

CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN

Document and Revision History

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Distribution List

ARTC Environmental Rep.	
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Compliance Matrix

Reference	Requirement	Location in document						
Conditions of Approval								
A5	<p>Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken in consultation with identified parties, evidence of the consultation undertaken must be submitted to the Planning Secretary with the document. The evidence must include:</p> <p>(a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval;</p> <p>(b) a log of the dates of engagement or attempted engagement with the identified party and a summary of the issues raised by them;</p> <p>(c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations;</p> <p>(d) outline of the issues raised by the identified party and how they have been addressed; and</p> <p>(e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.</p>	Section 1.5						
C4	<p>CEMP Sub-plans must be prepared in consultation with the relevant government agency(ies) and council(s) identified for each CEMP Sub-plan* in Table 3.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 40%;">Required CEMP Sub-Plan</th> <th style="width: 50%;">Relevant agencies to be consulted for each CEMP Sub-plan</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(c)</td> <td>Soil and Water Management Plan</td> <td>Relevant Councils</td> </tr> </tbody> </table>		Required CEMP Sub-Plan	Relevant agencies to be consulted for each CEMP Sub-plan	(c)	Soil and Water Management Plan	Relevant Councils	Section 1.5 Appendix F
	Required CEMP Sub-Plan	Relevant agencies to be consulted for each CEMP Sub-plan						
(c)	Soil and Water Management Plan	Relevant Councils						
C5	<p>The CEMP Sub-plans must state how:</p> <p>(a) the environmental performance outcomes identified in the documents listed in Condition A1 as modified by these conditions will be achieved;</p> <p>(b) the mitigation measures identified in the documents listed in Condition A1 as modified by these conditions will be implemented;</p> <p>(c) the relevant terms of this approval will be complied with; and</p> <p>(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.</p>	<p>Section 2.3 Section 2.4</p> <p>Section 6</p> <p>Section 2.3</p> <p>Section 5 Section 6 Section 9/CEMP (Appendix B)</p>						
C6	<p>The Soil and Water Management Plan must be prepared by a suitably qualified and experienced person and include:</p> <p>(a) an Asbestos Management Plan (AMP) prepared in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 2013</p> <p>(b) an Acid Sulfate Soil Management Plan (ASSMP) developed in accordance with the Acid Sulfate Soils Manual (ASSMAC, 1998); and</p> <p>(c) an Unexpected Contamination Finds Procedure.</p>	<p>Appendix B</p> <p>Appendix A</p> <p>Appendix C</p>						
C7	<p>Details of all information requested by an agency to be included in a CEMP Sub-plan as a result of consultation, including copies of all correspondence from those agencies, must be provided with the relevant CEMP Sub-Plan.</p>	Section 1.4						
C8	<p>Construction must not commence until the CEMP and all CEMP Sub-plans have been approved by the ER and must be implemented for the duration of</p>	Section 1.4						

	<p>construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been approved by the ER.</p>	
C6	<p>The Soil and Water Management Plan must be prepared by a suitably qualified and experienced person and include:</p> <p>(a) an Asbestos Management Plan (AMP) prepared in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 2013</p> <p>(b) an Acid Sulfate Soil Management Plan (ASSMP) developed in accordance with the Acid Sulfate Soils Manual (ASSMAC, 1998); and</p> <p>(c) an Unexpected Contamination Finds Procedure.</p>	Section 1.1
E8	<p>Measures identified in in the documents listed in Condition A1 to not worsen or improve flood characteristics must be incorporated into the detailed design of the CSSI.</p>	Section 6.9 Section 4.5
E9	<p>Flood information developed during detailed design, such as flood reports, models and geographic information system outputs, and work as executed information from a registered surveyor certifying finished ground levels, the dimensions and finished levels of all structures constructed as part of the CSSI within flood prone land, must be provided to the relevant council, EESG and the SES in order to assist in preparing relevant documents and to reflect changes in flood behaviour as a result of the CSSI. The council, EESG and the SES must be notified in writing that the information is available no later than one (1) month following the completion of construction. Information requested by the relevant Council, EESG or the SES must be provided no later than six (6) months following the completion of construction or within another timeframe agreed with the relevant council, EESG and the SES.</p>	Section 4.5 Section 6.9 Appendix B of CEMP
E40	<p>All reasonably practicable erosion and sediment controls must be installed and appropriately maintained to minimise water pollution. When implementing such controls, any relevant guidance in the Managing Urban Stormwater series must be considered.</p>	Section 6.1 Appendix E
E41	<p>A Site Contamination Report, documenting the outcomes of Stage 1 and Stage 2 contamination assessments of land upon which the CSSI is to be carried out, or land associated with the CSSI, that is suspected, or known to be, contaminated must be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under Section 105 of the Contaminated Land Management Act 1997 (NSW).</p> <p>Note: for that land where Stage 1 and Stage 2 contamination assessments have already been undertaken, they do not need to be undertaken again for the purposes of this condition.</p>	Section 6.4
E42	<p>A Remediation Action Plan must be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under Section 105 of the Contaminated Land Management Act 1997 (NSW).</p>	Section 6.4
E43	<p>The proponent must engage a NSW EPA accredited Site Auditor throughout the duration of works to ensure that any work required in relation to soil or groundwater contamination is appropriately managed. The Proponent must adhere to the management measures accepted by the Site Auditor.</p>	Section 6.4
E44	<p>The Proponent must submit to the Planning Secretary the following:</p> <p>(a) an Interim Audit Advice or a Section B Site Audit Statement prepared by the Site Auditor that certifies that the Remediation Action Plan prepared in Condition E42 is appropriate and that the site can be made suitable for the proposed use.</p> <p>(b) if work is to be completed in stages, any Interim Audit Advice/s issued by the Site Auditor to confirm satisfactory completion of each stage.</p>	Section 6.4

	(c) a Section A1 Site Audit Statement or a Section A2 Site Audit Statement and accompanying Site Audit Report prepared by a NSW EPA accredited Site Auditor must be submitted to the Planning Secretary and the relevant Council for information no later than one month before the commencement of operation.	
E45	Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement determines the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with.	Section 6.4
E61	Waste generated during construction and operation must be dealt with in accordance with the following priorities: (a) waste generation must be avoided and where avoidance is not reasonably practicable, waste generation must be reduced; (b) where avoiding or reducing waste is not possible, waste must be re-used, recycled, or recovered; and (c) where re-using, recycling or recovering waste is not possible, waste must be treated or disposed of at a waste management facility or premise lawfully permitted to accept the materials or in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014.	CEMP
E62	All waste must be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes.	CEMP
E63	The CSSI must be designed, constructed and operated so as to not worsen water quality of surface water discharged from the rail corridor unless an EPL in force in respect of the CSSI contains different requirements.	Section 6.7 Appendix D,
E64	Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be constructed in accordance with relevant guidelines and designed by a suitably qualified and experienced person.	Section 6.8, Section 3.1.2
E65	Works on waterfront land must be carried out in accordance with <i>Guidelines for Controlled Activities on Waterfront Land</i> (NRAR 2018).	Section 6.8, Section 3.1.2
CCT1	A remediation action plan (RAP) will be prepared for Area 1 in accordance with the National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) prior to placement of the asbestos capping layer. Remediation in Area 1 will be undertaken in accordance with the endorsed RAP. Following this, a validation report will be prepared by a suitably qualified environmental consultant to validate the suitability of the project site for its proposed use. Installation of the capping layer will be done under the supervision of a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM. The final elevation of residual contaminated soils will be surveyed prior to the installation of the marking layer and capping layers. Final levels should also be surveyed and included in the SWMP and ARTC asbestos register.	Section 6.4
CCT2	West of Robey Street within Area 2, existing investigations will be supplemented with additional sampling using a test pit or trenching method in accordance with NEPM 2013 and WA Department of Health (WA-DoH) 2009, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. If enabling works in this area are undertaken prior to additional sampling, ACM will be assumed to be present and works will be supervised by an appropriately licensed contractor. This will be specified in site EMPs for the enabling works.	Section 3.1.2, Appendix B
CCT3	An acid sulfate soils management plan (ASSMP) will be developed prior to start of enabling works in accordance with the ASSMAC (1998) Acid Sulfate Soils Manual and included in the SWMP. ASS encountered during construction will be managed in accordance the ASSMP.	Section 6.5 Appendix A
CCT4	An asbestos management plan (AMP) will be prepared prior to start of enabling works in accordance with NSW EPA guidelines (including waste guidelines),	Section 6.6

	SafeWork NSW 2014, Managing Asbestos in or on Soil and relevant industry codes of practice. This AMP will be included in the SWMP.	Appendix B
CCT5	An emu pick involving the systematic manual collection of identified asbestos surface fragments will be undertaken prior to soil disturbance in Area 1 and the section west of Robey Street in Area 2, to remove ACM fragments from the site surface. A clearance certificate will be obtained from a licensed asbestos assessor.	Appendix B
CCT6	Adopt construction techniques to avoid groundwater disturbance where practicable. If groundwater is encountered, temporarily store all extracted groundwater to be disposed of offsite in appropriate containers then ensure it is tested for potential contaminants (including PFAS). Options for final disposal of extracted groundwater include: <ul style="list-style-type: none"> • removal offsite to a water recycling facility if the level of contaminants does not exceed the water acceptance thresholds • discharge to a sewer via a trade waste agreement with Sydney Water • treatment through a groundwater remediation system before being released to surface water (with approval from NSW EPA). For the above options, the analytical testing results will need to demonstrate compliance with the applicable licence or discharge criteria 	Section 6.7
CCT7	Procedures to store, handle and use materials and equipment appropriately to prevent spills will be prepared and implemented during construction, and included in the SWMP. Immediately contain and clean up leakage of fuels, oils, chemicals and other hazardous liquids in accordance with the Safety Data Sheet and ARTC's NSW Pollution Incident Response Management Plan to prevent migration of contaminants to other parts of the site	Section 6.3
CCT8	Employ stockpile management procedures as per ARTC's Standard Environmental Management Measures for segregating soil and preventing cross-contamination of clean soil with contaminated soil. These will be documented in the SWMP.	Section 6.1.4
CCT9	ACM impacted soil will be handled and managed in accordance with the AMP at all times during construction. Areas that are designated as ACM contaminated areas will be clearly fenced off and suitable warning signs posted prior to soil disturbance in that area. Hygiene facilities will be provided incorporating a high standard of washing facilities and storage area for contaminated clothing/footwear. These areas will only be accessible to authorised personnel and work permitted only under controlled/supervised conditions by appropriately qualified/licensed personnel.	Appendix B
CCT10	An unexpected finds procedure will be prepared prior to commencement of enabling works and included as part of the SWMP. It will identify the process to follow in the event that indicators of contamination are encountered during construction (such as odours, ACM or visually contaminated materials).	Appendix C
CFL1	Plan, implement and maintain measures, which are aimed at: <ul style="list-style-type: none"> • intercepting flow from areas upstream of the project and diverting it in a controlled manner whether through or around the construction sites • implementing construction practices that minimise the potential for scour through stabilisation of disturbed surfaces. 	Section 6.19
CFL2	Spoil stockpiles will need to be located in areas which are not subject to frequent inundation by floodwater and ideally outside the 1% AEP flood extent. The CEMP will define the flood immunity criteria for stockpiles proposed to be located in areas that are inundated during a 1% AEP event. These criteria will be based on the duration of stockpiling operations, the type of material stored, the nature of the receiving drainage lines and also the extent to which the stockpile will impact flooding conditions in adjacent areas.	Section 6.1.4 Section 6.9
CFL3	As a minimum, site facilities are to be located outside high flood hazard areas	Section 6.9

	<p>based on a 1% AEP flood and ideally outside the 1% AEP flood extent. For site facilities located within the floodplain, the CEMP is to identify how risks to personal safety and damage to construction facilities and equipment will be managed.</p> <p>The CEMP will need to include details of:</p> <ul style="list-style-type: none"> • the procedure to monitor accurate and timely weather data, and disseminate warnings to construction personnel of impending flood producing rain • an evacuation plan for construction personnel should a severe weather warning be issued. 	<p>Site Establishment Management Plan (SEMP)</p>
<p>CFL4</p>	<p>The CEMP will need to include details and procedures to manage the potential for proposed construction activities to adversely impact on flood behaviour in adjacent development. A more detailed assessment of the impact that construction activities will have on flood behaviour, as well as the scope of measures which will be required to mitigate those impacts, will need to be undertaken during the detailed design phase, with the benefit of more refined construction plans and details by the preferred construction contractor. Subject to the outcomes of further design development and flood assessment during the detailed design phase, a floor level survey may need to be undertaken of affected properties (i.e. in properties where there is a potential increase in flood levels) to determine whether construction activities will increase flood damages in adjacent development and if mitigation measures are required. The layout of the construction compounds, material storage areas, as well as temporary crane pads and temporary piling platforms will need to be designed to:</p> <ul style="list-style-type: none"> • limit the extent of works located in floodway areas • divert overland flow either through or around work areas in a controlled manner • minimise adverse impacts on flood behaviour in adjacent development. Measures to manage residual flood impacts may include: <ul style="list-style-type: none"> • staging construction to limit the extent and duration of temporary works on the floodplain • ensuring construction equipment and materials are removed from floodplain areas at the completion of each work activity or should a weather warning be issued of impending flood producing rain • providing temporary flood protection to properties identified as being at risk of adverse flood impacts during any stage of construction of the project • developing flood emergency response procedures to remove temporary works during periods of heavy rainfall. 	<p>Section 6.9 SEMP</p>
<p>CRW6</p>	<p>The size of stockpiles will be determined by material quantity requirements, space availability, stockpile stability and safety, indicative volumes and restrictions. Stockpile siting and management will include the following parameters:</p> <ul style="list-style-type: none"> • will be no higher than three metres • will be sited as far as practical from sensitive receivers and where possible equipment i.e. site compound buildings, sited between the stockpile and receiver • will be located in areas which are not subject to frequent inundation by floodwater and ideally outside the 1% AEP flood extent • will not be sited next to schools or day care facilities • will be temporary and material not needed for ongoing maintenance will be removed at completion of construction. 	<p>Section 6.1.4</p>
<p>CWQ1</p>	<p>A Soil and Water Management Plan will be developed to manage soil and water risks during the projects main construction works, including risks associated with encountering existing and potential soil contamination. Procedures to</p>	<p>This plan</p>

	store, handle and use materials and equipment appropriately to prevent spills and leaks will be included in the SWMP.	Section 6.3
CWQ2	Leakage of fuels, oils, chemicals and other hazardous liquids will be immediately cleaned up in accordance with the Safety Data Sheet and relevant emergency response procedures.	Section 6.3
CWQ3	Adequately stocked spill kits will be readily accessible to site personnel during all refuelling activities.	Section 6.3
CWQ4	Construction plant and equipment will be regularly inspected and maintained to prevent leaks.	Section 6.3
CWQ5	All potentially contaminating substances will be stored in secure, bunded and impervious locations away from surface water features and outside of the extent of the 20 year ARI design flood wherever practicable.	Section 6.3
CWQ6	Impervious and bunded areas will be established for the on-site maintenance of construction plant and equipment.	Section 6.3
CWQ7	The area of exposed soils within the project site will be minimised through staging vegetation clearing and ground disturbing works across the project site. Disturbed areas and all long-term stockpiles will be protected or stabilised during periods of inactivity. Areas disturbed by construction activities will be rehabilitated and restored as soon as possible after completion of works in the area.	Section 6.1.1 Section 6.1.4 Section 2.2 of the CEMP
CWQ8	Where feasible, construction activities will be scheduled to avoid ground disturbance works or in-stream works during periods of heavy or prolonged rainfall.	Section 6.8
CWQ9	Protect stockpiles of loose material from erosion due to rain and wind.	Section 6.1.4
CWQ10	Erosion and sediment control measures will be implemented prior to soil disturbance in accordance with <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004) and included in the SWMP. Erosion and sediment controls throughout the project site will be regularly inspected and maintained.	Section 6.1.4
CWQ11	Remove all material from the site as soon as practical at the completion of work.	Section 6.4.1
CWQ12	Specific measures and procedures for works within waterways, such as the use of silt barriers will be implemented where necessary.	Section 6.8
CWQ13	Instruct site workers on the need to prevent materials from washing or blowing into the stormwater system	Section 7
CWQ14	Infiltration trenches will be installed to allow for potentially contaminated water to be collected and infiltrated back into groundwater rather than flowing to surface water.	Section 6.4
CWQ15	A groundwater construction monitoring program will be prepared and implemented as per chapter 8 of Technical Report 7 – Groundwater Impact Assessment. This monitoring program will verify the effectiveness of construction activities at preventing changes in the beneficial use potential of the aquifer system. A surface water quality monitoring program will be prepared and implemented for specific construction works (refer to section 6.2.3 of Technical Report 8 Surface Water Impact Assessment).	Section 8.1 Appendix D
CWQ16	Bins will be provided on-site for litter. All general litter and waste collected on-site will be transported off-site to an appropriate waste facility.	CEMP
DWQ2	Batter slope gradients, surface treatments and the construction program will be designed to minimise erosion risk, so the annual sediment export rate is below 150 m ³ at each outlet to avoid the need for sediment basins in accordance with the Blue Book.	Section 6.1.4
DWQ6	A baseline groundwater monitoring program will be implemented to characterise baseline groundwater conditions as per Chapter 8 of Technical Report 7 - Groundwater Impact Assessment.	Section 8.1 Appendix D

1 Introduction

1.1 Context

This Construction Soil and Water Management Sub Plan (CSWMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Botany Rail Duplication Project (BRD; the Project). This CSWMP has been prepared by a combination of personnel noted in the revision table and the projects contamination consultant, Douglas Partners.

This Plan has been prepared to address the requirements of the Minister's Conditions of Approval SSI-9714 (CoA), the environmental management measures listed in the Botany Rail Duplication Project Environmental Impact Statement (EIS) and all applicable legislation.

1.2 Background

Australian Rail Track Corporation (ARTC) proposes to construct and operate a new second track within the existing rail line between Mascot and Botany, in the Bayside local government area (LGA). The Botany Rail Duplication ('the project') would increase freight rail capacity between to and from Port Botany. The project is State significant infrastructure in accordance with Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.3 Project description

The project would involve:

- Track duplication – constructing a new track predominantly within the rail corridor for a distance of about three kilometres (km)
- Track realignment (slewing) and upgrading – moving some sections of track sideways (slewing) and upgrading some sections of track to improve the alignment of both tracks and minimise impacts to adjoining land uses
- New crossovers – constructing new rail crossovers to maintain and improve access at two locations (totalling four new crossovers)
- Bridge work – constructing new bridge structures at Mill Stream, Southern Cross Drive, O'Riordan Street and Robey Street (adjacent to the existing bridges), and re-constructing the existing bridge structures at Robey Street and O'Riordan Street
- Embankment/retaining structures – construction of a new embankment and retaining structures adjacent to Qantas Drive between Robey and O'Riordan streets and a new embankment between the Mill Stream and Botany Road bridges.

Ancillary work would include bi-directional signalling upgrades, drainage work and protecting/relocating utilities. Subject to approval of the project, construction is planned to start at the end of 2020, and is expected to take about three years for the main construction works to be undertaken. Construction is expected to be completed in late 2023 with commissioning activities undertaken in early 2024.

It is anticipated that some features of the project would be constructed while the existing rail line continues to operate. Other features of the project would need to be constructed during programmed weekend rail possession periods when rail services along the line cease to operate.

The project would operate as part of the existing Botany Line and would continue to be managed by ARTC. ARTC is not responsible for the operation of rolling stock. Train services are currently, and would continue to be, provided by a variety of operators. Following the completion of work, the existing functionality of surrounding infrastructure would be restored. The location and key works for the project are included in Figure 1.

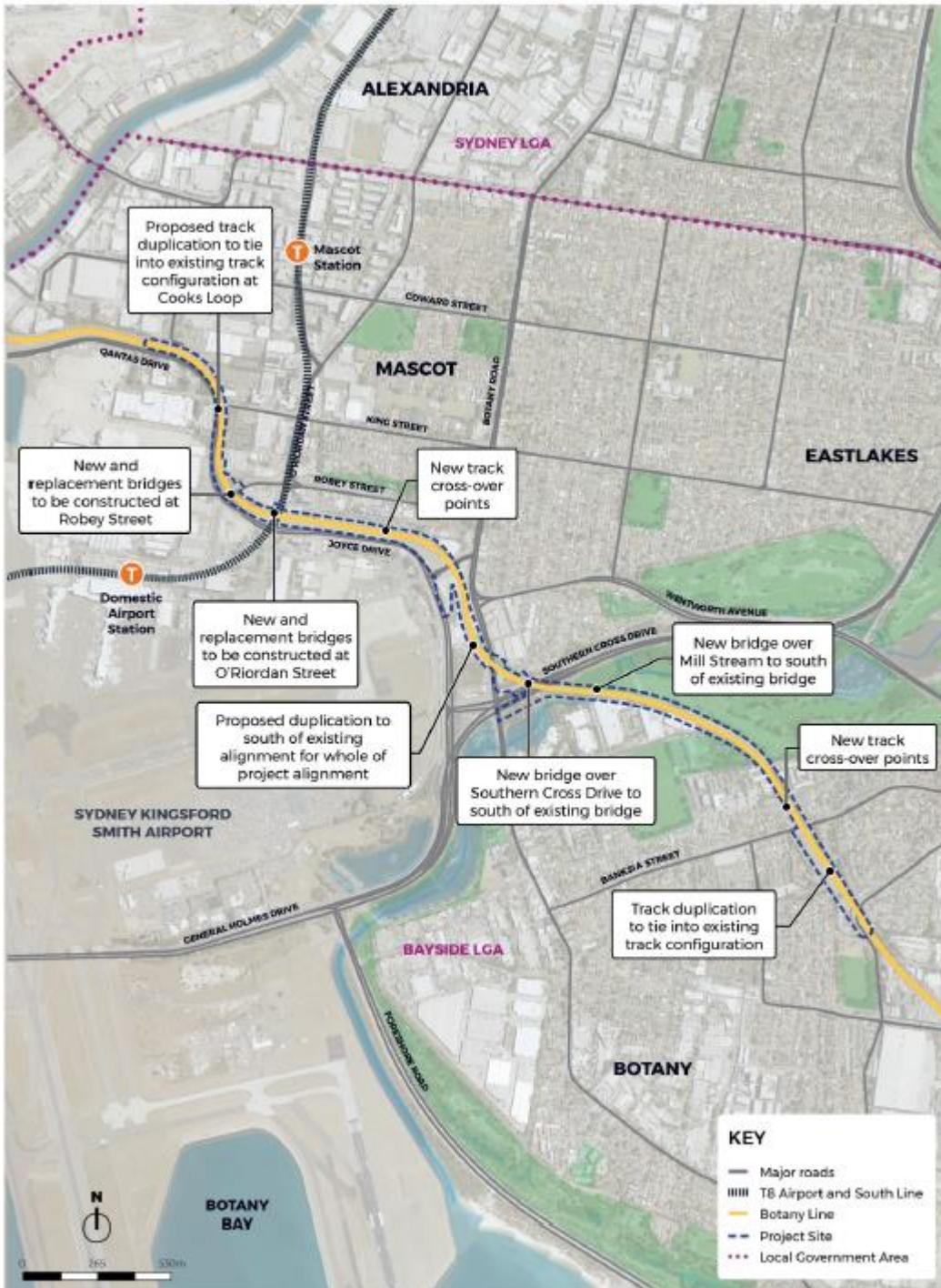


Figure 1: Project Overview

1.4 Approval

This Plan will be reviewed and by the approved Environmental Representative (ER) in accordance with CoA C8. Construction will not commence until the CEMP and all CEMP Sub-Plans (including this CSWMP) have been approved by the ER, and will be implemented for the duration of construction.

1.5 Consultation

The CSWMP has been provided to Bayside Council for consultation in accordance with CoA C4 Table 3 and updated following receipt of comments.

In accordance with CoA A5, the evidence of consultation has been included in Appendix E of the CEMP and will be provided to the Planning Secretary for information upon request. Details of comments related to the CSWMP are provided in Appendix F of this plan.

2 Purpose and objectives

2.1 Purpose

The purpose of this Plan is to describe how the John Holland proposes to minimise and manage potential soil and water quality impacts during construction of the BRD Project.

2.2 Scope

The scope of this Plan is limited to the management of soil and water quality (including contamination) and mitigation required for construction of the Project. If acid sulphate soils (ASS) or asbestos is encountered, these will be managed in accordance with the ASS Management Plan (ASSMP) and Asbestos Management Plan (AMP) included in Appendix A and B of this Plan. Contamination will be managed in accordance with this plan.

In addition, any waste removal associated with the works will be managed in accordance with the Waste Control Plan (included in Appendix D to the CEMP).

2.3 Objectives

The key objective of this Plan is to ensure all CoA, environmental management measures and licence/permit requirements, relevant to soil and water are described, scheduled and responsibility assigned. The following targets have been established for the management of soil and water impacts during the Project:

- Ensure compliance with the relevant legislative requirements, CoA, EPL 21678 and revised environmental management measures (REMMs)
- ~~No~~-pumped water discharges,
- Minimise pollution of surface water through appropriate erosion and sediment control
- Maintain existing water quality of surrounding surface watercourses
- Source construction water from non-potable sources, where feasible and reasonable
- Ensure training on best practice soil and water management is provided to all construction personnel through site inductions
- Effectively treat surface water removed as part of de-watering and discharge activities across the Project in accordance with established discharge and reuse criteria.

2.4 Performance outcomes

Based on the outcomes of the EIS and implementation of the mitigation measures, environmental performance outcomes for soil and water have been identified in the EIS. The project specific environmental performance outcomes are identified in Table 2.1.

Table 2.1 – Performance outcomes (Construction)

Desired Performance Outcomes	Target	How Addressed
Construction compounds and work areas are laid out such that flows are not significantly impeded.	<p>Management measures to be implemented to avoid long term impacts on surface water</p> <p>Minimise use of potable water during construction</p> <p>No impacts on groundwater dependent ecosystems from drawdown activities</p>	<p>Erosion and Sediment Control Plans</p> <p>Sustainability Management Plan</p> <p>Flora and Fauna Control Plan (CEMP Appendix D)</p> <p>SWMP Appendix E</p>
Erosion and sediment controls during construction are implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and Managing Urban Stormwater: Soils and Construction Volume 2 (DECC, 2008a).	<p>No adverse impacts to water quality during construction</p> <p>ERSED controls implemented at source</p> <p>Water Quality monitored during construction</p>	<p>Erosion and Sediment Control Plans</p> <p>SWMP Appendix E</p>
<p>Contamination is managed in accordance with relevant regulatory requirements.</p> <p>Any soil waste is assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (EPA, 2014a)</p>	<p>Waste Classifications provided for all waste by the Contamination Consultant prior to disposal</p> <p>Implementation of the RAP Site Audit Statement achieved for the project</p>	<p>Waste Management Control Plan (CEMP Appendix D)</p> <p>Remediation Action Plan (Section 6.4.3)</p>

3 Environmental requirements

3.1 Relevant legislation and guidelines

3.1.1 Legislation

The legislation relevant to this Plan is included in Table 3.1, below as well as in Appendix J of the CEMP.

Table 3.1 – Legislation relevant to this Plan

Act	Requirement
<i>Protection of the Environment Operations Act 1997</i>	<p>Do not risk harming the environment by wilfully or negligently:</p> <ul style="list-style-type: none"> • disposing of waste unlawfully. • causing any substance to leak, spill or otherwise escape (whether or not from a container); or • emitting an ozone depleting substance

Act	Requirement
	<p>Properly and efficiently maintain and operate any installed pollution control equipment (including monitoring devices).</p> <p>Notify the EPA immediately of pollution incidents where material harm to the environment is caused or threatened.</p>
<p><i>Contaminated Land Management Act 1997</i></p>	<p>Notify the EPA if:</p> <ul style="list-style-type: none"> • Contaminants exceed thresholds contained in guidelines or the regulations where contamination has entered or will foreseeably enter neighbouring land, the atmosphere, groundwater or surface water • Contaminants in soil are equal to or exceed guideline levels with respect to the current or approved use of the land. • Contamination meets other criteria that may be prescribed by the regulations.

3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this plan include:

Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be constructed in accordance with relevant guidelines and designed by a suitably qualified and experienced person.

- Acid Sulfate Soil Manual (ASSMAC 1998)
- National Acid Sulfate Soils Guidance (DAWE 2018)
- Acid Sulfate Soil and Rock – Victorian EPA Publication 655.1 – July 2009.
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) (ANZG 2018).
- Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997
- Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries
- *NSW Fisheries, November 2003. Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings* (Ref: NSWF – 1181)
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2004)
- Environmental Best Management Practice Guideline for Concreting Contractors, DEC (2004)
- National Environment Protection (Assessment of Site Contamination) Measure (2013)
- Guidelines for Controlled Activities on Waterfront Land (NRAR 2018)
- Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011)
- Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015)
- Guidelines for the NSW Site Auditor Scheme (3rd edition) (EPA, 2017)

- Site Investigations for Urban Salinity (DWLC,2002)
- Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA Department of Health, 2009)
- Guidelines for Controlled Activities on Waterfront Land (NRAR 2018).

4 Existing environment

The following sections summarise what is known about factors influencing soils and water within and adjacent to the Project corridor.

4.1 Topography and soil characteristics

The Project site is located in a highly modified landscape that features industrial, commercial and transport related developments. The topography is generally flat at elevations less than 12 m (m) Australian height datum (AHD). In sections, the rail corridor is constructed on engineered embankments that are elevated above the adjoining ground level.

The surrounding topography generally slopes gently upwards from zero metres AHD at Botany Bay in the south to elevations of 30 to 40 m AHD to the northeast, east and south-east of the Project site.

The project is straddling along two types of soil landscapes, Aeolian Tuggerah to the east of the rail corridor, and Disturbed Terrain extending across the airport to the west, along the Botany Wetlands, the lower reaches of the Cooks River and up Alexandra Canal to the north.

A band of Ashfield Shale underlies a series of low crests running north-east to south-west, parallel to the western part of the Project site. Ashfield shale comprises black to dark grey shale and laminate. The nearest exposure of Ashfield Shale is located about 1km north of the project site.

Minor occurrences of Hawkesbury Sandstone are also mapped to the west of the Cooks River. These geological units are overlain by Quaternary sediments, which infilled drowned river valleys that were incised into the bedrock. These sediments, referred to locally as the Botany Sands, are composed of predominantly unconsolidated to semi-unconsolidated permeable sands interspersed with lenses and layers of peat, peaty sands, silts, and clays (low permeability).

Reclamation and stabilisation of Sydney Airport land altered the original southern drainage channel networks of Alexandra Canal and Cooks River, which were diverted around the airport. Other influences on landform include drainage and reclamation of the original swamps, estuaries and wetlands that surrounded Botany Bay, landfill activities, and extensive cut/fill works.

4.1.1 Soil salinity

Most of the Project site is classified as having low salinity potential. This is due to the high permeability soils surrounding the waterways in the area that allows for rapid drainage and flushing of salts.

4.1.2 Acid sulfate soils

The site is located along the boundary between an area of low probability of acid sulfate soils (ASS) and disturbed terrain to the west and south. There is a high probability of ASS associated with the Mill Stream sediments. Works below the water table are predicted to encounter ASS (e.g. piled foundations for the proposed bridges and retaining structures).

Appendix A is the ASSMP which provides management methods and procedures to minimise environmental impacts resulting from the disturbance of ASS. This ASSMP also provides neutralisation and treatment methods, verification testing requirements, emergency response procedures and groundwater and leachate management procedures

4.1.3 Contaminated land

Prior to excavation works, a Contamination Assessment and literature review was undertaken.

Aerial photographs, which do not cover the southern or northern ends of the current site, indicate that the rail corridor has been in place over most of the alignment since at least 1930. The alignment north of approximately O’Riordan Street was realigned to the west to accommodate the expansion of the airport at some time between 1942 and 1970. The surrounding land uses were predominantly residential to the east and south transitioning to a more commercial / industrial use from the 1960’s / 1970’s. The airport was present to the west of the site in 1930 and underwent various phases of development over the years.

Based on data contained in the EIS, seven contamination areas previously notified to the EPA for contamination have been identified within 500m of the Project two of which were identified as requiring regulation under the CLM Act.

The two sites are:

1. Former Mascot Galvanising (336 – 348 King Street Mascot). The site is located 150m east of the project site and has four current remediation orders. Contamination types include zinc, lead and chromium in soil and groundwater.
2. Former Email Site (Corner of Page Street and Holloway Street Pagewood). The site is located 420m east of the project area and has a groundwater plume migrating off-site towards the south. Contamination types include chlorinated hydrocarbons (trichloroethene and tetrachloroethene).

The EIS considered that due to its location the Email site was unlikely to pose a risk during construction or operation of the site. However, it was considered that groundwater impacts from the former Mascot Galvanising site may have migrated beneath the site.

The Sampling and Analysis Quality Plan included a review of previous reports relevant to the site. The following areas of environmental concern were identified:

- Asbestos impacted fill between Banksia Street and the Mill Stream;
- Possible PFAS impacts in groundwater near the airport;
- An area of restricted solid waste in the vicinity of Coleman Street; and
- The presence of ASS at depth.

Asbestos and ASS will be managed under the AMP and ASSMP in Appendices A and B.

The Unexpected Finds Procedure presented in Appendix C will be implemented for any previously unidentified contamination encountered on the project.

4.2 Surface water

The Project site is mainly located within the Botany Bay catchment, which encompasses surface water features near and within the project site including the Botany Wetlands, Mill Stream and Botany Bay.

Surface water from the northern 1.4 km of the project site flows in a north westerly direction to Alexandra Canal via existing drainage network and the Upper Mascot Open Channel. Alexandra Canal is located within the lower reaches of the Cooks River catchment. Alexandra Canal is tidally dominated through its connection to the Cooks River. Runoff into Alexandra Canal was heavily contaminated in the past from surrounding heavy industry. Contaminants entering via stormwater today come from heavy industry, urban areas, and road networks.

Surface water from the southern 1.6 km of the project site flows to Mill Stream, directly via overland flow or through existing drainage networks. Engine Pond and Mill Stream are located south of the Southern Cross Drive and intersect the project site. Engine Pond acts as a sink for surface water runoff from the surrounding local area. While a locally and regionally significant surface water feature, it is not considered to be a pristine environment and is expected to be moderately disturbed by runoff from the surrounding urban environment.

4.2.1 Surface water baseline

Water quality monitoring has been undertaken in Mill Pond from 21 December 2017 and 20 February 2020 as part of the EIS scope and monthly from June 2021 – October 2021 as part of the Sydney Gateway sampling program. Water samples, which were collected from three locations in Mill Stream and were analysed to establish baseline water quality conditions in the study area. Figure 2 shows the locations of background sampling points (SW11, SW10 and SW9). Note monitoring carried out by Sydney Gateway has only included SW9 for the September and October sampling periods.

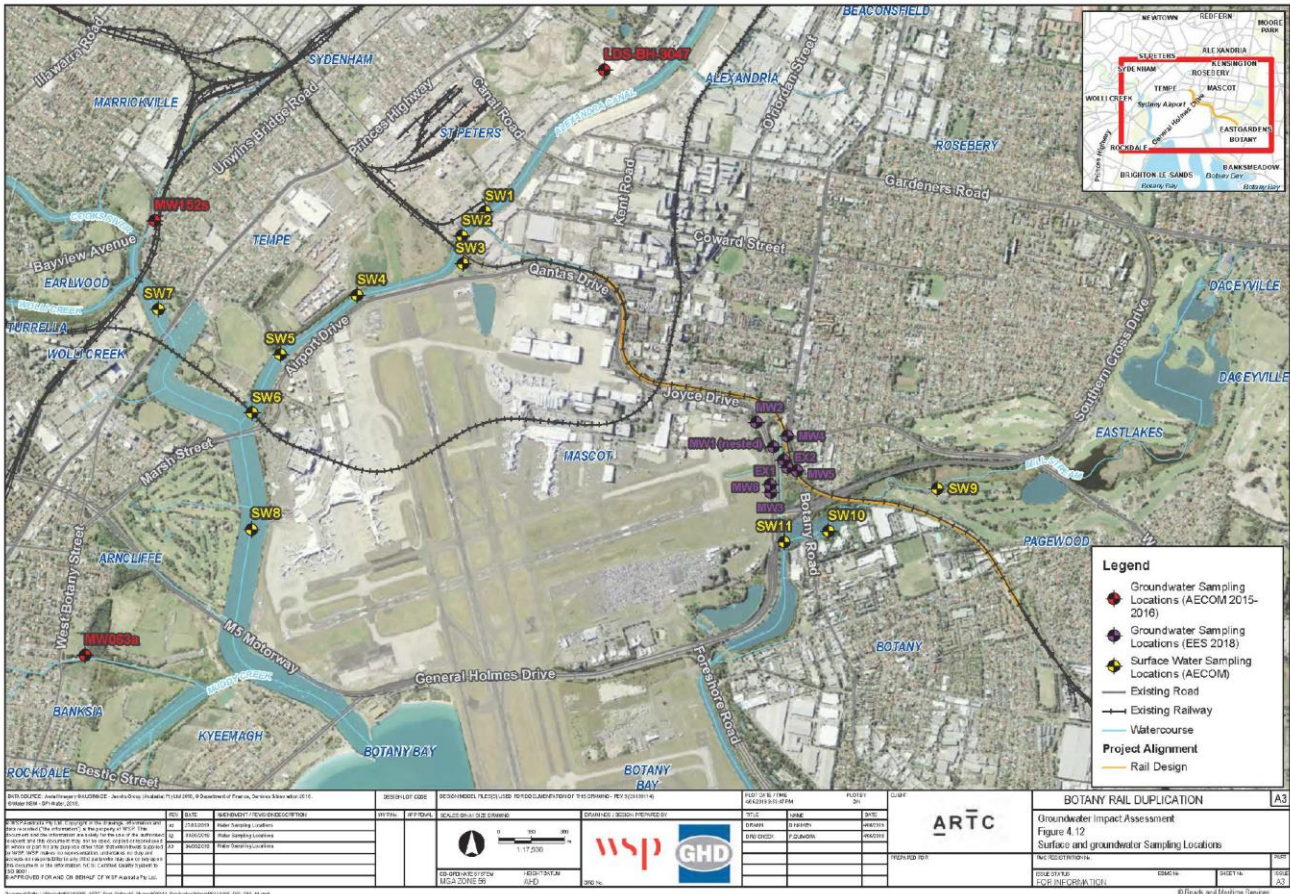


Figure 2 – Surface and Groundwater sampling locations (source: EIS Technical Report 7, 2019)

A review of this data indicated the Mill Stream sub-catchment is in poor condition. The analysis indicates that:

- Samples obtained from Mill Stream frequently exceeded ANZECC guidelines default trigger values for total nitrogen, total phosphorus, aluminium, copper, iron, lead, manganese, mercury, zinc, total suspended solids, turbidity and ammonia.

In relation to PFAS, the results indicate that:

- PFAS compounds, including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), were detected in almost all samples obtained from Mill Stream
- Concentrations of PFAS were below the 95 per cent level of protection criteria for marine species from the PFAS National Environmental Management Plan (HEPA, 2018).

4.3 Groundwater

There are two main groundwater systems beneath the project site; a deeper confined groundwater system associated with the Hawkesbury Sandstone and a shallow, unconfined/semiconfined system within marine sands.

The Botany Sands is considered an unconfined, high permeability aquifer with flow directions generally controlled by topography.

Ongoing monitoring was undertaken by NSW Department of Industry – Water (DoI-Water) from March 1999 through to March 2015 at ten wells primarily located within the Botany Sands aquifer presented in the EIS details the following:

- Average variation in elevations – Following the topography of the area, groundwater is intercepted at higher elevations (27 mAHD) in the northwest, and at lower elevations (<5 mAHD) to the south near Botany Bay
- General depth to groundwater – Groundwater at bores located at the north and northwest of the Botany Sands is recorded at shallow depths, ranging from about 1 to 4 m below ground. Bores located to the south have encountered deeper water table, from about 8 to 12 m below ground. All bores are screened in sandy material
- Annual rainfall records plotted against groundwater levels show that groundwater is generally stable, with spikes noted in periods with above average rainfall and minimal response during periods of below average rainfall.

4.4 Rainfall and climate

Rainfall data have been obtained from the EIS TP 8 for the closest Bureau of Meteorology (BOM) weather station site at Sydney Airport (BOM site number 066037) for the period 1929-2018.

The data details that most rainfall occurs in the Autumn season and the highest average rainfall occurs in June. The lowest rainfall occurs in Spring. The average annual rainfall is 1081.2 millimetres.

Weather data is captured and recorded within the project sharepoint site from the BOM Sydney Airport weather station.

Table 4.1 - Average rainfall Sydney Airport (1939 to present)

Mth	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Avg	94.4	118.0	123.7	106.7	95.9	122.1	71.7	75.3	59.5	71.6	80.3	72.6	1091.3

4.5 Flooding

The Project site is mainly located within the Mill Stream catchment which is a sub-catchment of the Georges River catchment. small portion of the Project site, west of Robey Street discharges to Alexandria Canal via the stormwater system. Alexandria Canal is a sub-catchment of Cooks River catchment.

Both the Georges River and Cooks River catchments have been extensively developed meaning that the rainfall-runoff response of the catchments has been altered from a natural state. This has resulted in changes to the quantity and speed of runoff within the catchments.

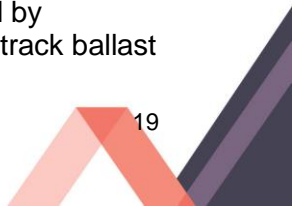
This means that these systems experience very low flows during dry periods and very high flows after storms, causing erosion and flooding in some areas.

4.5.1 Mill Stream

The peak 1% AEP flood level at the Mill Stream bridge is RL 6.0 m AHD, which is about 1.5 m below the underside of the bridge. At Southern Cross Drive where Mill Stream runs under the rail line to the west of Botany Road, the road acts as an overland flowpath to convey flows that surcharge the section of Mill Stream within the Lakes Golf Club during events greater than two per cent AEP.

During a one per cent AEP event the overland flow that is conveyed along Southern Cross Drive collects at the low point in Botany Road between Wentworth Avenue and Southern Cross Drive.

A section of rail line about 220 m to the east of the Mill Stream bridge would be inundated by overland flow during events greater than 10% AEP. During a two per cent AEP event the track ballast



layer would be inundated to a maximum depth of 0.3 m, increasing to 0.5 m and 1.0 m during a one per cent AEP event and the PMF respectively.

4.5.2 Alexandra Canal

Flooding along Alexandra Canal is mainly confined to the channel itself for floods up to the five per cent AEP event. However, during a one per cent AEP event, flooding tops the canal banks upstream of the Botany Rail Line, causing inundation of adjacent commercial and industrial development of depths exceeding one metre at several locations. This can result in hazardous flooding conditions to persons and property. Flooding also occurs downstream of the Botany Rail Line during the one per cent AEP event, discharging over Airport Drive and Sydney Airport land at a depth typically less than 0.1 m.

5 Aspects and potential impacts

The key aspects and potential impacts associated with the management of soil and water during the delivery the works are listed in Table 5.1. These potential impacts and opportunities have been taken into account in the development of this CSWMP and site-specific procedures for the works.

Soil and water related risks are assessed within Appendix C of the Construction Environmental Management Plan (CEMP). Ongoing analysis of the key environmental risks arising during construction will be undertaken as part of the management review process (refer to the CEMP).

Table 5.1 - Aspects and Potential Impacts

Aspects	Potential impacts/opportunities
Discharge of contaminated water from within site boundary during rainfall or from site activities such as concrete washout	<ul style="list-style-type: none"> • Contamination of adjacent watercourse • Contamination of soils
Dust from the worksites or from vehicles	<ul style="list-style-type: none"> • Potential pollution of waterways and air
Earthworks / Embankment works/Drainage excavation works	<ul style="list-style-type: none"> • Potential spread of contamination into soils /surface or groundwater • Personnel exposure to contaminants • Sediment degrading surrounding environment • Change to flooding characteristics • Potential increased flooding risk on roads and properties during drainage construction activities
Flooding of worksites/adjacent properties	<ul style="list-style-type: none"> • Contamination of floodwaters by sewage, fuels and/or chemicals onsite and off-site in adjacent properties
Leaks or spillages of fuels, oils and grease from construction plant and equipment and at compounds	<ul style="list-style-type: none"> • Contamination of soil • Contamination of watercourse, riparian environment and groundwater ecosystems • Personnel exposure to contaminants
Disturbance of Potential Acid Sulphate soils and Actual Acid Sulphate Soils during excavations.	<ul style="list-style-type: none"> • Mobilisation of metals within runoff to levels toxic to natural systems. • Release of acidic runoff.
Modifications to natural hydrology or water quality from excavations	<ul style="list-style-type: none"> • Localised pollution of waterways • Potential loss of surface flow from existing drainage lines
Sediment laden runoff during rainfall	<ul style="list-style-type: none"> • Runoff entering drainage lines causing pollution and impacting aquatic life in Cooks River
Sediment tracking onto public roads from vehicles leaving site	<ul style="list-style-type: none"> • Potential impact on traffic safety • Potential for sediment laden runoff during rainfall • Potential for generation of dust

Storage of hazardous substances	<ul style="list-style-type: none"> • Contamination as a result of a spill • Impact to watercourses from pollution
Construction laydown spills	<ul style="list-style-type: none"> • Contamination of soils • Potential for pollutants to wash into drainage system • Sediment laden/ contaminated runoff entering drainage system • Potential for contamination of floodwaters by sewerage, fuels and/or chemicals onsite
Inappropriate management (handling, stockpiling, transport and disposal) of identified contamination or contaminated materials encountered during construction works (e.g. excavation)	<ul style="list-style-type: none"> • Potential for spread of contamination (soil/water) • Personnel exposure to contaminants • Local media coverage • Fines and prosecution from Regulatory Authorities
Salinity	<ul style="list-style-type: none"> • Potential for mobilisation of saline groundwater and soils during construction to sensitive ecosystems • Increases in salinity levels due to construction works (dewatering/runoff) affecting local and nearby sensitive ecosystems

6 Soil and water management

6.1 Erosion and sediment control

6.1.1 General principles

Environmental protection during construction will involve the installation, use and maintenance of a number of temporary erosion and sediment control measures as required in accordance with the following principles:

- Before undertaking any construction work (including any earthmoving or vegetation removal works), implement all soil and water management works required to minimise pollution of waters
- All erosion and sediment controls will be installed in accordance with best-practice guidelines such *NSW Blue Book Volumes 1 and 2D* (Landcom, 2004 and DECC, 2008)
- Maintaining ground cover for as long possible to prevent erosion and sedimentation
- Diversion of 'clean' run-off from offsite around or through the worksite without it contacting exposed soils or mixing with 'dirty' onsite water and maintaining existing drainage infrastructure wherever possible
- Installation of any permanent scour protection measures required for the operational phase would occur as soon as practical
- Minimise soil erosion and mobilisation of sediment during rain events
- Minimise area of exposed soil by staging vegetation and ground disturbance works
- Use of suitable sediment retention structures and control measures to filter or retain mobilised sediment generated during rain events over surface disturbances
- Maximum sediment capture through effective positioning of temporary erosion and sediment control structures
- Progressive rehabilitation and/or stabilisation of completed areas to minimise erosion hazard, as soon as practicable
- Regular inspection and maintenance of all erosion and sediment controls to ensure they are effective
- Use of water efficient fittings and fixtures where reasonable and feasible for temporary site facilities

- Targeted training on erosion and sediment principles for key staff (as relevant to scope and personnel – in the form of formal organisational training or toolbox sessions)
- Construction compounds to be enclosed with silt fences and/or similar to ensure runoff does not enter public areas or stormwater
- Ensure that any road, footpath, shared path or cycleway which is open to the public is at all times kept free of project related mud, dirt, dust, deleterious material, debris, obstructions and trip hazards arising from construction activities
- Install, maintain and utilise appropriate site exit controls. This includes wheel wash facilities and/or rumble grid. These measures would be put in place to mitigate the risk of any loss of fuels, lubricants, load or other substances
- Any spillage or build-up of such material or debris would be cleaned up as soon as practicable
- Diversion of run-off from areas of exposed soil to appropriate sediment control devices (such as infiltration trenches) as much as practicable
- Topsoil will be maintained wherever practicable. Should topsoil need to be removed from site, seeds will be collected prior to removal.

6.1.2 Resources

Ultimate responsibility for erosion and sediment control will rest with the construction personnel who will be responsible for the on-ground installation and maintenance of erosion and sediment controls. This would include (although is not limited to):

- Hard standing and deployment of spray-on soil stabilisers as required
- Installation, cleaning and maintenance of controls such as sediment fences, gravel socks, inlet filters, straw bales, sandbags etc
- Installation of temporary drain and channel liners (e.g. geofabric, jute matting etc.)
- All dewatering activities (if required).

Relevant personnel will receive training and ongoing toolbox talks on installation and maintenance of erosion and sediment controls.

6.1.3 Sediment basins

Sediment basins are not required during the construction stage due to the limited ground disturbance in the BRD works scope. Additionally, sediment basins are not considered feasible for the project due to the limited space available on the Project site.

6.1.4 Erosion and sediment control plans

Erosion and Sediment Control Plans (ESCPs) will be developed for the Project area in accordance with requirements of the “Blue Book” prior to the start of construction. An example ESCP is presented in Appendix E of this Plan. The ESCPs will contain the following key management measures, as applicable to the works:

Site entry and access requirements

- Establish stabilised access points with rumble grids or wheel washes to prevent mud tracking on roads
- Clearly delineate access points
- Use of street sweepers
- Sealed haul roads would be regularly cleaned
- Unsealed haul roads would be regularly damped down with fixed or mobile sprinkler systems
- Appropriate site speed limits would be imposed and signed on haul routes
- Exclusion zones would be designated on construction sites to limit disturbance.

Soil stripping and stockpiling

- Stockpile areas are to be established within the approved Compounds in low-hazard areas clear of watercourses, stormwater drainage lines/culverts and not within the dripline of any retained trees where feasible and reasonable.
- During construction (and earthworks), excavated material may be stockpiled directly adjacent to the works (in line with the cut and fill methodology in the RAP).
- Stockpiles will not be located next to schools or day care facilities
- Temporary stockpiles and material which cannot be beneficially used for construction or for ongoing maintenance will be removed at completion of construction
- Stockpile areas within the compounds will be located in areas which are not subject to frequent inundation by floodwater and ideally outside the 1% AEP flood extent
- Diversion drains / bunds are to be installed on the high side of stockpile areas within compounds if run off from upslope lands could impact on the stockpile
- As much as is feasible, mulched vegetation, topsoil and subsoil (if applicable) are to be stockpiled separately
- Any contaminated material stockpiles (i.e. asbestos, contaminated soil) will be covered on-site and short-term material stockpiles (>5 days not in use) with potential to generate dust will be wetted down or covered to prevent fugitive dust emissions or run-off during wet weather. Long-term stockpiles (>30 days) will be stabilized and /or covered in accordance with “Blue Book” requirements.
- Stockpiles will be constructed to no more than 3m in height where possible. Topsoil and mulch stockpiles will be constructed to no more than 2m in height where possible
- Stockpiles will be battered down to a maximum slope of 2:1 (H:V) where space permits.
- Material transport from site to surrounding pavement surfaces would be minimised
- Topsoil will be maintained wherever practicable. Should topsoil need to be removed from site, seeds will be collected prior to removal
- Segregate soil and prevention of cross-contamination of clean soil with contaminated soil to be undertaken in accordance with ARTC’s Standard Environmental Management Measures
- Protect stockpiles to prevent erosion during rainfall and wind.

Dust control

- Dust suppression will be carried out whenever necessary to minimise sediments becoming air borne due to wind erosion
- Wherever possible, water detained onsite will be re-used for dust control.

Stabilisation

- Undertake progressive stabilisation of ground surfaces as quickly as possible as they are completed rather than at the end of the works program
- Temporary ground covers such as hydraulic soil stabilisers or geotextile fabric will be used as much as possible to stabilise batters, stockpiles and large surface areas
- Scour protection and energy dissipation would be used around discharge points at local points to reduce erosion where necessary.
- Batter slope gradients, surface treatments and the construction program will be designed to minimise erosion risk, so the annual sediment export rate is below 150 m³ at each outlet to avoid the need for sediment basins in accordance with the Blue Book.

Sediment controls

- Sediment controls will be installed around stormwater inlet pits where appropriate and where they will not cause or exacerbate flooding. Traffic management and safety will need to be considered if installing such devices on or near live traffic

- Maximise the diversion of turbid construction runoff through the use of green infrastructure as well as sediment retention devices such as sediment sumps, sediment fences and other sediment traps
- Mulch bunds will not be used in concentrated flow areas or if they have the potential to result in tannin leachate into waterways
- All erosion and sediment controls will be inspected by the Environmental Manager (or delegate) at least weekly, before forecast rainfall exceeding 20 mm in 24 hours, after rainfall exceeding 20 mm in 24 hours and before a site closure of more than two days. Maintenance will be carried out as required prior to the next forecast rainfall event
- Site supervisors will undertake daily erosion and sediment control checks and record any issues within site diaries. Site supervisors will ensure controls are maintained and in working order.
- Concrete washout will be confined to designated concrete washout locations or using a Concrete Waste Separation Unit (CWSU), which allows for recycling of concrete waste
- No stockpiles of materials or storage of fuels or chemicals would be located adjacent to the existing drainage or waterways.

6.2 Reuse

Where practicable, any water collected in excavations / work sites will be reused within, the Premises (e.g. dust suppression, watering retained vegetation). Prior to any reuse within the premises, the Environment Manager (or delegate authorised by the Environment Manager) is to sign off that the water is suitable for reuse

6.2.1 Onsite reuse

For onsite reuse, the following criteria will be utilised:

- pH – 6.5 to 8.5.
- No visible oil and grease
- No potential for water to leave the premises
- No surface runoff will be generated from the reuse (reuse includes dust suppression, watering retained vegetation etc.)
- No potential for water to reach any watercourse

Should the on-site reuse criteria be unable to be reached, water will be treated on-site using sediment tanks or disposed off-site as liquid waste. Re-use criteria will be updated following issuing of the Project EPL.

6.2.2 Offsite discharge

BRD EPL 21678 does not permit discharge offsite . In the event that off-site disposal options are required, water disposal options will be investigated, and disposed of at an appropriately licensed facility

6.3 Refuelling, chemicals and spill management

Hazardous substances and dangerous goods will be stored and used onsite in accordance with the following protocols:

Hazardous materials

- Hazardous substances will be stored onsite in lockable containers, in their original or suitable replacement receptacles
- All hazardous substances will be clearly labelled and will have Hazardous Chemicals and Safety Data Sheets (SDS) affixed or available nearby. The SDS will be used to determine compatibility of hazardous chemicals to be stored together, i.e. no flammables with corrosives, not all corrosives compatible with each other etc

- A bund sized to 110% of the largest stored receptacle will be established around any storage area for hazardous substances
- Storage and handling of flammable or combustible liquids will be in accordance with OEH guidelines for Bunding and Spill Management, as well as AS 1940-1993 – The Storage and Handling of Flammable and Combustible Liquids
- An up-to-date register of hazardous substances will be kept onsite at all time
- Hazardous substances will only be used onsite as required, in accordance with the manufacturer/supplier instructions
- The use of any hazardous substance that could result in a spill will be undertaken away from drainage or stormwater lines and, wherever possible, within defined bunds
- All potentially contaminating substances will be stored in secure, banded and impervious locations away from surface water features and outside of the extent of the 20 year ARI design flood, wherever practicable.

Spill management

- Spill kits will be kept on-site at all times and be readily accessible to site personal (specifically during refuelling activities). All staff would be made aware of the location of the spill kit and be trained in its use
- Any substances with the potential to impact water quality will be assessed by the Environment Manager to determine what environmental safeguards or procedures are required for that substance to minimise the risk of environmental harm
- All spills or leakages will be immediately contained and absorbed. Routine inspections of all construction vehicles and equipment would be undertaken for evidence of fuel/oil leaks
- Construction plant and equipment will be regularly inspected and maintained to prevent leaks
- In the event of a spill, the Spill Management Procedure will be implemented. As set out in the CEMP, the management of environmental incidents where material harm to the environment is caused or threatened will be managed in accordance with the Incident Management Plan (BRD-JH-PM-0000-MPL-12008)
- Leakage of fuels, oils, chemicals and other hazardous liquids will be immediately cleaned up in accordance with the SDS and relevant emergency response procedures.

Refuelling and maintenance

- Construction plant, vehicles and equipment would be refuelled off-site, or in designated re-fuelling areas located at a minimum distance of 50 m from drainage lines or waterways, where possible
- Impervious and banded areas will be established for the on-site maintenance of construction plant and equipment.

6.4 Contamination

6.4.1 Site wide contamination

The following mitigation measures will be implemented to mitigate risks associated with contamination on the Project site.

General

- Where contamination is encountered, workers will apply the appropriate Personal Protective Equipment (PPE) as advised by the Contamination Consultant. The appropriate PPE will depend on the contaminant type and the works to be undertaken. Appropriate PPE will be decided upon in consultation with an Occupational Hygienist.

- A NSW EPA accredited Site Auditor will be engaged throughout the duration of works to ensure that any work required in relation to soil or groundwater contamination is appropriately managed.

Excavation and stockpiling of contaminated material

Contaminated material will be excavated and where stockpiling is required, stockpiled at a suitably segregated location(s) away from sensitive areas (e.g. water bodies, drainage lines, stormwater pits, etc) and ongoing excavations, and in a manner that will not cause nuisance to the neighbouring properties. Soil stockpiles are to be managed as follows:

- All stockpiles of contaminated material shall be surrounded by star pickets and marking tape or other suitable material to clearly delineate their boundaries
- Stockpiles shall be lightly conditioned by sprinkler or covered by geotextile or similar cover to prevent dust generation
- Any stockpile to remain on-site overnight should be adequately secured in order to reduce the risk of sediment runoff
- Should the stockpile remain on-site for over 24 hours, geotextile silt fences must be erected to prevent losses by surface erosion, silt fences may be located at the area boundary
- Remove all material from the site as soon as practical at the completion of work.
- Stockpiles of contaminated material (where stockpiled in a compound or area not suitable for reuse) shall be stockpiled at a suitably segregated location(s) and placed on geofabric, and ideally on hardstand where possible, to reduce cross contamination of the underlying soil; and

Any contaminated material stockpiles (e.g., asbestos impacted fill) will be covered to prevent fugitive dust emissions or run-off during wet weather.

All movement of soil within the site and off-site is to be tracked, from cradle to grave. Copies of tracking records must be provided to the Contamination Consultant.

Note, where practicable, strategies will be investigated to avoid double handling and stockpiling of asbestos containing materials. Imported material (stockpiles) will be placed on hardstand or a geofabric material to avoid cross contamination of other areas.

Loading and transport of contaminated material

A record of the truck dispatch will be provided to the Contamination Consultant. All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site will be selected to meet the following objectives:

- Comply with all road traffic rules
- Minimise noise, vibration and dust to adjacent premises
- Utilise State roads and minimise use of local roads as far as practicable.

The remediation work will be conducted such that all vehicles:

- Conduct deliveries of soil, materials, equipment or machinery only during the specified hours of remediation
- Have securely covered loads to prevent any dust or odour emissions during transportation
- Exit the site in a forward direction.

In addition, measures will be implemented to ensure no contaminated material is spilled onto public roadways or tracked off-site on vehicle wheels. Roadways will be kept clean throughout the remediation works and will be broomed, if necessary, to achieve a clean environment.

All loads will be securely covered and may be lightly wetted, if required, to ensure that no materials or dust are dropped or deposited outside or within the site. Prior to exiting the site each truck should be inspected by Remediation Contractor personnel and either noted as clean (wheels and chassis) or

broomed prior to leaving the site. Any soil spilled onto surrounding streets will be cleaned by mechanical or hand methods, on a daily basis.

Removal of waste materials from the site will only be carried out by contractors holding the appropriate license(s), consent or approvals to dispose the waste materials according to the waste classification and with the appropriate approvals obtained from the EPA, were required.

Groundwater

Infiltration trenches will be installed to allow for potentially contaminated water to be collected and infiltrated back into groundwater rather than flowing to surface water.

Unexpected finds of contamination

In the event of unexpected finds of contamination the Unexpected Contaminated Land Procedure (refer Appendix C) will be implemented. In brief, the following would occur:

- Cease work in the area of concern immediately
- Isolate the area with barrier tape or any other physical barrier to prevent workers from entering the area of contamination
- Report the area of concern to the Environment Manager and HS Manager immediately. Nearby work groups would be notified
- Environment Manager will arrange for the Contamination Consultant to inspect the site and carry out an initial assessment of the nature and extent of the contamination
- The Contamination Consultant will advise what management is required in accordance with this plan.

6.4.2 Contamination Report

A Site Contamination Report, documenting the outcomes of Stage 1 and Stage 2 contamination assessments of land upon which the CSSI is to be carried out, or land associated with the CSSI, that is suspected, or known to be, contaminated will be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under Section 105 of the *Contaminated Land Management Act 1997* (NSW).

6.4.3 Remediation Action Plan

A remediation action plan (RAP) will be prepared for Area 1 (extending to the east and southeast towards Port Botany from Southern Cross Drive and Mill Pond Road) in accordance with the National *Environmental Protection (Assessment of Site Contamination) Measure* (NEPM 2013) prior to placement of the asbestos capping layer. Remediation in Area 1 will be undertaken in accordance with the endorsed RAP.

The RAP will be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under Section 105 of the *Contaminated Land Management Act 1997* (NSW).

6.4.4 Validation Report and Site Audit Statement

A validation report will be prepared by a suitably qualified environmental consultant to validate the suitability of the project site for its proposed use. Installation of the capping layer will be done under the supervision of a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM. The final elevation of residual contaminated soils will be surveyed prior to the installation of the marking layer and capping layers. Final levels will also be surveyed and included in the SWMP and ARTC asbestos register.

An Interim Audit Advice or a Section B Site Audit Statement will also be prepared by the Site Auditor that certifies that the RAP is appropriate and that the site can be made suitable for the proposed use. A Section A1 Site Audit Statement or a Section A2 Site Audit Statement and accompanying Site Audit Report prepared by a NSW EPA accredited Site Auditor will be submitted to the Planning

Secretary and the relevant Council for information no later than one month before the commencement of operation.

6.5 Acid sulphate soils

If ASS or PASS is encountered during construction, management of ASS and PASS will be undertaken in accordance with the requirements of the ASSMP (Appendix A of this Plan).

The ASSMP has been developed in accordance with ASSMAC (1998) *Acid Sulfate Soils Manual*. The ASSMP provides management methods and procedures to minimise environmental impacts resulting from the disturbance of ASS. The ASSMP also provides neutralisation and treatment methods, verification testing requirements, emergency response procedures and groundwater and leachate management procedures.

6.6 Asbestos

Asbestos impacted fill has been identified between Banksia Street and the Mill Stream. Asbestos may also be encountered at the surface or in fill in other parts of the site. Asbestos impacted fill / finds will be managed under the AMP in Appendix B.

The AMP outlines general requirements that apply to removal of friable and non-friable asbestos in soil / fill based upon the following:

- *NSW Work Health and Safety (WHS) Regulation 2017*, Chapter 8 Asbestos
- *SafeWork NSW Code of Practice: How to Safely Remove Asbestos*.

Prior to any excavation an emu pick will be carried out for ACM by the a licenced asbestos assessor or Competent Person in accordance with the AMP (Appendix B). Areas of asbestos will be demarcated/flagged with warning signs indicating asbestos has been found at the location and any hygiene facilities/PPE requirements for the area. This can include asbestos found as part of contamination assessment, historical sampling or unexpected find.

An asbestos assessment has been carried out for the alignment as part of the Contamination Sampling and Remediation process and will supplement historical results. Details of the analysis and sampling results are included in the Contamination Reports, Waste Classifications and Remediation Action Plan for the Project.

6.7 Water quality

Adopt construction techniques to avoid groundwater disturbance, where practicable. If groundwater is encountered, temporarily store all extracted groundwater to be disposed of offsite in appropriate containers then ensure it is tested for potential contaminants (including PFAS).

Water quality of surface water discharged from the rail corridor will not worsen the surrounding water quality, and will be managed under EPL 21678,. Cumulative impacts to water quality have been addressed in the Surface and Groundwater Monitoring Program (refer to Appendix D). Surface water monitoring locations have been determined in consultation with Sydney Gateway and capture both downstream water environments for BRD and cumulative with Sydney Gateway.

6.8 Working in or near to waterways

Works on waterfront land (including Mill Stream) will be carried out in accordance with *Guidelines for Controlled Activities on Waterfront Land* (NRAR 2018). The following measures will be carried out to manage activities within watercourses or on waterfront land:

- Implementing practices to minimise disturbance of banks
- Use of silt barriers will be implemented, where necessary
- All drainage feature crossings (permanent and temporary watercourse crossings and stream diversions), drainage swales and depressions will be designed by a suitably qualified and experienced professional and will be designed and constructed in accordance with relevant guidelines.

6.9 Flooding

The construction works will have negligible impacts on flooding within the catchment, with minimal loss of flood storage and minimal changes or restrictions to existing flood regimes.

JH will implement a number of measures to mitigate the impacts of flooding on the Project site. These include the following:

- Where feasible, construction activities will be scheduled to avoid ground disturbance works or in-stream works during periods of heavy or prolonged rainfall.
- Stockpiling and storage of materials to occur outside potential flood areas
- Temporary facilities and hazardous material storage to be above flood levels.
- Maintain overland flow paths
- Monitoring of rainfall will be undertaken in accordance with Surface and Groundwater Monitoring Program
- Construction equipment (or excess material) would be removed from prone areas where significant events are predicted
- Site inspections will be completed to ensure erosion and sediment controls are place prior to the event
- Where applicable, temporary levees or bunds would be strategically placed to contain potential flooding impacts resulting from any temporary works on the floodplain and minimise the risk to surrounding properties which might otherwise be affected.
- Stockpiles will be located away from areas subject to concentrated overland flow
- Site facilities are to be located outside high flood hazard areas based on a 1% AEP flood and ideally outside the 1% AEP flood extent
- In the event of an emergency the requirements set out in the Emergency Management Plan (ERP) will be implemented.

Details of flood management associated with compounds will be incorporated in the Site Establishment Management Plan (SEMP) for the specific compound prior to establishment. The layout of the construction compounds, material storage areas, as well as temporary crane pads and temporary piling platforms will be designed to:

- Limit the extent of works located in floodway areas
- Divert overland flow either through or around work areas in a controlled manner
- Minimise adverse impacts on flood behaviour in adjacent development. Measures to manage residual flood impacts may include:
- Staging construction to limit the extent and duration of temporary works on the floodplain
- Ensuring construction equipment and materials are removed from floodplain areas at the completion of each work activity or should a weather warning be issued of impending flood producing rain
- Providing temporary flood protection to properties identified as being at risk of adverse flood impacts during any stage of construction of the project.

7 Training

All personnel working on site will undergo site induction training relating to soil and water issues (including asbestos). The training will cover the following issues such as:

- Legislative requirements (POEO Act, EPL etc.) including Section 120
- Erosion and sedimentation control planning and hold points
- Duty to notify of environmental harm (or the potential for it) including chain of reporting
- Spill containment and management procedure

- Storage and use of hazardous substances
- Water discharge and reuse procedure
- Maintenance of environmental controls (e.g. erosion and sediment controls)
- Contamination and unexpected finds.

Asbestos removal will be managed by the Remediation Contractor.

Appropriate training will be provided to key personnel regarding erosion and sediment control. This training will likely take the form of a toolbox and will include:

- Legislation as it applies to erosion and sediment control
- Basics of soil management, handling and stockpiling
- Appropriate use, installation and maintenance of various erosion and sediment control techniques
- Effective site rehabilitation and stabilisation
- Use of erosion control techniques such as geotextiles, organic fibre mats, mulches and soil polymer stabilisers
- Preparing, reading and interpreting Erosion and Sediment Control Plans
- Typical controls around existing drains and maintenance of controls, including prevention of materials from washing or blowing into the stormwater system
- Relevant sampling, testing, and reporting requirements
- Toolbox talks will also be used to further reinforce awareness of soil and water issues.

Refer to Section 8.2 of the CEMP for further information on environmental training.

8 Monitoring, auditing and reporting

JH will regularly review the BRD activities to ensure compliance with this Plan. A regular inspection, program for soil and water will be conducted as follows:

- Details of daily inspections undertaken by the Site Supervisor will be logged in their respective site diaries. Erosion and Sediment Control issues or actions to be recorded by exception.
- Routine weekly inspections are to be conducted to monitor erosion and sediment controls in active worksites. Weekly inspections will be documented on the Environmental Inspection Form.
- Pre/Post inclement weather events will be recorded within the Inclement Weather Inspection Form.
- Inspect the operation of soil and water management works installed on the premises and undertake any works required to repair and/or maintain these controls:
 - At least weekly during normal construction hours (as per routine inspection)
 - Prior to any major rainfall event forecasted (>20mm, in 24 hours)
 - Daily following a major rainfall event in any 24 hour period (>20mm), if safe to do so
 - Prior to any site closure of greater than 48 hours

Typical records generated and maintained (on the Project Sharepoint System) would include:

- Copies of current ESCPs for all active construction sites
- Records of soil and water inspections undertaken
- Observations and works undertaken to repair and/or maintain soil and water management works
- Records of testing of any water prior to discharge
- Records of the release of the hold point to discharge water from the construction site to the receiving environment
- Records of water quality monitoring and results
- Unexpected finds

- Records for contamination management – soil classification, spoil tracking, disposal dockets, remedial action plans, occupational hygienist clearances, and Site Auditor sign-off.

8.1 Surface and groundwater monitoring program

The scope of the SGWMP is to describe how the John Holland will monitor potential impacts to surface water during construction. Operational monitoring and mitigation measures are not included in the scope of this construction phase plan.

A groundwater monitoring programme will be implemented to characterise baseline groundwater conditions (DWQ6) and to verify the effectiveness of construction activities at preventing changes in the beneficial use of the aquifer system (CWQ15).

The baseline monitoring program locations for groundwater monitoring will focus on the early detection of impacts and the potential for impacts at groundwater receptors. As such, the monitoring includes locations:

- Up and down-gradient of the project site and at depths equivalent to the depth of construction and operational infrastructure (i.e. the shallow groundwater system of the Botany Sands aquifer);
- Along the entire alignment of the project site, to understand the breadth of water quality characteristics on which impacts can be assessed; and
- Near groundwater receptors including industrial groundwater supply wells and in between the project site and receiving surface water features (Mill Stream).

Refer to Appendix D for detail on the Surface and Groundwater Monitoring Program.

9 Review and improvement

The CSWMP will be reviewed on an annual basis and earlier if required taking into account the below:

- The status and progress of JH's activities
- Changes in the design, delivery and operations processes and conditions
- Results of water quality sampling
- Lessons learnt during delivery and operations
- Where deemed appropriate in relation to items raised within inspections or audits
- Lessons learnt from incident, events or near misses
- Feedback from Compliance Tracking Reports
- Feedback on Construction Monitoring Program results.

Continuous improvement (both of this Plan and the risk analysis) will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continuous improvement process will:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Assess the risks contained within the CEMP Risk Assessment and update accordingly in line with construction progress along with the relevant mitigation and control measures
- Develop and implement a plan of corrective and preventative action to address any nonconformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

10 Enquiries, complaints and incident management

Environmental incidents and complaints are to be investigated, reported, documented, actioned and closed out as per the details provided in the Community Consultation Strategy and the CEMP.

10.1 Records

Records associated with this management plan and monitoring programme will be maintained in accordance with Section 12.1 of the CEMP.

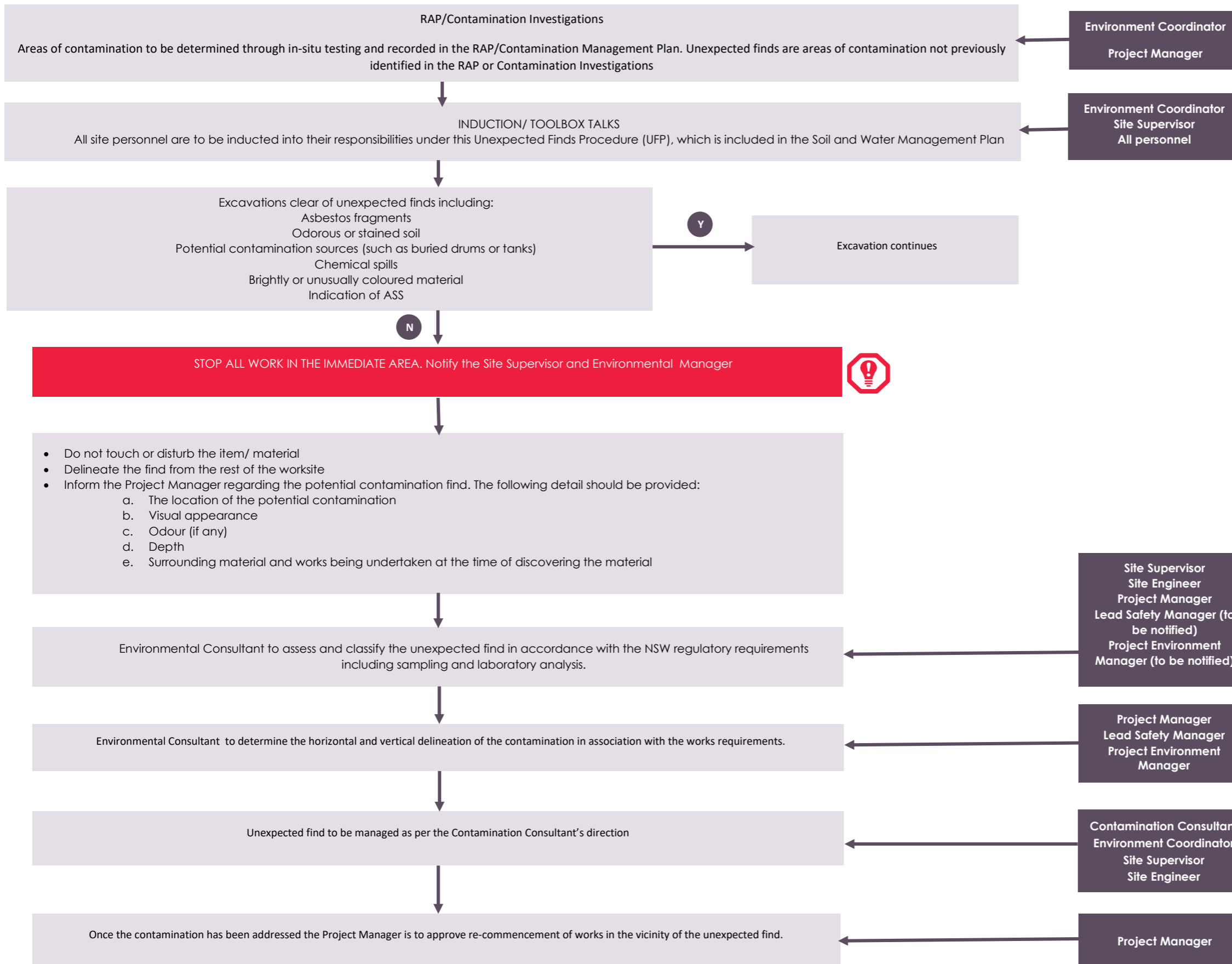
Appendix A: Acid Sulfate Soil Management Plan

Appendix B: Asbestos Management Plan

Appendix C: Unexpected Contaminated Land Procedure

UNEXPECTED FINDS PROCEDURE

MANAGEMENT AND RESPONSIBILITY



Unexpected Finds General Indicators

- Asbestos cement fragments or other potentially asbestos containing materials
- Odorous or stained soil
- Buried chemical drums or containers
- High proportion of waste materials or building debris
- Tarry or ashy material
- Brightly or unusually coloured material
- A yellow and/ or red mottling in the soil profile indicates there may be Acid Sulfate Soils (ASS)

Asbestos

An unexpected find occurs when ACMs not identified in the Asbestos Register is found on site. In the event of an unexpected find the below steps are to be followed:

- The area is to be demarcated, works in the area to cease and workers warned
- Notify the Site Supervisor, The Site Supervisor will notify the Project Manager
- Control dust by with dust suppression
- Arrange for testing of the suspected ACM and monitoring of the area (if required)
- An asbestos removalist is to be engaged to provide recommendations to treat the area, as required
- The area is to be made safe Asbestos finds are to be managed in accordance with the Construction Soil and Water Management Plan (BRD-JHG-EN-0000-MPL-13004)

Acid Sulfate Soils (ASS)

- ASS are naturally occurring soils, sediments or organic substrates that are formed under waterlogged conditions in coastal areas. When exposed to air after being disturbed, soils containing iron sulfides produce sulfuric acid and often release toxic quantities of iron, aluminum and heavy metals.
- If ASS is encountered, possible management strategies include:
 - Modifying the Project to avoid the area of ASS
 - Delineation and removal to a suitably licenced facility
 - Onsite treatment to neutralise the ASS, which could include the application of lime

NOTE:

These will be outlined in the Acid Sulfate Soil Management Plan (ASSMP) (Appendix C of the Soil and Water Management Plan BRD-JHG-EN-0000-MPL-13004) for areas with potential for ASS to be present.

The management of any ASS needs to include appropriate erosion and sedimentation controls to minimise the potential for pollution to waters.

Appendix D: Surface and Groundwater Quality Monitoring Program

1 Background

1.1 Purpose

This Surface and Groundwater Monitoring program (SGWMP) is for the establishment and management of a monitoring program to ensure that potential environmental impacts associated with the Botany Rail Duplication are adequately monitored during construction. The program has been produced in line with condition CWQ15 of the REMMs, the EIS Technical Report 7 and 8, relevant EPL for the project and all applicable legislation. Consultation was held with Sydney Gateway on the monitoring programs to address cumulative impacts.

The scope of the SGWMP is to describe how John Holland will monitor potential impacts to surface water and groundwater during construction. Operational monitoring and mitigation measures are not included in the scope of this construction phase plan.

1.2 Objectives

The key objective of this program is to ensure all approvals, licence and permit requirements relevant to surface and groundwater monitoring are described, scheduled, and assigned responsibility. The monitoring program purpose is to not worsen water quality of surface water discharged from the rail corridor (unless an EPL in force in respect of the CSSI contains different requirements).

The monitoring program includes baseline locations and provides suitable baseline data for use in deriving trigger values in accordance with *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2018) during construction.

By utilising the existing sampling points and trigger values from the EIS as modified by the Submission Report, the data is ensured to be comparable with existing information collected over the EIS period. The surface water sampling points detailed in the EIS are shown in Figure 1 (note only SW9, SW10 and SW11 relate to the Botany Rail Duplication project).



Figure 1: Surface water quality sampling points (from EIS TP 8 2019)

2 Construction monitoring program

The mobilisation of sediments and pollutants during construction works is identified as a potential impact on surface water within the highly urbanised and disturbed catchments and waterways. A soil conservation consultant will be engaged to provide design input into erosion and sediment controls to control dirty water and separate clean water flows around the works.

Other potential impacts during the construction stage include increased turbidity from soil disturbance, increased pH from the use of concrete products, discharge of poorly treated water from water quality treatment infrastructure, erosion and sediment migration from areas of existing and known contamination.

Construction water quality sampling locations have been chosen to continue the data sets from the background sampling program at relevant up and downstream locations in the waterways around the Project. Surface water monitoring locations are identified in Table 1.

Table 1 - Surface water sampling locations - construction

EIS/MDP Site Ref	New Site Ref	Water Body	Location Description	Location Reference	Monitoring Purpose
SW9	SW7	Mill Stream (Upper)	North of Project	Latitude – 33.9368 Longitude - 151.2078	Background up-stream of Mill Stream works
SW10	SW6	Mill Stream (Lower)	South of Project	Latitude – 33.9382 Longitude – 151.1977	Background downstream of Mill Stream works
SW11	SW5	Mill Stream Mill Pond (Lower)	South of Project	Latitude – 33.9542 Longitude – 151.1930	Background downstream of Mill Stream works and drainage lines

The groundwater monitoring program employs a risk-based approach and is generally consistent with the baseline monitoring program detailed in the EIS. The approach was developed by adopting the data quality objective (DQO) approach recommended in the *National Environmental Protection Measure* (NEPM) 2013. This approach helps identify potential groundwater quality risks, identify what parameters should be monitored and how often, and sets a framework for how the monitoring results should be interpreted. The groundwater monitoring program is designed to target the potential impacts to groundwater resources and their receptors during the construction stage of the Project.

Construction water quality sampling locations have been chosen to continue the data sets from the background sampling program at relevant up and downstream locations in the waterways around the Project. Groundwater monitoring locations are identified in Table 2.

Table 2 - Groundwater sampling locations – construction

Location ID	Easting	Northing	Existing Ground RL (m AHD)	Depth of well (m bgl)	Lithology	Ongoing baseline monitoring (as at April 2019)
GW14s	332104.69	6244353.19	4.10	6	Quaternary Sediments	Yes
GW15s	332081.84	6244179.48	3.25	6.02	Quaternary Sediments	Yes
WCX_GTY_BH_002	332395.54	6243838.78	5.63	3.96	Quaternary Sediments	Yes
WCX_GTY_BH_004	332115.79	6243985.37	3.30	3.97	Quaternary Sediments	Yes
MW04	332499.46	6243947.98	8.71	TBC	TBC	TBC
GW100s	331988.66	6244625.921	3.44	6.1	Fill / Quaternary Sediments	Yes
GW101	331863.565	6244877.462	2.19	6.1	Fill / Quaternary Sediments	Yes
GW102	332774.612	6244535.026	9.17	7.3	Fill / Quaternary Sediments	Yes
GW103	333004.73	6244155.16	8.14	5.98	Fill / Quaternary Sediments	Yes
GW104	331896.331	6244379.956	2.56	5.88	Fill / Quaternary Sediments	Yes
GW200-SG_BH059	333557.319	6243276.522	7.37	17.51	Fill / Quaternary Sediments	Yes
GW201	333899.745	6243165.058	9.30	6.51	Fill / Quaternary Sediments	Yes
GW203	334326.81	6242790.84	10.58	7.09	Fill / Quaternary Sediments	Yes
GW204	334297.052	6242711.503	9.89	5.2	Fill / Quaternary Sediments	Yes
GW205	333247.51	6243348.59	8.29	6.48	Fill / Quaternary Sediments	Yes
MW2	332876.5007	6243727.832	4.04	5.8	Fill / Quaternary Sediments	•
MW3	332959.6991	6243349.178	6.06	9	Fill / Quaternary Sediments	•
MW4	333047.8954	6243656.976	5.97	6	Fill / Quaternary Sediments	•
MW5	333101.1085	6243460.89	8.71	6	Fill / Quaternary Sediments	•

Surface water monitoring throughout construction at all locations in Table 1 will be as detailed in the analysis suites below in Table 3.

The groundwater monitoring program will commence prior to bulk earthworks for the Project and will be reviewed at a 6-monthly intervals or other intervals as deemed appropriate throughout the works. This review will include an assessment of any changes to the risk of ASS generation or the migration of existing contamination. The review will also be based around any access constraints and water levels in the existing wells.

Depending on the results of the baseline assessment and the first two quarterly construction monitoring events it may be possible to: reduce the number of wells and / or frequency of monitoring for three of the quarterly monitoring events whilst still maintaining the intent of the monitoring locations listed above.

Table 3 Summary of Construction Surface Water Quality Monitoring

Type of Measurement	Analytical Suite	Frequency of Monitoring	Analytes to be Sampled
In situ Measurements	Analytical Suite 1	Monthly at all sites	<ul style="list-style-type: none"> pH, electrical conductivity (EC), temperature, dissolved oxygen (DO), reduction-oxidation potential (redox), turbidity and direction of flow for tidal locations only
Laboratory analysis	Analytical Suite 2	Monthly during construction	<ul style="list-style-type: none"> pH, total dissolved solids (TDS), total suspended solids (TSS),

Type of Measurement	Analytical Suite	Frequency of Monitoring	Analytes to be Sampled
		works at Mill Pond, then quarterly for the remainder of construction	turbidity, carbonate and bicarbonate alkalinity, total alkalinity <ul style="list-style-type: none"> • Nutrients: nitrate, nitrite, total nitrogen, ammonia and total phosphorus • Contaminants of concerns including PFAS, TRHs and heavy metals.
Quarterly Wet Weather Events (>20mm)	Analytical Suite 3	One sample maximum per quarter where rainfall occurs	<ul style="list-style-type: none"> • Nutrients: nitrate, nitrite, total nitrogen, ammonia and total phosphorus • Contaminants of concerns including PFAS, TRHs and heavy metals.
Quarterly groundwater monitoring	Analytical Suite 4	Per monitoring well	<ul style="list-style-type: none"> • Total dissolved solids • pH • Dissolved metals, arsenic, cadmium, chromium, copper, iron, lead, nickel, manganese, mercury and zinc • Chloride, sodium and sulfate • Nitrate, ammonia and phosphorus • TRH • BTEX • PAH • PFAS

The following site specific trigger values are proposed for short term surface water quality monitoring within the waterways during construction:

- For physical and chemical stressors, use the least stringent of the 80th percentile values from the monitoring data and the default trigger values for aquatic ecosystems in marine waters
- For non-bioaccumulative toxicants, use the least stringent of the 80th percentile values from the monitoring data and the 80% species protection level for marine waters
- For bioaccumulative toxicants, use the least stringent of the 80th percentile values from the monitoring data and the 95% species protection level for marine waters.

A full list of proposed site specific trigger values for water quality monitoring during construction is presented in Table 4. These values are based upon baseline monitoring completed as part of the EIS and Response to Submissions Report.

Table 4 - Water quality monitoring criteria for Mill Stream

Parameter	Unit	Mill Stream
pH	pH units	As per EPL requirements
Turbidity	NTU	As per EPL requirements
Aluminium (pH>6.5)	µg/L	150
Arsenic III	µg/L	360
Arsenic IV	µg/L	140
Barium	mg/L	NC
Boron	µg/L	2500 ^a
Cadmium	µg/L	5.5 ^c

Parameter	Unit	Mill Stream
Chromium (VI)	µg/L	85
Chromium (III)	µg/L	91
Copper	µg/L	8
Cobalt	µg/L	150
Iron	µg/L	NC
Lead	µg/L	12
Manganese	µg/L	80 ^d
Mercury	µg/L	0.4 ^c
Nickel	µg/L	560
Zinc	µg/L	21
Bicarbonate alkalinity as CaCO ₃	mg/L	NC
Ammonia	ug/L	1700
Nitrate	ug/L	NC
Nitrite	ug/L	NC
Total Phosphorus	ug/L	NC
Total Nitrogen	ug/L	NC
PFOA	µg/L	220 ^c
PFOS	µg/L	0.13 ^c
TPH – C6-C9 fractions	µg/L	NC
TPH – mineral oil (>C9 fractions)	µg/L	NC
Ethylbenzene	µg/L	160
Total xylenes	µg/L	NC
p-xylene	µg/L	NC
m-xylene	µg/L	150
o-xylene	µg/L	NC
Naphthalene	µg/L	120
Anthracene	µg/L	0.4 ^c
Phenanthrene	µg/L	2.0 ^c
Fluoranthene	µg/L	1.4 ^c
Benzo(a)pyrene	µg/L	0.2 ^c

NC - No criteria

a – Freshwater DGV provided as screening criteria where marine DGV are unavailable

b – Where pH < 6.5, Aluminium DGV is 0.8 µg/L, with an unknown reliability and LOP.

c – 95% LOP adopted for bio accumulative toxicant

d – Unknown reliability

Where discharge from water treatment infrastructure to a waterway is identified to be outside of discharge criteria, Suite 3 sampling will be initiated within 24 hours of becoming aware of the event. Sampling will be conducted in the nearest up and downstream locations for the relevant catchments.

Assessment of groundwater quality impacts should focus on background (baseline) groundwater and surface water quality conditions where data is available to establish site specific criteria in accordance with ANZECC 2000 guidelines and ANZG (2018) while being cognisant of the NSW Water quality objectives and the Botany Bay and Catchment water quality improvement plan. Other

criteria such as ANZG (2018) values, NEMP (2018) values and NHMRC (2008) values would be adopted where site specific data cannot be established

Exceedances of the water quality objectives at downstream monitoring locations would be investigated as follows:

- The concentration at the downstream monitoring location would be compared to the concentration at the upstream monitoring location
- If the concentration at the upstream location exceeds or is equal to the concentration at the downstream location, no further action is required
- If the concentration at the upstream location is lower than the concentration at the downstream location and exceeds the site-specific trigger value, then the monitoring data should be reviewed against long-term averages
- If the review confirms the exceedance of the site-specific trigger value at the downstream location and the lower concentrations at the upstream location, and the exceedance deviates from long term averages and variability in the historic monitoring data, then an investigation into the source of contamination and risks to environmental values would be undertaken;
- If the investigation indicates potential for risks to environmental values, an action plan to mitigate potential harm would be developed.

3 Monitoring methods and sampling protocols

3.1 Sample collection

Grab samples will be collected manually from the sampling locations identified in Table 1 and Table 2. The volume of sample collected will be sufficient for the required physico-chemical (field) parameter analysis using a multi-probe water quality meter(s) and/or laboratory analysis.

3.2 Field measurements – surface water only

Field physico-chemical parameters including pH, DO, ORP, temperature, and turbidity will be measured at each sampling location using a fully calibrated multi-probe water quality meter(s). Other observations including odour and colour will also be recorded.

The multi-probe field water quality meter(s) will be calibrated against known standards, as supplied by the manufacturer, at the start and completion of each day of water quality sampling.

3.3 Recording of field results – surface water only

Results for each monitoring location will be recorded on appropriate field sheets (hard copy or digital) using unique sampling identification nomenclature consisting of the sample date, location, and sampler details.

3.4 Decontamination

Sampling equipment will be cleaned (decontaminated) between each sample. Where a sample site shows evidence of contamination (i.e. there is an algal bloom, or the site smells strongly of hydrocarbons, sewage or something else) equipment will need to be cleaned thoroughly. In addition, equipment will need to be cleaned periodically to prevent a build-up of dirt.

The following method will be followed:

- Rinse the equipment in tap water
- Clean with Liquinox (a PFAS free detergent), or equivalent
- Rinse again with tap water
- Rinse three times with de-ionised water, and finally
- Allow to dry.

De-ionised and tap water will be available for washing equipment in the field, if required.

3.5 Quality assurance and documentation

Quality assurance and control protocols during sampling and recording of physico-chemical (field) parameters will be undertaken monthly (each sampling event) in accordance with ANZECC / ARMCANZ (2018) to ensure the integrity of the dataset.

As part of sampling, quality assurance and control samples during sampling will be undertaken to ensure the integrity of the dataset. These are to include:

- Rinsate blanks (one per sampling event only)
- Blind duplicates (at a rate not less than 20% of total samples)
- Split duplicates (at a rate not less than 20% of total samples).

Samples are to be transported to a NATA-accredited laboratory under documented chain of custody protocols.

Field results will be checked for accuracy before leaving the site and errors or discrepancies will be cross-checked and further investigation initiated if required.

Monitoring and calibration records will be maintained in accordance with the appropriate standard.

3.6 Review

This plan will be updated as part of the Soil and Water Quality Management Sub Plan update.

Appendix E: Example Erosion and Sediment Control Plan

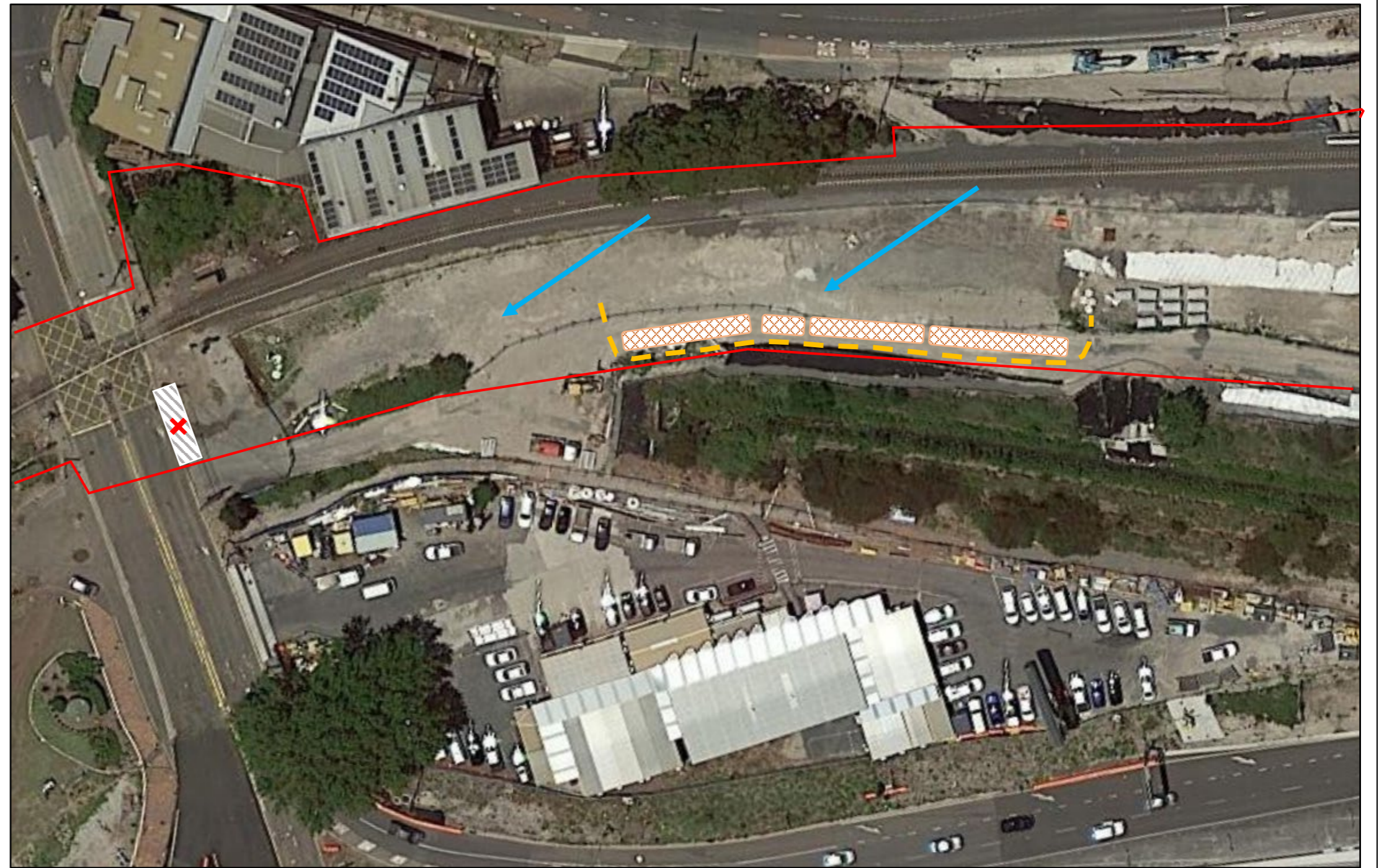
EROSION & SEDIMENT CONTROL PLAN (ESCP) – GENERAL HOLMES DRIVE








Sediment Fencing



Maintain Vegetation



LEGEND	
	Barriers
	Access Point (Entry & Exit)
	Access Road with Cattle Grid
	Sediment Fence
	Water Flow

Appendix F: Consultation

Agency	Comment	JH Response
Bayside Council	The plan indicates there is a high probability of ASS Soils and PFAS pollutants near the Mill Stream which is an environmentally sensitive area connecting with the Botany Wetland Corridor. It is therefore essential that regular monitoring of any pollutants from the Project into the Mill Stream be tested and if levels exceed ANZECC Water Quality and EPA standards then urgent action be implemented to treat the pollutants to acceptable water quality limits.	Surface water quality monitoring and assessment parameters included in Appendix D of this CSWMP.
	All temporary construction compounds along the route of the train line to be enclosed with silt screens and hay bales to ensure runoff containing chemicals, oils and fuels does not escape into Council's stormwater networks and into the Botany Wetland Corridor and the Mill Stream.	Details included in Section 6.1.1 Erosion and Sediment Control General Principles
	All temporary construction compounds along the route of the train line to include shaker grills to control soil and other construction debris being carried onto Council's streets.	Details included in Section 6.1.1 Erosion and Sediment Control General Principles
	Where ground condition are suitable direct runoff from construction compounds into infiltration trenches.	Details included in Section 6.1.1 Erosion and Sediment Control General Principles
	At Baxter Road there is an existing flooding problem with flood waters reaching 1m above existing ground levels in peak flood events. The existing drainage from this street is a 1200mm diameter pipe which passes under the existing rail line. It is therefore essential this pipeline is kept fully operational at all times during the course of the works to endure flooding does not occur in Baxter Road.	This is currently outside of the current approved scope. Flood risks to adjacent properties have been included in Section 5 and the comments provided to ARTC for response.
	To address this potential issue Council wishes to duplicate this 1200mm diameter pipeline as part of this Project.	This is currently outside of the current approved scope. Flood risks to adjacent properties have been included in Section 5 and the comments provided to ARTC for response.
	The groundwater in the Botany Area is affected by Toxic pollutants that have entered the water table from the Orica Site in Hillsdale and this plume is migrating slowly towards Botany Bay. Orica over the last 5 plus years has been addressing these pollutants with a treatment system along the centre of Foreshore Road. However these pollutants would be under the Rail Line and if any dewatering is undertaken as part of this Project such groundwater must be treated before discharging it into Council's stormwater network.	Any discharge to stormwater from the project would be subject to the requirements of the relevant EPL. Details are included in Section 6.2.2 of this CSWMP.

<p>There is a highly explosive ethane gas pipeline which runs through the area in close proximity to the BRD Project. It is essential the Project has no impact on this pipeline.</p>	<p>Refer to CNVMP.</p>
<p>There is an aviation fuel line which runs through the area in close proximity to the BRD Project. It is essential the Project has no impact on this pipeline.</p>	<p>Refer to CNVMP.</p>