclusions of fine cobbles.				
		Fill As above, becomes dry with no organic inclusions, turns yellow to white.	TP05_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey, homogeneous, stiff, medium plasticity, moist.	TP05_0.6-0.7	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.9 m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

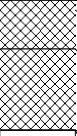
	Borehole No: TP06	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Eastings (MGA): 308076.6 Contractor: Ken Coles Northings (MGA): 6241019 Drill Rig: Excavator Reference Level: Method: Elevation - Surface (m): 0 Total Hole Depth (mbgs): 1.2 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP06_0-0.15	0.2	D	No Staining, Odours or ACM observed
		Reworked Natural Clay, orange to red to white, heterogeneous, firm, non-plastic, dry, with inclusions of yellow sand.				
		Reworked Natural Sandy Clay, brown to yellow, heterogeneous, firm, non-plastic, dry.	TP06_0.3-0.4	-	D	No Staining, Odours or ACM observed
			TP06_0.4-0.5	-	D	No Staining, Odours or ACM observed
		Natural Sandy Clay, orange, homogeneous, stiff, low plasticity, dry.				
1.0			TP06_1.0-1.1	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.2 m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
 © JBS&G

	Borehole No: TP07	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.4 Eastings (MGA): 308051.1 Northings (MGA): 6240978 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP07_0-0.1	0.3	D	No Staining, Odours or ACM observed
		Fill Silty Gravelly Sand, brown, heterogeneous, dense, fine, dry.				
		Fill Sandstone, yellow, heterogeneous, dense, coarse, dry.	TP07_0.2-0.3	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.4 m bgs - refusal in sandstone				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



Borehole No: TP08

Project No: 50342

Client: Tactical Group

Project Name: SIMTA Moorebank

Site Address: Moorebank Avenue, Moorebank, NSW.

Date: 22/12/14

Contractor: Ken Coles

Drill Rig: Excavator

Method:

Total Hole Depth (mbgs): 1.1

Eastings (MGA): 308146.1

Northings (MGA): 6240952

Reference Level:

Elevation - Surface (m): 0

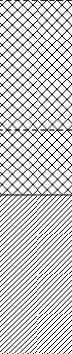
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP08_0-0.15	0.1	D	No Staining, Odours or ACM observed
		Fill Topsoil/sand, brown and yellow, heterogeneous, fine to coarse, dry, with inclusions of high organic matter.	TP08_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Fill Sand, yellow, heterogeneous, poorly graded, dense, dry.	TP08_0.4-0.5	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey, homogeneous, stiff, medium plasticity, moist.				
1.0			TP08_1.0-1.1	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.1 m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP09	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 1.1 Eastings (MGA): 308222.3 Northings (MGA): 6240940 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP09_0-0.15	0.1	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, heterogeneous, well graded, dense, dry, with inclusions of fine cobbles.	TP09_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Fill Sandy Clay, yellow to orange, heterogeneous, firm, non-plastic, dry, with inclusions of roots and wood.	TP09_0.4-0.5	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey, homogeneous, stiff, medium plasticity, moist.				
1.0			TP09_1.0-1.1	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.1 m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

	Borehole No: TP10	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 1.1 Eastings (MGA): 308063.5 Northings (MGA): 6240933 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass Fill Sand, brown, heterogeneous, dense, dry, fine.	TP10_0-0.15	0.1	D	No Staining, Odours or ACM observed
		Fill Sand, yellow, heterogeneous, dense, dry, with inclusions of fine gravel (sandstone).	TP10_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Sandy Clay, orange, homogeneous, stiff, low plasticity, dry.	TP10_0.4-0.5	-	D	No Staining, Odours or ACM observed
1.0						
		EOH End of Hole at 1.1 m bgs - program depth	TP10_1.0-1.1	-	D	No Staining, Odours or ACM observed
2.0						
3.0						
4.0						
Drilling Method		Sample Type	Reference Level	Log Details		
HA - Hand Auger		U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: RH		
SFA - Solid Flight Auger		D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG		
HFA - Hollow Flight Auger		CS - Core sample				
PT - Push Tube						
AH - Air Hammer						

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information



Borehole No: TP11

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW.

Date: 22/12/14
Contractor: Ken Coles
Drill Rig: Excavator
Method:
Total Hole Depth (mbgs): 1.4

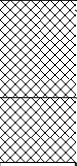
Eastings (MGA): 308095.9
Northings (MGA): 6240940
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP11_0-0.15	0.1	D	No Staining, Odours or ACM observed
		Fill Sand, brown, heterogeneous, dense, dry, fine.				
		Fill Sandy clay, orange, heterogeneous, stiff, medium plasticity, damp to dry, with inclusions of fine gravel (sandstone).	TP11_0.3-0.4	-	D	No Staining, Odours or ACM observed
			TP11_0.4-0.5	-	D	No Staining, Odours or ACM observed
		Natural Sandy Clay, orange to grey, homogeneous, stiff, medium plasticity, moist.				
1.0			TP11_1.0-1.1	-	D	No Staining, Odours or ACM observed
			TP11_1.3-1.4	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.4 m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

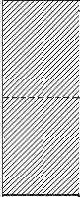
	Borehole No: TP12	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 23/12/14 Contractor: Matrix Drill Rig: HA Method: Total Hole Depth (mbgs): 0.5		
Eastings (MGA): 308015.7 Northings (MGA): 6240757 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP12_0-0.15	0.5	D	No Staining, Odours or ACM observed
		Fill Silty sand, dark brown, heterogeneous, medium coarse, dense, damp, with inclusions of high organics.				
		Fill Sand, dark brown to black, heterogeneous, dense, dry, with inclusions of coarse cobble and shale.	TP12_0.3-0.4	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.5m bgs - refusal				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

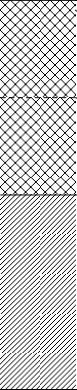
	Borehole No: TP13	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.6			Eastings (MGA): 308108.9 Northings (MGA): 6240633 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP13_0-0.15	0.2	D	No Staining, Odours or ACM observed
		Natural Clay, orange with grey and red mottle, heterogeneous, stiff, medium plasticity, dry.	TP13_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural As above, becomes wet and more orange.	TP13_0.5-0.6	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.6m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

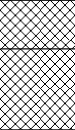
	Borehole No: TP14	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 23/12/14 Eastings (MGA): 308002.3 Contractor: Matrix Northings (MGA): 6240651 Drill Rig: HA Reference Level: Method: Elevation - Surface (m): 0 Total Hole Depth (mbgs): 1.2 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP14_0-0.15	0.4	D	No Staining, Odours or ACM observed
		Fill Clayey sand, dark brown, heterogeneous, medium coarse, dense, damp, with inclusions of organic matter.				
		Fill As above, becomes light brown, no organics, with inclusions of sandstone.	TP14_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Clay, grey to orange to red, homogeneous, stiff, medium plasticity, moist.	TP14_0.6-0.7	-	D	No Staining, Odours or ACM observed
1.0			TP14_1.0-1.1	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.2m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

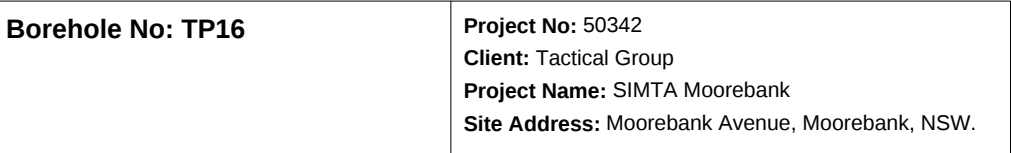
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

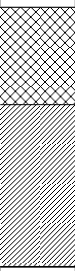
	Borehole No: TP15	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 23/12/14 Contractor: Matrix Drill Rig: HA Method: Total Hole Depth (mbgs): 0.4 Eastings (MGA): 308023.5 Northings (MGA): 6240629 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP15_0-0.1	0.2	D	No Staining, Odours or ACM observed
		Fill Silty sand, brown, heterogeneous, low plasticity, dense, dry.				
		Fill Sandstone, yellow, heterogeneous, medium gravels, dense, dry.	TP15_0.2-0.3	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.4m bgs - refusal on sandstone gravels				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP16_0-0.15	0.5	D	No Staining, Odours or ACM observed
		Fill Sand, white, homogeneous, poorly graded, medium grain, dense, dry to damp.	TP16_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey to red, homogeneous, medium plasticity, stiff, moist.	TP16_0.5-0.6	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.8m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: RH
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP17	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.8		
Eastings (MGA): 308110.1 Northings (MGA): 6240480 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP17_0-0.15	0.2	D	No Staining, Odours or ACM observed
		Fill Sand, brown, poorly graded, medium grain, loose, dry.	TP17_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Reworked Natural As above, becomes clayey, orange to grey to red, moist.				
		Natural Clay, orange to grey to red, homogeneous, medium plasticity, stiff, moist.	TP17_0.5-0.6	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP18	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 23/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.8		
Eastings (MGA): 308024.4 Northings (MGA): 6240455 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP18_0-0.15	0.3	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, heterogeneous, medium coarse, dry.	TP18_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Reworked Natural As above, becomes gold.				
		Natural Clay, orange to grey to red, homogeneous, medium plasticity, stiff, moist.	TP18_0.5-0.6	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

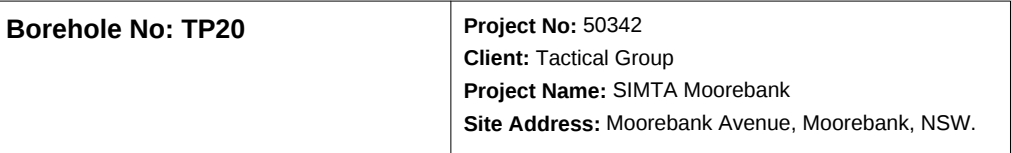
Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

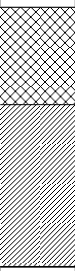
	Borehole No: TP19	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 1.4	
Eastings (MGA): 308153.9 Northings (MGA): 6240449 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP19_0-0.15	0.3	D	No Staining, Odours or ACM observed
		Fill Sand, brown, heterogeneous, poorly graded, medium grain, loose, damp, with inclusions of bricks and cobbles.	TP19_0.2-0.3	0.2	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, homogeneous, medium grain, medium dense, poorly graded, damp.	TP19_0.4-0.5	-	D	No Staining, Odours or ACM observed
1.0		Natural Clay, orange to grey to red, homogeneous, medium plasticity, very stiff, moist.	TP19_1.0-1.1	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.4m bgs - program depth				
2.0						
3.0						
4.0						
Drilling Method		Sample Type	Reference Level	Log Details		
HA - Hand Auger		U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: RH		
SFA - Solid Flight Auger		D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG		
HFA - Hollow Flight Auger		CS - Core sample				
PT - Push Tube						
AH - Air Hammer						

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information



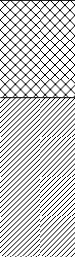
Eastings (MGA): 308037.5
Northings (MGA): 6240426
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface		0.0	D	No Staining, Odours or ACM observed. QC03 and QC03/A taken at TP20_0-0.15
		Surface Description: Grass	TP20_0-0.15			
		Fill Sand, yellow, heterogeneous, poorly graded, medium grain, dense, damp.		-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey to red, homogeneous, medium plasticity, stiff, moist.	TP20_0.4-0.5			
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: RH
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

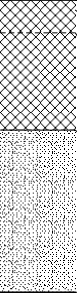
	Borehole No: TP21	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.8			Eastings (MGA): 308021.9 Northings (MGA): 6240375 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP21_0-0.15	0.0	D	No Staining, Odours or ACM observed
		Fill Sand, yellow to white, homogeneous, poorly graded, medium grain, medium dense, damp.	TP21_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Natural Clay, orange to grey to red, heterogeneous, medium plasticity, stiff, moist.	TP21_0.5-0.6	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP22	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 22/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9 Eastings (MGA): 308066.8 Northings (MGA): 6240376 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP22_0-0.15	0.2	D	No Staining, Odours or ACM observed
		Fill As below, with inclusions of higher organic matter (roots and grass).				
		Fill Clay, orange to grey, heterogeneous, medium plasticity, stiff, damp, with inclusions of red.	TP22_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Sand, yellow to white, homogeneous, poorly graded, medium grain, medium dense, damp.	TP22_0.5-0.6	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.9m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP23	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 23/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.7			Eastings (MGA): 308025.7 Northings (MGA): 6240330 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP23_0-0.15	0.6	D	No Staining, Odours or ACM observed
		Fill Clayey Sand, yellow to white, heterogeneous, medium to coarse grains, medium dense, dry.	TP23_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Clay, red to grey to orange, homogeneous, medium plasticity, stiff, moist.	TP23_0.5-0.6	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.7m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: RH Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



Borehole No: TP24

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW

Date: 23/12/14
Contractor: Ken Coles
Drill Rig: Excavator
Method:
Total Hole Depth (mbgs): 0.7

Eastings (MGA): 308061.2
Northings (MGA): 6240322
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		SurfaceDescription: Grass	TP24_0-0.15	0.5	D	No Staining, Odours or ACM observed
		Fill Clayey Sand, yellow to white, heterogeneous, medium to coarse grains, medium dense, dry.				
		Natural Clay, red to grey to orange, homogeneous, medium plasticity, stiff, moist.	TP24_0.3-0.4	-	D	No Staining, Odours or ACM observed
			TP24_0.5-0.6	-	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.7m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP25	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 17/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.5			Eastings (MGA): 308020.4 Northings (MGA): 6240281 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Sand/gravel	TP25_0-0.1	0.3	D	TP25 on access track. No Staining, Odours or ACM observed
		Fill Sand, light brown, homogeneous, fine, dense, damp, with inclusions of gravels and rootlets.				
		Natural Silty Sandy Clay, yellow to grey, heterogeneous, low plasticity, firm, damp, with inclusions of sandstone.	TP25_0.3-0.4	0.1	D	No Staining, Odours or ACM observed
		EOH End of Hole at 0.5m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G



Borehole No: TP26

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW.

Date: 17/12/14
Contractor: Ken Coles
Drill Rig: Excavator
Method:
Total Hole Depth (mbgs): 0.7

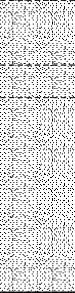
Eastings (MGA): 308059.5
Northings (MGA): 6240276
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Gravel/sand	TP26_0-0.1	0.2	D	No Staining, Odours or ACM observed
		Fill Sand, brown, heterogeneous, fine, dense, damp, with inclusions of gravel.				
		Natural Sand, yellow, homogeneous, fine, dense, well graded, dry.	TP26_0.3-0.5	0.1	D	No Staining, Odours or ACM observed
		Natural Silty Clay, red to grey, heterogeneous, low plasticity, stiff, damp, with inclusions of sandstone.				
		EOH End of Hole at 0.7m bgs - program depth				
1.0						
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

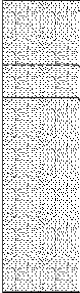
	Borehole No: TP29	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.			
Date: 23/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9			Eastings (MGA): 308018 Northings (MGA): 6240173 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Bark and vegetation 100%	TP29_0-0.15	0.5	D	No Staining, Odours or ACM observed
		Natural Clay, orange to blue to grey, medium plasticity, very stiff, moist to wet.	TP29_0.3-0.4	-	D	No Staining, Odours or ACM observed
		Natural Becomes sandy.	TP29_0.5-0.6	-	D	No Staining, Odours or ACM observed
		Natural As above.				
1.0		EOH End of Hole at 0.9m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

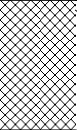
	Borehole No: TP30	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 23/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 0.9 Eastings (MGA): 308052.2 Northings (MGA): 6240177 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: 100% grassy and vegetated	TP30_0-0.15	0.6	D	No Staining, Odours or ACM observed
		Natural Sand, yellow to white, heterogeneous, medium to coarse grains, dry to damp, with inclusions of heavily weathered sandstones.	TP30_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Natural Becomes clayey.	TP30_0.5-0.6	-	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.9m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

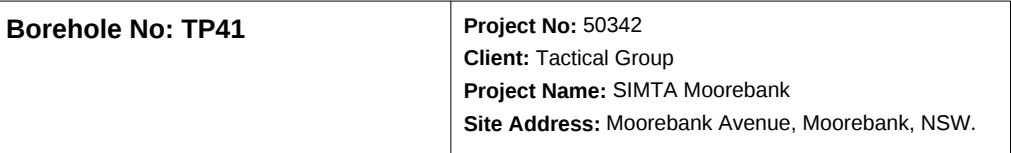
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP40	Project No: 50342
		Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 17/12/14 Eastings (MGA): 307790.7 Contractor: Ken Coles Northings (MGA): 6239766 Drill Rig: Excavator Reference Level: Method: Elevation - Surface (m): 0 Total Hole Depth (mbgs): 0.8 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP40_0-0.1	0.2	D	No Staining, Odours or ACM observed
		Fill Sand, brown, heterogeneous, fine, dense, damp.	TP40_0.1-0.2	0.1	D	No Staining, Odours or ACM observed
		Natural Silty Sandy Clay, yellow to red, heterogeneous, medium plasticity, stiff, with inclusions of sandstone and gravel.	TP40_0.5-0.7	0.0	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

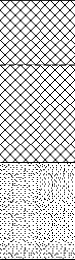


Eastings (MGA): 307703.8
Northings (MGA): 6239756
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

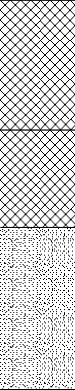
	Borehole No: TP42	Project No: 50342
		Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 17/12/14		
Contractor: Ken Coles		
Drill Rig: Excavator		
Method:		
Total Hole Depth (mbgs): 0.8		
Eastings (MGA): 307623.7 Northings (MGA): 6239753 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP42_0-0.1	0.5	D	No Staining, Odours or ACM observed. QC02 and QC02/A taken at TP42_0-0.1
		Fill Sand, brown, homogeneous, fine, firm, dense, damp, with inclusions of rootlets.	TP42_0.2-0.3	0.2	D	
		Fill As above, yellow.				No Staining, Odours or ACM observed
		Natural Silty Sandy Clay, yellow to grey, heterogeneous, very stiff, low plasticity.	TP42_0.5-0.7	0.2	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 0.8m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

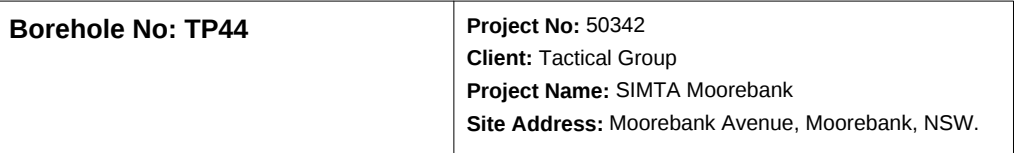
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

	Borehole No: TP43	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 17/12/14 Eastings (MGA): 307534.7 Contractor: Ken Coles Northings (MGA): 6239756 Drill Rig: Excavator Reference Level: Method: Elevation - Surface (m): 0 Total Hole Depth (mbgs): 1.2 Bore Diameter (mm):	

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP43_0-0.1	0.6	D	No Staining, Odours or ACM observed
		Fill Sand, brown, homogeneous, fine, dense, damp, with inclusions of rootlets.	TP43_0.2-0.3	-	D	No Staining, Odours or ACM observed
		Fill Sand, yellow, homogeneous, fine, dense, well graded.	TP43_0.4-0.5	0.2	D	No Staining, Odours or ACM observed
		Natural Silty Sandy Clay, orange to brown to grey, red mottle, heterogeneous, fine, stiff, medium plasticity, damp, with inclusions of sandstone and gravel.	TP43_0.8-1.0	0.2	D	No Staining, Odours or ACM observed
1.0		EOH End of Hole at 1.2m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

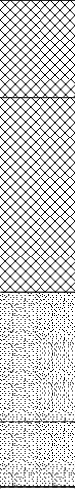
NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

[illegible]

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP45	Project No: 50342
		Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
Date: 16/12/14 Eastings (MGA): 307335.7 Contractor: Ken Coles Northings (MGA): 6239769 Drill Rig: Excavator Reference Level: Method: Elevation - Surface (m): 0 Total Hole Depth (mbgs): 1.5 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP45_0-0.1	1.7	D	No Staining, Odours or ACM observed
		Fill Sand, brown, heterogeneous, fine, low plasticity, damp, with inclusions of rootlets.				
		Fill Silty Clay, orange, grey to red mottle, stiff, low plasticity, with inclusions of shale.	TP45_0.3-0.4	0.5	D	No Staining, Odours or ACM observed
1.0		Natural Sand, white, homogeneous, low plasticity, dense, damp.	TP45_1.1-1.3	0.5	D	No Staining, Odours or ACM observed
		Natural As above, yellow.	TP45_1.3-1.5	0.5	D	No Staining, Odours or ACM observed
		EOH End of Hole at 1.5m bgs - program depth				
2.0						
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

	Borehole No: TP46	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 16/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 2.7	
Eastings (MGA): 307107.4 Northings (MGA): 6239825 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

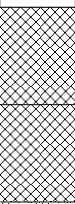
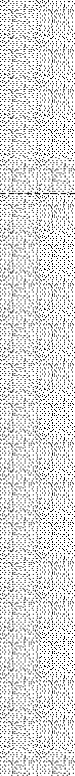
SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP46_0-0.1	0.2	D	No Staining, Odours or ACM observed. QC01 and QC01/A taken at TP46_0-0.1
		Fill Silty Clay, brown, heterogeneous, fine, low plasticity, damp.	TP46_0.2-0.3	0.2	D	No Staining, Odours or ACM observed
		Fill Sandy Gravel, grey, heterogeneous, dense, medium gravel coarse sand, damp, with inclusions of shale, brick, rotting timber and sandstone.	TP46_0.5-0.7	0.5	D	No Staining, Odours or ACM observed
1.0			TP46_1.0-1.2	0.5	D	No Staining, Odours or ACM observed
		Fill Gravelly Clay, yellow to grey, heterogeneous, fine, medium plasticity, damp, with inclusions of shale, sandstone, large igneous gravel.	TP46_1.8-2.0	0.1	D	No Staining, Odours or ACM observed
2.0			TP46_2.4-2.6	0.1	D	No Staining, Odours or ACM observed
		EOH End of Hole at 2.7m bgs - program depth				
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

© JBS&G

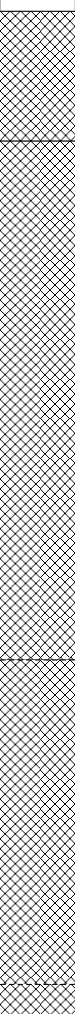
	Borehole No: TP48	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 16/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 3.0	
Eastings (MGA): 307042 Northings (MGA): 6240301 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass	TP48_0-0.1	0.1	D	No Staining, Odours or ACM observed
		Fill Gravelly Sand, brown, heterogeneous, damp, fine.				
		Fill Gravelly Clay, orange, heterogeneous, firm, medium plasticity, damp.	TP48_0.3-0.4	0.1	D	Slight Staining, no Odours or ACM observed
		Natural Sand, brown, homogeneous, dense, fine, well graded, with inclusions of sandstone.	TP48_0.6-0.8	0.0	D	No Staining, Odours or ACM observed
1.0		Natural As above, light brown.				
2.0						
3.0		EOH End of Hole at 3.0m bgs - program depth				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

	Borehole No: TP49	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 16/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 3.1	
Eastings (MGA): 306865.5 Northings (MGA): 6240447 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Soil/gravel	TP49_0-0.1	1.5	D	No Staining, Odours or ACM observed
		Fill Gravelly Sand, yellow, heterogeneous, dense, coarse, poorly graded, with inclusions of sandstone.	TP49_0.2-0.3	1.0	D	No Staining, Odours or ACM observed
		Fill Gravelly Clay, grey, heterogeneous, firm, medium plasticity, damp, with inclusions of approximately 30% shale.	TP49_0.5-0.7	0.5	D	No Staining, Odours or ACM observed
1.0			TP49_1.0-1.2	0.5	D	No Staining, Odours or ACM observed
2.0		Fill As above, moisture.	TP49_2.0-2.2	0.3	D	No Staining, Odours or ACM observed
			TP49_2.8-3.0	0.3	D	No Staining, Odours or ACM observed
3.0		Fill As above, coarse, with inclusions of shale and boulders.				
		EOH End of hole at 3.1m bgs - program depth				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information



Borehole No: TP50

Project No: 50342
Client: Tactical Group
Project Name: SIMTA Moorebank
Site Address: Moorebank Avenue, Moorebank, NSW.

Date: 16/12/14
Contractor: Ken Coles
Drill Rig: Excavator
Method:
Total Hole Depth (mbgs): 2.8

Eastings (MGA): 306775.3
Northings (MGA): 6240435
Reference Level:
Elevation - Surface (m): 0
Bore Diameter (mm):

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Gravel/soil	TP50_0-0.1	1.9	D	No Staining, Odours or ACM observed
		Fill Gravelly Sand, grey to brown, heterogeneous, dense, coarse, with inclusions of shale and igneous gravel.	TP50_0.2-0.3	0.1	D	No Staining, Odours or ACM observed
		Fill As above, with inclusions of soil.	TP50_0.5-0.6	0.1	D	No Staining, Odours or ACM observed
1.0		Fill Gravelly Clay, yellow to grey to brown, heterogeneous, firm, low plasticity, damp, with inclusions of shale and igneous gravel.	TP50_1.0-1.2	0.1	D	No Staining, Odours or ACM observed
2.0		Fill As above, increase clay and less shale.	TP50_2.0-2.2	0.1	D	No Staining, Odours or ACM observed
		Fill As above, inclusions of shale, igneous gravel, boulders, grey.				
		Natural Silty Sandy Clay, red, homogeneous, damp, firm, low plasticity.				
3.0		EOH End of Hole at 2.8m bgs - program depth				
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger SFA - Solid Flight Auger HFA - Hollow Flight Auger PT - Push Tube AH - Air Hammer	U - Undisturbed tube sample D - Disturbed sample CS - Core sample	AHD - Australian Height Datum BGS - Below Ground Surface	Logged By: GB Project Manager: BG

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information
© JBS&G

	Borehole No: TP51	Project No: 50342 Client: Tactical Group Project Name: SIMTA Moorebank Site Address: Moorebank Avenue, Moorebank, NSW.
	Date: 16/12/14 Contractor: Ken Coles Drill Rig: Excavator Method: Total Hole Depth (mbgs): 2.5	
Eastings (MGA): 306940.9 Northings (MGA): 6240621 Reference Level: Elevation - Surface (m): 0 Bore Diameter (mm):		

SUBSURFACE PROFILE			SAMPLE			
Depth	Graphic Log	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments
0.0		Ground Surface				
		Surface Description: Grass/gravel	TP51_0-0.1	0.1	D	No Staining, Odours or ACM observed
		Fill Sandy Gravel, yellow to brown, heterogeneous, low plasticity, damp to dry, with inclusions of shale.	TP51_0.2-0.3	0.1	D	No Staining, Odours or ACM observed
		Fill Gravelly Shale, grey, heterogeneous, dense, coarse to large shale, dry, with inclusions of occasional clay, sandstone and igneous gravel.				
		Fill Gravelly Clay, dark brown, heterogeneous, firm, low plasticity, damp, with inclusions of shale.	TP51_0.8-1.0	0.1	D	No Staining, Odours or ACM observed
1.0						
		Fill Gravelly Clay, yellow, heterogeneous, firm, medium plasticity, damp, with inclusions of fine shale and igneous gravel.				
			TP51_1.8-2.0	0.0	D	No Staining, Odours or ACM observed
2.0						
		Natural Sand, brown, homogeneous, dense, fine, well graded.	TP51_2.2-2.4	0.0	D	No Staining, Odours or ACM observed
		EOH End of Hole at 2.5m bgs - program depth				
3.0						
4.0						

Drilling Method	Sample Type	Reference Level	Log Details
HA - Hand Auger	U - Undisturbed tube sample	AHD - Australian Height Datum	Logged By: GB
SFA - Solid Flight Auger	D - Disturbed sample	BGS - Below Ground Surface	Project Manager: BG
HFA - Hollow Flight Auger	CS - Core sample		
PT - Push Tube			
AH - Air Hammer			

NOTE: This bore log is for environmental assessment purposes only and is not intended to provide geotechnical information

© JBS&G