APPENDIX E – Construction Waste Management Sub-Plan

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Construction Waste Management Sub-Plan

Gregory Hills Public School (SSD41306367)

Revision: 2

Date: 30/5/2023

Approved for submission by:

Richard King

Project Manager

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Document Control

Document	Construction Waste Management Sub-Plan	**Project**	Gregory Hills Public School
Date	30/05/2023	**Prepared By**	Nate Pirola
Issued To	SINSW	**Reviewed By**	Richard King

Table 1: Document Control

Revision History

Rev	Date	Details	Authorised Name / Position
Rev 1	29/5/2023	Construction Waste Management Sub-Plan	Richard King – Project Manager
Rev 2	30/5/2023	CWMSP update incorporating SINSW compliance team comments	Richard King – Project Manager

Table 2: Revision History

Confidentiality & Copyright

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1.0 Introduction

The following Construction Waste Management Sub-Plan (CWMSP) has been prepared to manage waste generated from from the construction of the Gregory Hills Public School project. This CWMS has been developed in response to SSD41306367 Condition B17.

The implementation of this CWMSP provides for the effective management of solid and liquid waste, and details management practices for the reuse, recycling and lawful disposal of waste generated during construction.

B17. The Construction Waste Management Sub-Plan (CWMSP) must address, but not be limited to, the procedures for the management of waste including the following: (a)the recording of quantities, classification (for materials to be removed) and validation (for materials to remain) of each type of waste generated during construction and proposed use for materials to remain; (b)information regarding the recycling and disposal locations; and (c)confirmation of the contamination status of the development areas of the site based on the validation results.

Figure 1: Condition B17 Requirements

2.0 SSDA Conditions Satisfaction Table

The table below provides an overview of the Conditions of Consent addressed under this Construction Waste Management Sub-Plan.

Condition	Description	Relevant Report Section
B17a	(a) the recording of quantities, classification (for materials to be removed) and validation (for materials to remain) of each type of waste generated during construction and proposed use for materials to remain;	Section 6.4
B17b	(b) information regarding the recycling and disposal locations; and	Section 6.5
B17c	(c) confirmation of the contamination status of the development areas of the site based on the validation results.	Section 6.6, Appendix A and Appendix B

Table 3: SSDA Conditions Satisfaction Table

3.0 Site Description

- The site is located at 28 Wallarah Circuit, Gregory Hills NSW 2557 and is legally described as Lot 3257 DP1243285.
- The subject site is located in Dharawal Country.
- The site is located within the Camden Local Government Area and is within the Turner Road Precinct of the South-West Growth Centre.
- The site has an area of approximately 2.9ha and falls from the south-east corner (RL116.5) to the north- west corner (RL113).
- The site has three (3) street frontages:
    - Wallarah Circuit (southern boundary)
    - Gregory Hills Drive (northern boundary)
    - Long Reef Circuit (eastern Boundary)
- Howard Park and the riparian corridor along Sykes Creek are located to the West of the site.
- To the North, East and South of the site is emerging and recently completed residential development.
- To the West of the site, beyond Sykes Creek and Howard Park, is the Gregory Hills town centre. A pedestrian bridge links Wallarah Circuit with the town centre across Sykes Creek.
- To the East of the residential area fronting Long Reef Circuit are high voltage power lines within an easement which include pedestrian paths and cycleways. Further East is an easement for high pressure gas infrastructure.
- A Gregory Hills Temporary School (GHTS) has recently been established in the North West corner of the site, with vehicular and pedestrian access off Long Reef Circuit in the North East corner. This temporary school commenced operation on Day 1 Term 1 2023 and will remain in operation until the permanent school can accommodate these students.

Figure 2 – Site Aerial Map (Source SDRP Presentation)

4.0 Surrounding Development

To the north, south and east of the site is residential development comprising one (1) and two (2) storey dwellings. Howard Park adjoins the site to the west. A natural water course (Sykes Creek) and riparian area are mapped between Howard Park and Gregory Hills Town Centre which is to the west of Sykes Creek.

Figure 3 Surrounding Development (Source: SDRP Presentation)

5.0 Scope/ Project Description

Gregory Hills Public School (GHPS) is a proposed K-6 school within a land release area which is currently under construction. There is an overhead pedestrian bridge linking the Town Centre with the playing field of the school site. The works generally comprise:

- Design and Construction of GHPS, including the construction of a school to accommodate 1,012 students within Core 35 facilities with 44 permanent teaching spaces and 4 support classes, delivered under a MMoC / DfMA solution.
- The proposed school development will include new core facilities to meet EFSG requirements to Core 35, including:
    - Library
    - Multipurpose Hall
    - OSCH Facilities
    - Canteen
    - Administration and Staff Facilities
    - 44 new Home Bases
    - 4 new Support Learning Home Bases
    - Car Parking Facilities, including:
        - Car Parking with Disabled/Accessible Car Parking
        - Waste Storage and Collection Area

- Secure Drop-off and Pick-up Facilities for the Support Learning Unit
- Bus Set Down Area (on street)
- Kiss and Drop Area (on street)
- Bicycle Parking and End of Trip Facilities

- Student And Staff Amenities
- Covered Walkways
- External Landscaping
- Bicycle Access to be provided for both School Students and Staff to support and encourage alternate transport modes
- Evacuation, Lockdown and Emergency Responses to be considered

6.0 Waste Management Strategies

6.1 Purpose & Objectives

The purpose of the CWMSP is to implement a waste management strategy for the effective management of waste generated during construction. Rubbish and waste generated during the construction period will be transported in skip bins from the construction site, which will be accessed via Wallarah Circuit.

Where possible, rubbish will be sorted onsite for recycling to minimise impacts on landfill. All waste generated by the project shall be beneficially reused, recycled, or directed to a waste facility lawfully permitted to accept the materials in accordance with DECCW's Waste Classification Guidelines 2008 and the Protection of the Environment Operations Act 1997.

The deliverables for this CWMSP include but are not limited to the below requirements/details:

- Prevent the importation of waste onto the site from external sources
- Prevent or mitigate construction generated waste in the following priority order;
  - Avoiding waste, then
  - Reusing materials, then
  - Recycling and reprocessing, then
  - Disposing waste (if first three measures are not possible).
- Ensure disposal of chemical, fuel and lubricant containers, solid and liquid wastes complies with requirements of the EPA and Council.
- Ensure recycling is undertaken efficiently
- Recording quantities and classification of each type of waste generated during construction which is to be removed from onsite
- Recording quantities and validations of each type of waste generated during construction which is to remain onsite
- Recording information regarding the recycling and disposal locations
- Confirming the sites contamination status based on the validation results

6.2 Responsibilities & Accountability

Responsibilities for the effective implements of the CWMSP is provided below:

Management Strategies	Responsibilities
Design	
• Use of modular components in design • Use of prefabricated components in design • Design for materials to standard sizes • Design for operational waste minimisation	• Architect Engineer, Builder & Sub Contractors
Procurement	
• Select recycled and reprocesses materials • Components that can be reused after deconstruction	• Architect, Engineer, Builder & Sub Contractors
Pre-construction	
• Waste management plan to be reviewed & approved prior to construction. • Contract a Waste Contractor	• Builder • Waste Contractor
Construction on-site	
• Use the avoid, reuse, reduce, recycle principles • Minimisation of recurring packaging materials • Returning packaging to the supplier • Separation of recycling of materials off site • Audit & monitor the correct usage of bins • Audit and monitor the Waste Contractor	• Builder & Sub-contractor • Waste Contractor

Table 4: Roles & Responsibilities (Source EC Cell GHS CWMP R1)

6.3 Identification & Classification

Typical waste and quantities that are anticipated to be generated during the construction phase of the project are indicated in the tables below:

MATERIAL TYPE ON SITE	ESTIMATED WEIGHT (t) or VOLUME (m^3)			ON-SITE TREATMENT
	Reuse	Recycling	Landfill Disposal	Proposed reuse and/or recycling collection methods
Concrete, Brick, Block Work, Render, Tiles		84 (m^3)		Co-mingled Bins
Metals		60 (m^3)		Co-mingled Bins
Timber Off-Cuts		74 (m^3)		Co-mingled Bins
Cardboard		24 (m^3)		Co-mingled Bins
Plasterboard		80 (m^3)		Co-mingled Bins
Containers, Plastics, Plastic Packaging		87 (m^3)		Co-mingled Bins
Pallets And Reels	40 units			Co-mingled Bins
Liquid Waste			24 (m^3)	Separated Container/Bin
General Waste			54 (m^3)	General Waste Bins
Sub Total		**409 (m^3)**	**78 (m^3)**	

Table 5: Typical Construction Waste Estimated Volumes (Source EC Cell GHS CWMP R1)

MATERIAL TYPE ON SITE	ESTIMATED VOLUME (m^3) or WEIGHT (t) (Most Favourable → Least)			ON-SITE TREATMENT	OFF-SITE TREATMENT	
	Reuse	Recycling	Disposal	Proposed reuse and/or recycling collection methods	Disposal / Transport Contractor	Waste Depot, Recycling Outlet or Landfill site
Excavated Natural Material (ENM) Greenfield site	345 m^3			Separated to a designated stockpile	N/A	Reused on site or sent to re-purposing facility
Sub-Total	345 m^3					

Table 6: Typical Excavation Waste Estimated Volumes (Source EC Cell GHS CWMP R1)

6.4 Waste Recording & Reporting

The following information in relation to the storage, treatment and disposal of waste will be recorded in accordance with EPA requirements:

- Amount and type of waste transported,
- Name and licence plate number of the transporter,
- Date of transportation
- Name and location of the receiving waste facility.
- Waste will be transported to an approved waste facility only
- Documentation including Transport Certificates will be completed if required
- The transporter will be informed of the nature of waste to be transported;
- The EPA will be informed of any suspected breaches in the POEO Act with respect to transportation of waste.

Monthly project reports shall be prepared by the nominated waste disposal contractor and provided to the Client outlining the project's waste disposal and recycling information.

6.5 Recycling and Disposal Location

All recycled materials will go to Bingo's Eastern Creek Recycling Ecology Park or an equivalent licensed recycling facility. Any excess material generated on site will go to Bingo's Eastern Creek Landfill or an equivalent licensed landfill facility. Information of the recycling and land fill facilities will be provided by the nominated waste disposal contractor.

6.6 Site Validation

As part of the SSDA submission, Douglas Partners completed a Preliminary Site Investigation Report (refer Appendix A). The findings of this report noted that there were "no signs of obvious broad scale contamination". Further to this, Lipman engaged SESL Australia to complete stockpile sampling onsite which determined a Excavated Natural Material (ENM) classification and therefore the stockpiled material to be used as fill was suitable for reuse (refer Appendix B).

The current civil design implements a cut and fill strategy to minimise excavated materials disposal. If excess excavated materials require disposal, waste disposal records (including weighbridge dockets and monthly waste/recycling reports) will be obtained, filed, stored and archived accordingly.

7.0 Review and Complaints

The Project Manager is responsible for reviewing the Construction Waste Management Sub-Plan (CWMSP) to ensure the requirements remain current and reflect any changes to site conditions. This is to be reviewed within 1 month of any significant changes to the projects waste management strategy.

If complaints are received, they will be managed through the SINSW Community Communication Strategy. The Lipman project team will assist with enquiries and adjust the CWMSP if required.

APPENDIX A – Preliminary Site Investigation Report

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Preliminary Site Investigation (Contamination) with Limited Sampling

Proposed New Primary School
28 Wallarah Circuit, Gregory Hills, NSW

Prepared for
School Infrastructure NSW

Project 213594.01
October 2022

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

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Revision 4	1	0	School Infrastructure NSW c/- Jacobs Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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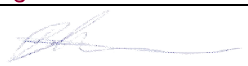
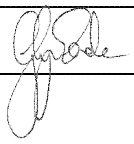
Author		7 October 2022
Reviewer		7 October 2022

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Report on Preliminary Site Investigation (Contamination) with Limited Sampling
Proposed New Primary School
28 Wallarah Circuit, Gregory Hills, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by Schools Infrastructure on behalf of Jacobs Group to complete this Preliminary Site Investigation for Contamination with limited sampling (PSI) for the proposed primary school to be located at Gregory Hills (hereinafter referred to as 'the site'). The site is shown on Drawing 1, Appendix A and covers an approximate area of 2.9 ha.

The objective of the PSI is to assess the suitability of the site from a contamination perspective for the proposed primary school and whether further investigation and/or management is required. It is understood that the PSI will also be used to support a State Significant Development Application (SSDA) for the construction and operation of a new primary school at Gregory Hills (SSD-41306367). This report addresses the Secretary's Environmental Assessment Requirements (SEARs) issued for the project, notably Item 16 for Contamination and Remediation.

DP has previously conducted a validation assessment for the site in 2020 (DP reference 92219.25.R.001.Rev0 issued 13 July 2020 – DP (2020)) which validated the site as suitable for the proposed school land use. DP (2020) has been reviewed as part of this PSI, and the findings of the assessment are summarised in Section 6 of this report.

The field work for this PSI was conducted concurrently with a geotechnical investigation, the findings of which are reported under separate cover (reference 213594.00.R.001).

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [the 'NEPM']* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

2. Proposed Development

The new primary school at Gregory Hills will generally comprise the following:

- 44 General Learning Spaces;
- 4 Support Learning Spaces;
- Administration, staff hub, amenity and building service areas;
- Library, communal hall and canteen;

- Outside School Hours Care (OSHC) services;
- Sport courts, outdoor play space, a Covered Outdoor Learning Area (COLA) and site landscaping;
- Dedicated bicycle and scooter parking;
- Three (3) kiss and drop spaces for Supported Learning Students (SLS) located on Wallarah Circuit.
- On-site car parking.
- Signage.
- Footpath widening on Wallarah Circuit.

Figure 1 Site plan (source Bennett and Trimble)

3. Scope of Work

The scope of work undertaken for the PSI is as follows:

- Undertake a site history investigation to determine potential areas of environmental concern (PAEC) for the site including:
  - Review of local topographic, soil, geological, salinity and acid sulfate soils mapping;
  - Review of client supplied available previous contamination investigation reports for the site (including DP (2020));
  - Review of available historical aerial photos to identify land uses. activities and changes in the land that may indicate the potential for contamination;

  - Search of the Contaminated Land Register for Notices issued under the *Contaminated Land Management Act* 1997; and
  - NSW Office of Water groundwater bore search.
- Completion of a site walk over to establish the current site condition;
- Preparation of safety documentation, carry out a DBYD search and engage a Telstra-approved service locator to confirm the location of services, where required;
- Excavation of 16 test pits (TP1 to TP10 and TP102, TP103, TP106, TP108, TP110 and TP111) across the development site using a small excavator for both this contamination investigation and the concurrent geotechnical investigation.
- Test pits were excavated to a minimum of 0.5 m into natural soil or to a maximum depth of 3 m or prior refusal. Test pits were also used for geotechnical observations and sampling;
- Samples were collected from approximate depth ranges of 0 - 0.2 m, 0.2 - 0.5 m and, if filling is encountered, from regular depth intervals based on field observation;
- Review of the geotechnical borehole logs which were drilled on site as part of the concurrent geotechnical investigation;
- Laboratory analysis of 10 selected soils samples collected from the excavated test pits for a range of contaminants of potential concern (CoPC) including metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), phenols, asbestos, organochlorine and organophosphorus pesticides (OC/OP).
- Quality assurance and quality control (QA/QC) sampling and analysis included intra laboratory duplicates; and
- Soil analytical results were assessed against NSW EPA endorsed criteria for human health and environmental/ecological receptors relevant to the proposed development.

4. Site Information

4.1 Site Description and Location

The site is located in Dharawal Country at 28 Wallarah Circuit, Gregory Hills NSW 2557, and is legally described as Lot 3257 DP1243285.

The site is located within the Camden Local Government Area and is within the Turner Road Precinct of the South-West Growth Centre.

The site has an area of approximately 2.926 ha (by Deposited Plan). This will be reduced to 2.907ha under approved DA2022/742/1 once Long Reef Circuit has been widened.

Topography is minimal with a fall from the south-east corner (RL116.5) to the north- west corner (RL113).

The site has three (3) street frontages:

- Wallarah Circuit (southern boundary)
- Gregory Hills Drive (northern boundary)
- Long Reef Circuit (eastern Boundary)

The site is primarily vacant land, with the exception of an existing group of trees in the southwest corner of the site that pre-date the subdivision and development of the precinct. There is also an existing electrical substation located on the south-eastern boundary.

There are easements of varying widths located to the northern boundary identified for drainage.

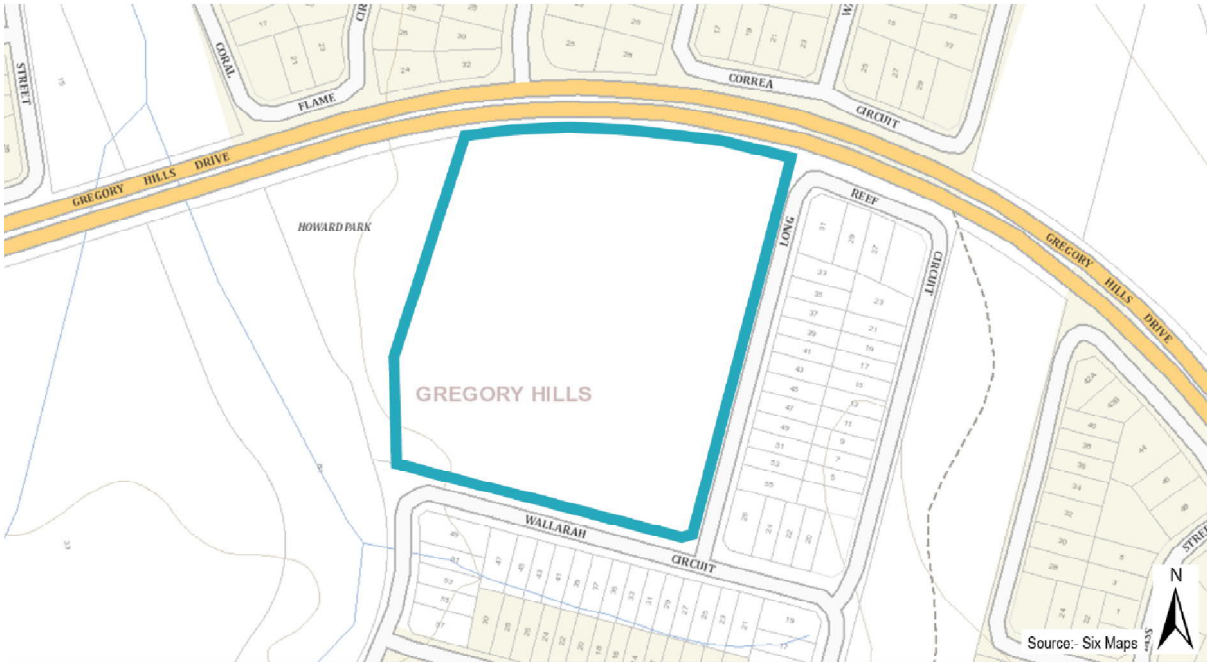


Figure 2 – Locality Map (Six Maps)

Figure 3 – Site Aerial Map, (Source Bennet and Trimble)

4.2 Surrounding Development

To the north, east and south of the site is emerging and recently completed residential development.

To the east of the residential area fronting Long Reef Circuit are high voltage power lines within an easement which include pedestrian paths and cycleways.

To the west of the site, beyond Sykes Creek and Howard Park, is the Gregory Hills town centre. A pedestrian bridge links Wallarah Circuit with the town centre across Sykes Creek.

Figure 4 Surrounding Development (Nearmap)

5. Environmental Setting

5.1 Topography

The site is relatively flat, sloping gently towards the north west with the ground surface levels falling from the south eastern corner at about RL 116 m relative to the Australian Height Datum (AHD) to about RL 113 m AHD at the north western corner.

The surrounding regional topography generally slopes to the north – north west.

5.2 Site Geology and Soil Landscapes

Reference to the Wollongong-Port Hacking 1:100 000 Geology Sheet indicates that the site is underlain by Bringelly Shale (geological code 'Rwb') of the Wianamatta Group of Middle Triassic age. Bringelly shale comprises of shale, carbonaceous claystone, laminite, lithic sandstone and rare coal.

Reference to the Wollongong-Port Hacking 1:100 000 Soils Landscape Sheet, indicates that the site is underlain by Blacktown soils (mapping unit bt), which is a residual soils group associated with gently undulating rises, broad rounded crests, and ridges with gently inclined slopes. The unit comprises of shallow to moderately deep (<100 cm) red and brown podzolic soils on crests, upper slopes and in well-drained areas. In areas of greater depth (150-300 cm), there are yellow podzolic soils and soloths on lower slopes and in areas of poor drainage (Sydney). Local relief is to 30 m, slopes are usually <5%. These soils are typically of low fertility, are moderately reactive, with high plasticity in the subsoil, and generally have poor soil drainage.

5.3 Acid Sulphate Soils

Published acid sulphate soils risk mapping indicates that the site is classified as Cq (p4), i.e. extremely low probability of occurrence. Based on the review of the mapping, no further investigation or reporting for acid sulphate soils is considered required for the proposed development.

5.4 Surface Water and Groundwater

An unnamed creek, acting as a tributary of South Creek, is located adjacent to the east boundary of the site and flows in a northerly direction.

A search of the publicly available registered groundwater bore database indicated that there are no registered groundwater bores within 1 km radius of the site.

Based on the regional topography and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater beneath the site is towards the north – north west direction. The creek located to the east of the site is the likely receiving surface water body for the groundwater flow path. Given the local geology (i.e. Bringelly Shale), the groundwater in the fractured rock beneath the site is anticipated to be saline and to be of very low yield. Accordingly, there would be no significant potential beneficial uses of groundwater at the site.

6. Site History Review

6.1 Previous Investigation

DP has previously completed a validation assessment report for the site in 2020 *(DP Report on Validation Assessment, Proposed Primary School, Gregory Hills, NSW,* reference 92219.25.R.001.Rev0, date 13 July 2020) (DP (2020)). The investigation was completed post decommissioning of the earthworks compound and to confirm site suitability for the proposed primary school land use.

The scope of DP (2020) included a site walk over and a desktop study including review of NSW EPA records, historical reports, historical aerial photographs and review of previous reports, as well as intrusive sampling and analysis.

A summary of the works conducted, and the findings of DP (2020) are provided in Section 6.3.1 to Section 6.3.5 below. Extracts from DP (2020), which include drawings showing the former earthworks compound location and test locations completed, and a summary of analytical results, are provided in Appendix H.

6.1.1 Summary of Site History Information

DP (2020) included a site history review which included the review of the following relevant reports which are summarised below:

- Douglas Partners Pty Ltd *Report on Land Capability and Contamination Assessment, Turner Road Precinct*, Project 40741, dated 28 February 2007 (DP, 2007);
- Douglas Partners Pty Ltd Report on *Phase 2 Contamination Assessment, Proposed Residential Subdivision, Part Stage 3B, Gregory Hills*, Project 40741.75-2, dated 5 September 2020 (DP, 2012);
- DP Report on *Remediation Action Plan, AEC15 – Asbestos Pipe System, Gregory Hills*, Project 40741.78 dated September 2012 (DP, 2012a); and
- DP *Validation Report, Asbestos Pipe System, AEC15 Gregory Hills*, Project 40741.92 dated 19 March 2013 (DP, 2013).

DP (2007) included a Phase 1 contamination assessment of a 536 ha parcel of land known as the Turner Road Precinct (which incorporated the current site), located within the suburbs of Catherine Field and Currans Hill. The contamination assessment works included a review of site history information, site inspection and interviews with site personnel. Based on the information obtained Areas of Environmental Concern (AEC) requiring further targeted assessment were identified.

The historical information indicated that the Turner Road Precinct was used for agricultural, recreational and rural residential purposes. One AEC was identified within the current site boundary, being an asbestos irrigation pipe system (AEC15).

A Phase 2 Contamination Assessment (DP, 2012) was subsequently completed for the larger Stage 3B site (which incorporates the current site). The purpose of DP (2012) was to investigate Stage 3B in more detail to confirm the contamination status of the site and its suitability for the proposed residential land use. No additional AECs were identified across the Stage 3B site and the site was considered to be suitable for the proposed residential subdivision, subject to remediation and validation of AEC15.

The identified asbestos pipe system (AEC15) was remediated and validated by DP as documented in DP (2013). The validation report concluded that AEC15 had been remediated and rendered suitable for the intended residential land use.

It was noted that whilst the previous investigations validated the specific sites/AEC as being suitable for residential use, the assessment criteria against which test results were assessed are also applicable to a primary school land use. As such, the site can also be considered to be validated for use as a primary school.

DP (2020) also included a review of available Nearmap imagery to determine site activity post 2012 (i.e. site activity since the completion of DP (2012) with the following noted for the site:

- Prior to 2014, the site was vacant land and used for agricultural purposes;
- In 2014 bulk earthworks were undertaken for areas of the site as part of the larger subdivision development works;

- Between June 2014 and January 2015, the subdivision earthworks contractors compound was established with stockpiled materials (both construction materials and soils) observed surrounding the compound within the site. From a review of the aerial photographs, the stockpiled soils appear to comprise sands and gravels for use within the development site. It is understood that the stockpiling was transient and that no stockpiled materials were used for filling within the site;
- Between August 2015 and February 2016, the Gregory Hills Maintenance compound was established;
- The balance of the site (i.e. outside the compound areas) was used for the transient stockpiling of both construction materials and soils for the duration of part of the site being used as an earthwork compound;
- Between December 2018 and March 2019, the earthworks compound was decommissioned with all stockpiled materials removed from the site;
- Between July 2019 and September 2019, the Gregory Hill maintenance depot was decommissioned.

6.1.2 Site Walkover/Observations

A site walkover was conducted by an experienced DP Environmental Engineer on the 27 March 2019. The below site features were observed:

- The secured site compound was decommissioned, with all fencing and machinery removed;
- Site sheds were still present within both the earthworks and Gregory Hill Maintenance compounds;
- Roadbase gravels comprising natural crushed shale, igneous and basalt gravels were observed across areas of the compounds and the balance of the site;
- No recycled aggregates were observed to have been used as a roadbase within the compound;
- Most of the construction materials stored within the balance of the site, observed from a review of the aerial photography, had been removed from the site;
- The minor construction materials that were still present on site, were in the process of being removed. This included timber, timber pallets, metal gridded reinforcements and compressed fibre cement pipes.
- All soil/gravel/sand stockpiles observed during the aerial review appeared to have been removed from the site, however, some remnant gravels were noted on the ground surface in some of the areas (however appeared to comprise a natural gravel product and not recycled aggregates). Site observations suggesting that these stockpiles were removed and not spread across the site surface. Remanent gravels were observed on the ground surface;
- A large soil stockpile was present within the centre of the site and after discussions with the earthworks contractor and Dart West Developments (site developer) the material was understood to comprise natural materials sourced from the larger Gregory Hills Development site and was to be used as fill for the bulk earthworks required for the site;
- Minor staining was observed within the compound area (test pits were positioned to target the observed staining). It is noted that the ground surface was wet from a wet weather event, and as such some of the observed staining could have been associated with wet ground and ponding;

- Most of the site was observed to have been stripped of topsoil with some topsoil observed within the vicinity of the trees to the west of the compounds;
- Topsoil fill mounds were observed to the east of the compounds; suspected ACM fragments were observed within the topsoil fill present and on the ground surface adjacent to the topsoil mounds. Representative fragments were collected (F1 and F5) to confirm or otherwise the presence of asbestos; and
- Compressed fibre cement pipes were stored and historically stored within the site. As such, fragments of compressed fibre cement were observed within areas of the site. Although considered to be low risk of containing asbestos, representative fragments were collected (F2 to F4) to confirm the absence of asbestos with no asbestos was detected within these samples.

6.1.3 Summary of Intrusive Investigations

Thirty-three test pits were excavated within the site (17 test pits targeting the compounds and 16 targeting the balance of the site), with shallow fill identified in most of the test pits excavated. The fill at all locations was underlain by natural silty clay and shale. The test pit locations are shown on Drawing 1.

Thirty-three surface soil samples were analysed for a combination of metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols and asbestos. Three intra-laboratory replicates were analysed for heavy metals, TRH and BTEX.

A summary of the analytical data assessed against the adopted site assessment criteria (SAC) is provided below:

- Concentrations of BTEX, OCP, OPP, PCB and asbestos in all soil samples submitted for laboratory analysis were below the laboratory limits of reporting (LOR) and the adopted SAC;
- Concentrations of TRH and PAH, in all samples submitted for laboratory analysis were below the adopted SAC except for the following:
  - Sample 1/0-0.1 reported a B(a)P concentration of 1.3 mg/kg which exceeded the adopted Ecological Investigation Levels (EIL) (0.7 mg/kg);
  - Sample 6/0-0.1 reported a TRH F1 concentration of 88 mg/kg which exceeded the adopted Health Investigation Levels (HIL) (40 mg/kg) and a TRH F2 concentration of 130 mg/kg which exceeded the adopted EIL (120 mg/kg); and
  - Sample 9/0-0.1 reported a B(a)P concentration of 4.1 mg/kg which exceeded the adopted EIL (0.7 mg/kg) and a B(a)P TEQ concentration of 5.8 mg/kg which exceeded the adopted HIL (3 mg/kg).
- Concentrations of metals in all samples submitted for laboratory analysis were below the adopted SAC;
- No asbestos was detected within the compressed fibre cement fragments 21/F1, 24/F1 and F2 to F4; and
- Chrysotile (white) and amosite (brown) asbestos was detected within suspected ACM fragments F1 and F5.

Further discussion on the reported PAH and TRH exceedances is provided in Section 6.1.4 below.

6.1.4 Summary of Delineation, Remediation and/or Validation Completed

6.1.4.1 ACM Impacted Topsoil Stockpiles

Based on the results of the assessment, the topsoil mounds observed in the vicinity of TP32 and TP33, where ACM was confirmed to be present on the surface of the mounds and on the ground surface surrounding the mounds, was determined to require off-site disposal for the site to be considered suitable for the proposed land use. This material was excavated, stockpiled, waste classified and subsequently disposed offsite.

6.1.4.2 PAH and TRH HIL Exceedances at TP6 and TP9

Reported concentrations of TRH and PAH at TP6 (6/0-0.1) and TP9 (9/0-0.1), respectively, exceeded the adopted HIL for the site. Delineation sampling was subsequently undertaken with 1 m step out surface samples collected from each cardinal direction. In addition, samples of the underlying natural soil were also submitted to the laboratory to delineate the vertical extent (samples 6/0.2-0.3 and 9/0.3-0.4).

Delineation samples collected were tested for the respective identified contaminant of concern (i.e. either PAH or TRH). All reported concentrations for the delineation samples collected (both laterally and vertically) were below the adopted SAC.

Based on the results, the filling present within a 2 m by 2 m area surrounding the TP6 and TP9 hotspot areas required excavation and offsite disposal. This material was excavated, stockpiled, waste classified and subsequently disposed offsite.

6.1.4.3 PAH EIL Exceedance at TP1

The reported concentration of B(a)P at TP1 (sample 1/0-0.1), exceeded the adopted EIL for the site. Delineation sampling was subsequently undertaken with 1 m step out surface samples collected from the north, south, east and west locations. Whilst undertaking the delineation sampling, and upon further inspection of the TP1 location, trace bitumen fragments were observed on the ground surface.
The delineation samples collected were tested for B(a)P with all reported concentration reported below the adopted EIL.

As trace bitumen fragments were observed, and the delineation samples all returned reported concentrations below the laboratory limit of reporting, DP considers that the identified EIL exceedance is not representative of a larger impact and is likely associated with the trace bitumen observed.

The NEPM states that where B(a)P occurs in bitumen fragments it is relatively immobile and does not represent a significant health risk.

Based on the above and the findings of the assessment, no further investigation or remediation was considered required for the TP1 location.

6.1.4.4 PAH, TRH and ACM Impacted Fill Removal and Validation

Subsequent to the intrusive investigation works, excavation of the PAH, TRH and ACM impacted fill was completed under the supervision of DP. The materials were excavated on 1 April 2019 and were stockpiled on-site and subsequently waste classified prior to off-site disposal.

Visual assessment of the excavation footprint was conducted by DP on 1 April 2019 which indicated that all ACM impacted topsoil mounds and associated surface fragments had been excavated and stockpiled on site. In addition, the PAH and TRH impacted fill at TP6 and TP9 were also excavated to the delineated extents (i.e. surface soils excavated from a 2 m by 2 m area with the underlying natural soils exposed.

As the PAH and TRH exceedance areas had been delineated prior to excavation and results at these locations were below the SAC, no further validation sampling was considered necessary.
With regards to the ACM impacted topsoil and surface fragments, in addition to the site walkover, seven confirmatory validation samples (comprising 500 ml samples and 10 L bulk sieve samples) were collected from the excavation footprint and screened for asbestos with reference to the DoH (2009)[1]. No ACM was observed within the validation samples collected.

Following the removal of the stockpiled impacted material from the site, visual assessment of the stockpile footprint was conducted by DP on 16 January 2020. The inspection comprised walking along 1 m transects with a second inspection completed at a 90-degree direction change. The inspection confirmed that the stockpiled material had been removed from the site, that the stockpile footprints were over excavated and that no ACM was observed within the former stockpile footprints.

6.1.5 Key Findings

Based on the investigation findings and validation works completed, it was concluded that the earthworks compound and surrounding storage areas have been appropriately decommissioned and validated and the site is considered suitable, from a contamination perspective, for the proposed primary school development.

Based on the field observations and laboratory results, no obvious signs of unacceptable, broad scale contamination impacts were identified in relation to the site use as an earthworks compound. Whilst the potential for isolated contamination pockets cannot be ruled out, these can be removed and managed at the time of site development with the implementation of standard operational protocols. An Unexpected Finds Protocol (UFP) should be prepared and implemented setting out the standard procedures for inspecting and managing any unexpected, contamination issues encountered during development works.

The conclusions drawn above did not extend to the stockpile of soil observed within the site at the time of the investigation and subsequently used as fill across the site. However, it was understood that the stockpile comprised natural soils won from other bulk earthworks completed for other stages of the Gregory Hills development site.

[1] Western Australian Deportment of Health (WA DoH) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia,* dated May 2009

6.2 Statutory Notices and Licences

EPA Notices available under Section 58 of the Contaminated Lands Management Act (CLM Act) Database searched 7 July 2022	There were no records of notices for the site or adjacent sites.
Sites notified to EPA under Section 60 of the CLM Act Database searched 7 July 2022	The site and adjacent sites were not listed as a notified contaminated site.
Licences listed under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act) Database searched 7 July 2022	There were no records issued to the site or adjacent sites.

6.3 Site History Integrity Assessment

The information used to establish the history of the site in DP (2020) was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data.

In particular, aerial photographs can provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

6.4 Summary of Site History

The site history information suggests that the site has been used for agricultural purposes up until 2014, after which the following has been undertaken at the site:

- bulk earthworks were undertaken across areas of the site as part of the larger subdivision development works;
- Between June 2014 and January 2015, the earthworks compound was established with stockpiled materials (both construction materials and soils) observed surrounding the compound within the site. From review of the aerial photographs, the stockpiled soils appear to comprise sands and gravels for use within the development site. It is understood that the stockpiling was transient and that no materials stockpiled were used for filling within the site;

- Between August 2015 and February 2016, the Gregory Hills Maintenance compound was established;
- The balance of the site (i.e. outside the compound areas) was used for the transient stockpiling of both construction materials and soils for the duration of part of the site being used as an earthwork compound;
- Between December 2018 and March 2019, the earthworks compound was decommissioned;
- Between July 2019 and September 2019, the Gregory Hill maintenance depot was decommissioned with all stockpiled materials removed from the site.

Once, the compound was decommissioned, DP completed a validation assessment for the site (DP (2020)) which indicated the site as being suitable for the proposed school.

7. Post DP (2020)

Based on the review of recent aerial photographs (refer Drawing 1, Appendix A) and observations made during a site walkover completed by a DP Environmental Engineer on 6 June 2022, the site has remained relatively unchanged since the completion of DP (2020) with the except for the following:

- The large stockpile present within the site during intrusive investigations completed for DP (2020) and was understood to comprises natural soils won from bulk earthworks completed within other areas of the Gregory Hills development site, has been used to fill areas of the site post completion of the intrusive investigation works and prior to issue of DP (2020);
- All associated stockpiled transient materials (construction materials and material stockpiles) were removed from the site prior to validation of the stockpile footprint and issue of DP (2020);
- The site is now grass covered in most areas which limited a view of the ground surface, and where present the grass generally appeared to be in healthy condition; and
- No obvious signs of contamination were observed during the site walkover;

8. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site may become contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Potential Sources (S)

Based on the site history review completed, the following potential sources of contamination and associated CoPC have been identified.

- S1: Fill: Various CoPC and may include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), phenols and asbestos.

Potential Receptors (R)

The following potential human receptors have been identified:

- R1: Current users [maintenance workers];
- R2: Future Construction and maintenance workers;
- R3: End users [primary school children and staff]; and
- R4: Adjacent site users [residential].

The following potential environmental receptors have been identified:

- R5: Surface water [unnamed tributary of South Creek];
- R6: Groundwater; and
- R7: Terrestrial ecology.

Potential Pathways (P)

The following potential pathways have been identified:

- P1: Ingestion and dermal contact;
- P2: Inhalation of dust and/or vapours;
- P3: Surface water run-off into creeks and dams;
- P4: Leaching of contaminants and vertical migration into groundwater;
- P5: Lateral migration of groundwater providing base flow to water bodies; and
- P6: Plant uptake.

Summary of Potentially Complete Exposure Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways (P1 to P6) between the above source (S1) and receptors (R1 to R7) are provided in Table 1 below.

Table 1: Summary of Potentially Complete Exposure Pathways

Source and CoPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill - metals, TRH, BTEX, PAH, and asbestos	**Human Health** P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours P3: Surface water run-off P4: Leaching of contaminants and vertical migration into groundwater P5: Lateral migration of groundwater providing base flow to water bodies **Environmental** P3: Surface water run-off P4: Leaching of contaminants and vertical migration into groundwater P5: Lateral migration of groundwater providing base flow to water bodies P6: Plant uptake	**Human Health** R1: Current users R2: Construction and maintenance workers R3: End users [primary school children and staff] R4: Adjacent site users [residential] **Environmental** R5: Surface water e.g. Tributary of South Creek R6: Groundwater R7: Terrestrial ecology	An intrusive investigation is recommended (targeted sampling) to assess possible contamination in fill soils.

9. Sampling and Analysis Quality Plan

9.1 Data Quality Objectives

The DSI was devised with reference to the seven-step data quality objective process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix C.

9.2 Sampling Rationale

Based on the CSM and data quality objectives (DQO) the following sampling rationale was adopted.

For this investigation a total of 16 test locations were positioned across the site, with 11 samples selected for analysis. The number of sample locations selected for analysis is approximately 25% of the requirements for site investigations, as recommended by the NSW EPA *Sampling Design Guidelines 1995,* for the site areas. Based on the desktop review and CSM, the preliminary nature of this investigation and that the site was previously validated and subsequently filled with material sourced from the bulk earthworks completed in other stages of the larger Gregory Hills Development, DP considered that this density of testing is suitable for this PSI. The borehole and test pit locations are shown on Drawing 1, in Appendix A.

10. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 8) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario (which is the applicable land use criteria for a proposed primary school). The derivation of the SAC is included in Appendix C and the adopted SAC are listed on the summary analytical results tables presented in Appendix D.

11. Results

11.1 Field Work Results

The test pits were excavated with a Hyundai Robex 60CR-9 excavator with a 450 mm bucket. Boreholes drilled for the geotechnical investigation were completed with a truck-mounted drill rig. The test pits and boreholes were logged on site by a DP geo-environmental engineer and representative disturbed samples were collected to assist in strata identification and for laboratory testing.

The field logs for this assessment and the geotechnical investigation are included in Appendix E.
The logs recorded the following general sub-surface profile for test pits and boreholes:

- Topsoil Fill: Brown silty clay with rootlets was encountered in the top 0.15 m to 0.3 m of the soil profile in all test pits and bores.
- Fill: Brown/orange/grey silty clay, silty gravel and gravelly sand fill was observed underlying the topsoil fill in all locations to depths of between 0.4 to 1.6 m below ground level (bgl) with varying concentrations of gravel and cobbles observed in some locations.
- Residual Soil: Silty clay was observed below topsoil and/or fill at all locations to depts of between 0.5 m and 1.4 m bgl or to the depth of test pit termination at TP9, TP10 and TP110. Gravel was observed in silty clay in most test pits and bores.
- Bedrock: Variably weathered shale and sandstone was observed below silty clay in all locations excluding TP9, TP10 and TP110.

No anthropogenic material was observed in any of the test pits and boreholes undertaken for the current investigation at the site. There were no apparent records of visual or olfactory evidence (e.g. staining, odours or free phase product etc.) to suggest the presence of contamination within the soils or groundwater observed in the investigation.

No free ground water was observed within the test pits excavated and boreholes drilled within the site. Noting that representative groundwater levels cannot be provided from the test pits because of the nature of the excavation methodology which disturbs soil strata and the short duration that each test pit is kept open. In addition, it was not possible to observe any permanent groundwater levels once rotary core drilling commenced within the boreholes as water was used for flushing and cooling during the coring process.

Following completion of the borehole, two boreholes (101 and 109) were converted into standpipe piezometers to facilitate measuring of groundwater levels in the longer term. The piezometers were developed using a bailer to remove excess drilling-induced liquids and given time to recharge. Groundwater was observed within the piezometers on 13 July 2022 at depths of 3.8 m and 5.0 m below ground level (respectively).

11.2 Laboratory Analytical Results

The results of laboratory analysis are summarised in Tables 1 and 2 in Appendix D. The laboratory certificates of analysis together with the chain of custody and sample receipt information are provided in Appendix F.

12. Discussion

This PSI included a review of site history information, soil sampling and laboratory analysis. The site history review undertaken by DP indicated that the site has been used for agricultural purposes up until 2014, after which bulk earthworks associated with the Gregory Hills subdivision commenced. A portion of the site was subsequently used as the earthworks contractors site compound up until 2019.

Once, the compound was decommissioned, DP completed a validation assessment for the site (DP (2020)) which validated the site as suitable for the proposed school. Since completion of the validation report, the site has undergone some site filling to the current site level. It is understood that the materials used as fill across the site were sourced from the larger Gregory Hills Development site.

Sixteen test pits were excavated, and six boreholes were drilled as part of this PSI and the concurrent geotechnical investigation. Test pits and boreholes were excavated/drilled through fill (where encountered) and into natural material. Fill was encountered in test pits excavated to depths of between 0.4 m to 1.6 m bgl.

Fill comprised brown, grey and orange silty clay with rootlets and gravel and cobbles observed in some locations. No anthropogenic materials or asbestos-containing materials were observed within the test pits and boreholes excavated.

Eleven samples were selected for analysis targeting the fill placed within the site post completion of DP(2020). Reported concentrations of TRH, BTEX, PAH, OCP within all samples submitted for analysis were below the laboratory limit of reporting. Reported concentrations of metals were within the adopted SAC.

12.1 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix G. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

13. Conclusions and Recommendations

Based on the findings of DP(2020) and this PSI, it is considered that the site is suitable for use as an educational establishment, namely a public primary school.

Based on the field observations and laboratory results, no signs of obvious broad scale contamination impacts were found. Whilst the potential for isolated contamination pockets cannot be ruled out, these can be removed and managed at the time of site development with the implementation of standard operational protocols. In this regard a UFP should be prepared and implemented setting out the standard procedures for managing any unexpected, contamination issues encountered during development works.

14. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for the proposed primary school development at Gregory Hills , NSW in accordance with DP's proposal 213594.00.P.002.Rev0 dated 24 March 2022 and acceptance received from Jacobs Group on behalf of School Infrastructure NSW dated 26 April 2022. The work was carried out under a NSW Education School Infrastructure Consultancy Services Agreement SINSW03031/22 dated 22 April 2022. This report is provided for the exclusive use of School Infrastructure NSW for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the subsurface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Subsurface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

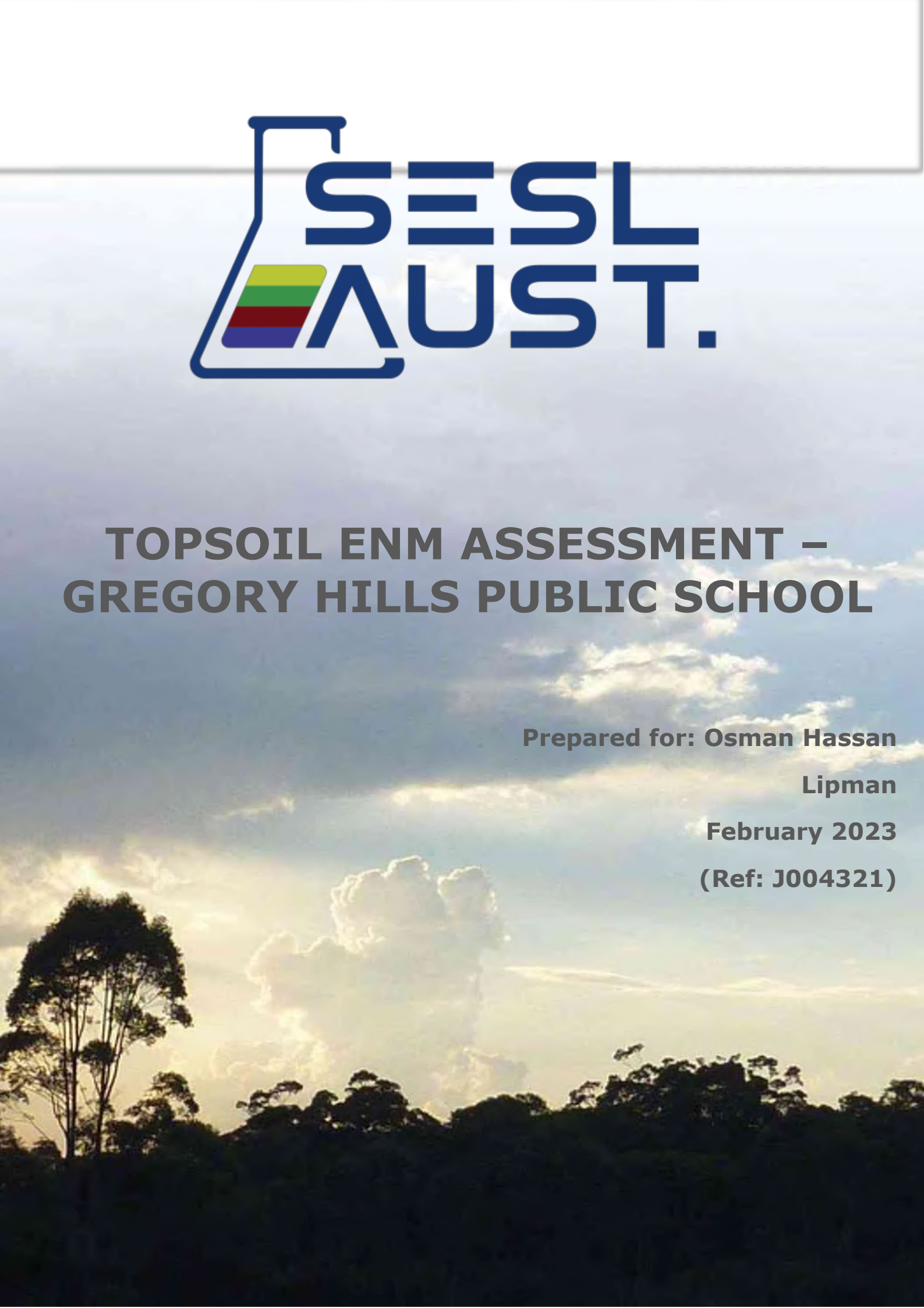
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to vegetation preventing visual inspection and reasonable access (where appropriate). It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Douglas Partners Pty Ltd

APPENDIX B – Topsoil ENM Assessment



TOPSOIL ENM ASSESSMENT – GREGORY HILLS PUBLIC SCHOOL

Prepared for: Osman Hassan

Lipman

February 2023

(Ref: J004321)

Prepared for: Lipman
Reference: J004321

15/02/23

Attn to Osman Hassan

Level 6
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North Sydney NSW 2060

J004321- Topsoil Stockpile Re-Use Assessment - Gregory Hills Public School

1. Introduction

SESL Australia was engaged by Lipman (the Client) to perform an Excavated Natural Material (ENM) assessment on 3 stockpiles with an approximate combined volume of 2300 m^3 located at Gregory Hills Public School - 28 Wallarah Cct, Gregory Hills 2557 (the Site).

2. Project Objective

The objective of this assessment is to determine if material stockpiled at the Site is compliant with the *NSW EPA Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 - The Excavated Natural Material Order 2014* (hereafter referred as the ENM Order) for the purpose of off-site re-use.

3. Scope of Works

SESL completed the following scope of works to meet the project objective:

- Mobilisation to the Site.

- Collection of twelve samples in total from the three stockpiles.
- Laboratory analysis of samples for:
  - Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn);
  - Total Recoverable Hydrocarbons (TRH);
  - Polycyclic Aromatic Hydrocarbons (PAH) including benzo(a)pyrene;
  - Benzene, Toluene, Ethylbenzene, Xylene and Naphthalene (BTEXN);
  - Organochlorine Pesticides (OCP);
  - Organophosphorus Pesticides (OPP);
  - Polychlorinated Biphenyls (PCB);
  - Asbestos;
  - pH;
  - Electrical conductivity (EC); and
  - Foreign Materials.

The results of the analytical testing were evaluated and the waste classification of the material is presented in this report.

4. Fieldwork

SESL's Environmental Scientist, Kane Snow conducted this assessment on the 19th of January 2023. Twelve soil samples were collected from three stockpiles within the Site. Five samples were collected from Stockpile 1 (volume ~ 1500 m^3), three samples were collected from Stockpile 2 (volume ~ 200 m^3) and four samples were collected from Stockpile 3 (volume ~ 600 m^3). For a sampling map refer to **Appendix A**.

Samples were collected using a shovel to collect the bulk composite sample and a fresh pair of latex gloves was used to collect the discrete sample to avoid cross-contamination. The material encountered mainly consisted of a light brown CLAY LOAM containing natural stones. There were no obvious signs of contamination and no odours or foreign materials with the exception of small amounts of general rubbish (chunks of treated timber, PVC fragments, plastic food wrappers, etc.) was detected. No Asbestos Containing Material (ACM) was observed on the surface or within the stockpile.

5. Analytical Results

Analysis was undertaken by ALS Laboratory Group (NATA #825). SESL summary certificates comparing results against the adopted ENM Order criteria are provided in **Appendix B**, and laboratory certificates of analysis are provided in **Appendix C**. An interpretation of data is summarised as follows:

- Concentrations of BTEXN were within the upper limits of the average and maximum concentrations permitted under the ENM Order in all samples.
- Concentrations of PAH (total) were within the upper limits of the average and maximum concentrations permitted under the ENM Order in all samples.
- Concentrations of benzo(a)pyrene were within the upper limits of the average and maximum concentrations permitted under the ENM Order in all samples.
- Concentrations of metals were within the upper limits of the ENM Order for both the average and maximum accepted concentrations in all samples analysed with the exception of SP3-1 and SP3-2. These samples had a concentration of arsenic (23 mg/kg and 24 mg/kg, respectively) greater than the average concentration (20 mg/kg), but lower than the maximum concentration (40 mg/kg). SP3-2 contained nickel (31 mg/kg) greater than the average concentration (30 mg/kg), but lower than the maximum concentration (60 mg/kg).
- Asbestos was absent in all samples analysed.
- Concentrations of pH and EC were within the upper limits of the average and maximum concentrations permitted under the ENM Order in all samples
- Concentrations of foreign materials were within the upper limits of the average and maximum concentrations permitted under the ENM Order in all samples.

6. Quality Assurance / Quality Control

In accordance with SESL Quality Assurance and Quality Control (QA/QC) procedures and AS4482.1 (2005), samples were stored in insulated transport containers containing ice and delivered to the designated laboratories under Chain

of Custody protocols within 48 hours of sample collection. Chain of Custody and QA/QC records are included in **Appendix D**.

A review of the laboratory analytical data indicated that:

- Analytical testing was undertaken by a NATA accredited laboratory.
- The laboratory limits of reporting (LOR) were below the assessment criteria.
- Samples were extracted and analysed within holding times.
- Analyte Relative Percentage Difference (RPD) were within acceptance limits.
- Analyte percentage recoveries in surrogate samples were within acceptance limits.
- Analyte concentrations in laboratory method blanks were within acceptance limits.
- Analyte concentrations in laboratory method blanks were within acceptance limits.
- Analyte percentage recoveries in laboratory control samples were within acceptance limits.
- Analyte percentage recoveries in laboratory spikes were within acceptance limits.
- Laboratory QA/QC requirements were within acceptance limits.

7. Conclusions and Recommendations

7.1 Conclusions

Analytical results of samples were compared against the ENM Order criteria. SESL's result summary certificates have been provided in **Appendix B**.

Based on site observations and the results of laboratory analysis, the stockpiled material located at 28 Wallarah Circuit, Gregory Hills 2557 is compliant with the terms and definitions outlined in the ENM Order and may be re-used offsite in accordance with the terms and conditions outlined in the *NSW EPA Resource Recovery Exemption 'The Excavated Natural Material Exemption 2014 (ENM Exemption).*

7.2 Recommendations

As stated, the stockpiled material (estimated at 2300 m^3) is classifiable as ENM, and is therefore suitable for re-use offsite. No additional material is to be added to the stockpile assessed by SESL on the 19th January 2023. The minor fragments of general rubbish must be removed from the light brown CLAY LOAM prior to removal from the site. In the event that site workers identify any foreign materials that are not consistent with SESL's observations and may compromise the ENM classification of the material, they will need to be removed by the client to mitigate potential cross-contamination

SESL AUSTRALIA PTY LTD

Kane Snow
Jr Environmental Scientist
B Sc (Chem)

Samantha Grant-Vest
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B Env, B Hort

APPENDICES

A. Sampling Map
B. SESL Summary Certificates
C. Laboratory Certificates of Analysis
D. Chain of Custody & QA/QC Records

Limitations of This Report:

SESL has performed an investigation and consulting services for this project, as outlined in our discussions and in accordance with current professional and industry standards for environmental site assessment. The findings of this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of this site and do not represent the actual state of the site at all points. Should materials or conditions be encountered other than those which have been described, these will require additional assessment.

The SESL assessment is based on the result of limited site investigation. SESL cannot provide unqualified warranties nor assume any liability for site conditions not observed, accessible during the time of the investigations. Despite all reasonable care and diligence, the ground conditions encountered, and the concentrations of contaminants measured, may not be representative of conditions between the locations samples and investigated. In addition, site characteristics may change as a result of soil heterogeneity, chemical reactions and other events. These changes may occur subsequent to SESL investigation and assessment.

This report, associated documentation and the information herein, have been prepared solely for the use of the named Client and any relevant authority. Any reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuring liability resulting from use of the report by a third party cannot be transferred to SESL.

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