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Remediation Action Plan

Stage 1 - St Mary's Intermodal Freight Terminal
Lot 2 Forrester Road, St Mary's, NSW

Prepared for
Pacific National (NSW) Pty Ltd

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Table of Contents

	Page
1. Introduction.....	1
2. Objectives of the RAP	1
3. Site Information	2
3.1 Site Description.....	2
4. Previous Contamination Investigations.....	2
4.1 PB (2015).....	3
4.2 ERM (2005a).....	3
4.3 ERM (2005b).....	3
4.4 ERM (2005c).....	4
4.5 DP (March 2019a) Preliminary Site Investigation.....	4
4.6 DP (March 2019b) Supplementary Contamination Assessment	5
4.7 Additional Information	6
4.8 Contamination Summary	6
5. Remediation Options.....	7
6. Remediation Acceptance Criteria	8
7. Personnel and Responsibilities	9
8. Remediation Strategy.....	9
8.1 Remediation Procedures and Sequence.....	9
8.2 Remediation/Disposal Methodology	11
8.2.1 Waste Classification.....	11
8.2.2 Excavation and Off-Site Disposal of Soils	11
8.2.3 Treatment of Asbestos Contaminated Soils	11
8.2.4 Containment Cell.....	13
8.3 Site Establishment	13
8.4 Contingencies for Unexpected Finds.....	14
8.5 Minimisation of Cross-Contamination	14
8.6 Waste Disposal.....	15
8.7 Contingency for Stockpiling of Contaminated Material.....	15
8.8 Loading and Transport of Spoil.....	15
8.9 Disposal of Material	15
8.10 Materials for use in Backfilling and Imported Fill	16
9. Validation Plan	16
9.1 Validation Scope	16
9.1.1 Validation Data Quality Objectives (DQO).....	16
9.1.2 Validation of ACM Impacted Areas.....	17
9.2 Quality Assurance Plan.....	18
9.2.1 Sample Collection and Handling.....	18
9.2.2 Field QA/QC.....	18
9.2.3 Laboratory Quality Assurance and Quality Control.....	18
9.2.4 Achievement of Data Quality Objectives	18
9.2.5 Validation Reporting.....	18
10. Site Management Plan.....	19
10.1 Site Operations	20
10.2 Environmental Management.....	20
10.3 Work Health and Safety.....	21
11. Conclusion.....	21
12. References	21
13. Limitations	22

Appendix A: About This Report

Appendix B: Drawings 1 to 4

Appendix C: Site Photographs

Report on Remediation Action Plan

Stage 1 - St Mary's Intermodal Freight Terminal

Lot 2 Forrester Road, St Mary's, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Urbanco Group Pty Ltd (Urbanco), on behalf of Pacific National (NSW) Pty Ltd (Pacific National) to produce a Remediation Action Plan (RAP) for the proposed St Marys Freight Hub at Lot 2 Forrester Road, St Mary's, NSW (the Site, as shown on Drawing 1 in Appendix B).

The proposed St Marys Freight Hub is a State Significant Development under the provision of Schedule 1, Clause 19(1b) of the State Environmental Planning Policy - State and Regional Development 2011. The site has an approximate total area of 11 ha and the proposed development will comprise upgrade of the existing rail infrastructure sidings, construction of hardstand areas, new internal access roads, wash bay, repair bay, office building, fuel storage area, container shed, transport shed, vehicle parking bays and reach stacker/forklift parking bays, and other ancillary development.

Previous investigations, including a Preliminary Site Assessment (PSI) (ref: 94525.00) and Supplementary Contamination Investigation (SCA) (ref: 94525.02), identified that the site can be made suitable for the proposed development subject to the successful remediation and validation of asbestos impacted soil at PAEC 1 (former stockpile footprint) located in the far northern portion of the site.

The RAP is required to support the redevelopment of the site. The purpose of the RAP is to establish appropriate remediation objectives, strategies, methodologies and validation processes to enable remediation of PAEC 1 defined by the SCA in accordance with EPA requirements.

The RAP has been developed based on available standards and guidelines prepared by the relevant authorities, and the results of the previous contaminated land investigations undertaken by DP at the site as discussed in Section 4.

2. Objectives of the RAP

The main objective of the RAP is to facilitate the remediation of the site in an acceptable manner, to a condition suitable for the proposed commercial/industrial development.

The specific objectives of this RAP are therefore to provide a strategy for site remediation which:

- Minimises impacts from the site on the environment and on public health and safety during site remediation;
- Maximises the protection of workers involved with site remediation;

- Renders the site safe, from an environmental perspective, for the proposed land use and substantially reduces potential exposure pathways to contaminants in accordance with remediation acceptance criteria (RAC) as defined in this RAP; and
- Minimises impacts on the local environment during and following site remediation.

3. Site Information

The site is located in the suburb of St Marys within the local government area of Penrith City Council ("Council") and is identified as:

- Part Lot 2 Deposited Plan (D.P.) 876781 (Lot 2 – approximately 9.95 ha of the site)
- Part Lot 2 and 3 in D.P. 876781 (Lot 3 – approximately 0.75 ha of the site); and
- Part Lot 196 in D.P. 31912 (Lot 196 – approximately 0.35 ha of the site).

The broader site (ie land owned by Pacific National) is identified as Lots 2 and 3 in D.P. 876781, Lot 196 in D.P. 31912, Lot 2 in D.P. 734445 and Lot 2031 in D.P. 815293.

The location and boundary of the site (and the broader site) are shown on Drawing 1, Appendix B.

3.1 Site Description

The site was vacant at the time of the PSI and SCA. The site generally consists of cleared land with exposed filled surfaces, with over-grown vegetation present in some parts. Multiple overhead transmission lines (high and low voltage) traverse the site. Multiple stockpiles of soil and construction material are present throughout the site. Prominent site features are shown on Drawing 2, Appendix B. Photographic Plates showing site conditions are presented in Appendix C.

4. Previous Contamination Investigations

DP is aware of the following investigations previously undertaken at the site and its vicinity:

- Parsons Brinckerhoff Australia Pty Limited (PB) report on *Proposed Container Freight Terminal at 6-8 Forrester Road, St Marys, Geotechnical Investigation Report, Document No: 2135587S-GEO-REP-350A Rev A* dated 2 September 2015 (PB, 2015);
- Environmental Resources Management Australia Pty Ltd (ERM) report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 1 Environmental Site Assessment, Project No: 0030809 Draft* dated 15 April 2005 (ERM, 2005a);
- ERM report on *55 - 67 and 69 - 81 Lee Holm Drive, St Marys, NSW, Phase 2 Soil and Groundwater Investigation, Project No: 0030809RP2V3 Final* dated 30 August 2005 (ERM, 2005b);
- ERM report on *55-67 and 69-81 Lee Holm Drive, St Marys, NSW, Validation Report, Project No: 0021594RP1 Final* dated 22 December 2005 (ERM, 2005c);

- DP (March, 2019a) *Preliminary Site Contamination Investigation, Proposed St Mary's Freight Hub, 2 Forrester Road, St Mary's NSW*. Project 94525.00.R.001.Rev0; and
- DP (March, 2019b) *Supplementary Contamination Investigation, Proposed St Mary's Freight Hub, 2 Forrester Road, St Mary's NSW*. Project 94525.02.R.001.Rev1.

The key findings of the above-listed investigations that are relevant for this RAP are summarised in the following sub-sections. The boundaries of former investigations are shown on Drawing 3, Appendix B.

4.1 PB (2015)

PB (2015) was a preliminary geotechnical investigation undertaken within the Lot 2 portion of the site to assess the geotechnical properties of sub-surface fill which included excavation of eight test pits to a maximum depth of 4.2 m bgl within the site and the samples collected from the test pits were analysed for various geotechnical parameters. No contamination testing was undertaken during PB (2015).

Fill (generally uncontrolled) was encountered to depths of between 0.5 m – 3 m in all eight test pits during PB (2015) overlying residual and alluvium soils.

4.2 ERM (2005a)

ERM (2005a) was a due diligence assessment undertaken within Lot 2, D.P 734445 and Lot 3, (i.e. a portion of the site and the broader site) to assess potential liabilities and risk to the future land owner from any soil and groundwater contamination and environmental compliance issues associated with the land. ERM (2005a) comprised a desktop review of site history, permits/authorisations and a site walkover.

Based on the assessment completed, ERM (2005a) identified a risk of soil and groundwater contamination within Lot 2, D.P 734445 and Lot 3, and recommended undertaking a Phase 2 contamination investigation.

4.3 ERM (2005b)

ERM (2005b) was undertaken within Lot 2, D.P 734445 and Lot 3 to characterise fill and the underlying natural material at these lots and to assess the potential for soil and groundwater contamination in Lot 2, D.P 734445 from the historic site activities. DP was only provided with the executive summary of ERM (2005b) that provided no information on the number and depths of ERM (2005b) investigation. A review of Figure 2 included in the validation report (ERM, 2005c) indicates that 88 test pits were excavated and three monitoring wells were installed at these two lots during ERM (2005b).

ERM (2005b) reported the following exceedances above the ERM adopted site assessment criteria (SAC) in the soil samples analysed:

- Within Lot 2, D.P 734445: Concentration of TRH C₁₀-C₃₆ in soil samples from TP 001 (0.15 m), TP 019 (0.1 m) and TP 088 (0.2 m), and the concentration of PAH in soil sample from TP 001 (0.15 m); and

- Within Lot 3: Concentration of toluene in soil sample MW 1 (0.1 m). In addition, a fragment of bonded cement sheet was also observed in fill material at TP 039 (0.1 m). Asbestos fibres were also reported in sample TP 035 (0.1 m).

ERM (2005b) concluded that the site was suitable for the ongoing commercial/industrial use provided contamination identified at the above-mentioned locations was remediated and validated. DP notes that the executive summary of ERM (2005b) provides no information on groundwater assessment.

4.4 ERM (2005c)

ERM (2005c) comprised excavation of impacted fill material from the six hot spots identified during ERM (2005b) and decommissioning of three monitoring wells (MW 1 to MW 3). Impacted fill was excavated down to the underlying natural soil at former intrusive locations (TP 001, TP 019, TP 035, TP 039, TP 088 and MW 1), none of which are within the current site. All target analytes were reported below the relevant validation criteria in the soil samples analysed from the remediation excavations.

Based on the remediation and validation works completed, ERM (2005c) concluded Lot 2, D.P 734445 and Lot 3 as suitable for the ongoing commercial/industrial use.

4.5 DP (March 2019a) Preliminary Site Investigation

DP completed a PSI of the Site in March 2019 which included completion of the following scope:

- A site walkover and a desktop review of site history information were undertaken to identify PAEC and contaminants of potential concern (COPC) which may arise from previous land uses;
- Drilling of four bore holes to a maximum depth of 10.5 m below ground level (bgl) or 2 m below the encountered groundwater level. Installation of a groundwater monitoring well in each bore hole;
- Excavation of eight test pits to a minimum depth of 0.5 m into natural soil, or to a maximum depth of 3.3 m;
- Collection of representative soil samples from the bore holes and test pits at surface and every 0.5 m depth intervals to a maximum depth of investigation;
- Collection of representative groundwater samples from monitoring wells;
- Laboratory analysis of selected soil and groundwater samples for various contaminants of potential concern (COPC) associated with filling; and
- Laboratory analysis of suspected fragments of bonded asbestos-containing material (ACM) for asbestos identification.

The results of the PSI identified the following PAEC that required further investigation and/or remediation for the Site to be considered suitable for the proposed development:

- PAEC 1: Former building and stockpile footprints - A fragment of ACM was identified in one former stockpile footprint area in the far northern portion of the site;

- PAEC 3: Current Stockpiles - Multiple soil stockpiles were identified within the site. A limited visual assessment of the stockpiles was undertaken as part of the PSI. Given the preliminary nature of the PSI and the significant number/volume of soil stockpiles observed on-site, the presence of fill related COPC impact to stockpiles at the site could not be ruled out and therefore required further investigation;
- PAEC 4: Soil surrounding timber power poles - Five timber power poles were identified within the site. Leached timber treatment chemical from poles have the potential to impacted soil in close vicinity to the poles. Further investigation is required to determine the contamination status and any remediation requirements for PAEC 4 ;
- PAEC 5: Surficial ACM - Surficial ACM was identified in one area of the site associated with a former stockpile footprint (PAEC 1). DP also considered that there was a potential for surficial ACM to also be present within the rail corridor associated with abandoned train brake pads;
- PAEC 6: Fuel and chemical leaks and spills - There is a potential that any fuel and chemical leaks and spills of fuel from vehicles (and stored chemicals within the former structures) have a potential to contaminate soil at the site. A limited visual assessment of PAEC 6 was undertaken as part of the PSI assessment; and
- PAEC 9: The majority of the site was owned by James Hardie and Coy Pty Limited between 1969 and 1984. James Hardie sites are associated with manufacture and disposal of asbestos waste. Review of historic aerial photography during the period of Jamie Hardie ownership does not indicate evidence of the manufacture of asbestos (i.e. development of industrial type buildings) or filling with asbestos waste (i.e. no extensive disturbance areas) at the site.

4.6 DP (March 2019b) Supplementary Contamination Assessment

DP completed a Supplementary Contamination Assessment (SCA) to further assess the PAEC identified during the PSI as discussed in Section 4.5 to determine any remediation requirements (if any) for the site.

SCA field work was completed at the site between 19 and 22 March 2019 and included the following scope of works:

- Excavation of test pits and collection of soils samples from former building/stockpile foot prints (PAEC1), current soil stockpiles (PAEC3) and to investigate the potential for fuel and chemical leaks and spills (PAEC 6);
- Collection of surface soil samples from the vicinity of the base of five timber power poles (PAEC 4) and nearby to the railway corridor (PAEC 5); and
- Laboratory analysis of selected soil samples for the identified contaminants of concern (COC) associated with each PAEC.

Results of grid based test pits completed across the far northern area during the SCA identified concentrations of asbestos detected within the fragments of ACM in the 10 L bulk samples collected from filling in two test pits (TP205 and TP208) was calculated to exceed commercial / industrial HSLs.

The extent of ACM impact to fill was considered likely to be limited given that ACM was not detected at concentrations exceeding commercial / industrial HSLs in any of the remaining grid or delineation based samples completed within the far northern portion of the site.

4.7 Additional Information

Subsequent to the completion of DP (2019a), DP contacted the EPA in regard to its investigations of James Hardie asbestos legacy sites. DP understands that the EPA obtained information from Hardie Industries regarding up to 47 sites which were used to dispose of bulk asbestos waste and the EPA determined that 27 of the sites required inspections and assessment for asbestos contamination. Information provided in the EPA web site does not indicate that any of the sites are located within the Penrith City Council LGA.

4.8 Contamination Summary

Contamination investigations undertaken within the broader site boundary by ERM (2005b) identified concentrations of TRH, PAH, asbestos and toluene in soil above the ERM assessment criteria at six locations (TP001, TP019, TP035, TP039, TP088 and MW1). Impacted soils from all six locations identified in ERM (2005b) were remediated (ie. excavated and disposed) with the remaining soils reporting concentrations of COPC below the assessment criteria (as reported in ERM 2005c). Considering the remediation works undertaken by ERM, and given that the identified impacted soils were located outside of the Site boundary, impacts to the Site from the former contamination identified by ERM, was not considered a matter for concern. As such, no further consideration or comment is required.

Investigations undertaken at the Site by DP (the PSI) identified nine PAEC, six of which (PAEC 1, PAEC 3 to PAEC 6 and PAEC 9) required further investigation to assess for COPC. The remaining three (PAEC 2, PAEC 7 and PAEC 8) did not require further assessment. Following further investigation undertaken in the SCA, additional investigation or remediation was not considered necessary at PAEC 3, PAEC 4 to PAEC 6 and PAEC 9. However, identified ACM impact to fill was identified in the far northern portion of the site (PAEC 1) at concentrations that requires remediation for the site to be suitable for the proposed commercial/industrial redevelopment. It is the contamination identified at PAEC 1 that is to be addressed by this RAP. Based on delineation sampling completed to date the estimated approximate extent of fill soils requiring remediation in the far norther stockpile footprint is presented on Drawing 4 (Appendix B). The lateral extent of remediation will be further delineated through either additional test pit investigation or 'chase out' remediation. The vertical extent of remediation is generally expected to be limited to the depth of filling.

Nearby surface soils also require remediation due to an ACM fragment identified during the PSI on sites surfaces in the northern portion of the site.

It was recommended that a RAP be prepared, documenting how the management or remediation works are to be carried out and validated in accordance with EPA requirements, which is to be endorsed by NSW Department of Planning prior to the commencement of any earthworks or remediation works at the site. It was further noted that the management or remediation options should include delineation, excavation and validation followed by either off-site disposal or on-site burial at appropriate depths below the final design ground level and that the RAP should include an unexpected finds protocol.

5. Remediation Options

The preferred hierarchy for remediation of soil at contaminated sites in a decreasing order of preference, as set out in NEPC (2013) and outlined in NSW EPA *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme* 3rd Edition, 2018 (NSW EPA, 2018) is:

- 1) Onsite treatment of excavated soil (so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level); and
- 2) Offsite treatment of excavated soil (so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site).
- 3) Consolidation and isolation of the contaminant by containment within a properly designed barrier; and
- 4) Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material.

DP assessed selected remediation alternatives, taking into considerations their applicability for the Site, time constraints, economic feasibility, and potential environmental and health impacts. Off-site treatment is generally not viable for the contaminants observed at the site, therefore this option was not further considered at this time.

As requested by Pacific National, three remediation/disposal options have been included for material which fails the Remediation Acceptance Criteria (RAC) for consideration. These include offsite disposal, on-site treatment within an asbestos treatment area or the containment of material within a dedicated containment cell. The appropriate course of action and ongoing management requirements for the contaminated excavated material will be determined by the Environmental Consultant in consultation with Pacific National at the time of remediation.

The following table evaluates each of the remediation options for the site.

Table 1: Option Evaluation

Remediation Work	Advantages	Disadvantages
Removal of asbestos impacted soil	<ul style="list-style-type: none"> Time effective Removes risk with no further management required if all asbestos impacted soils are removed Record on S10.7 certificate (formerly Section 149) is avoided 	<ul style="list-style-type: none"> Requires relocation to landfill Potentially generates dust and asbestos fibres if poorly executed High relative cost

Remediation Work	Advantages	Disadvantages
On site Asbestos Treatment	<ul style="list-style-type: none"> Treated and validated soil does not require removal Record on S10.7 certificate (formerly Section 149) is avoided Removes risk with no further management required 	<ul style="list-style-type: none"> Usually not suitable for high levels of ACM May not be suitable if there is considerable additional demolition debris Not suitable for fibre generating materials (i.e. friable fragments) if encountered Potential to generate dust which requires management (need to consider proximity to sensitive receptors) Screening cannot be achieved in clayey soils, manual segregation would be required
Management <i>in situ</i> (cap and contain)	<ul style="list-style-type: none"> Minimal disturbance of soil and therefore minimal dust generation Minimal amount of sampling required Potentially lower cost and time delays, and greater confidence of outcomes 	<ul style="list-style-type: none"> Asbestos impacted soil remains on site and will need to be properly managed (long term management plan required) Level of site may need to be raised Planning authority approval would be required Record on S10.7 certificate (formerly Section 149) will be necessary (implication for property value)

6. Remediation Acceptance Criteria

The following table presents the adopted remediation acceptance criteria (RAC) for Asbestos, along with their source documents.

Table 2: Remediation Acceptance Criteria for Soil (RAC)

Contaminant	RAC	Rationale
Asbestos	<p><u>500 ml Sample:</u></p> <ul style="list-style-type: none"> 0.05% w/w of asbestos in soil with bonded ACM generally comprising 15% asbestos; 0.001% w/w FA and AF; and 	<p><u>500 ml Sample</u></p> <p>NEPC (2013) defines the various terminology for asbestos:</p> <p>Bonded ACM: Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve.</p> <p>FA: Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically un-bonded or was previously bonded and is now significantly degraded and crumbling.</p>

Contaminant	RAC	Rationale
	<ul style="list-style-type: none"> No visible asbestos on the ground surface. <p><u>50 g Sample:</u></p> <ul style="list-style-type: none"> The presence or absence of asbestos at a limit of reporting of 0.1 g/kg 	<p>AF: Asbestos fines including free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7mm x 7mm sieve.</p> <p>Given that the proposed land use is commercial / industrial, the 'Commercial / Industrial D' Asbestos Health Screening Levels (in accordance with Table 7, Schedule B1 of NEPC 2013) have been adopted.</p> <p><u>50 g Sample</u></p> <p>The presence or absence of asbestos at a limit of reporting of 0.1 g/kg has been adopted as the RAC for confirmation of the ATA visual validation.</p>

7. Personnel and Responsibilities

It is the site owner's responsibility to ensure that appropriate personnel are appointed to manage and conduct the remediation and validation works. This will include:

- The Principal's Representative (PR), who is responsible for overseeing the implementation of this RAP. The PR is responsible for ascertaining that the remediation works have been undertaken in accordance with the RAP;
- The Contractor, who will be responsible for conducting the general remedial works and managing the site. The contractor should appoint a Site Manager or other person responsible for implementation of this RAP. The Contractor will be responsible for preparing a list of contacts, including emergency contacts for the site operations and provision of signage at the site to allow the public to contact nominated site personnel out of hours;
- The Asbestos Contractor will be a suitably licensed and qualified contractor (AS A or AS B Licence holder) who will be responsible for the handling/removal of the asbestos-cement fragments or any other asbestos containing material which would be classified as asbestos works. The Asbestos Contractor and the contractor can be the same entity; and
- The Environmental Consultant will be responsible for providing supervision as necessary for the remedial works, providing advice as required and undertaking the validation works in accordance with this RAP. Supervision of the remedial works will be to assist with the contractors understanding of the RAP at the commencement of each phase.

8. Remediation Strategy

8.1 Remediation Procedures and Sequence

The procedures for the remediation process outlined below will rest with the Contractor and will depend upon the equipment to be used and the overall sequence of removal. It is the contractor's responsibility to devise a safe work method statement and to implement proper controls that enable the personnel undertaking the remediation to work in a safe environment. This RAP does not relieve the contractor(s) of their ultimate responsibility for occupational health and safety of their workers and to prevent contamination of areas outside the immediate workspace. This RAP sets out the minimum standards and guidelines for remediation which will need to be used in preparing individual method statements for each remediation location.

All asbestos excavation works must be undertaken by an appropriately licensed Asbestos Contractor. Works must comply with all NSW legislative requirements including (but not limited to) all SafeWork requirements, notification of works to SafeWork five days prior to work commencing, implementation of this RAP and the Asbestos Contractor's Work Method Statement, wearing of appropriate personal protective equipment (PPE) and air monitoring for asbestos fibres (where appropriate). An Environmental Consultant will provide information/reporting to the Asbestos Contractor as required enabling the Asbestos Contractor to undertake the work safely and in accordance with relevant NSW legislation.

DP recommends that the asbestos remediation contractor must be licensed for Class B asbestos removal. A Class B licence is suitable for the remediation related to fill in the northern portion impacted with asbestos given that asbestos at the site has been identified in the bonded (non-friable) form (i.e. ACM in good condition). It is recommended that air quality monitoring is undertaken by the environmental consultant during bonded ACM removal work.

All pieces of bonded ACM and material not suitable for commercial/industrial land use are to be manually removed as they are encountered during the remediation and bulk earthworks programme, and disposed off-site in accordance with regulatory requirements. The removal of these materials shall be recorded on daily field sheets that are to be copied and provided to the Environmental Consultation for inclusion in the validation report.

In the event that AF or FA are observed or identified during the remediation, works shall cease until a Class A asbestos removal license is obtained by the remediation contractor. A licenced asbestos assessor must undertake air quality monitoring for all removal work requiring a Class A asbestos removal licence.

The licensed asbestos remediation contractor must give written notice to WorkCover NSW at least five days before remediation work commences.

The following remediation methodology is proposed for the ACM impacted filling identified within the northern portion of the site:

1. Environmental Consultant to undertake air monitoring during the works.
2. Determine the remediation/disposal methodology to be adopted for the impacted materials (i.e. disposal / treatment / containment) as detailed in Section 9.2. All three options are suitable for the ACM impacted filling.
3. If the disposal option has been adopted, prepare a waste classification for the materials to facilitate off-site disposal to a licenced landfill.
4. Excavation of filling under full time supervision of the Environmental Consultant. Excavation will progress to chase out all filling observed within the side walls of the excavations, if present.
5. Depending on the remediation option selected, dispose materials or stockpile materials within an Asbestos Treatment Area (ATA) or dedicated stockpile area for containment as detailed in Section 9.2.3. If stockpiling is undertaken, the controls detailed in Section 9.7 will be required to be adopted.
6. Validation of the resultant remedial excavation surface and sidewalls, undertaken by the Environmental Consultant, including the collection of validation samples in accordance with Section 10.

7. If required, further excavation by the contractor to 'chase out' any additional impacted materials identified by the validation inspection and sampling which will be followed by further validation by the suitably qualified Environmental Consultant as required.
8. Survey of the full extent of the remediation areas, supply coordinates and produce a survey drawing showing the extent of the known location of the remediation area relative to proposed development layout.

8.2 Remediation/Disposal Methodology

8.2.1 Waste Classification

If materials are required to be disposed of at an off-site location, sampling and analysis of the materials at a frequency of 1 sample per 25 - 50 m³ of soil (dependent on stockpile volume) will be required to provide a classification of the materials for waste disposal according to the provisions of NSW EPA *Waste Classification Guidelines* (2014) (EPA, 2014b).

The material must be disposed of at a waste facility licensed to receive asbestos waste.

The tipping dockets will require to be provided to the Environmental Consultant for waste reconciliation purposes. In addition, any asbestos disposal must be tracked and reported to the EPA using WasteLocate.

8.2.2 Excavation and Off-Site Disposal of Soils

Prior to commencing with the remedial excavation of soils, the environmental consultant will establish the identity and extent of the ACM impacted soil to be remediated through this process.

Excavation of impacted soil should include over excavation of underlying soils to remove the full extent of all surficial ACM and potential ACM impacted soils. Excavated ACM and any asbestos impacted soils are to be disposed off-site to an appropriately licenced landfill in accordance with EPA (2014).

Validation of the remediation excavation will be undertaken in accordance with Section 10. A survey of the final remediation excavation areas and depths of any related excavations is to be undertaken and provided to the environmental consultant prior to final validation.

8.2.3 Treatment of Asbestos Contaminated Soils

If the asbestos treatment option is adopted, an asbestos treatment area (ATA) should be established at the site for treatment of ACM-impacted soils.

The following steps shall be undertaken for the remediation of materials contaminated with bonded ACM fragments, initially as a trial to demonstrate that screening/segregation (treatment) will meet the desired objectives:

- Excavation of ACM-impacted filling and transport to the designated ATA awaiting treatment;

- Spreading materials in a designated ATA in a layer no thicker than 0.1 m. Given the inherent heterogeneous distribution of bonded ACM in fill, it is recommended that impacted materials are treated in 10 to 40 m³ portions to minimise the potential for mixing of highly impacted soils with low/non impacted soils as part of the treatment process and to mitigate overall risks associated with potential cross-contamination;
- Inspection and removal by hand ("emu-bobbing") of the asbestos by the Remediation Contractor;
- Re-working and spreading the material across the ATA using appropriate plant/equipment, with the material being "emu-bobbed" by the Remediation Contractor. Clods of clay must be broken down/crushed as part of the spreading process. Each spreading will be recorded, which will specify the date, time, ID of stockpile, volume of material being treated, description of the soil, number of passes, number of asbestos finds per pass, and photographed;
- Repeating the spreading and "emu-bobbing" process iteratively until no bonded ACM fragments are observed on three consecutive complete passes by the Remediation Contractor and Environmental Consultant;
- Place recovered bonded ACM in a demarcated stockpiling/treatment/storage area with clear signage and fencing to limit access. Double bag bonded ACM fragments for temporary storage whilst on site in a secure designated area awaiting off-site disposal;
- Validation of the material by both visual, screening test and laboratory analysis and with reference to the procedures specified in Section 7.5.1 of NEPC (2013) Schedule B2 comprising:
 - o Validation samples collected by the Environmental Consultant at a minimum approximate rate¹ of one sample per 10 m³ comprising:
 - Manual on-site screening by passing one ~10 L bulk sample through a 7 mm aperture sieve (or spreading out each sample on contrasting coloured sheeting if soils are too cohesive) for visual identification of bonded ACM and weighing recovered fragments to calculate the asbestos %w/w and compare against the RAC (Section 7); and
 - Collect a 500 ml sample for each ~10 L sample for laboratory analysis of FA and AF (with scope to reduce the frequency to 30% if bonded ACM is consistently observed to be in good condition) to calculate the asbestos %w/w and compare against the RAC (Section 7).
- If the tests indicate the material fails validation due to the presence of bonded ACM fragments, the treatment/process can be repeated. If the tests indicate the material fails the validation due to FA and AF in soil, it will be considered a contingency situation (i.e. off-site disposal to landfill or onsite containment within a containment cell);
- Successfully validated material will be transported out of the designated ATA for re-use at depth within the site; and
- Following completion of all treatment, visual validation of the resultant ATA surface, undertaken by the Environmental Consultant including the collection of validation samples in accordance with Section 10.2 will be undertaken.

¹ The nominated minimum approximate frequency of one sample per 10 m³ exceeds that recommended in DoH (2009) for the validation of 'screened' material of one sample per 70 m³. The recommended sampling frequency is considered appropriate given that treatment will not comprise 'screening' through a 7 mm x 7 mm (or larger) mesh, rather, it will comprise turning and manual hand picking which has a lower likelihood of removing all or most ACM fragments.

The procedures described herein must be clearly documented including compilation of a photographic record. The recorded information shall include, but may not be limited to, the date, location, description of the material removed, quantity estimate, and how it was disposed, including tip docket for volume reconciliation.

Measures are to be taken by the Remediation Contractor to minimise dust generation capable of leaving the ATA. Air quality (para-occupational monitoring) adjacent to the ATA shall be monitored by the Environmental Consultant while stockpiles are present or soil treatment is occurring. The para-occupational monitoring shall be undertaken with reference to the National Occupational Health and Safety Committee (NOHSC) (2005a) *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (April 2005)]* during the remediation works using static battery operated air monitoring pumps.

8.2.4 Containment Cell

If the containment cell option is adopted, any material which exceeds the RAC for asbestos will be placed within a containment cell. A designated stockpiling area should be established at the site so that all material requiring containment can be consolidated in one area prior to placement within the containment cell.

The containment cell requires the following:

- A suitable size to contain all impacted material and taking into account soil bulking factor;
- Survey of the excavated cell
- The Remediation Contractor shall place the impacted material into the cell; after placement of the material, the surface of the impacted material shall be covered using a coloured geotextile cover layer to act as a physical marker for any future excavation works;
- Suitable soil cover shall be placed above the geotextile cover; and
- The top of the containment cell (i.e. the geotextile cover) shall be a minimum 0.5 m below the final site level.

The Remediation Contractor shall survey the base and top of the containment cell and confirm the construction of the cell in as-built drawings. It will be necessary to include the survey as part of the Validation Report and the EMP. If a containment cell is required and after the area for the cell has been determined a work method statement should be prepared by DP to provide clear instruction to the remediation contractor on the requirements for construction.

If a containment cell is constructed an Environmental Management Plan will need to be prepared and a notification on title will be required (Section 10.7 Certificate (formerly Section 149 Certificate)).

8.3 Site Establishment

Prior to the implementation of remediation, the site is to be established in accordance with all NSW legislative requirements.

Air quality monitoring for airborne asbestos fibres using the Membrane Filter Method in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres* (NOHSC: 3003, April 2005), is to be conducted prior to commencement of works (baseline) and on a daily basis when works involving the excavation, transport or placement of asbestos impacted and potentially impacted soils/materials are being conducted within the site. The Environmental Consultant is to conduct the air quality monitoring or manage the works through an experienced contractor. If friable asbestos is recorded at any stage of the remediation works, air quality monitoring will be required to be carried out by a suitably licensed asbestos assessor.

The client will be notified by the Environmental Consultant, of any laboratory detections of airborne asbestos fibres during the course of the works. In the event of detections, the Remediation Contractor should make appropriate modifications to works methods, as required.

8.4 Contingencies for Unexpected Finds

If unexpected conditions are encountered during the remediation (such as buried tanks, unexpected contaminated soil or contaminants including additional ACM or FA/AF asbestos), the following general approach will be adopted:

- Stop work in the area of impact and barricade area to prevent access;
- The remediation contractor is to contact the principle representative (PR) and the environmental consultant;
- The environmental consultant will make an assessment of the severity of the find in terms of the potential impact to human health and the environment;
- The environmental consultant will liaise with the PR as required;
- The environmental consultant will provide advice to the PR regarding the recommended course of action;
- PN will obtain necessary approvals from NSW Department of Planning; and
- The remediation contractor is to implement the agreed management/remedial strategy.

8.5 Minimisation of Cross-Contamination

Measures should be enforced as required to minimise the potential for cross contamination. In addition to the recommendations provided in the following sections for management of the remediation works, the following are the minimum requirements to be adopted:

- Plant movements within areas of active remediation should be restricted and monitored to ensure vehicles do not pass over validated surfaces; and
- Areas that have been remediated and validated should be delineated with a clear marking system and isolated. Truck and vehicle movements into these areas should be avoided, however and if required, vehicles should pass through a wheel washing bay before entering the remediated area.

8.6 Waste Disposal

If materials are required to be disposed of at an off-site location, sampling and analysis of the materials at a frequency of 1 sample per 25 - 50 m³ of soil (dependent on stockpile volume) will be required to provide a classification of the materials for waste disposal according to the provisions of NSW EPA *Waste Classification Guidelines* (2014) (EPA, 2014b).

8.7 Contingency for Stockpiling of Contaminated Material

Potentially contaminated material shall be stockpiled at a suitable designated location. Dust control is required for all stockpiled materials and should include light conditioning with water for exposed materials or covering with anchored geotextile or similar.

All stockpiles of contaminated material to remain on the site overnight shall be surrounded by star pickets and marking tape or other suitable material to clearly delineate their boundaries and be adequately secured in order to reduce the risk of sediment runoff. Should stockpiles remain for over 48 hours, they should be appropriately managed to prevent fugitive dust leaving the site (e.g. light wetting or covering with anchored geotextile depending on weather conditions) and geotextile silt fences or hay bales should be erected around each stockpile to prevent losses by surface erosion.

The defined stockpiling area will be subject to validation upon completion of the remediation works.

8.8 Loading and Transport of Spoil

All transport of waste and disposal of materials must be conducted in accordance with the requirements of the *Protection of the Environment Operations* (POEO) Act, 1997. All required licences and approvals required for disposal of the material must be obtained prior to removal of the materials from the site.

Transport of spoil shall be via a clearly delineated, pre-defined haul route, which should be lightly conditioned with water (dust suppression, i.e. water cart) and have designated site egress locations with wheel washing facilities.

Removal of waste materials from the site shall only be carried out by a licensed contractor holding the appropriate licence, consent or approvals to dispose of the waste materials according to the classification outlined in the EPA (2014) and with the appropriate approvals obtained from the NSW EPA, if required.

The truck dispatch shall be logged and recorded by the contractor for each load leaving the site. A record of the truck dispatch will be provided to the PR.

8.9 Disposal of Material

All materials excavated and removed from the site as part of the remediation shall be disposed in accordance with the POEO Act, 1997 and to a facility/site legally able to accept the material. Copies of all necessary approvals from the receiving site shall be given to the PR prior to any contaminated material being removed from the site.

All relevant analytical results shall be made available to the contractor and proposed receiving site/waste facility to enable selection of a suitable disposal location.

Details of all contaminated and spoil materials removed from the site as part of the remediation and a record of the disposal of materials will be maintained and documented by the contractor with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate) provided to the environmental consultant and the PR. A site log will be maintained by the PR to track disposed loads against on-site origin.

8.10 Materials for use in Backfilling and Imported Fill

Any additional material required for redevelopment works, including backfilling of remediation excavations shall be either:

- Materials from validated areas of the site; or
- Imported materials must be certified as VENM or ENM under the appropriate Resource Recovery Order by the supplier (including laboratory analysis), as well as meeting the SAC established in this RAP. The material and material management should also comply with relevant legislation (e.g. POEO Act, 1997) and any site fill management plan (where relevant).

The report for any imported VENM is to be prepared by a suitably qualified consultant. Sampling and analysis of any imported material should be undertaken to confirm its suitability for use on the site as follows:

- Collection of samples at a density of one sample per 1,000 m³ of imported VENM, or a minimum of 3 samples per source site;
- Analysis of samples for heavy metals, PAH, TPH, BTEX, PCB, OCP, OPP, phenol, asbestos and any other identified contaminant of concern;
- Collection and analysis of QA/QC samples in accordance with Section 10.2; and
- Comparison of results with published background levels SAC established in the SCA to determine its status as VENM and its suitability for use on the site.

Materials used on site should also meet other requirements (e.g. geotechnical and salinity requirements).

9. Validation Plan

9.1 Validation Scope

9.1.1 Validation Data Quality Objectives (DQO)

The objective of the validation plan is to assess the results of post remediation testing against the RAC stated within this RAP and to provide information on environmental impacts which may have resulted from the works.

The validation assessment will be conducted in accordance with Data Quality Objectives (DQOs) and Quality Assurance/Quality Control (QA/QC) procedures to demonstrate the repeatability and reliability of the results.

The following DQOs will be adopted based on those provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- State the Problem;
- Identify the Decision;
- Identify Inputs to the Decision;
- Define the Boundary of the Assessment;
- Develop a Decision Rule;
- Specify Acceptable Limits on Decision Errors; and
- Optimise the Design for Obtaining Data.

A checklist of Data Quality Indicators (DQI) will be completed as part of the validation assessment.

9.1.2 Validation of ACM Impacted Areas

Following the excavation of ACM impacted soils from the northern portion of the site, the environmental consultant will validate remediation excavation and the surficial ACM (which may include soil from the ATA) across the remainder of the northern portion of the site as follows:

1. Visual inspection for signs of anthropogenic material including ACM and construction and demolition waste. The visual inspection will be conducted from ground level of the remedial excavation and of surface soils across the remainder of the northern portion of the site on a 2 m grid;
2. The results of the visual inspection will be confirmed through soil sampling at the densities equivalent to that required by WA DoH (2009);
3. Sampling and analysis of the soil by the environmental consultant with reference to NEPC (2013) and WA DoH (2009) guidelines as follows:
 - o Collection of ~10 L bulk samples by the environmental consultant;
 - o Collection of a 500 ml sample for each ~10 L bulk sample for laboratory analysis of AF and FA to calculate the asbestos %w/w and compare against the RAC;
4. Where 'walls' are formed by the remedial excavation, strip trenches will also be excavated, at a rate of one strip trench per 10 m horizontal length or a minimum of 1 per sidewall, to confirm the extent of filling has been excavated; and
5. Where Impacted fill (ACM and/or construction and demolition waste) is observed, or analytical results identify asbestos above the RAC, further chase out of that location will be required and steps 1 to 3 will be repeated. The additional soil generated during the chase out will require remediation with reference to Section 9; and
6. A survey of the final remediation excavation areas is to be undertaken and provided to the environmental consultant prior to final validation.

Development works within the site (other than remediation works detailed in this RAP) should only progress following written confirmation by the environmental consultant.

9.2 Quality Assurance Plan

9.2.1 Sample Collection and Handling

The general sampling procedures comprise:

- The use of stainless steel or disposable sampling equipment;
- Decontamination of sampling equipment prior to the collection each sample;
- Labelling of the sample containers with individual and unique identification including Project No. and Sample No.; and
- The use of chain-of-custody documentation so that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to hand-over to the laboratory.

9.2.2 Field QA/QC

Appropriate sampling procedures will be undertaken to prevent cross contamination. These include:

- Standard DP operating procedures are followed;
- Replicate field samples are collected and analysed;
- Samples are stored under secure, temperature controlled conditions;
- Chain-of-custody documentation is employed for the handling, transport and delivery of samples to the selected laboratory; and
- Proper disposal of contaminated soil, fill or surface water originating from the site.

9.2.3 Laboratory Quality Assurance and Quality Control

A NATA accredited laboratory will be used to conduct analysis. For consistency with previous investigations, Envirolab Services Pty Ltd should be used as the analytical laboratory for asbestos analysis.

9.2.4 Achievement of Data Quality Objectives

Based on fulfilment of the data quality objectives, an assessment of the overall data quality will be presented in the final validation report.

9.2.5 Validation Reporting

A validation assessment report will be prepared by the environmental consultant in accordance with EPA NSW *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (2011). The objective of the validation report will be to confirm that the site has been remediated to a suitable standard for the proposed redevelopment and that no related adverse human health and environmental effects have occurred as a result of the works. The validation report will also include a summary of the information from previous investigations.

The validation report will include:

- Documentation of the implementation of the Remedial Strategy;
- Details of the location and total estimated volume of materials excavated and replaced within the site and volume of material removed from the site for disposal as well as the tonnages reported by the licensed landfill;
- Photographic record during the works and of final excavations;
- Survey records of excavations and final levels after fill placement;
- Drawings showing contamination assessment sample locations and validation sample locations;
- Detailed analytical results;
- Details of materials imported to the site, as required; and
- Details, including survey records, of the final cover.

10. Site Management Plan

It is the responsibility of the contractor to develop a Site Management Plan detailing site management, environmental management and workplace health and safety (WH&S) plans for the site. This section provides a brief summary of some of the items which need to be included in the Contractor's plans.

Works shall comply with all legislative requirements including, but not limited, to those set out under the following legislation and guidance (and subsequent amendments and regulations):

- *Environmentally Hazardous Chemicals Act 1985* (NSW);
- *Environmental Offences and Penalties Act 1989* (NSW);
- *Protection of the Environment Operations Act (POEO) 1997* (NSW);
- *Protection of the Environment Operations Act 1997 (including POEO Amendment (Scheduled Activities and Waste) Regulation 2008)* (NSW);
- *Work Health and Safety Act 2011* (NSW);
- *How to manage and control asbestos in the workplace Code of Practice*, Safework Australia, 2011a;
- *How to safely remove asbestos Code of Practice*, Safework Australia, 2011b;
- *Code of Practice for the Management and Control of Asbestos in Workplaces*, NOHSC:2018, 2005; and
- *Code of Practice for the Safe Removal of Asbestos 2nd edition*, NOHSC: 2002, 2005.

All remediation works detailed in this RAP are to be conducted by an appropriately Licenced Asbestos Contractor in accordance with the requirements of NSW WorkCover (2008) *Working with Asbestos - Guide 2008*.

10.1 Site Operations

The schedule of remedial works, including timing and staging is to be prepared by the contractor to meet the requirements of this RAP.

Remediation works will be restricted to the hours set out by NSW Department of Planning.

It is the site owner/developers responsibility to ensure that appropriate personnel are appointed to manage and conduct the remediation and validation works. This will include:

- The PR, who is responsible for overseeing the implementation of this RAP;
- A head contractor, who will be responsible for conducting the remedial works and managing the site; and
- An environmental consultant, who will be responsible for providing advice as required for the remedial works and undertaking the validation works in accordance with this RAP.

Other parties who may be employed to assist in the implementation of this RAP include, but are not limited to, occupational hygienist(s) and asbestos licensed contractor(s).

The PR will be responsible for preparing a list of contacts for the works. The head contractor will be responsible for preparing a list of contacts, including emergency contacts for site operations and provision of signage at the site to allow the public to contact nominated site personnel out of hours.

10.2 Environmental Management

The work shall be undertaken with all due regard to the minimisation of environmental effects and to meet all statutory requirements. The contractor shall have in place a Construction Environmental Management Plan (CEMP) which addresses the following items:

- Site stormwater management plan;
- Soil management plan;
- Noise control plan;
- Dust control plan; and
- Contingency measures for environmental incidents.

The contractor shall also be responsible to ensure that the site works comply with the following conditions:

- Fugitive dust leaving the confines of the site is minimised;
- No water containing suspended matter or contaminants leaves the site in a manner which could pollute the environment;
- Vehicles shall be cleaned and secured so that no mud, soil or water are deposited on any public roadways or adjacent areas;
- Spoil is managed in accordance with Section 9.2.1 of this RAP; and
- Noise and vibration levels at the site boundaries comply with the legislative requirements.

10.3 Work Health and Safety

The contractor should develop a site emergency response plan (ERP) and workplace health and safety plan (WHSP). This will ensure the safety of the personnel working on site, given any likely emergency situation which may occur. The OHSP and ERP should include emergency phone numbers and details of local emergency facilities.

Appropriate fencing and signage should be installed around and within the site to prevent unauthorised access to the site, restricted access remedial areas and deep excavations.

All personnel on site are required to wear the following personnel protective equipment (PPE) at all times:

- Steel-capped boots;
- High visibility clothing; and
- Hard hat meeting AS1801-1981 requirements.

The following additional PPE will be worn as required:

- Hearing protection meeting AS 1270 - 1988 requirements when working around machinery or plant equipment if noise levels exceed exposure standards;
- Safety glasses or safety goggles with side shields meeting AS 1337 - 1992 requirements (as necessary, particularly during demolition);
- Appropriate safety masks (i.e. P1 or P2); and
- Any additional protection identified by the Asbestos Removal Contractor or environmental consultant.

All contractors are required to show compliance with the Work Health and Safety Regulation 2011, including the preparation of a Site Safety Management Plan and Safe Work Method Statements.

11. Conclusion

It is considered that remediation and validation of identified contamination, in accordance with this RAP, will render the site compatible with the proposed commercial / industrial land use. In addition, adherence to the RAP should enable appropriate management of any potential impacts on the environment which may occur during the course of the remediation works.

12. References

1. National Environment Protection Council (2013), *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013*, 11 April 2013.
2. NSW EPA, Contaminated Site, *Guidelines for the NSW Site Auditor Scheme 2nd Edition*, April 2006.
3. NSW EPA, *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.

4. NSW EPA, *Managing Land Contamination, Planning Guidelines, SEPP55 - Remediation of Land*, 1988.
5. NSW EPA Contaminated Sites (2011), *Guidelines for Consultants Reporting on Contaminated Sites*, August 2011.

13. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lot 2 Forrester Road, St Mary's, NSW in accordance with DP's proposal NWS180083.P.003.Rev0 dated 21 March 2019 and acceptance received from My Guy Evans on behalf of Pacific National Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Pacific National Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

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

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

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (geotechnical / environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

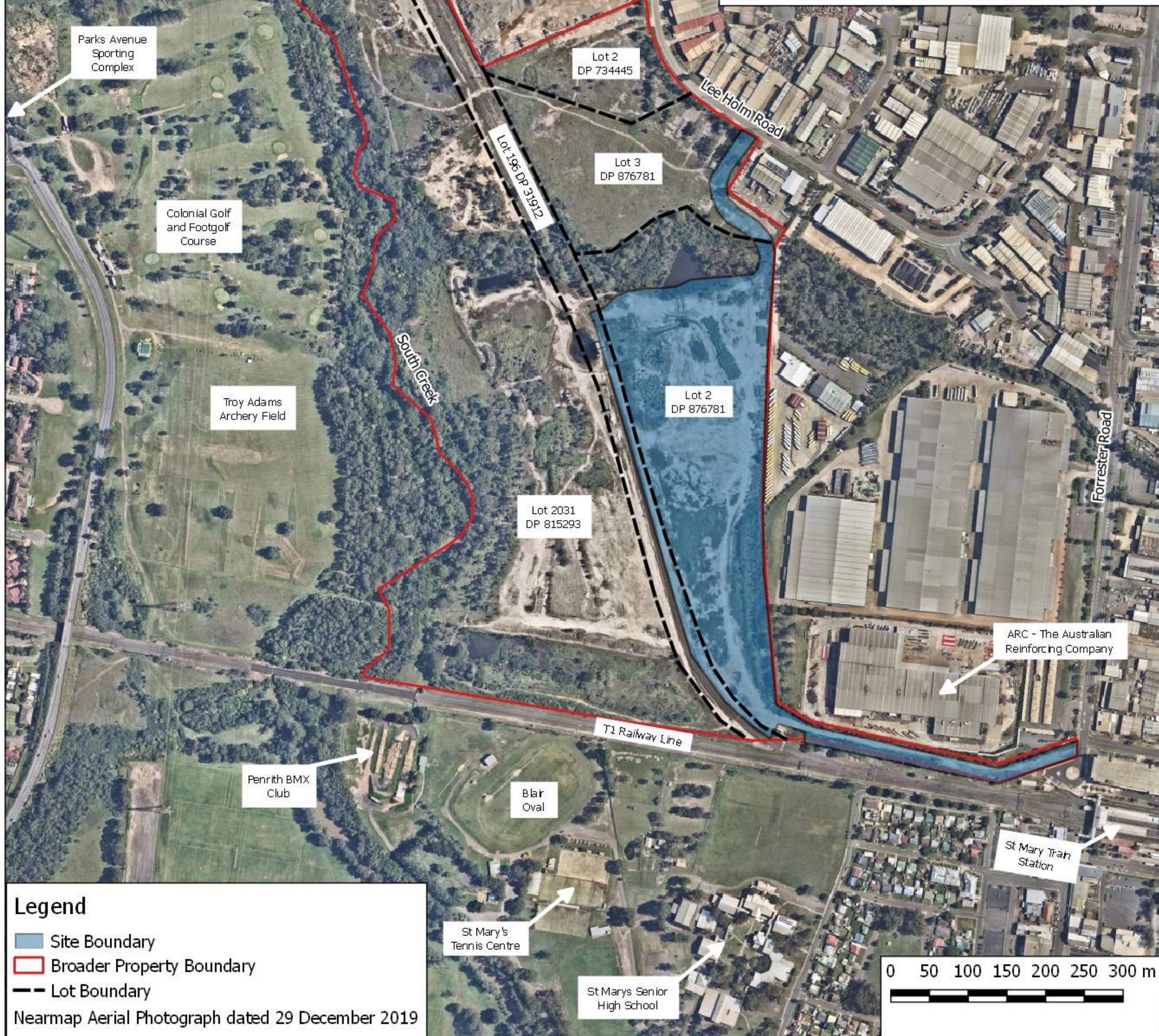
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.



Site Inspection

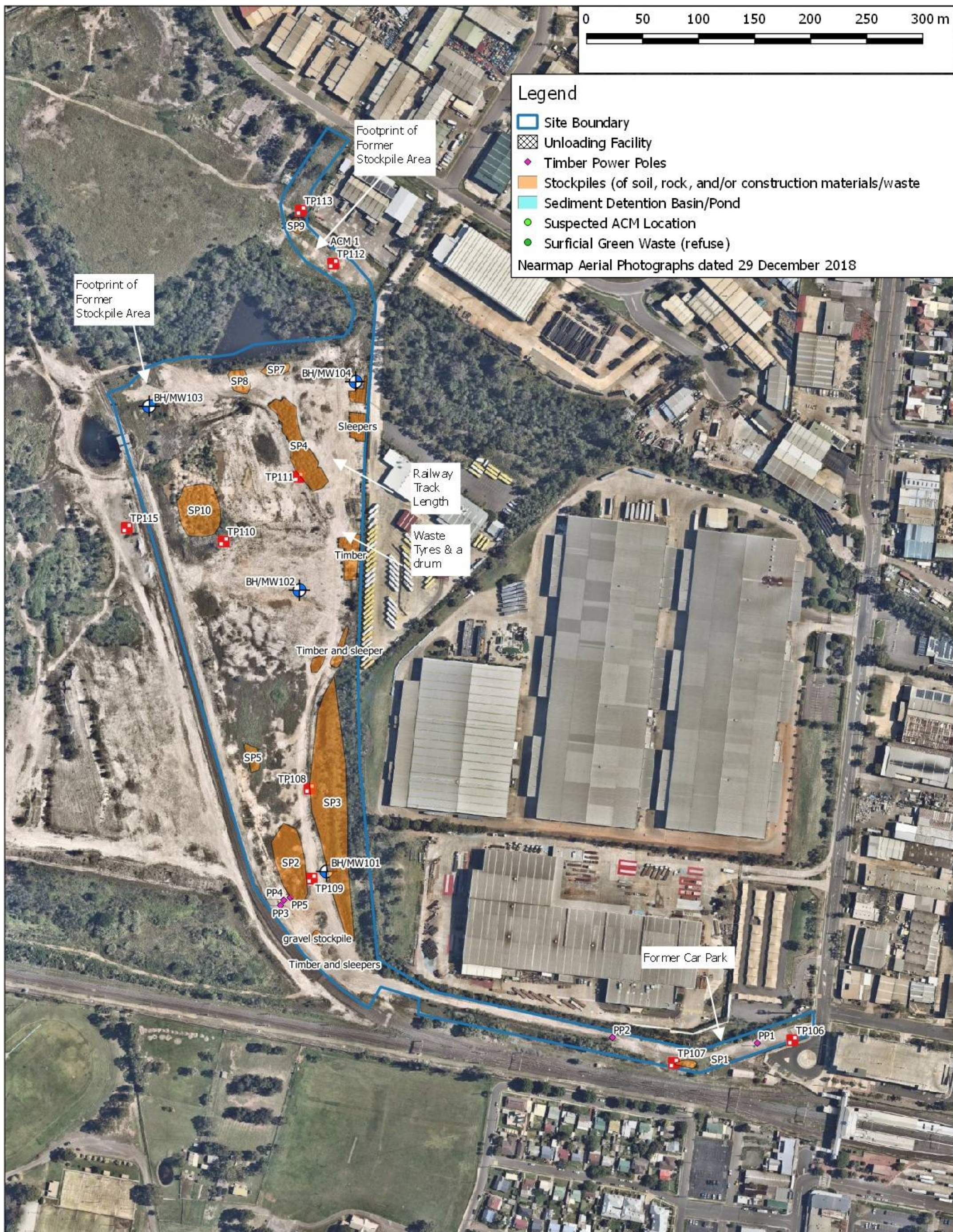
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

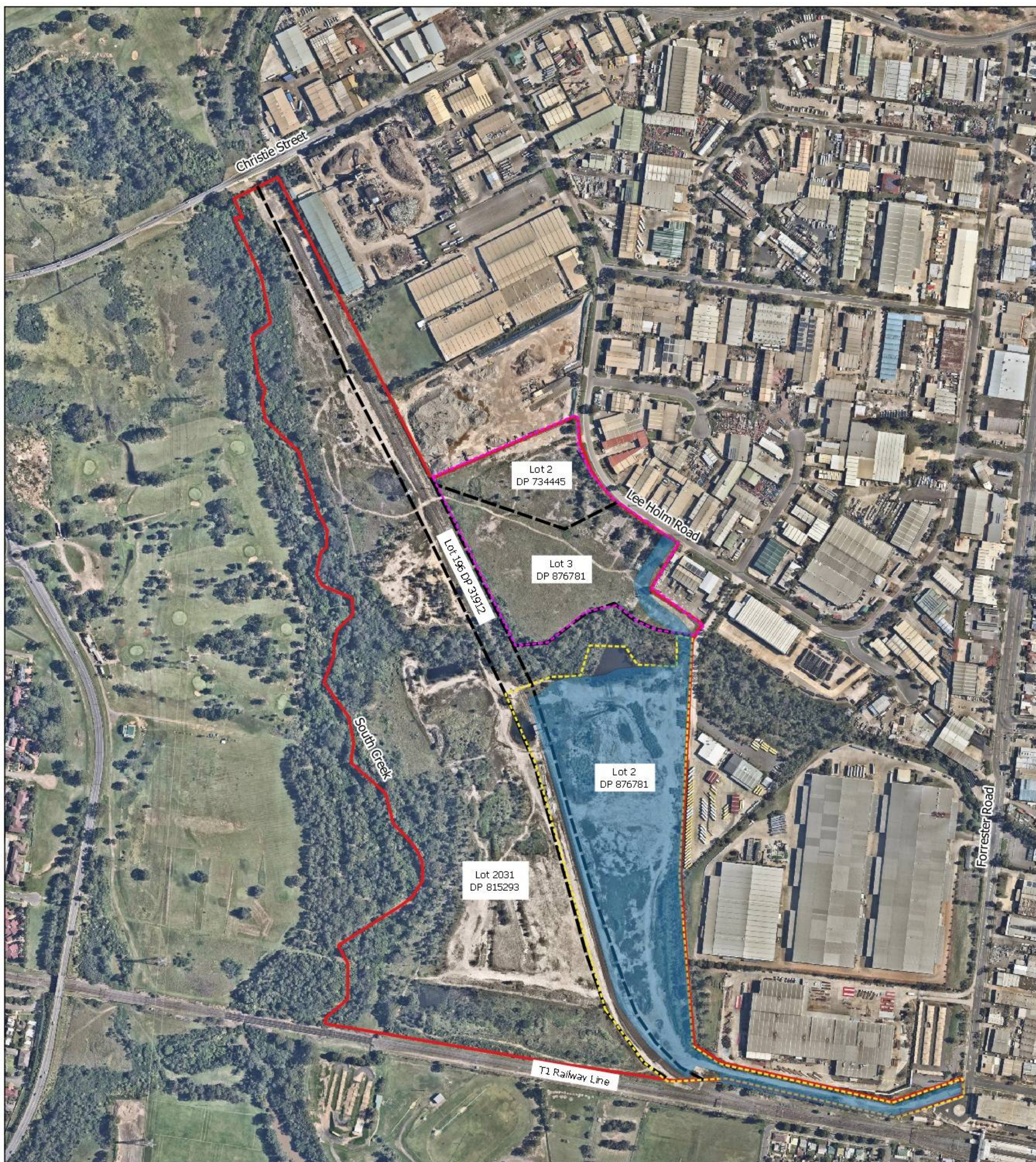
Appendix B

Drawings 1 to 4



 Douglas Partners <i>Geotechnics Environment Groundwater</i>	TITLE: Site Layout and Locality Remediation Action Plan 2 Forrester Rd, St Marys, NSW			 MGA	OFFICE: Macarthur
					DRAWN: CKM
					DATE: 28.2.19
CLIENT: Pacific National (NSW) Pty Ltd	PROJ. 94525.02	DRAWING No: 1	REVISION: 0	SCALE: As Shown	





Legend

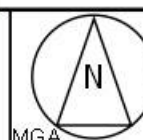
- Site Boundary
- ERM (2005a, 2005b & 2005c)
- PB 2015
- Lot Boundary
- Broader Site Boundary

nearmap Aerial Photograph dated 29 December 2018

0 50 100 150 200 250 300 m



TITLE: **Former Investigation Boundaries
Remediation Action Plan
2 Forrester Rd, St Marys, NSW**



OFFICE: Macarthur

DRAWN BY: CKM

DATE: 28.2.19

CLIENT: Pacific National (NSW) Pty Ltd

PROJ. 94525.02

DRAWING No: 3

REVISION: 0

SCALE: As Shown



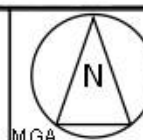
Legend

- Site Boundary
- PSI Test Pit Locations
- SCA Test Pit Locations
- Estimated Extent of ACM Impact to filling Requiring Remediation
- ACM Fragments on surface soil

10 0 10 20 30 40 m



TITLE: Far Northern Footprint- Estimated Extent of ACM
Impacted Fill Requiring Remediation
Remediation Action Plan
2 Forrester Rd, St Marvs, NSW



OFFICE: Macarthur

DRAWN BY: GAR

DATE: 28.2.19

CLIENT: Pacific National (NSW) Pty Ltd

PROJ. #: 94525.02

DRAWING No: 4

REVISION: 0

SCALE: As Shown

Appendix C

Site Photographs



Photo 1 - Site surface covered with overgrown vegetation in parts of site



Photo 2 - Unloading facility along the railway corridor



Site Photographs

Remediation Action Plan

Proposed St Marys Freight Hub - Stage 1,
2 Forrester Road, St Marys, NSW

CLIENT: Pacific National

PROJ: 94525.03

PLATE: 1

REV: A

DATE: 13-May-19



Photo 3 - Refuse on the side of access pathway from the Forrester Road entrance



Photo 4 - Exposed site surface comprising aggregate filling with some anthropogenic material near
Road entrance

Forrester


	Site Photographs	PROJ:	94525.03
	Remediation Action Plan	PLATE:	2
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-May-19



Photo 5 - Soil stockpile covered with overgrown vegetation along the eastern boundary



Photo 6 - Soil stockpile with demolition waste on top



	Site Photographs	PROJ:	94525.03
	Remediation Action Plan	PLATE:	3
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-May-19



Photo 7 - Test pit 205 where ACM was identified in fill



Photo 8 - ACM impacted fill excavated from test pit 205

	Site Photographs	PROJ:	94525.03
	Remediation Action Plan	PLATE:	4
	Proposed St Marys Freight Hub - Stage 1, 2 Forrester Road, St Marys, NSW	REV:	A
	CLIENT: Pacific National	DATE:	13-May-19