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REMEDIAL ACTION PLAN

PROPOSED UPGRADES TO NORTHMEAD PUBLIC SCHOOL

52A MOXHAMS ROAD, NORTHMEAD

REPORT NO 20429/13-AA 19 MARCH 2025

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Document Information

Document Title	Remedial Action Plan
Site Address	52A Moxhams Road, Northmead
Job No	20429/13
Report No	20429/13-AA
Client	NSW Department of Education
Client Address	GPO Box 33, Sydney NSW 2001

Document Control

Rev	Date	Revision Detail/Status	Author	Reviewer	Approver
0	19/03/2025	Initial Issue	John Xu		John Xu

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Job No: 20429/13
Our Ref: 20429/13-AA
19 March 2025

NSW Department of Education
GPO Box 33
SYDNEY NSW 2001

re: **Proposed Upgrades to Northmead Public School (ID 2763)**
52A Moxhams Road, Northmead
Remedial Action Plan

This report presents a remedial action plan (RAP), which once implemented and validated will render the above site suitable for the proposed upgrades to Northmead Public School for primary school land use.

Reference should be made to the Executive Summary of this report.

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECHNIQUE PTY LTD

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Acronyms and Abbreviations

Acronym / Abbreviation	Description
ACM	Asbestos containing material
ADSI	Additional Detailed Site Investigation
AEC	Area of Environmental Concern
AF	Asbestos Fines
AMP	Asbestos Management Plan
ARCP	Asbestos Removal Control Plan
BTEX	Benzene Toluene, Ethyl Benzene and Xylenes
CEMP	Construction Environmental Management Plan
COC	Chains of Custody
CoPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CT	Contaminant Threshold
DoE	Department of Education
DP	Deposited Plan
DSI	Detailed Site Investigation
EMP	Environmental Management Plan
ENM	Excavated natural material
EP&A Act	Environmental Planning and Assessment Act
EPA	Environment Protection Authority
FA	Fibrous Asbestos
FCP	Fibro Cement Piece
Geotechnique	Geotechnique Pty Ltd
GLS	General Learning Spaces
HSL	Health Screening Level
IARC	International Agency for Research on Cancer
LAA	Licensed Asbestos Assessor
LOR	Limit of Reporting
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OH&S	Occupational Health and Safety
OOSH	Out of School Hours
PAEC	Potential Area of Environmental Concern
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per and Poly Fluoroalkyl Substances
PID	Photo-Ionisation Detector
POEO	Protection of Environment Operations
PPE	Personal Protective Equipment
PSI	Preliminary Desktop Site Investigation

Acronym / Abbreviation	Description
TRH	Total Recoverable Hydrocarbons
RAP	Remedial Action Plan
REF	Review of Environmental Factors
SCC	Specific Contaminant Concentration
SEPP	State Environmental Planning Policy
SEPP TI	State Environmental Planning Policy (Transport and Infrastructure)
SINSW	School Infrastructure NSW
TCLP	Toxicity Characteristics Leaching Procedure
UV	Ultraviolet
VENM	Virgin excavated natural material
VOC	Volatile organic compounds
WHSP	Work Health Safety Plan

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EXECUTIVE SUMMARY

This remedial action plan (RAP) has been prepared to accompany a Review of Environmental Factors (REF) prepared for the Department of Education (DoE) relating to upgrades to Northmead Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

The investigations conducted to date identified soil contaminated with asbestos including bonded asbestos containing material (ACM) and / or asbestos fines (AF) in a number of test pit / borehole locations, as indicated and tabulated on Drawing No 20429/10-AA2 in **Appendix A**.

Remediation of the contaminated soil is required and as a result, an RAP providing details for remediation / management and validation has been prepared.

The objectives of the RAP are to provide methods of remediation that can be implemented and validated so that a statement can be made declaring the site environmentally suitable for the proposed land use; to ensure all remediation works are carried out with due regard to the protection of the environment; to ensure all remediation works comply with current regulations and guidelines; and to provide details of the validation processes to be adopted during and at completion of remediation.

Based on the previous detailed site investigation (DSI) and additional DSI (ADSI), Area 1 and Area 2 requiring remediation were identified as indicated on Drawing No 20429/13-AA1 in **Appendix A**. Remediation is therefore deemed necessary, as detailed in Section 8.0 of the report.

This RAP has been prepared to provide guidance to contractors cleaning up / manage the contaminated soil / material within the site.

Based on the advantages, disadvantages, risks and costs of each of the remediation options, it is our opinion that remediation in accordance to Drawing No 20429/13-AA1 will be appropriate for the site:

- Disposal of friable and bonded asbestos contaminated soil / material in Area 1 and Area 2 at an appropriately licensed landfill facility.

Asbestos air monitoring will be required during all remedial works given the presence of AF in fill.

The RAP once implemented and validated will render the above site suitable for the proposed upgrades to Northmead PS for the primary school land use.

The waste must be disposed of at a licensed landfill facility with an appropriate waste classification. All landfill delivery / disposal dockets and the associated NSW EPA consignment for transportation of asbestos waste shall be provided to Geotechnique for inclusion in a site validation report.

Removal and disposal of the waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.

The proposed remediation works are considered to be Category 2. A minimum of 30 days notice of the intention to proceed with remedial works must be given to Parramatta City Council.

The Site Management Plan, Occupational Health & Safety Plan, Site Validation and Contingency Plan, outlined in Sections 9.0, 10.0, 11.0 and 12.0 of the report are required to be implemented during remediation works.

During site remediation and validation, a site inspection will be conducted to identify any changes to the condition of the area for the proposed upgrades.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, fly tipped stockpile(s) / imported fill materials [which are different to those encountered during the previous assessments], etc.) are encountered, Geotechnique will carry out additional assessment.

After completion of the remediation works, validation must be carried out in accordance with Section 11.0 of the report.

A report will then be prepared on the suitability of the site for the proposed upgrades to Northmead Public School for primary school land use. Asbestos clearance by an NSW SafeWork licensed asbestos assessor is required.

Reference should be made to Section 16.0 of the report for details of the recommendations regarding unexpected finds, any other materials to be excavated and removed from the site and any fill to be imported to the site.

Reference should also be made to Section 17.0 of the report for the limitations of this RAP.

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APPENDICES

1.0 INTRODUCTION

This remedial action plan (RAP) has been prepared to accompany a Review of Environmental Factors (REF) prepared for the Department of Education (DoE) relating to upgrades to Northmead Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* under Section 170, Section 171 and Section 171A of the EP&A Regulation**.**

Figure 1 below shows the location of the site.

Figure 1 - Location of Northmead Public School

Geotechnique carried out Preliminary Desktop Site Investigation (PSI), Detailed Site Investigation (DSI) and Additional Detailed Site Investigation (ADSI) for the site between October 2023 and December 2024 as detailed in the following:

- PSI report: Site Contamination DD PSI-Northmead PS-2763-Geotechnique-DDWO05135/23 (Ref. 20429/2-AA dated 23 October 2023);
- DSI report: Site Contamination DD DSI-Northmead PS-2763-Geotechnique-DDWO05135/23 (Ref. 20429/6-AA dated 24 October 2023); and
- ADSI report: Additional Detailed Contamination Assessment (Ref: 20429/10-AA dated 5 December 2024).

The investigations conducted to date identified soil contaminated with asbestos including bonded asbestos containing material (ACM) and / or friable asbestos in a number of test pit / borehole locations, as indicated and tabulated on Drawing No 20429/10-AA2 in **Appendix A**.

Remediation of the contaminated soil is required and as a result, an RAP providing details for remediation / management and validation has been prepared.

The objectives of the RAP are to provide methods of remediation that can be implemented and validated so that a statement can be made declaring the site environmentally suitable for the proposed land use; to ensure all remediation works are carried out with due regard to the protection of the environment; to ensure all remediation works comply with current regulations and guidelines; and to provide details of the validation processes to be adopted during and at completion of remediation.

2.0 PROPOSED ACTIVITY DESCRIPTION

The proposed activity for upgrades to Northmead Public School (PS) includes:

- One (1) new single storey classroom building comprising of four (4) general learning spaces (GLS), two (2) special program spaces, a singular learning commons space and a singular multi-purpose space;
- Minor internal alterations to an existing Admin Building (known as Building A); and
- Removal of existing portable classroom buildings containing six (6) classrooms.

Figure 2 shows the footprint of proposed single storey classroom building.

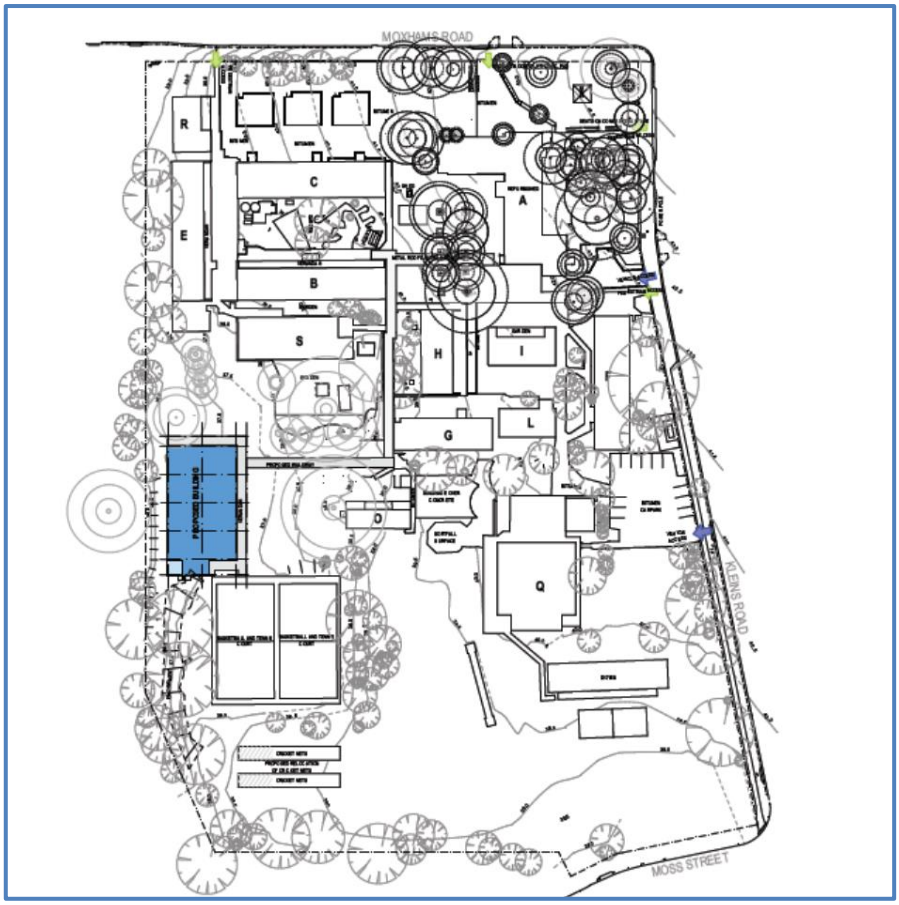

Figure 2 – Footprint of Proposed Classroom Building (Shaded Blue) in Northmead Public School

3.0 ACTIVITY SITE

The project site is located at 52A Moxhams Road, Northmead, and is legally described as:

- Lot 1 DP 366405;
- Lot 1 DP 176742;
- Lot 1 DP 20061; and
- Lot 1 DP 209810.

Northmead PS is located on the southern side of Moxhams Road and on the western side of Kleins Road.

4.0 SCOPE OF WORK

In order to achieve the objectives of the RAP, the following scope of work was conducted:

- Review and summary of PSI, DSI and ADSI reports prepared by Geotechnique.
- Developing an appropriate remedial strategy and devising details for validation, culminating in preparation of the RAP.

5.0 TOPOGRAPHY, GEOLOGY & HYDROGEOLOGY

The site inspection by our Environmental Scientist revealed that in general, the site and the surrounding land gently slope towards the west.

The Geological Map of Penrith (Geological Series Sheet 9030, Scale 1:100,000, Edition 1, 1991), published by the Department of Minerals and Energy indicates the residual soils within the site to be underlain by Hawkesbury Sandstone comprising medium to very coarse grained quartz sandstone, minor laminated mudstone and siltstone lenses.

The Soil Landscape Map of Penrith (soil Landscape Series Sheet 9030, Scale 1:100,000, 1989), prepared by the Soil Conservation Service of NSW, indicates that the site is located within the Luddenham soil landscape area and typically consists of poorly drained / relatively impermeable residual natural soils.

Based on information from all borehole locations (refer to Drawing No 20429/6-AA1) the sub-surface profile encountered during sampling on 28 September 2023 for the DSI is generalised as follows:

Fill	Gravelly Sandy Clay, low plasticity, brown, was encountered in BH1 to depth approximately 1.5m below the existing ground level (EGL); underlain by natural soil. Silty Sand, fine grained, brown, trace of gravel, was encountered in BH5 to depth about 0.8m below the EGL. Inclusion of ceramic, brick and fibro-cement fragments in the fill was noted.
Topsoil	Silty Sand, fine grained, dark brown, was encountered in BH2 to BH4 to depth approximately 0.2m below the EGL, underlain by natural soil
Natural Soil	Silty Sandy CLAY, medium plasticity, yellow mottled with grey, low to medium plasticity, brown or medium plasticity, yellow mottled with grey Silty SAND, fine grained, brown or yellow mottled with grey

All the recovered fill samples were screened for the presence of volatile organic compounds (VOC) using a calibrated Photo-Ionisation Detector (PID). The PID readings on recovered soil samples were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

There were no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole locations and recovered soil samples that would indicate potential for contamination. Inclusion of ceramic, brick and fibro-cement fragments in the fill was noted in BH5.

Based on information from all test pit locations (refer to Drawing No 20429/10-AA1) the sub-surface profile encountered during sampling on 6 November 2024 for the ADSI is generalised as follows:

Fill	Silty Sand, fine grained, brown with trace of gravel and inclusion of brick fragments, was encountered in TP-BH5a, TP-BH5b, TP-BH5c, TP2, TP2-1, TP2-2 and TP3 to TP5 to depths ranging from approximately 0.5m to 1.0m below the EGL; underlain by natural soil. Inclusion of fibro-cement fragments in the fill was noted in TP-BH5a, TP-BH5c and TP2. Gravelly Sandy Clay, low plasticity, brown was encountered in TP1 to depth approximately 1.0m below the EGL; underlain by natural soil.
Natural Soil	Silty Sandy CLAY, low to medium plasticity, brown

All the recovered fill samples were screened for the presence of VOC using a calibrated PID. The PID readings on recovered soil samples were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

There were no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole / test pit locations and recovered soil samples that would indicate potential for contamination. Inclusion of fibro-cement fragments in the fill was noted in TP-BH5a, TP-BH5c and TP2.

Based on the contents of the fill material, the profiles of natural soils within the site, as well as regional geological information, it appears that the fill might have resulted from cutting of the natural soil and levelling the ground during the residential development in the adjoining western properties in the late 1960s.

No groundwater or perched water was encountered to a maximum depth of approximately 4.0m below the EGL during sampling for the DSI in conjunction with geotechnical investigation and to a maximum depth of approximately 1.5m below the EGL during the sampling for the ADSI, and during the short time the boreholes / test pits remained open. It should be noted that fluctuations in the level of groundwater might occur due to variations in rainfall and / or other factors not evident during investigation.

There is no water body such as a creek, river, or wetland close to and transecting the site. Toongabbie Creek is located approximately 200m to the west of the site.

A site-specific groundwater analysis is outside the scope of the assessment. However, a search was carried out on 8 August 2023 through the website of WaterNSW for any registered groundwater bore data within a radius of 500m of the site. The search revealed that no information available on that date.

6.0 SITE CONDITION IN PROPOSED BUILDING FOOTPRINT

An inspection of the proposed building footprint (the area) was carried out by an Environmental Engineer from Geotechnique on 6 November 2024 and the following salient observations were made:

- The area is between western boundary and the western toe of the fibro / galvanised iron (GI) demountable buildings located in the western side of the central portion of the site.
- The majority was open area and covered by grass.
- A small portion comprised cricket pitch.

7.0 SITE HISTORY AND PREVIOUS SITE CONTAMINATION INVESTIGATIONS

7.1 Site History Information

Geotechnique carried out a review of site history information as part of the PSI for the Northmead PS in August 2023, as detailed in the PSI report 20429/2-AA dated 23 October 2023. The review included historical aerial photographs, NSW Department of Lands records, Planning Certificate under Section 10.7 (2 & 5) of the Environmental Planning and Assessment Act 1979, Council records, NSW EPA record of Notices for Contaminated Land and records of the Environment Operations (POEO) Public Register, SafeWork NSW records, available information regarding controlled chemicals, Per and Poly Fluoroalkyl Substances (PFAS) and school asbestos register.

Aerial photographs reveal that the site had been used for schooling purposes since 1950s, and gradually expanded with additional buildings since 1960s. Moxhams Road and Kleins Road West had been formed and located immediately to the north and east of the site respectively in or prior to 1950s. The properties to the north and east of the site across the roads had been residential land since 1950s. The adjoining southern and western properties had been vacant and developed into urban residential in 1960s. During the development, ground disturbance was noted along the western boundary of the site and Moss Street had been formed and located immediately to part of the south of the site.

NSW Land Registry Services Records indicate the site has been used as Northmead PS since at least early 1950s. A search for school information from the School Infrastructure NSW (SINSW) website did not reveal when the Northmead PS was established.

The Section 10.7 (2 & 5) Planning Certificate indicated no issues arising under the Contaminated Land Management Act 1997.

Available records of Parramatta City Council associated with the Northmead PS indicated various Council development application approval for renovation and / or construction activities between 2000 and 2010.

A search of the NSW EPA records revealed no EPA Notices issued for the site. A search of the Protection of the POEO Public Register found no records for the site.

A search of the records held by SafeWork NSW has not located any records pertaining to the site.

Based on the site inspection by our Environmental Scientist and discussion with staff from Northmead PS, there was a maintenance room with concrete flooring inside the Q building block where chemicals (fuel and pesticides) were kept. The Scientist was told that controlled chemicals were not stored within the site.

A search of the NSW Government PFAS investigation program (accessed via the EPA website on 13 September 2023) revealed that the listed 50 investigation sites were not related to the site and the land within a radius of 500m of the site.

The Department of Education's schools asbestos register contains information about the existence and location of any known or presumed asbestos-containing materials on school sites, based on advice from experts.

The site inspection undertaken by EDP in June 2021 indicated that twelve buildings within Northmead PS contain ACM within eaves lining, electrical box / cabinet, ceiling structures / lining, wall linings internal-infill, gable verge linings, floor coverings res / textile and windows. Asbestos was also assumed to be present in several difficult to access areas.

Based on the available information regarding the historical fibro in grounds investigations / events, no previous investigations had been recorded against the school. However, ACM maybe present in grounds from time to time, and caution must be exercised prior to any ground disturbances.

7.2 Site Condition and Surrounding Environment of Northmead PS

At the time of inspection for the PSI by an Environmental Scientist from Geotechnique on 13 September 2023, the following observations were made:

- A Building Block for school office comprising brick & fibro building with galvanised iron (GI) roof founded on concrete slab identified in the north-eastern portion of the site.
- B Building Block for classrooms comprising brick and GI construction with GI roof founded on bearers and joists identified in the central portion of the site.
- C Building Block for classrooms comprising brick construction with tile roof founded on bearers and joists noted in the northern portion of the site.
- E Building Block for classrooms comprising brick construction with GI roof founded on bearers and joists noted in the north western portion of the site.
- F Building Block for classrooms comprising brick construction with GI roof founded on bearers and joists noted in the eastern portion of the site.
- G Building Block for classrooms comprising brick construction with tile roof founded on bearers and joists in the central portion of the site.
- H Building Block for classrooms comprising brick with GI roof founded on bearers and joists noted in the central portion of the site.
- I Building Block for classrooms comprising weatherboard construction with GI roof founded on bearers and joists noted in the eastern portion of the site.
- L Building Block for classrooms comprising weatherboard construction with GI roof founded on bearers and joists noted in the eastern portion of the site.
- O Building Block for toilets comprising brick construction with GI roof founded on bearers and joists noted in the central portion of the site.
- Q Building Block for school hall, canteen, toilets, electrical distribution room, sports storeroom comprising brick construction with GI roof founded on concrete slab noted in the south eastern portion of the site. There was a maintenance room with concrete flooring inside the Q building block where chemicals (fuel and pesticides) were kept.

- R Building Block for out of school hours (OOSH) comprising weatherboard construction with GI roof founded on bearers and joists noted in the north western corner of the site.
- S Building Block for school library comprising brick and GI construction with GI roof founded on concrete slab noted in the central portion of the site.
- Eight fibro / GI demountable buildings for classrooms with GI roof used for classrooms were noted in the northern and central portion of the site.
- New demountable building not in current use comprising modern fibro clad and GI with a GI roof noted in the south eastern portion of the site.
- Storage shed for archives comprising brick construction with GI roof founded on concrete slab noted in the central portion of the site.
- Plastic water tank noted in the south eastern portion of the site.
- Cricket pitch noted in the western portion of the site.
- Tennis court noted in the south western portion of the site.
- Courtyard with concrete hardstand under shade cloth identified in the central portion of the site.
- AC playground surface was noted in the northern portion of the site.
- Play area with asphalt concrete under GI awning noted in the eastern portion of the site.
- There were no obvious features associated with any underground storage tanks (bowser, breather pipe, inlet valve and piping) or odour that would indicate the potential for contamination.

At the time of inspection observations of the neighbouring properties were as follows:

To the north	Moxhams Road, further north; Residential dwellings
To the west	Residential dwellings
To the south	Residential dwellings & Moss Street
To the east	Kleins Road, further east; Residential dwellings

The site features, as well as the layout of the site and surrounding properties are indicated on Drawing No 20429/2-AA1.

7.3 Outcomes of the PSI

Based on the desktop review and assessment of a range of available site historical data sources, several areas of environmental concern (AEC) / Potential AEC (PAEC) including ACM, metal & GI features and possible pest control around the buildings, the areas of possible filling, as well as associated contaminants of potential concern (CoPC) had been identified within the site.

Based on the assessment, Geotechnique considered that the risk of harm to human health and environment was low at current site condition without any disturbance to the ground surface / soil within the site; therefore, the site was considered environmentally suitable for the proposed upgrades to Northmead PS.

However, it is likely that there would be disturbance of the ground surface / soil within the site; subsequently and based on the findings of the PSI, intrusive investigations including sampling and testing for a DSI will be required to address the identified AEC / PAEC and the associated potential contaminants to assess and characterise the site respect to contamination, to update the Conceptual Site Model (CSM), to assess the

suitability of the site for the proposed land use, and to make recommendations regarding any future remedial works if required.

7.4 Outcomes of the DSI

Geotechnique carried out the DSI between September and October 2023 in an area within Northmead PS, as detailed in the DSI report 20429/6-AA dated 24 October 2023.

The objectives of the DSI were to determine the contamination status of the area, to assess the suitability of the area for the proposed land use, and to make recommendations regarding any future remedial works if required.

To achieve the objectives of the DSI, the scope of work included review of the PSI report, site inspection, as well as soil sampling and laboratory testing.

An Environmental Scientist from Geotechnique made the following observations during site inspection for this DSI in the investigation area on 28 September 2023:

- The area was between western boundary and the western toe of the fibro / GI demountable buildings located in the western side of the central portion of the site.
- The majority was open area and covered by grass.
- A small portion comprised part of cricket pitch.

On 28 September 2023, the Environmental Scientist also carried out sampling as follow:

- Five boreholes BH1 to BH5 (refer to Drawing No 20429/6-AA1) were drilled nominated for geotechnical investigation at and in the vicinity of the investigation area determined by SINSW.
- Fibro cement pieces (FCPs) were noted within the fill in BH5. One FCP sample was collected.

Collected soil samples were analysed for Metals, Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Organochlorine Pesticides (OCP), Polychlorinated Biphenyls (PCB) and / or asbestos. FCP was tested for asbestos.

Based on the test results for the DSI, most of the laboratory test results satisfied the criteria for stating that the analytes selected were either not present (i.e. concentrations less than laboratory limit of reporting[LOR]), or present in the sampled soils at concentrations that do not pose a risk of hazard to human health or the environment for the proposed school upgrades.

However, the results of sampling and testing for the DSI identified soil contamination, with the identified contaminant being bonded ACM in one borehole location BH5, as indicated and tabulated on Drawing No 20429/6-AA2.

Based on the assessment, Geotechnique considered that the site could be made suitable for the proposed school upgrades, subject to implementation of the following recommendations, prior to earth works / site preparation:

- Carrying out further site investigation to determine and confirm the asbestos (bonded ACM) status of the fill, and to assess whether remediation work is required.

- If the asbestos contamination is identified based on the outcome of the further site investigation, an RAP should be prepared to devise strategies for remediation / management of the asbestos impacted fill.
- Site validation is to be carried out following the remediation of the asbestos impacted fill if required.

7.5 Outcomes of the ADSI

Geotechnique carried out the ADSI between November and December 2024 in the footprint of the proposed classroom building within Northmead PS, as detailed in the ADSI report 20429/10-AA dated 5 December 2024.

Based on the findings of the previously completed DSI and review and recommendation by Structural & Civil designer, the ADSI was carried out to characterise and confirm the asbestos contamination status of the fill, and to assess whether remediation work is required.

In order to achieve the objectives of the assessment, the scope of work included review of PSI and DSI reports, site inspection, as well as soil sampling, on-site asbestos sieving test and laboratory testing.

Field sampling from ten locations as shown on Drawing No 20429/10-AA1 for the ADSI was carried out by an Environmental Engineer form Geotechnique on 6 November 2024 as follow:

- Three locations TP-BH5a, TP-BH5b and TP-BH5c were excavated at and in the vicinity of previously identified ACM in BH5.
- Five locations TP1 to TP5 were excavated in the proposed building footprint area.
- Two locations TP2-1 and TP2-2 were excavated in the vicinity of TP2 where inclusion of FCP was noted in the fill.
- Inclusion of FCP in the fill was noted in TP-BH5a, TP-BH5c and TP2. Three FCP samples (one FCP sample from each location) were collected.

Collected soil samples were analysed for Metals, TRH, BTEX, PAH, OCP, PCB and / or asbestos. FCP samples were tested for asbestos.

The findings of the ADSI are summarised as follows:

- The majority of the investigation area (refer to the Figure 2 in Page 2) was vacant at the time of sampling and site inspection. A cricket pitch and part of demountable buildings were located at and in the vicinity of the area.
- All the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e. concentrations less than laboratory limits of reporting, or present in the sampled soil at concentrations that do not pose a risk of hazard to human health or the environment under the condition for the proposed school upgrades, with the exception of asbestos.

  The identified contaminant being bonded ACM and friable asbestos in a number of test pit locations, as indicated and tabulated on Drawing No 20429/10-AA2.

  Bonded ACM pieces / fragments generally do not present a significant health risk unless tooled, cut, sanded, abraded or machined, which may release asbestos dust or fibres. Asbestos dust contains tiny almost indestructible fibres, which can cause damage to the lungs when breathed in.

Friable asbestos presents a risk of harm to human health due to the exceedance of relevant Health Screening Level (HSL) for residential setting including primary schools.

- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.

Based on the ADSI, Geotechnique considered that the investigation area can be made suitable for the proposed school upgrades if the asbestos contamination which present a risk to human health are addressed in accordance with mitigation measures provided in Section 8.0 of the ADSI report. Furthermore, from environmental engineering considerations the required mitigation measures will not have a significant effect on the environment.

8.0 REMEDIAL ACTION PLAN

Based on the DSI & ADSI, soil contaminated with asbestos (bonded asbestos and / or asbestos fines) were identified in a number of locations, as shown Drawing No 20429/10-AA2. Therefore, remediation / management is required.

8.1 Site Remediation Policy

The preferred hierarchy of options for site remediation and / or management is set out in Section 6 (16) of the NEPM 1999 (April 2013), which is summarised as follows, in order of preference:

- On-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and
- Off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or

If the above are not practicable:

- Consolidation and isolation of the soil on-site by containment within a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed where necessary by replacement with appropriate material;

Or:

Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option.

8.2 Remediation and Management Strategies

The contaminant identified is asbestos (bonded and / or friable asbestos). Based on the contaminant identified the following remediation strategies are considered.

Based on the preferred hierarchy of options for site remediation and / or management as summarised in Section 8.1 and reference to *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, it is our opinion that the available techniques for remediation of asbestos contaminated soils that would be suitable for the site are described below:

- **On-site Treatment:** This involves undertaking physical treatment of asbestos contaminated soils with the following methods;
  - Hand (emu-bob) picking of bonded asbestos.
  - Tilling, a process of mechanically turning over the soil to facilitate the picking of bonded asbestos.
  - Mechanical screening.

  The following factors are to be considered:

  Advantages

  - No soil with bonded asbestos on ground surface need to be removed for off-site disposal, thereby minimising the occupation of landfill space;
  - Cost saving (of Landfill Disposal) for large volumes;
  - Reducing bonded asbestos to acceptable level.

  Disadvantages

  - Trial & error process;
  - Disposal of some contaminated soil may still be required;
  - Not an option for soil contaminated with friable asbestos;
  - May not be suitable if the ground surface containing significant amount of bonded asbestos fragments;
  - May not be suitable for soil with high clay contents;
  - There is potential to generate considerable dust which requires management and monitoring to ensure there are no off-site impacts.

- **Cap and Contain:** This involves encapsulating the contaminated soil above groundwater table through construction of an engineered barrier to prevent human exposure to asbestos and in contact with groundwater. The cap may be a layer of clean certified fill material, such as virgin excavated natural material (VENM), excavated natural material (ENM) or hardstand material (such as concrete, asphalt).

  The following factors are to be considered;

  Advantages

  - Minimising the occupation of landfill space;
  - Cost saving (of Landfill Disposal) for large volumes;
  - Short time frame.

  Disadvantages

  - Asbestos contaminated soil will need to be properly managed;
  - Subject to Council approval;
  - Long term cost involved;
  - Owner of contaminated soil remains liable;

- A cap and contain strategy would require the implementation of long term institutional controls. This would be in the form of an Environmental Management Plan (EMP). The EMP should clearly define the entity responsible for managing the cap, the extent of the encapsulated soils, details of the monitoring requirements and an outline the reporting responsibilities. The entity responsible for the EMP will depend on who the owner of land is, this may be a private entity, a company or government (local, state or federal). If the encapsulated soils are to be placed onto government land, prior agreement from the relevant agency would be required.
- Potential devaluation of land where on-site burial occurred.

- **Excavation and Off-site Disposal:** This involves the excavation and off-site disposal of the asbestos contaminated soil at an appropriately licensed landfill facility.

  The following factors are to be considered;

  Advantages

  - Risk and the liability are removed from the site;
  - Simple & straightforward process;
  - Short time frame.

  Disadvantages

  - Adding to already filling landfill;
  - Requires movement of contaminated soil on public roads;
  - Can be very costly;
  - Requiring reinstatement with clean materials to fill void.

8.3 Remediation Goal

The goal of remediation is to be able to provide a statement declaring that the site is environmentally suitable for the proposed upgrades to Northmead PS for primary school land use.

8.4 Lateral & Vertical Extents of Contamination Requiring Remediation

Based on the laboratory test results, on-site asbestos sieving test results and soil profiles for the DSI and ADSI, it is our opinion that the information is sufficient to delineate the estimated lateral and vertical extents of the contaminated soils. Two (2) areas requiring remediation were identified and labelled as Area 1 and Area 2 as shown on Drawing No 20429/13-AA1. Included on the drawing is a table indicating the estimated area / size (in square metres), thickness (in metre) and volume (in cubic metres) of the contaminated fill.

It is reiterated that the defined remediation size and thickness for each area are estimates only. The actual size and thickness may be decreased or increased. This will be confirmed by the necessary visual assessment, validation sampling and testing.

8.5 Adopted Remedial Method

Many factors such as advantages, disadvantages, risks and the costs of separating relatively small amounts of waste, compared to apparently less complicated disposal off-site, etc., need to be considered in adoption of the final remediation and management strategies.

One single remediation / management strategy is unlikely to render the site suitable for the proposed residential land use. A combination of the techniques noted in Section 8.2 will provide a balance between cost of remediation and ongoing management controls.

Based on the advantages, disadvantages, risks and costs of each of the remediation options, it is our opinion that remediation in accordance to Drawing No 20429/13-AA1 will be appropriate for the site:

- Disposal of friable (AF) and bonded asbestos contaminated soil / material in Area 1 and Area 2 at an appropriately licensed landfill facility.

It is recommended the following methodology / procedure for remediation strategy to be implemented in relation to Area 1 & Area 2 impacted by AF and bonded ACM:

1. Physical (peg and markers) and digital (GPS) identification of the Area 1 & Area 2 (refer to Drawing No 20429/13-AA1 for the estimated spatial extent and thickness).
2. Excavation of the contaminated soil for off-site landfill disposal under instruction / supervision of an Environmental Consultant. The remediation process will be carried out through excavation of contaminated soil and immediate loading on dump trucks for off-site disposal at a facility that can lawfully accept the waste. If for any reason a temporary stockpile of contaminated soil is formed, this stockpile should be labelled, covered and appropriately protected against erosion.
3. Appropriate waste classification (refer to the following Section 8.6).
4. Removal and disposal of the waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA. A SafeWork Class A licensed asbestos removalist must be engaged to supervise excavation and loading of the soil contaminated with friable asbestos. The removalist is required to prepare an Asbestos Removal Control Plan (ARCP) prior to remediation.
5. Disposal of the waste at an appropriately licensed landfill facility.
6. Validation sampling and testing as per Section 11.1.
7. The removalist licence, the ARCP, landfill disposal dockets and the associated NSW EPA consignment for transportation of asbestos waste shall be provided to Geotechnique for inclusion in a site validation report.

8.6 Waste Classification

Waste classification is required to provide information to the nominated landfill facility regarding classification of the contaminated soil to be disposed.

In NSW the criteria for disposal of contaminated soils / material are generally governed by the "Waste Classification Guidelines Part 1: Classifying Waste", the NSW EPA 2014. This guideline outlines a clear, step-by-step process for classifying waste. There are six waste classes to be used:

- Specific Waste, including clinical and related waste, asbestos waste, as well as waste tyres
- Liquid Waste
- Hazardous Waste
- Restricted Solid Waste

- General Solid Waste (Putrescible)
- General Solid Waste (Non-putrescible)

Waste is classified according to Contaminant Threshold (CT) values without Toxicity Characteristics Leaching Procedure (TCLP) test or Specific Contaminant Concentration (SCC) values with the TCLP test.

The laboratory test results for the waste classification for Area 1 and Area 2 are summarised in Tables WC1 to WC6 in **Appendix B** of this report. A copy of the laboratory analytical reports and certificates analysis is kept in our office and will be provided upon request.

According to the "Waste Classification Guidelines Part 1: Classifying Waste" (NSW EPA 2014), soil content, as well as the laboratory test results (refer to Table WC6 in **Appendix B**), the contaminated soil in Area 1 and Area 2 to be excavated and removed from the site is classified as General Solid Waste (non - Putrescible) - Special Waste (Asbestos Waste).

The waste must be disposed of at a facility that can lawfully accept the waste.

Removal and disposal of the waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.

All the transport records (truck registration number, driver, date and time leaving the site) and lawful facility delivery / disposal dockets and the associated NSW EPA consignment for transportation of asbestos waste must be obtained and provided to Geotechnique for reporting / recording purposes.

8.7 Preparation for Remedial Works

Prior to conducting remedial works on-site, the following procedures will be carried out:

- The remedial works are considered Category 2, as defined under the Chapter 4 Remediation of Land in the *State Environmental Planning Policy (Resilience and Hazards) 2021 under the Environmental Planning and Assessment Act 1979*, which has repealed "*Managing Land Contamination: Planning Guidelines*"-*SEPP 55 Remediation of Land*. Development consent to carry out the works is not likely to be required. Under Clause 4.13 of the *State Environmental Planning Policy (Resilience and Hazards)*, a minimum of 30 days notice of the intention to proceed with remedial works must be given to Parramatta City Council.
- Notification must be provided by the remediation contractor to SafeWork NSW to excavate and dispose of asbestos contaminated material / soils at an EPA licensed landfill facility, specifically by the Class A licensed contractor for friable asbestos and Class B Licence for bonded asbestos.
- Under the Protection of the Environment Operations (Waste) Regulation, asbestos transporters are required to track loads of asbestos using WasteLocate.
- The nominated licensed landfill shall be contacted and informed of the soil classification details in order to obtain an approval for acceptance of the contaminated soil. All documentation required by the landfill facility shall be completed as required.
- Marking of the contaminated areas by an Environmental Representative and fencing off with red ribbon to prevent / minimise access during any future works.

- All intended environmental management measures (refer to Section 9.0) will be installed by the appointed contractor. Geotechnique will inspect all measures prior to remedial works commencing.
- No waste should be transported before acceptance of the application.
- Signage shall be placed at the site entrance, identifying the contact details of the appointed remediation contractor.
- The site shall remain secure during non-working hours.
- Asbestos air monitoring will be required during all remedial works given the presence of AF in fill.
- Provide a remediation schedule to Geotechnique, once the site owner or relevant party, has authorised the remediation.

9.0 ENVIRONMENTAL MANAGEMENT PLAN

The appointed remediation contractor will be provided with a copy of this RAP, so that they are aware of the contamination status of the soils and the remediation methodology to be adopted.

All remediation work must be undertaken with due regard to the minimisation of environmental effects and meet all statutory environmental and safety requirements. The Work Health Safety Plan (WHSP), Construction Environmental Management Plan (CEMP) and any Asbestos Management Plan (AMP) must therefore address the issues identified in table below.

Category	Measure
Demolition (including Asbestos Management)	Appropriate measures shall be taken to ensure that demolition works are completed in accordance with SafeWork NSW Standards and Codes of Practice. Any asbestos identified should be managed in accordance with SafeWork NSW Codes of Practice and Australian Standards.
Site Stormwater Management and Control	Appropriate measures shall be taken to ensure that potentially contaminated water does not leave the site. Such measures should include, but not be limited to: ▪ Diversion and isolation of any stormwater from any contaminated areas; and ▪ Provision of sediment traps including geotextiles or hay bales.
Soil Management	Appropriate measures shall be taken to ensure soils are excavated using an appropriate methodology to reduce nuisance dust and odours from leaving the boundary, and soils are disposed of in accordance with the NSW Government *Protection of the Environment Operations (Waste) Regulation 2014*.
Dust and Odour	Control of dust and odour shall be maintained by the contractor to ensure no nuisance dust or odours are received at the site boundary. Action levels and specific control measures would be described in the site CEMP and may include, but not necessarily be limited to the following: ▪ Site wide water spraying, as and when appropriate, to eliminate wind-blown dust; ▪ Use of mist sprays, and / or sprinklers on stockpiles, fill screening areas and loaded fill to lightly condition the material; ▪ Use of tarpaulin or tack-coat emulsion or sprays to prevent dust blow from stockpiles or from vehicle loads; ▪ Covering of stockpiles or loads with polythene or geotextile membranes; ▪ Restriction of stockpile heights to 2m above surrounding site level; ▪ Ceasing works during periods of inclement weather; and

Category	Measure
	▪ Regular checking of fugitive dust and odour, to ensure compliance with the CEMP requirements, undertaking immediate remedial measures to rectify any cases of excessive dust or odour (e.g. use of misting sprays or odour masking agent). It is advised that all site workers use adequate dust masks during soil excavation and that machine operators remain within an enclosed, air-conditioned cabin.
Noise and Vibration	Noise and vibration will be restricted to reasonable levels. All plant and machinery used on site will be noise muffled to ensure emissions do not breach statutory levels.
Hours of Operation	Working hours will be restricted to those specified by council.
Community Engagement	Community engagement should be carried out in accordance with Schedule B(8) of the NEPM 1999 (April 2013). Prior to the commencement of remediation works, every occupier of land either wholly or partly within 100m of the boundary of the premises (including local council and the RMS) should be notified at least 30 days in advance. The notice should include: ▪ Advice of demolition and excavation work to be carried out on the premises; ▪ State the time and date such work is to commence; ▪ Indicate that the works are being conducted to minimise any risk of site contamination impacting on off-site receptors; ▪ Provide appropriate signage on the site fencing, including site contact name and phone number to be contacted should any matter arise; and ▪ Provide contact information and procedure for registering any complaints.
Incident Management and Community Relations	While various environmental management and occupational safety plans will be developed to protect human health and the environment, incidents may occur which pose a risk to the various stakeholders. To mitigate these risks and ensure that a suitable response is carried out quickly, a response plan to any incident that may occur on site should be prepared and various responsibilities assigned. The site health and safety plan and environmental management plan should document these procedures and responsibilities, and incident contact numbers should be maintained in an on-site register. All other relevant emergency contact numbers such as Police, Fire Brigade, and Hospital should be listed in the Health and Safety Plan and posted on-site for easy access.

10.0 OCCUPATIONAL HEALTH & SAFETY PLAN

A site-specific Occupational Health and Safety (OH&S) Plan has to be developed by remediation contractor to ensure that the remediation works are conducted in a safe manner. Personnel working on the site are required to read and understand the OH&S Plan prior to works commencing.

10.1 Potential Contaminants Associated with Human Health Issue

The human health issue associated with asbestos is listed below, with brief descriptions of physical form and some general health and safety information. Note that the effects listed are usually the result of prolonged exposure to high concentrations. These extremes are not likely to be achieved during the works proposed.

According to the International Agency for Research on Cancer (IARC) asbestos is a listed known human carcinogen. The health effects of asbestos are well understood and result from inhalation of airborne respirable fibres. If deposited in the lungs, the fibres can initiate diseases that take many years to produce

serious health effects. These effects include asbestosis (scar-like tissue in the lungs and in the pleural membrane that surrounds the lungs), lung cancer and mesothelioma.

People with asbestosis have difficulty breathing, often a cough and in severe cases heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death. The likelihood of asbestos-related disease is related to the concentration and duration of exposure to respirable asbestos fibres.

Inhalation of associated dust should be prevented.

Other contaminants might be identified to have association with human health issues during the remediation works. The OH&S requirements will provide adequate protection for workers and / or the public during the works.

10.2 Personal Protective Equipment (PPE)

In order to minimise exposure to asbestos and to ensure the safety of workers, the minimum level of PPE for workers actively involved in handling the contaminated material / soils and visitors to the site, who will be observing activities being undertaken in or around excavation includes:

- Highly visible disposable long sleeve worker coveralls / overalls to be disposed of at the completion of each day.
- Steel-capped boots, complying with relevant Australian Standard; or waterproof boots with steel toe and shank, also complying with relevant Australian Standard, when deemed necessary in muddy condition.
- Safety glasses with side shields, complying with relevant Australian Standard.
- Hard hat, meeting relevant Australian Standard.
- Dust mask or half-face respirator with particulate filter. P2 rated face mask is the lowest rating of “dust mask” that can be used, when deemed necessary to prevent excessive inhalation of dust. If significant amounts of asbestos-cement pieces are encountered and air monitoring for dust and asbestos fibres indicates the presence of airborne asbestos (this is not expected), full-face respirator with particulate filter should be worn.
- Nitrile work gloves, complying with relevant Australian Standard, when deemed necessary to prevent dermal contact with the contaminated soil.
- Long sleeve shirts and pants, when deemed necessary to prevent sunburnt from Ultraviolet (UV) radiation and to assist with limiting dermal contact with contaminated soil.

It should be noted that wearing PPE can reduce the dexterity of workers and senses of vision, hearing and smell. Heat stress is another important consideration that must be taken into account during hot weather.

Smoking, eating or drinking on-site will only be carried out in a designated lunchroom. Hands are to be washed thoroughly upon completion of work and prior to eating, drinking or any other hand-to-mouth activity.

Other site workers, other visitor or consultants not directly associated with the remedial works, but present on the site, should wear the following PPE (as a minimum):

- Highly visible safety vests.
- Steel-capped boots.

- Hard hat.

10.3 Safety Measures around Excavations

The safety measures to be adopted during any deep excavation works (i.e. deeper than 1.2m) are as follows:

- Only the minimum number of workers necessary will be used to adequately and safely complete the job at hand.
- During non-working hours, the entire site will be secured.
- All personnel performing the works in and around the excavation will wear appropriate personal protective equipment, as listed above.
- Environmental conditions will be monitored prior to excavation, including wind direction, wind speed, temperature and the likelihood of rain. Excavation works will not take place during periods of high wind, elevated temperature or heavy rain.
- Any deep excavation that is to remain open during non-working hours will be subject to dust suppression controls in the form of water sprinklers and/or protective plastic coverings.

11.0 SITE VALIDATION

Validation sampling and testing forms a crucial part of the site remediation process in that it monitors the success or otherwise of the adopted remediation strategy and confirms the suitability of the site for the proposed upgrades to Northmead PS for the primary school land use.

The objective of the validation is to obtain sufficient information and data to make recommendation on the suitability of the site for the proposed upgrades to Northmead PS for the primary school land use.

11.1 Area 1 & Area 2 Impacted by Asbestos in Friable & Non-Friable Forms

Area 1 and Area 2 were impacted by asbestos in friable and non-friable forms in the fill. The estimated size to be remediated (refer to Drawing No 20429/13-AA1) is 130m^2 (Area 1) or 60m^2 (Area 2) both with estimated depths ranging from 0.5m to 1.0m below the EGL.

Following completion of the remediation, asbestos clearance inspection must be carried out by NSW SafeWork licensed Asbestos Assessor (LAA).

Validation sampling through on-site sieving test for bonded ACM, in accordance with gravimetric procedures as per NEPM 1999 (April 2013), will be undertaken. In addition, a 500ml soil sample will be collected and sent to laboratory for friable asbestos analysis under Chains of Custody (COC) conditions.

In accordance with Section 5.5 of the NSW EPA 2022 “Contaminated Land Guidelines Sampling Design Part 1 – Application”, the following validation samples (refer to Drawing No 20429/13-AA2) will be recovered from the excavated areas:

Area 1

- 12 samples (2 samples from each sampling location to the full depth of excavation along the walls) in locations V101 to V106;

- 2 samples (1 sample from each sampling location from the ground surface of the excavation base to a depth of 0.1m below the base) in locations V107 and V108.

Area 2

- 10 samples (2 samples from each sampling location to the full depth of excavation along the walls) in locations V201 to 205;
- 1 sample in sampling location V206 from the ground surface of the excavation base to a depth of 0.1m below the base.

In summary, the samples to be recovered and analysed are presented below.

Area	Estimated Excavation Size (m^2)	Estimated Excavated Depth (m)	Number of Samples to be Collected	Analysis	Remarks
1	130	Ranging from 0.5m to 1.0m	14	Asbestos (bonded & friable)	➢ 14 samples for 10 L sieving test of bonded ACM ➢ 14 samples for laboratory friable asbestos analysis
2	60	Ranging from 0.5m to 1.0m	11	Asbestos (bonded & friable)	➢ 11 samples for 10 L sieving test of bonded ACM ➢ 11 samples for laboratory friable asbestos analysis

For asbestos assessment, the adopted validation criteria are:

- 0.01% w/w for bonded ACM in soil
- 0.001% w/w for friable asbestos in soil
- No visible asbestos for surface soil

If the validation test results meet the criteria the remediation area will be deemed as satisfactorily remediated.

If the validation test results do not meet the validation criteria, further excavation will continue followed by inspection, sampling and testing. This process will continue until the test results meet the acceptance criteria.

A clearance certificate by the LAA will be required for the remediated areas.

11.2 Footprints of Buildings / Features Post Demolition / Removal

Upon complete demolition / removal of the buildings / features for the proposed school upgrade works, assessment (by visual inspection, sampling and testing) of the soil in the footprints of buildings / features will be required to confirm the contamination status of the soil in the footprints. If contamination is detected, an addendum RAP will be prepared, subsequently, remediation and validation will be required.

11.3 Imported Material

If any material is to be imported to the site, the material will be validated as being suitable for use within the site prior to use. The imported fill must be free from asbestos, ash, and odour, not be discoloured and acid sulphate soil. Environmentally, VENM or ENM, or material defined by the Resource Recovery Framework under the POEO act, will be suitable for use as fill for the site. Salinity assessment might be required.

The validation process will be as follows:

- Review of classification reports for VENM or ENM or the material defined by the Resource Recovery Framework prepared by suitably qualified consultant(s) made available by the supplier of the materials.
- Inspection of incoming material at the source site and during importation, if the documentation provided is found to be adequate, to ensure the material comply with those validated.
- If the documentation provided is found to be inadequate or if the incoming material is suspect, appropriate sampling and testing will be carried out by suitably qualified consultant(s) prior to acceptance within the site.

12.0 CONTINGENCY PLAN

12.1 Unexpected Finds

Contamination assessment had been undertaken to assess the identified contaminants of potential concern within the site. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and / or in unexpected locations during remediation. Residual hazards that may be present at the site are generally detectable through visual or olfactory means, for example:

- $10m^2$ of ACM sheets / fragments encountered in any location.
- Friable ACM such as lagging encountered in any location.
- Bottles / containers / drums of chemicals.
- Odorous, unusual coloured or stained hydrocarbons impacted soils; and
- Ash and / or slag contaminated soils / fill materials.

The objective of the Unexpected Finds Management Protocol is to mitigate potential environmental and human health impacts associated with unexpected finds that may be encountered during remediation works.

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances, any other unexpected potentially hazardous substance, imported fill materials (which are different to those encountered during the previous assessments), etc., be identified, we recommend that this office be contacted for assessment and an unexpected finds management protocol in **Appendix C** of this report should be implemented.

The procedure to be followed in the event of an unexpected find is presented below:

- In the event of an unexpected find, all work in the immediate vicinity should cease and an environmental consultant should be contacted immediately.
- Temporary barricades should be erected to isolate the area from access to the public and works.
- The environmental consultant should attend the site and assess the extent of remediation that may be required.

- In the event additional remediation is required, the procedures outlined within this report should be adopted where appropriate, alternatively an addendum RAP should be prepared.
- An additional sampling and analytical rationale should be established by the consultant and should be implemented with reference to the relevant guideline documents; and
- Appropriate validation sampling should be undertaken by the appointed Environmental Consultant in accordance with the addendum RAP and the results should be included in the validation report.

12.2 Contingency Scenarios & Corrective Actions

In some circumstances, remediation works can be unpredictable. The following table presents anticipated possible problems or events and the corresponding corrective actions to be implemented:

Incident / Event	Corrective Action
Spillage / leakage of oil, hydraulic fluid, or other fuels from the excavator and / or trucks	For major spill; place sandbags down slope, cover area in sand, excavate impacted sand and soils and dispose of at an appropriate EPA approved facility. For minor spill; cover area in sand, excavate impacted sand and soils and dispose at an EPA approved facility. Stop apparent spillage / leakage.
Failure of sediment control measures	Replace or repair failed control measure. Determine reason for failure and ensure no repeat. Clean up any materials penetrating the safeguard and return to either the stockpile or excavation (origin).
Excessive dust generation	Cease activities until more appropriate dust control measures can be implemented. Cover all areas generating dust with plastic sheeting. Improve water control (i.e., sprays) where appropriate. Assess measures being implemented.
Discovery of asbestos cement pieces / fragments in locations other than identified locations / areas during remediation	An unexpected finds management protocol (**Appendix C** to be implemented).
Discovery of unexpected contamination and suspect materials that are not identified from the previous assessments	An unexpected finds management protocol (**Appendix C**) to be implemented.
Complaint from neighbouring property or sensitive receptor	Initiate pro-active consultation process with all neighbouring properties to ensure any concern and complaints will be resolved prior to commencement of any remediation work. The future appointed principal contractor (who is likely to be the future appointed civil contractor) will have responsibility to initiate a pro-active consultation process in the event of complaints from neighbouring properties.
Excessive noise	Identify source and add or amend noise attenuation equipment.

13.0 POTENTIAL CONTAMINATION CONSTRAINTS OR RISKS

Based on the previous DSI and ADSI, the potential constraints or risks on proposed school upgrades are:

- Soil contaminated with / impacted by asbestos (bonded asbestos and / or asbestos fines) was identified in a number of test pit / borehole locations, as shown on Drawing No 20429/10-AA2. Area 1 and Area 2 requiring remediation were identified as indicated on Drawing No 20429/13-AA1. The asbestos contamination risks can be appropriately managed in accordance with this RAP.
- Unexpected findings of suspect material during any stage of future demolition works / earthworks / site preparation / construction works, which can be appropriately managed in accordance with the recommended unexpected finds management protocol in **Appendix C** of this report.

14.0 MITIGATION MEASURES FOR ASBESTOS CONTAMINATION RISKS

Table 1 below presents recommended mitigation measures to manage the asbestos contamination risks and the unexpected finds.

Table 1 – Recommended Mitigation Measures to Manage Asbestos Contamination Risks and Unexpected Finds

Mitigation Name	When to Mitigation Measure to be complied with	Mitigation Measures	Reasons for Mitigation Measures
Asbestos risk to human health	Prior to commencement of any earthworks	Carry out remediation by excavating and disposing asbestos contaminated material / soil in an EPA licensed landfill facility followed by validation of the remediated areas according to the RAP	To minimise risk to human health during construction works; and To make the site environmentally suitable for the proposed land use
Unexpected Finds	During any stage of future demolition works / earthworks / site preparation / construction works	In the event of unexpected finds, refer to the recommended unexpected finds management protocol in **Appendix C** and Section 12.1, carry out contamination assessment and prepare an addendum RAP if contamination is identified	To determine the presence or otherwise of an unacceptable risk to human health and environment and to manage the site suitable for the proposed school upgrades for primary school land use

15.0 SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

Based on nature of asbestos contamination risks or issues at the site, it is our assessment that the potential impacts on the proposed upgrade work or activity can be appropriately mitigated or managed in accordance with this RAP and the recommended unexpected finds management protocol. Therefore, from contamination consideration, it is determined that the extent and nature of potential impacts from the proposed development work or activity, once the RAP / unexpected finds management protocol implemented and validated, are “Low” and will not have significant impact on the locality, community and / or the environment.

16.0 CONCLUSION AND RECOMMENDATIONS

Based on the previous DSI and ADSI, soil contaminated with / impacted by asbestos (bonded asbestos and / or asbestos fines) was identified in a number of test pit / borehole locations, as shown on Drawing No 20429/10-AA2. Area 1 and Area 2 requiring remediation were identified as indicated on Drawing No 20429/13-AA1. Remediation is therefore deemed necessary, as detailed in Section 8.0 of the report.

This RAP has been prepared to provide guidance to contractors cleaning up / manage the contaminated soil / material within the site.

Based on the advantages, disadvantages, risks and costs of each of the remediation options, it is our opinion that remediation in accordance to Drawing No 20429/13-AA1 will be appropriate for the site:

- Disposal of friable and bonded asbestos contaminated soil / material in Area 1 and Area 2 at an appropriately licensed landfill facility.

Asbestos air monitoring will be required during all remedial works given the presence of AF in fill.

The RAP once implemented and validated will render the above site suitable for the proposed school upgrades to Northmead PS for the primary school land use.

The contaminated soil in Area 1 and Area 2 to be excavated and removed from the site for off-site disposal is classified as **General Solid Waste (non -Putrescible**) -**Special Waste (Asbestos Waste)**.

The waste must be disposed of at a licensed landfill facility with an appropriate waste classification. All landfill delivery / disposal dockets and the associated NSW EPA consignment for transportation of asbestos waste shall be provided to Geotechnique for inclusion in a site validation report.

Removal and disposal of the waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.

The proposed remediation works are considered to be Category 2. A minimum of 30 days notice of the intention to proceed with remedial works must be given to Parramatta City Council.

The Site Management Plan, Occupational Health & Safety Plan, Site Validation and Contingency Plan, outlined in Sections 9.0, 10.0, 11.0 and 12.0 of the report are required to be implemented during remediation works.

During site remediation and validation, a site inspection will be conducted to identify any changes to the condition of the area for the proposed upgrades.

If suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheets / pieces / pipes, ash material, fly tipped stockpile(s) / imported fill materials [which are different to those encountered during the previous assessments], etc.) are encountered, Geotechnique will carry out additional assessment.

After completion of the remediation works, validation must be carried out in accordance with Section 11.0 of the report.

A report will then be prepared on the suitability of the site for the proposed upgrades to Northmead PS for primary school land use. Asbestos clearance by an NSW SafeWork licensed asbestos assessor is required.

An unexpected finds management protocol (**Appendix C**) should be implemented if suspect materials are encountered during future demolition works / earthworks / site preparation / construction works.

For any other materials to be excavated and removed from the site, it is recommended that waste classification of the materials, in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA 2014; NSW EPA resource recovery exemptions and orders under the Protection of the Environment Operations (Waste) Regulation 2014; or NSW EPA *Certification: Virgin excavated natural material* is undertaken prior to disposal at a facility that can lawfully accept the materials.

For any material to be imported to the site, the classification reports for VENM or ENM or the material defined by the Resource Recovery Framework must be assessed by the appointed Environmental Consultant prior to such importation, as outlined in Section 11.3, to ensure suitability for the proposed use. The imported fill must not contain asbestos and ash, be free of unusual odour, not discoloured and not acid sulphate soil or potential acid sulphate soil.

17.0 LIMITATIONS

The services performed by Geotechnique in preparing this report were conducted in a manner consistent with the level of quality and skill generally exercised by members of the profession and consulting practice.

This report has been prepared for the purposes stated within. This report can also be relied upon by SINSW, DoE and relevant authorities for development and building application assessment processes. Any reliance on this report by other parties shall be at such parties' sole risk as the report might not contain sufficient information for other purposes.

The information in this report is considered accurate at the completion of field sampling for the ADSI (6 November 2024). Any variations to the site form or use beyond that date will nullify the conclusion stated.

No contamination assessment can eliminate all risk; even a rigorous professional assessment might not detect all contamination within a site. Although the assessment conducted at the site was carried out in accordance with current NSW guidelines, the potential always exists for contaminants and contaminated soils to be present between sampled locations and in the grass / building / feature covered areas.

Presented in **Appendix D** is a document entitled "Environmental Notes", which should be read in conjunction with this report.

LIST OF REFERENCES

Contaminated Land Guidelines: Consultants Reporting on Contaminated Land – NSW Environment Protection Authority 2020

Contaminated Land Management Act 1997

Contaminated Land Management Regulation 1998

Environmental Planning and Assessment Act 1979 (EP&A Act)

Geology of the Penrith 1:100,000 Sheet (9030) – Geological Survey of New South Wales, Department of Minerals and Energy 1991

Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia

National Environment Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council (NEPM) 1999 (April 2013)

Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A – The Excavated Natural Material Exemption & Order 2014

Soil Landscape of the Penrith 1:100,000 Sheet (9030) – Soil Conservation Service of NSW 1989

State Environmental Planning Policy (Resilience and Hazards) 2021 under the Environmental Planning and Assessment Act 1979

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI)

Waste Classification Guidelines, Part 1: Classifying Waste, NSW EPA 2014

APPENDIX A

DRAWINGS

Drawing No	
20429/2-AA1	*Site Features*
20426/6-AA1	*Borehole Locations*
20429/6-AA2	*Location of Concern / Contamination*
20429/10-AA1	*Detailed Test Pit Locations*
20429/10-AA2	*Locations of Contamination*
20429/13-AA1	*Areas to be Remediated*
20429/13-AA2	*Proposed Validation Sample Locations*

Imagery © NearMap.com

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SF#	Description
1	A Block, brick/fibro building, GI roof, school office/admin building
2	C Block, brick building, tile roof, bearers and joists, classrooms
3	E Block, brick building, GI roof, bearers and joists, classrooms
4	B block, brick/GI building, GI roof, bearers and joists
5	O Block, brick building, GI roof, bearers and joists
6	Part Q block, brick/GI building, GI roof slab, hall/toilets
7	Plastic water tank
8	New demountable not in use, modern fibro clad and GI
9	Gravel/bitumen staff car park
10	Tennis court
11	F Block, classroom building, brick, GI roof, bearers and joists
12	Part Q Block, GI awning, concrete hardstand, canteen building
13	Canteen brick building, GI roof
14	L Block, weatherboard clad, GI roof, bearers and joists, classroom
15	G Block, brick building, tile roof, bearers and joists, classroom
16	Courtyard, shad cloth, concrete hardstand
17	Storage shed (archives), brick building, GI roof, concrete slab
18	Demountable, fibro/GI
19	H Block, classroom brick building, GI roof, bearers and joists
20	I Block, classroom, weatherboard clad, GI roof (bearers and joists)
21	AC playground surface
22	Play area, GI awning, AC surface
23	S Block, library, brick/GI building, GI roof concrete slab
24	R Block, OOSH building, weatherboard clad building, GI roof, bearers and joists
25	Toilets
26	Electrical distribution
27	Sports storeroom
28	Maintenance room, mowers, fuel, pesticides, cleaning products
29	Cricket pitch

SF# - Site Feature Number

LEGEND

- Site Boundary
- Lot Boundary
- (#) Site Feature Number
- Slope

0 15 30 45 60 75m

Scale 1:1500

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Various Lots
52A Moxhams Road, Northmead

Site Layout and Features

Drawing No: 20429/2-AA1
Job No: 20429/2
Drawn By: MH
Date: 13 October 2023
Checked By: JH/JX

File No: 20429-2
Layers: 0, AA1

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LEGEND

Site Boundary

Borehole

0 15 30 45 60 75m

Scale 1:1500

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Borehole Locations

Drawing No: 20429/6-AA1
Job No: 20429/6
Drawn By: MH
Date: 3 October 2023
Checked By: JH/JX/IJ

File No: 20429-6
Layers: 0, AA1

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LEGEND

Site Boundary

Borehole

0 15 30 45 60 75m

Scale 1:1500

Location of Concern / Contamination	Depth (m)	Contaminant	Asbestos (% w/w)
BH5	0.0-0.15	Asbestos (Bonded ACM) in 500mL soil sample	0.01%
	0.0-0.8	Asbestos (Bonded ACM) inclusion in fill	-
Site Assessment Criteria (SAC)	0.01% w/w for bonded ACM in soil 0.001% w/w for AF in soil 0.001% w/w for FA in soil No Visual Asbestos for surface soil		

Notes: AF, FA : Asbestos Fines, Fibrous Asbestos
ACM : Asbestos Containing Material

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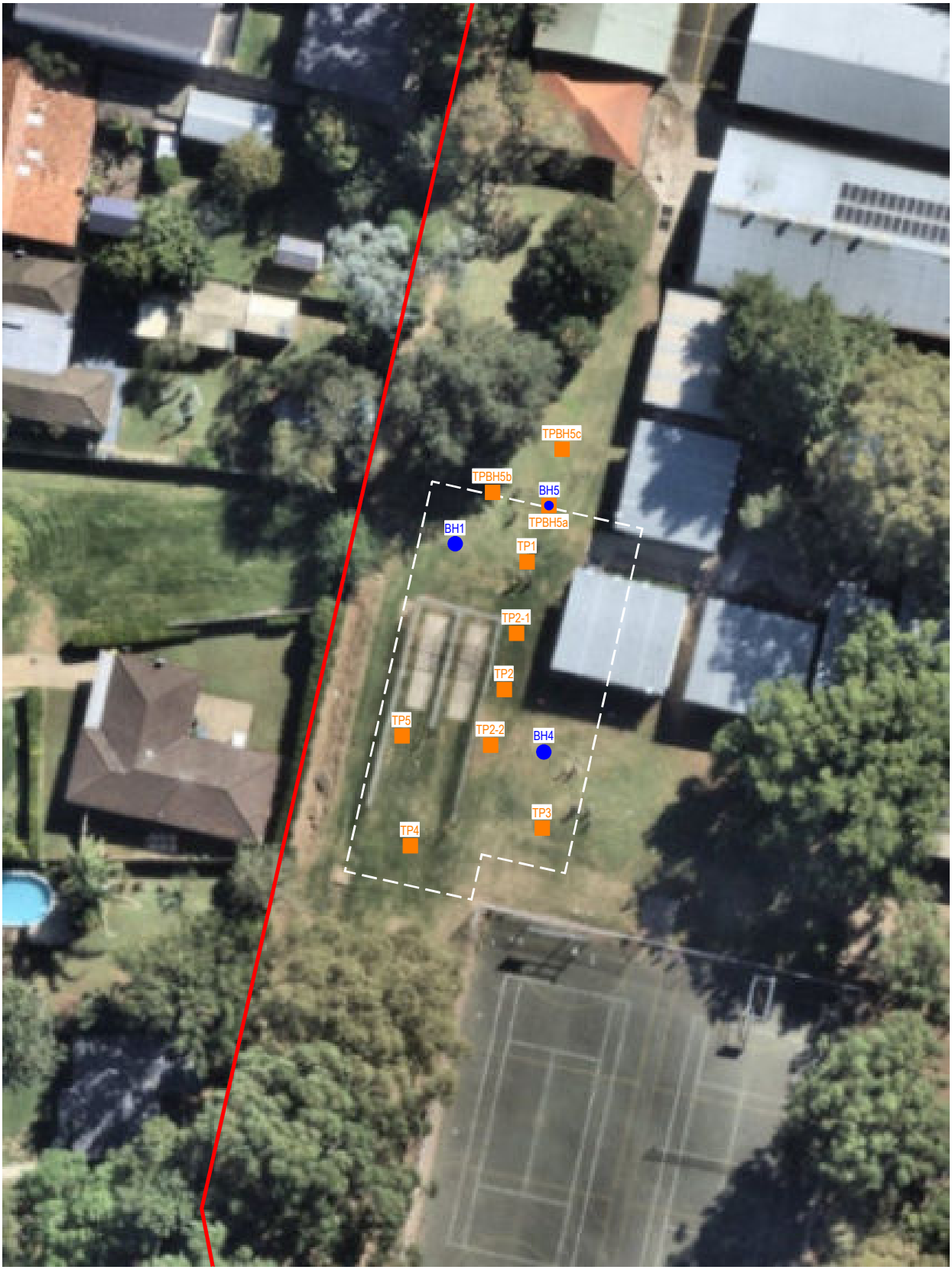
Location of Concern/Contamination

Drawing No: 20429/6-AA2
Job No: 20429/6
Drawn By: MH
Date: 13 October 2023
Checked By: JX

File No: 20429-6
Layers: 0, AA2



Imagery © NearMap.com

LEGEND

- Site Boundary
- Proposed Building Footprint
- Borehole (September 2023)
- Test Pit (November 2024)

0 5 10 15 20 25m

Scale 1:500

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Various Lots
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Detailed Test Pit Locations

Drawing No: 20429/10-AA1
Job No: 20429/10
Drawn By: MH
Date: 11 November 2024
Checked By: MA

File No: 20429-10
Layers: 0, AA1

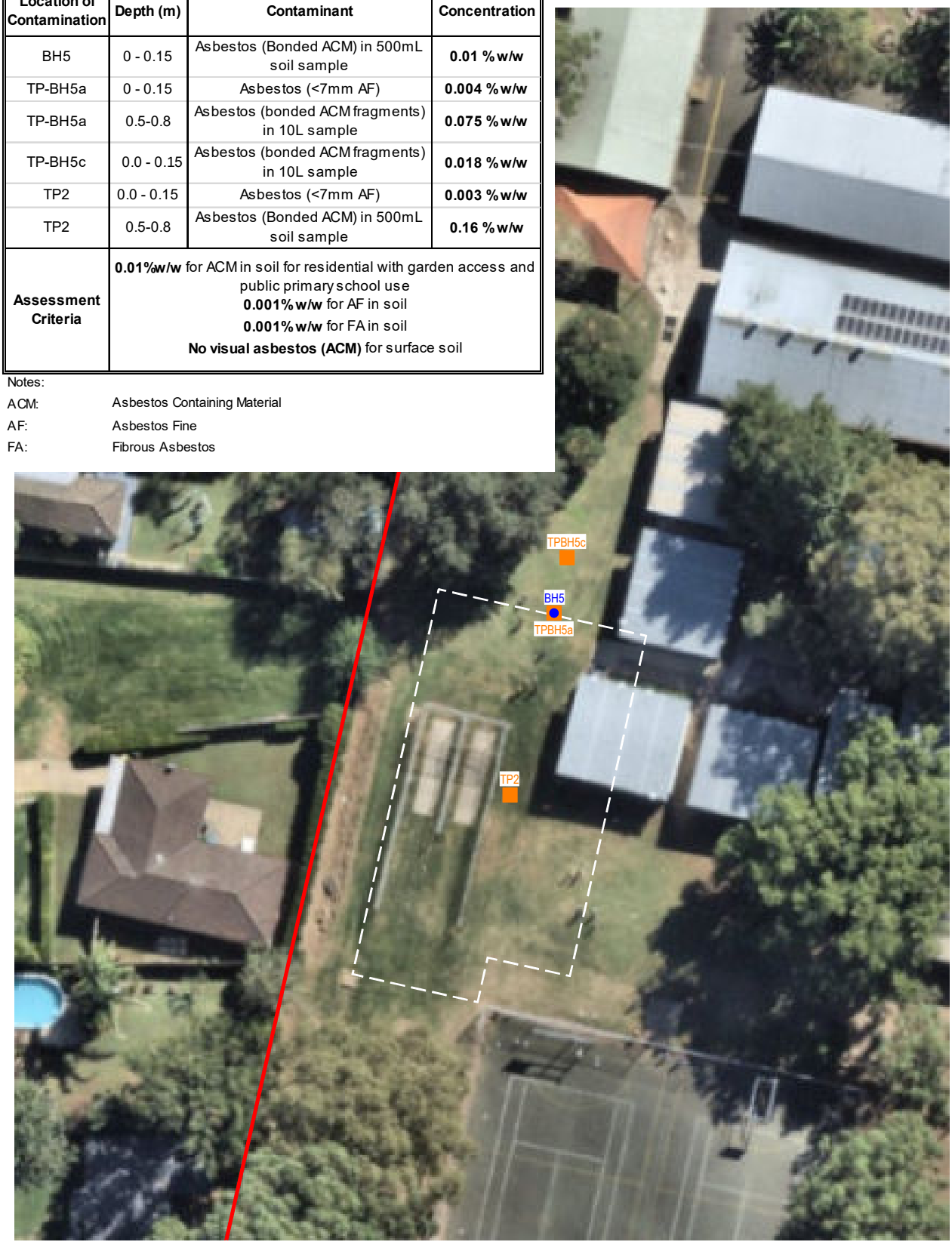
Location of Contamination	Depth (m)	Contaminant	Concentration
BH5	0 - 0.15	Asbestos (Bonded ACM) in 500mL soil sample	**0.01 %w/w**
TP-BH5a	0 - 0.15	Asbestos (<7mm AF)	**0.004 %w/w**
TP-BH5a	0.5-0.8	Asbestos (bonded ACM fragments) in 10L sample	**0.075 %w/w**
TP-BH5c	0.0 - 0.15	Asbestos (bonded ACM fragments) in 10L sample	**0.018 %w/w**
TP2	0.0 - 0.15	Asbestos (<7mm AF)	**0.003 %w/w**
TP2	0.5-0.8	Asbestos (Bonded ACM) in 500mL soil sample	**0.16 %w/w**
Assessment Criteria	**0.01%w/w** for ACM in soil for residential with garden access and public primary school use **0.001% w/w** for AF in soil **0.001% w/w** for FA in soil **No visual asbestos (ACM)** for surface soil		

Notes:

ACM: Asbestos Containing Material

AF: Asbestos Fine

FA: Fibrous Asbestos



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LEGEND

Site Boundary

Proposed Building Footprint

Borehole (September 2023)

Test Pit (November 2024)

0 5 10 15 20 25m

Scale 1:500

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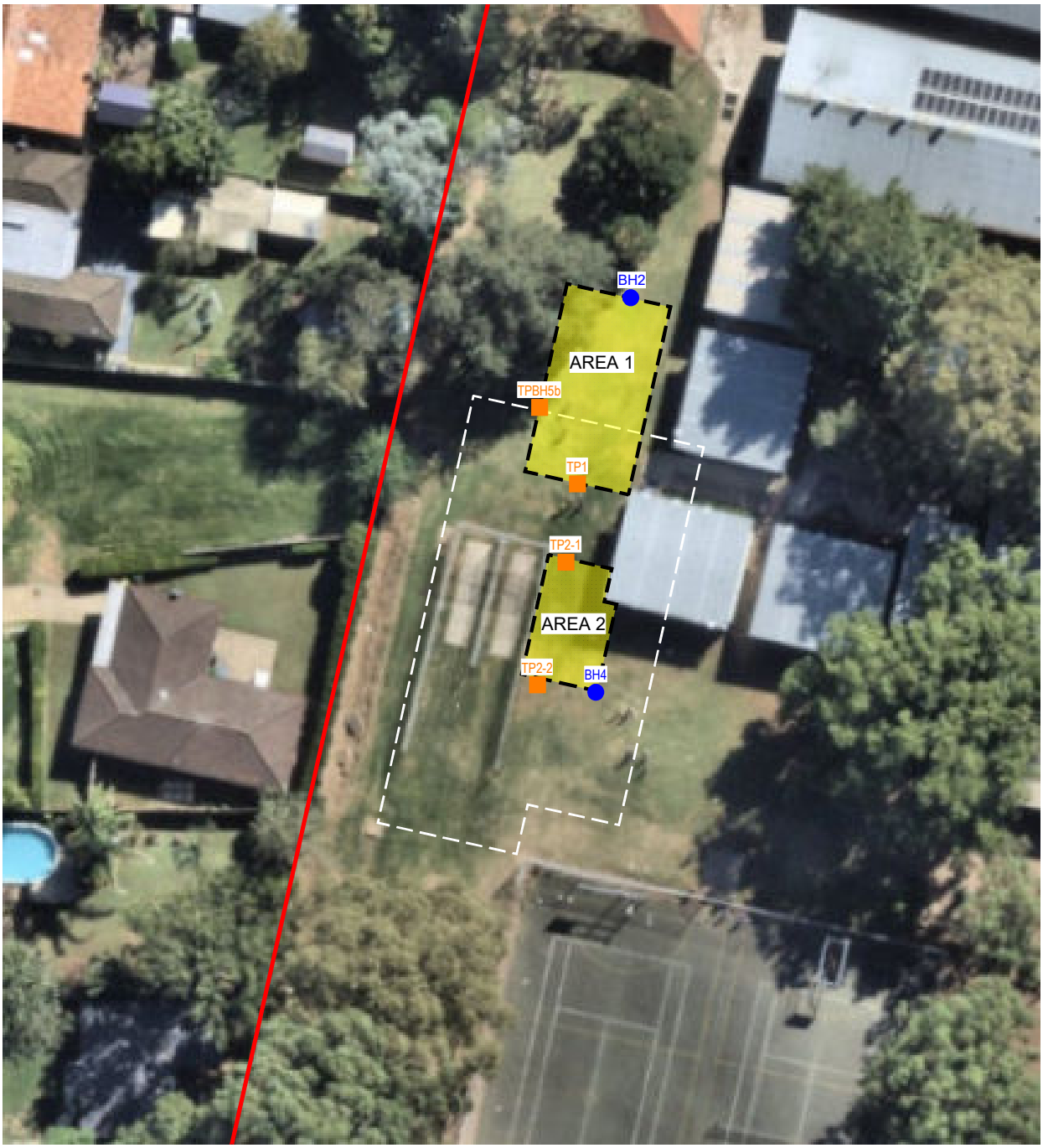
Locations of Contamination

Drawing No: 20429/10-AA2
Job No: 20429/10
Drawn By: MH
Date: 20 November 2024
Checked By: MA

File No: 20429-10
Layers: 0, AA2



LEGEND

Imagery © NearMap.com

- Site Boundary
- Proposed Building Footprint
- Area to be Remediated
- Borehole (September 2023)
- Test Pit (November 2024)

0 5 10 15 20 25m

Scale 1:500

AREA	MATERIAL	ESTIMATED AREA (sq. m)	ESTIMATED THICKNESS	ESTIMATED VOLUME (cu. m)	CONTAMINANT	INCLUSION	REMEDIATION METHOD
1	Silty Sand	130	Ranging from about 0.5m to 1.0m	98	Asbestos (ACM & AF)	FCP (bonded ACM) & brick fragments	Excavation & Landfill Disposal
2	Silty Sand	60	Ranging from about 0.5m to 1.0m	45	Asbestos (ACM & AF)	FCP (bonded ACM) & brick fragments	Excavation & Landfill Disposal

Notes: ACM: Asbestos Containing Material AF: Asbestos Fines FCP: Fibro-cement piece

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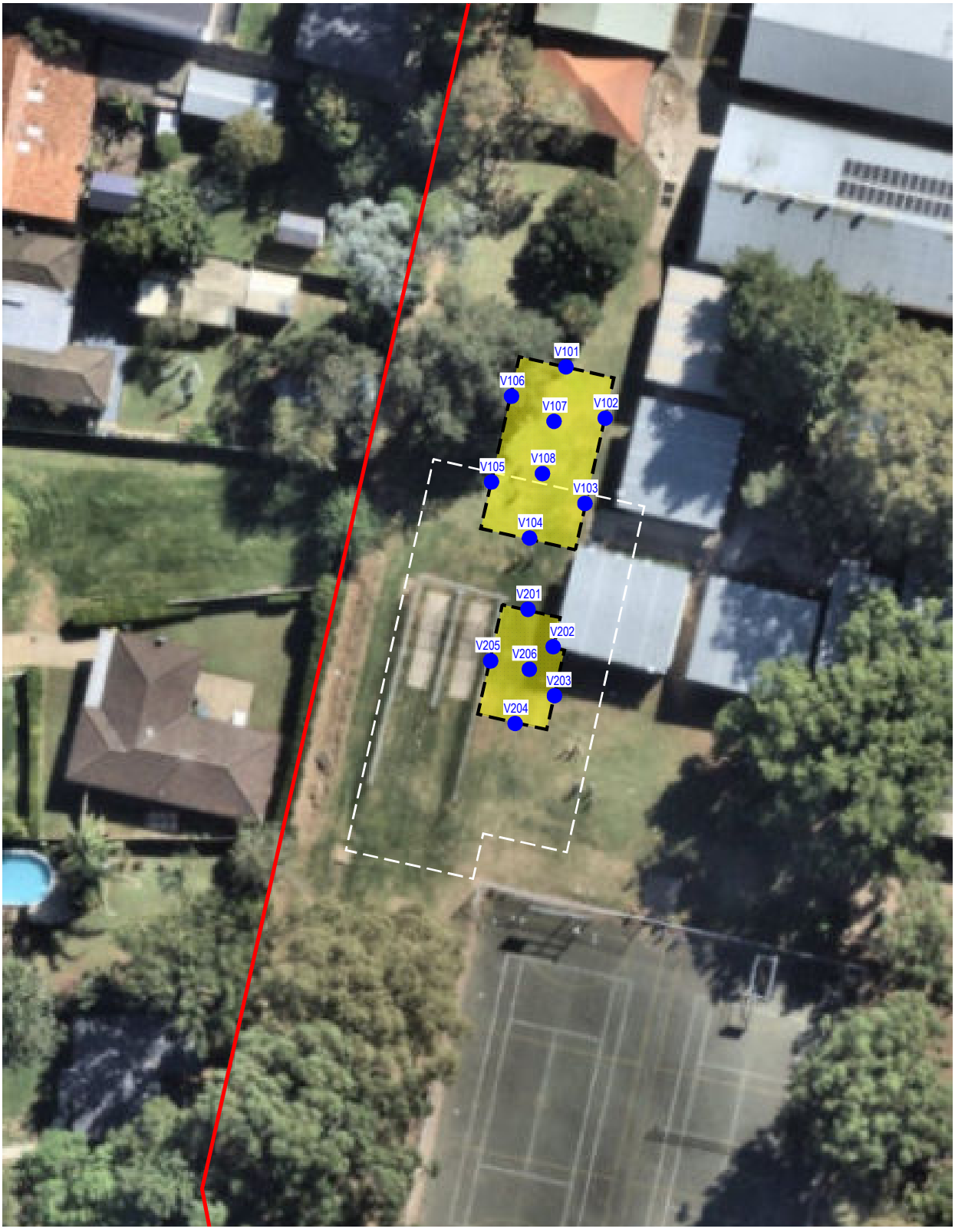
Areas to be Remediated

Drawing No: 20429/13-AA1
Job No: 20429/13
Drawn By: MH
Date: 7 March 2025
Checked By: JX

File No: 20429-13
Layers: 0, AA1



Imagery © NearMap.com

LEGEND

- Site Boundary
- Proposed Building Footprint
- Area to be Remediated
- Proposed Validation Sample

0 5 10 15 20 25m

Scale 1:500

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Proposed Validation Sample Locations

Drawing No: 20429/13-AA2
Job No: 20429/13
Drawn By: MH
Date: 14 March 2025
Checked By: JX

File No: 20429-13
Layers: 0, AA2

APPENDIX B

WASTE CLASSIFICATION SUMMARY TABLES WC1 TO WC6

Table WC1	*Metals*
Table WC2	*Total Recoverable Hydrocarbons (TRH), Benzene Toluene Ethylbenzene Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAH) & Organochlorine Pesticides (OCP)*
Table WC3	*Scheduled Chemicals*
Table WC4	*Polychlorinated Biphenyls (PCB)*
Table WC5	*Asbestos*
Table WC6	*Waste Classification – Area1 & Area 2*

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TABLE WC1
METALS
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

		METAL (mg/kg)							
Sample Location	Depth (m)	ARSENIC	CADMIUM	CHROMIUM (Total)	COPPER	LEAD	MERCURY	NICKEL	ZINC
BH4	0.0-0.15	6	1.1	13	50	81	0.06	9.6	190
BH4	1.15-1.25	3	<0.3	18	<0.5	5	<0.05	0.9	6
BH5	0.0-0.15	9	<0.3	18	8	38	0.11	3.0	45
BH5	0.85-0.95	13	<0.3	64	5.2	57	<0.05	1.2	12
TPBH5c	0.0-0.15	2	<0.3	14	6.2	32	0.17	1.3	32
TP1	0.0-0.15	7	<0.3	8.9	21	58	0.11	4.5	180
TP2	0.0-0.15	7	0.4	11	24	92	0.12	5.9	370
TP2	0.5-0.8	6	<0.3	15	15	46	0.1	3.9	130
DDS1		10	0.4	16	23	71	0.16	5.0	150
DSS1	-	14	<0.4	17	28	65	0.2	6	110
Limit of Reporting (LOR) (SGS)		1	0.3	0.5	0.5	1	0.05	0.5	2
Practical Quantitation Limit (PQL) (Env)		4	0.4	1	1	1	0.1	1	1
Maximum		14	1.1	64	50	92	0.2	9.6	370

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TABLE WC2
TOTAL PETROLEUM HYDROCARBONS (TPH), BTEX, POLYCYCLIC AROMATIC HYDROCARBONS (PAH) & ORGANOCHLORINE PESTICIDES (OCP)
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

		TRH (mg/kg)		BTEX (mg/kg)				PAH(mg/kg)		OCP (mg/kg)
Sample Location	Depth (m)	C6-C9	C10-C36	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES (TOTAL)	BENZO(a)PYRENE (BaP)	TOTAL PAHs	ENDOSULFAN (TOTAL) [1]
BH5	0.0-0.15	<20	<110	<0.1	<0.1	<0.1	<0.3	0.2	1.6	<0.3
TPBH5c	0.0-0.15	<20	<110	<0.1	<0.1	<0.1	<0.3	0.2	2.5	<0.3
TP1	0.0-0.15	<20	230	<0.1	<0.1	<0.1	<0.3	0.2	1.5	<0.3
TP2	0.0-0.15	<20	240	<0.1	<0.1	<0.1	<0.3	0.2	1.6	<0.3
DDS1		<20	<110	<0.1	<0.1	<0.1	<0.3	0.1	0.5	<0.3
DSS1	-	<25	<50	<0.2	<0.5	<1	<1	0.1	1.6	<0.3
Limit of Reporting (LOR) (SGS)		20	110	0.1	0.1	0.1	0.3	0.1	0.1	0.5
Practical Quantitation Limit (PQL) (Env)		25	50	0.2	0.5	1	1	0.05	0.1	0.1
Maximum		<25	240	<0.2	<0.5	<1	<1	0.2	2.5	<0.5

Notes:

1: Alpha, beta Endosulfan and Endosulfan Sulphate

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TABLE WC3
SCHEDULED CHEMICALS
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

Sample Location	Depth (m)	Scheduled Chemicals [1] (mg/kg)											
		HEXACHLOROBENZENE (HCB)	ALPHA, BETA, DELTA - BHC	GAMMA BHC (LINDANE)	HEPTACHLOR EPOXIDE	HEPTACHLOR	ALDRIN	DIELDRIN	ENDRIN	ENDRIN ALDEHYDE	DDD+DDE+DDT	CHLORDANE (alpha & gamma)	**Scheduled Chemicals**
BH4	0.0-0.15	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.6	<0.2	<50
BH5	0.0-0.15	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.6	<0.2	<50
TPBH5c	0.0-0.15	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.3	<0.2	<50
TP1	0.0-0.15	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.3	<0.2	<50
TP2	0.0-0.15	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.3	<0.2	<50
DDS1		<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.3	<0.2	<50
DSS1	-	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<50
Limit of Reporting (LOR) (SGS)		0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	-
Practical Quantitation Limit (PQL) (Env)		0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	-
Maximum		<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.2	<50

Notes:

1: Includes only Aldrin, Alpha BHC, Beta BHC, gamma BHC (Lindane), delta BHC, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, HCB & Isodrin

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TABLE WC4
POLYCHLORINATED BIPHENYLS (PCB)
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

Sample Location	Depth (m)	Polychlorinated Biphenyls (PCB (mg/kg)
BH5	0.0-0.15	<1
TPBH5c	0.0-0.15	<1
TP1	0.0-0.15	<1
TP2	0.0-0.15	<1
DDS1		<1
DSS1	-	<0.1
Limit of Reporting (LOR) (SGS)		1
Practical Quantitation Limit (PQL) (Env)		0.1
Maximum		<1

- Notes:
- a: Refer to attached ProUCL (Version 5.1) calculations for details.
- b: For statistical purposes, concentration less than LOR is assumed e

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TABLE WC5
ASBESTOS
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

Sample Location	Depth (m)	ASBESTOS
Soil Sample		
BH4	0.0-0.15	NOT DETECTED
BH5	0.0-0.15	DETECTED
BH5	0.5-0.8	NOT DETECTED
TPBH5a	0.0 - 0.15	DETECTED
TPBH5a	0.5 - 0.8	NOT DETECTED
TPBH5b	0.0 - 0.15	NOT DETECTED
TPBH5c	0.0 - 0.15	NOT DETECTED
TP1	0.0 - 0.15	NOT DETECTED
TP1	0.5 - 0.8	NOT DETECTED
TP2	0.0 - 0.15	DETECTED
TP2	0.5 - 0.8	DETECTED
TP2_1	0.0 - 0.15	NOT DETECTED
TP2 _ 2	0.0 - 0.15	NOT DETECTED

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TABLE WC6
WASTE CLASSIFICATION - AREA 1 & AREA 2
NORTHMEAD PUBLIC SCHOOL - 52A MOXHAMS ROAD NORTHMEAD
(Ref No: 20429/13)

Analyte	Total Concentration (mg/kg)					Leachable Concentration (mg/L)			Classification
	Maximum	CT1	CT2	SCC1	SCC2	Maximum	TCLP1	TCLP2	
Asbestos	Friable asbestos detected in the soil samples and asbestos containing material fragments (ACM) were identified								Special (Asbestos) Waste
Metals									
Arsenic	14	100	400	500	2,000	ND	5	20	General Solid Waste **
Cadmium	1.1	20	80	100	400	ND	1	4	General Solid Waste **
Chromium (VI)	64*	100	400	1,900	7,600	ND	5	20	General Solid Waste **
Lead	92	100	400	1,500	6,000	ND	5	20	General Solid Waste **
Nickel	9.6	40	160	1,050	4,200	ND	2	8	General Solid Waste **
Total Petroleum Hydrocarbons									
C6-C9	<25	650	2,600	650	2,600	NA	NA	NA	General Solid Waste **
C10-C36	240	10,000	40,000	10,000	40,000	NA	NA	NA	General Solid Waste **
Benzene	<0.2	10	40	18	72	ND	0.5	2	General Solid Waste **
Toluene	<0.5	288	1,152	518	2,073	ND	14.4	57.6	General Solid Waste **
EthylBenzene	<1	600	2,400	1,080	4,320	ND	30	120	General Solid Waste **
Xylenes (Total)	<1	1,000	4,000	1,800	7,200	ND	50	200	General Solid Waste **
Polycyclic Aromatic Hydrocarbons									
Benzo(a)pyrene (BaP)	0.2	0.8	3.2	10	23	ND	0.04	0.16	General Solid Waste **
Total PAHs	2.5	200	800	200	800	NA	NA	NA	General Solid Waste **
Organochlorine Pesticides									
Endosulfan (total) [1]	<0.5	60	240	108	432	ND	3	12	General Solid Waste **
Scheduled Chemicals [2]	<50	<50	<50	<50	<50	NA	NA	NA	General Solid Waste **
Polychlorinated Biphenyls (PCB)	<1	<50	<50	<50	<50	NA	NA	NA	General Solid Waste **

NOTES:

ND:	Not Determined
NA:	Not Applicable
TCLP:	Toxicity Characteristic Leaching Procedure
1:	Alpha, beta Endosulfan and Endosulfan Sulphate
2:	Includes only Aldrin, Alpha BHC, Beta BHC, gamma BHC (Lindane), delta BHC, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, HCB & Isodrin
CT1:	Contaminant concentration for defining General Solid Waste (without TCLP)
CT2:	Contaminant concentration for defining Restricted Solid Waste (without TCLP)
SCC1:	Contaminant concentration for defining General Solid Waste when combined with TCLP
SCC2:	Contaminant concentration for defining Restricted Solid Waste when combined with TCLP
TCLP1:	Leachable concentration for defining General Solid Waste when combined with SCC1
TCLP2:	Leachable concentration for defining Restricted Solid Waste when combined with SCC2
*:	Total Chromium
**:	Non-putrescible

APPENDIX C

UNEXPECTED FINDS MANAGEMENT PROTOCOL

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UNEXPECTED FINDS MANAGEMENT PROTOCOL

PROPOSED UPGRADES TO NORTHMEAD PUBLIC SCHOOL
52A MOXHAMS ROAD, NORTHMEAD

In the event that unexpected finds and /or suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos sheeting/pieces/pipes, ash material, imported fill (which are different to those encountered during the previous assessments), etc.) are encountered during future demolition works / earthworks / site preparation, the following actions are to be undertaken.

Management of unexpected finds and / or suspect materials
If unexpected finds and / or suspect materials are encountered:

- Works are to be ceased.
- An environmental consultant is to be engaged to take appropriate sampling and testing of contaminants of potential concern at a nominated rate in accordance with current NSW EPA guidelines.
- If contamination is identified, the contaminated materials must be disposed of at an EPA licensed landfill facility with an appropriate waste classification.

Management of bonded asbestos containing material (ACM)
If ACM is encountered, the following measures are to be implemented:

- Engage a Class B licensed bonded asbestos contractor.
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA.
- Competent personnel or a SafeWork NSW Licensed Asbestos Assessor or a Professional Hygienist should be engaged to provide a clearance certificate.

Management of friable asbestos within the soil
It is recommended that the following measures are implemented if friable asbestos is encountered:

- Engage a Class A licensed contractor for friable asbestos
- Removal of the asbestos waste must be carried out in accordance with the requirements of the regulators, such as SafeWork NSW and NSW EPA
- A SafeWork NSW Licensed Asbestos Assessor or a Professional Hygienist must be engaged to provide a clearance certificate

APPENDIX D

ENVIRONMENTAL NOTES

IMPORTANT INFORMATION REGARDING YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Geotechnique Pty Ltd, using guidelines prepared by the ASFE (Associated Soil and Foundation Engineers). The notes are offered to assist in the interpretation of your environmental site assessment report.

REASONS FOR AN ENVIRONMENTAL ASSESSMENT

Environmental site assessments are typically, though not exclusively, performed in the following circumstances:

- As a pre-acquisition assessment on behalf of either a purchaser or a vendor, when a property is to be sold
- As a pre-development assessment, when a property or area of land is to be redeveloped, or the land use has changed e.g. from a factory to a residential subdivision
- As a pre-development assessment of greenfield sites, to establish baseline conditions and assess environmental, geological and hydrological constraints to the development of e.g. a landfill
- As an audit of the environmental effects of previous and present site usage

Each circumstance requires a specific approach to the assessment of soil and groundwater contamination. In all cases the objective is to identify and if possible quantify the risks that unrecognised contamination poses to the ongoing proposed activity. Such risks may be both financial (clean-up costs or limitations in site use) and physical (health risks to site users or the public).

ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination within a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which did not show signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant that may occur; only the most likely contaminants are screened.

AN ENVIRONMENTAL SITE ASSESSMENT REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

In the following events and in order to avoid cost problems, you should ask your consultant to assess any changes in the conclusion and recommendations made in the assessment:

- When the nature of the proposed development is changed e.g. if a residential development is proposed, rather than a commercial development
- When the size or configuration of the proposed development is altered e.g. if a basement is added
- When the location or orientation of the proposed structure is modified
- When there is a change of land ownership, or
- For application to an adjacent site

ENVIRONMENTAL SITE ASSESSMENT FINDINGS ARE PROFESSIONAL ESTIMATES

Site assessment identifies actual sub-surface conditions only at those points where samples are taken, when they are taken. Data obtained from the sampling and subsequent laboratory analyses are interpreted by geologists, engineers or scientists and opinions are drawn about the overall sub-surface conditions, the nature and extent of contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional, no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, however, steps can be taken to help minimise the impact. For this reason site owners should retain the services of their consultants throughout the development stages of the project in order to identify variances, conduct additional tests that may be necessary and to recommend solutions to problems encountered on site.

Soil and groundwater contamination is a field in which legislation and interpretation of legislation by government departments is changing rapidly. Whilst every attempt is made by Geotechnique Pty Ltd to be familiar with current policy, our interpretation of the investigation findings should not be taken to be that of the relevant authority. When approval from a statutory authority is required for a project, approval should be directly sought.

STABILITY OF SUB-SURFACE CONDITIONS

Sub-surface conditions can change by natural processes and site activities. As an environmental site assessment is based on conditions existing at the time of the investigation, project decisions should not be based on environmental site assessment data that may have been affected by time. The consultant should be requested to advise if additional tests are required.

ENVIRONMENTAL SITE ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND CLIENTS

Environmental site assessments are prepared in response to a specific scope of work required to meet the specific needs of specific individuals e.g. an assessment prepared for a consulting civil engineer may not be adequate to a construction contractor or another consulting civil engineer.

An assessment should not be used by other persons for any purpose or by the client for a different purpose. No individual, other than the client, should apply an assessment, even for its intended purpose, without first conferring with the consultant. No person should apply an assessment for any purpose other than that originally contemplated, without first conferring with the consultant.

MISINTERPRETATION OF ENVIRONMENTAL SITE ASSESSMENTS

Costly problems can occur when design professionals develop plans based on misinterpretation of an environmental site assessment. In order to minimise problems, the environmental consultant should be retained to work with appropriate design professionals, to explain relevant findings and to review the adequacy of plans and specifications relative to contamination issues.

LOGS SHOULD NOT BE SEPARATED FROM THE REPORT

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists, based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these would not be redrawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however, contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. Should this occur, delays and disputes, or unanticipated costs may result.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of sub-surface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations, such as contractors.

READ RESPONSIBILITY CLAUSES CLOSELY

An environmental site assessment is based extensively on judgement and opinion; therefore, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. In order to aid in prevention of this problem, model clauses have been developed for use in written transmittals. These are definitive clauses, designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment and you are encouraged to read them closely. Your consultant will be happy to give full and frank answers to any questions you may have.