NSW (Off-Airport) Soil and Water Management Sub-Plan

Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works

Project number:	WSA-200-SBT
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Revision:	2

Document approval

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
A	19/05/2022	[redacted]	[redacted]	[redacted]	For stakeholder Consultation
0	9/08/2022	[redacted]	[redacted]	[redacted]	Response to stakeholder comments, Sydney Metro comments and ER comments
1	21/09/2022	[redacted]	[redacted]	[redacted]	Response to ER comments
2	15/08/2024	[redacted]	[redacted]	[redacted]	Updated to remove Groundwater Monitoring Program from Annexure A (new standalone document) and general review updates (minor).
Signature:				[redacted]	

Table of contents

Table of tables

Table of figures

Annexures

Compliance

<table>
<tr><th>No.</th><th>Requirement</th><th>Reference</th></tr>
<tr><td colspan="3">SSI 10051 Planning Approval</td></tr>
<tr><td>A10</td><td>The CSSI may be constructed and operated in stages. Where staged construction and/or operation is proposed, a Staging Report must be prepared. The Staging Report must be submitted to the Planning Secretary for information no later than one (1) month before the lodgement of any CEMP or CEMP sub plan for the first of the proposed stages of construction (or if only staged operation is proposed, one (1) month before the commencement of operation of the first of the proposed stages of operation), unless otherwise agreed with the Planning Secretary.</td><td>Section 2.3</td></tr>
<tr><td>C5 (c)</td><td>Of the CEMP Sub-plans required under Condition C1, the following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Subplan. Details of issues raised by a government agency during consultation (as required by Condition A6) must be provided with the relevant CEMP Sub-plan when submitted to the Planning Secretary / ER (whichever is applicable). Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why.
<table>
<tr><th></th><th>Required CEMP Sub-plan</th><th>Relevant government agencies to be consulted for each CEMP Sub-plan</th></tr>
<tr><td>(a)</td><td>Noise and vibration</td><td>Relevant Councils and WaterNSW (in relation to its assets)</td></tr>
<tr><td>(b)</td><td>Flora and fauna</td><td>DPIE EES, DPI Fisheries, and Relevant Councils</td></tr>
<tr><td>(c)</td><td>Soil and Water</td><td>DPI Fisheries, and Relevant Councils</td></tr>
<tr><td>(d)</td><td>Non-Aboriginal heritage</td><td>Relevant Councils, WaterNSW and Heritage NSW</td></tr>
</table></td><td>Section 1.4</td></tr>
<tr><td>C6</td><td>The CEMP Sub-plans must state how:
(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;
(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;
(c) the relevant terms of this approval will be complied with; and
(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.</td><td>Section 1.3
Section 7
This Table
Element 4</td></tr>
<tr><td>C7</td><td>With the exception of any CEMP Sub-plans expressly nominated by the Planning Secretary to be endorsed by the ER, all CEMP Sub-plans must be submitted to the Planning Secretary for approval.</td><td>Section 1.4</td></tr>
<tr><td>C8</td><td>The CEMP Sub-plans not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all relevant undertakings made in the documents listed in Condition A1. Any of these CEMP Sub-plans must be submitted to the ER with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is staged no later than one (1) month before the commencement of that stage.</td><td>Section 1.4</td></tr>
<tr><td>C9</td><td>Any of the CEMP Sub-plans to be approved by the Planning Secretary must be submitted to the Planning Secretary with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before construction or where construction is staged no later than one (1) month before the commencement of that stage.</td><td>Section 1.4</td></tr>
<tr><td>C12</td><td>In addition to the relevant requirements of the CEMF, the Soil and Water CEMP Sub-Plan must include but not be limited to:
(a) details how the requirements of Conditions E127, E128 and E129 will be met; and
(b) the unexpected, contaminated finds protocol required by Condition E98.</td><td>Element 4
Annexure C</td></tr>
</table>

<table>
<tr><th>No.</th><th>Requirement</th><th>Reference</th></tr>
<tr><td>C13 (b), (c)</td><td>The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies (as required by Condition A6) identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP. Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why.
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<tr><th></th><th>Required Construction Monitoring Programs</th><th>Relevant government agencies to be consulted for each Construction Monitoring Program</th></tr>
<tr><td>(a)</td><td>Noise and vibration</td><td>Relevant Councils and WaterNSW (in relation to its assets)</td></tr>
<tr><td>(b)</td><td>Surface water quality</td><td>DPIE Water, DPI Fisheries, and Relevant Councils</td></tr>
<tr><td>(c)</td><td>Groundwater</td><td>DPIE Water</td></tr>
<tr><td>(d)</td><td>Air Quality</td><td>Relevant Councils</td></tr>
</table></td><td>Section 6
Groundwater Monitoring Program
Annexure B</td></tr>
<tr><td>C14</td><td>Each Construction Monitoring Program must provide:
(a) details of baseline data available including the period of baseline monitoring;
(b) details of baseline data to be obtained and when;
(c) details of all monitoring of the project to be undertaken;
(d) the parameters of the project to be monitored;
(e) the frequency of monitoring to be undertaken;
(f) the location of monitoring;
(g) the reporting of monitoring results and analysis results against relevant criteria;
(h) details of the methods that will be used to analyse the monitoring data;
(i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicated unacceptable project impacts;
(j) a consideration of SMART principles;
(k) any consultation to be undertaken in relation to the monitoring programs; and
(l) any specific requirements as required by Conditions C15 to C16.</td><td>Groundwater Monitoring Program
Annexure B</td></tr>
<tr><td>C16</td><td>Groundwater Construction Monitoring Program must include:
(a) groundwater monitoring networks at each construction excavation site predicted to intercept groundwater in the documents listed in Condition A1;
(b) detail of the location of all monitoring bores with nested sites to monitor both shallow and deep groundwater levels and quality;
(c) define the location of saltwater interception monitoring where sentinel groundwater monitoring bores will be installed between the saline sources and that of each construction excavation site predicted to intercept groundwater in the documents listed in Condition A1;
(d) results from existing monitoring bores;
(e) monitoring and gauging of groundwater inflow to the excavations predicted to intercept groundwater in the documents listed in Condition A1, appropriate trigger action response plan for all predicted groundwater impacts upon each noted neighboring groundwater system component for each excavation construction site;
(f) trigger levels for groundwater quality, salinity and groundwater drawdown in monitoring bores and / or other groundwater users;
(g) daily measurement of the amount of water discharged from the water treatment plants;
(h) water quality testing of the water discharged from treatment plants;
(i) management and mitigation measures and criteria, including measures to address impacts on groundwater dependent ecosystems;
(j) groundwater inflow to the excavations to enable a full accounting of the groundwater take from the Sydney Basin Central Groundwater Source;
(k) reporting of groundwater gauging at excavations, groundwater monitoring, groundwater trigger events and action responses; and
(l) methods for providing the data collected to Sydney Water where discharges are directed to their assets.</td><td>Groundwater Monitoring Program</td></tr>
<tr><td>C17</td><td>With the exception of any Construction Monitoring Programs expressly nominated by the Planning Secretary to be endorsed by the ER, all Construction Monitoring Programs must be submitted to the Planning Secretary for approval.</td><td>Section 1.4</td></tr>
</table>

No.	Requirement	Reference
C18	The Construction Monitoring Programs not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all undertakings made in the documents listed in Condition A1. Any of these Construction Monitoring Programs must be submitted to the ER for endorsement at least one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage.	Section 1.4
C19	Any of the Construction Monitoring Programs which require Planning Secretary approval must be endorsed by the ER and then submitted to the Planning Secretary for approval at least one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage.	Section 1.4
C20	Unless otherwise agreed with the Planning Secretary, construction must not commence until the Planning Secretary has approved, or the ER has endorsed (whichever is applicable), all of the required Construction Monitoring Programs and all relevant baseline data for the specific construction activity has been collected.	Section 1.4
C21	The Construction Monitoring Programs, as approved by the Planning Secretary or the ER has endorsed (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary or the ER (whichever is applicable), whichever is the greater.	Section 1.4
C22	The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, ER and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program. *Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.*	Groundwater Monitoring Program Annexure B
Construction Environmental Management Framework		
3.5 (a)	Subject to Section 3.4(b) the Principal Contractors will prepare issue-specific environmental sub plans to the CEMP which address each of the relevant environmental impacts at a particular site or stage of the project. Issue specific sub plans will include as a minimum… Viii. Soil and water management… Some of these sub plans may also be informed by other environmental management documents included in the planning approval, for example the Construction Traffic Management Framework or Construction Noise and Vibration Standard.	This Plan
7.1(a)	The following groundwater management objectives will apply to construction: i. Reduce the potential for drawdown of surrounding groundwater resources; ii. Prevent the pollution of groundwater through appropriate controls; and iii. Reduce the potential impacts of groundwater dependent ecosystems. iv. For on-airport works, the Sydney Metro Western Sydney Airport Soil and Water CEMP will detail all the groundwater management objectives and will be consistent with the WSA Soil and Water CEMP, including all appendices to the CEMP.	Section 1.3 Groundwater Monitoring Program
7.2(b)	For off-airport works, the following content may be provided within other sub plans such as the Soil and Water Management Plan and Flora and Fauna Management Plan. Groundwater management of on-airport works will be implemented through the groundwater management plan approved as part of the SMWSA Soil and Water CEMP. In particular the groundwater quality criteria will be in accordance to the WSA Soil and Groundwater CEMP Appendix G.	The Groundwater Management Plan requirements are addressed in this Sub-Plan Groundwater Monitoring Program

No.	Requirement	Reference
7.2(b)i	Principal Contractors will develop and implement a Groundwater Management Plan for off-airport works. The Groundwater Management Plan will include as a minimum: i. The groundwater mitigation measures as detailed in the planning approval documentation	This Sub-Plan Section 7.2 Groundwater Monitoring Program
7.2(b)ii	The requirements of any applicable licence conditions	Section 3.3
7.2(b)iii	Details of proposed extraction, use and disposal of groundwater, and measures to mitigate potential impacts to groundwater sources, incorporating monitoring, impact trigger definition and response actions for all groundwater sources potentially impacted by SMWSA.	Section 7.2 Groundwater Monitoring Program (Section 4 and Section 7.12)
7.2(b)iv	Evidence of consultation with the relevant government agencies, such as DPIE for off-airport works or land.	Section 1.4
7.2(b)v	The respons bilities of key project personnel with respect to the implementation of the plan.	Section 8
7.2(b)vi	Procedures for the treatment, testing and discharge of groundwater from the site.	Section 7.5 Groundwater Monitoring Program (Section 7.5 to 7.12)
7.2(b)vii	Compliance record generation and management.	Section 9.5 Groundwater Monitoring Program (Section 8.5.2)
7.2(b)viii	Details of groundwater monitoring if required.	Groundwater Monitoring Program
7.3(a)	The on-airport Soil and Water CEMP (with the groundwater management plan) and the off-airport Groundwater Management Plan will include the following groundwater mitigation measures as well as relevant Conditions: i. Implementing all feasible and reasonable measures to limit groundwater inflows to stations and crossovers; and ii. Undertaking groundwater monitoring during construction (levels and quality) in areas identified as 'likely' and 'potential' groundwater dependent ecosystems.	Section 7.11 Groundwater Monitoring Program (Section 4 and Section 5)
12.1.(a)	The following soil and water management objectives will apply to construction: i. Minimise pollution of surface water through appropriate erosion and sediment control; ii. Minimise leaks and spills from construction activities; iii. Maintain existing water quality of surrounding surface watercourses; iv. Source construction water from non-potable sources, where feasible and reasonable; and v. For on-airport works, the Sydney Metro Western Sydney Airport Soil and Water CEMP will detail all the soil and water management objectives and will be consistent with the WSA Soil and Water CEMP, including all appendices to the CEMP.	Section 1.3
12.2 (a)	On-airport management of soil and water will be achieved through the implementation of the SMWSA Soil and Water CEMP and Principal Contractors will	This Sub-Plan

No.	Requirement	Reference
	develop and implement a Soil and Water Management Plan for all off-airport works. Both plans will include as a minimum:	
12.2 (a)i	The soil and water mitigation measures as detailed in the planning approval documentation and sustainability requirements	Section 7.4 to 7.10 Refer to Element 4 for specific cross-references for each soil and water mitigation measure as detailed in the Planning Approval
12.2 (a)ii	Details of construction activities and their locations, which have the potential to impact on water courses, storage facilities, stormwater flows, and groundwater	Section 2.4 Section 5
12.2 (a)ii	Surface water and ground water impact assessment criteria consistent with the principles of the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines for off-airport works and the Airports (Environment Protection) Regulations 1997 for on-airport works (with due consideration of the ANZECC guidelines)	Groundwater Monitoring Program (Section 1.6) Annexure B (Section 3.2.6)
12.2 (a)iv	Management measures to be used to minimise surface and groundwater impacts, including identification of water treatment measures and discharge points, details of how spoil and fill material required by the project will be sourced, handled, stockpiled, reused and managed; erosion and sediment control measures; salinity control measures and the consideration of flood events	Section 7 Spoil Management Sub-Plan
12.2(a)v	A contingency plan, consistent with the NSW Acid Sulphate Soils Manual (EPA 1998), to deal with the unexpected discovery of actual or potential acid sulphate soils both on and off-airport lands. The plan must including procedures for the investigation, handling, treatment and management of such soils and water seepage	Section 7.9.3 Annexure C
12.2(a)vi	Management measures for contaminated material (soils, water and building materials) and a contingency plan to be implemented in the case of unanticipated discovery of contaminated material, including asbestos, during construction	Section 7.9.1 Annexure C
12.2(a)vii	A description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, how the results of the monitoring would be recorded and reported, and, if any exceedance of the criteria is detected how any non-compliance can be rectified	Element 2: Monitoring and reporting
12.2(a)viii	The requirements of any applicable licence conditions	Section 3.3
12.2(a)ix	The respons bilities of key project personnel with respect to the implementation of the plan	Section 8
12.2(a)x	Procedures for the development and implementation of Progressive Erosion and Sediment Control Plans;	Section 9.2
12.2(a)xi	Identification of locations where site specific Stormwater and Flooding Management Plans are required; and	CEMP (Section 6.8)
12.2(a)xii	Compliance record generation and management.	Section 9.5

No.	Requirement	Reference
12.2(b)	Principal Contractors will develop and implement Progressive Erosion and Sediment Control Plans (ESCPs) for all active worksites in accordance with Managing Urban Stormwater: Soils & Construction Volume 1 (Landcom, 2004) (known as the "Blue Book"). The ESCPs will be approved by the Contractor's Environmental Manager (or delegate) prior to any works commencing (including vegetation clearing) on a particular site. Copies of the approved ESCP will be held by the relevant Contractor personnel including the Engineer and the Site Foreman.	Section 9.2
12.2 (c)	ESCPs will detail all required erosion and sediment control measures for the particular site at the particular point in time and be progressively updated to reflect the current site conditions. Any amendments to the ESCP will be approved by the Contractor's Environmental Manager (or delegate).	Section 9.2
12.2 (d)	Principal Contractors will develop and implement Stormwater and Flooding Management Plans for the relevant construction sites. These plans will identify the appropriate design standard for flood mitigation based on the duration of construction, proposed activities and flood risks. The plan will develop procedures to ensure that threats to human safety and damage to infrastructure are not exacerbated during the construction period.	CEMP (Section 6.8)
12.2 (e)	Principal Contractors will undertake the following soil and water monitoring as a minimum: i. Weekly inspections of the erosion and sediment control measures. Issues identified would be rectified as soon as practicable; ii. Additional inspections will be undertaken following significant rainfall events (greater than 20 mm in 24 hours); and iii. All water will be tested (and treated if required) prior to discharge from the site in order to determine compliance with the appropriate approvals and licencing. No water will be discharged from the site without written approval of the Contractor's Environmental Manager (or delegate). This is to form a HOLD POINT.	Section 9.4 Element 2 (Section 1.3) Section 7.5
12.2 (f)	The following compliance records will be kept by the Principal Contractors: i. Copies of current ESCPs for all active construction sites; ii. Records of soil and water inspections undertaken; iii. Records of testing of any water prior to discharge; and iv. Records of the release of the hold point to discharge water from the construction site to the receiving environment.	Section 9.5
12.2 (g)	The following water resources management objectives will apply to the construction of the project: i. Minimise demand for, and use of potable water; ii. Maximise opportunities for water re-use from captured stormwater, wastewater and groundwater; iii. Examples of measures to minimise potable water consumption include: ▪ Water efficient controls, fixtures and fittings in temporary facilities; ▪ Collecting, treating and reusing water generated in tunnelling operations, concrete batching and casting facility processes; ▪ Using recycled water or treated water from onsite sources in the formulation of concrete; ▪ Harvesting and reusing rainwater from roofs of temporary facilities; σ Using water from recycled water networks; ▪ Collecting, treating and reusing groundwater and stormwater; ▪ Using water efficient construction methods and equipment; and ▪ Providing designated sealed areas for equipment wash down	Section 1.3 Section 7.3
12.3 (a)	The on-airport Soil and Water CEMP and the off-airport Soil and Water Management Plan will include the following surface water and flooding mitigation measures as well as any relevant Conditions:	Section 7.4 Section 6.1 Annexure C

No.	Requirement	Reference
	i. Clean water will be diverted around disturbed site areas, stockpiles and contaminated areas; ii. Control measures will be installed downstream of works, stockpiles and other disturbed areas; iii. Exposed surfaces will be minimised, and stabilised / revegetated as soon feasible and reasonable upon completion of construction; iv. iv. Dangerous goods and hazardous materials storage will be within bunded areas with a capacity of 110 per cent of the maximum single stored volume; v. Chemicals will be stored and handled in accordance with relevant Australian standards such as: – AS 1940-2004 The storage and handling of flammable and combustible liquids – AS/NZS 4452:1997 The storage and handling of toxic substances – AS/NZS 5026:2012 The storage and handling of Class 4 dangerous goods – AS/NZS 1547:2012 On-site domestic wastewater management vi. Spill kits will be provided at the batch plants, storage areas and main work sites; vii. A protocol will be developed and implemented to respond to and remedy leaks or spills. viii. A remedial action plan and unexpected finds protocol would be established to facilitate the quarantining, isolation and remediation of contamination identified throughout the construction programme. Any asbestos identified on site would be managed in accordance with applicable regulatory requirements.	

Definitions

Term	Description
ACC	Areas of Contamination Concern
ACM	Asbestos Containing Material
ANZECC	Australian and New Zealand Environment and Conservation Council
AS/NZS	Australian Standard/New Zealand Standard
ASS	Acid sulfate soils
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CoA	Condition of Approval
CPBG	CPB Contractors Ghella Joint Venture
CSSI	Critical State Significant Infrastructure
DGV	Default Guideline Value
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industry
DSI	Detailed Site Investigation
EIS	Environmental Impact Statement
EMS	Environmental Management System
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1994 (NSW)
EPL	Environment Protection Licence
ER	Environmental Representative
ESCP	Erosion and Sediment Control Plan
GDE	Groundwater Dependent Ecosystem
GWMP	Groundwater Monitoring Program
ISO	International Standards Organisation
PASS	Potential Acid Sulphate Soils
PESCP	Progressive Erosion and Sediment Control Plan
PFAS	Perfluoroalkyl and Polyfluoroa kyl Substances
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
Project	Sydney Metro Western Sydney Airport

Term	Description
RAP	Remediation Action Plan
REMM	Revised Environmental Mitigation Measures
SBT Works	Station Boxes and Tunnelling Works
SEEC	Strategic Environmental and Engineering Consulting
SEP	Site Environmental Plan
SMWSA	Sydney Metro Western Sydney Airport
SSI 10051	State Significant Infrastructure project 10051 (this Project)
SWMP	Soil and Water Management Sub-Plan (this document)
SWQMP	Surface Water Quality Monitoring Program
TBM	Tunnel boring machine
VENM	Virgin excavated natural material
WSI	Western Sydney International
WTP	Water treatment plant

Part A: Overview

1. Introduction

1.1. Purpose and application

This NSW (Off-airport) Soil and Water Management Sub-plan (SWMP or Sub-Plan) is applicable to the Station Boxes and Tunnelling Works (SBT Works) Package of the Sydney Metro Western Sydney Airport (the Project). This Sub-plan describes how the CPB Contractors Ghella Joint Venture (CPBG) will minimise and manage the soil and water impacts of the SBT Works in NSW.

This Sub-Plan has been prepared to address the requirements of the:

- State Significant Infrastructure (SSI) 10051 Planning Approval (dated 23 July 2021)
- Sydney Metro Western Sydney Airport – CSSI Staging Report (Staging Report)
- AS/NZS ISO 14001:2016 Environmental Management Systems – Requirements with guidance for use
- Sydney Metro Construction Environmental Management Framework (CEMF)
- Environmental Impact Statement (EIS) and the Submissions Report, including the Revised Environmental Mitigation Measures (REMMs)
- Contractual requirements, including the SBT Design and Construction Deed and General and Particular Specifications
- Applicable legislation (NSW and Commonwealth).

1.2. Sub-Plan context

To achieve the intended environmental performance outcomes of the Project, CPBG have an established Environmental Management System (EMS) in accordance with the requirements of ISO 14001:2016. Guided by the Environment and Sustainability Policy, the EMS consists of a Construction Environmental Management Plan (CEMP), aspect-specific procedures and Sub-Plans as illustrated in Figure 1. Implementation of the EMS is achieved through tools, checklists and forms as detailed in the CEMP.

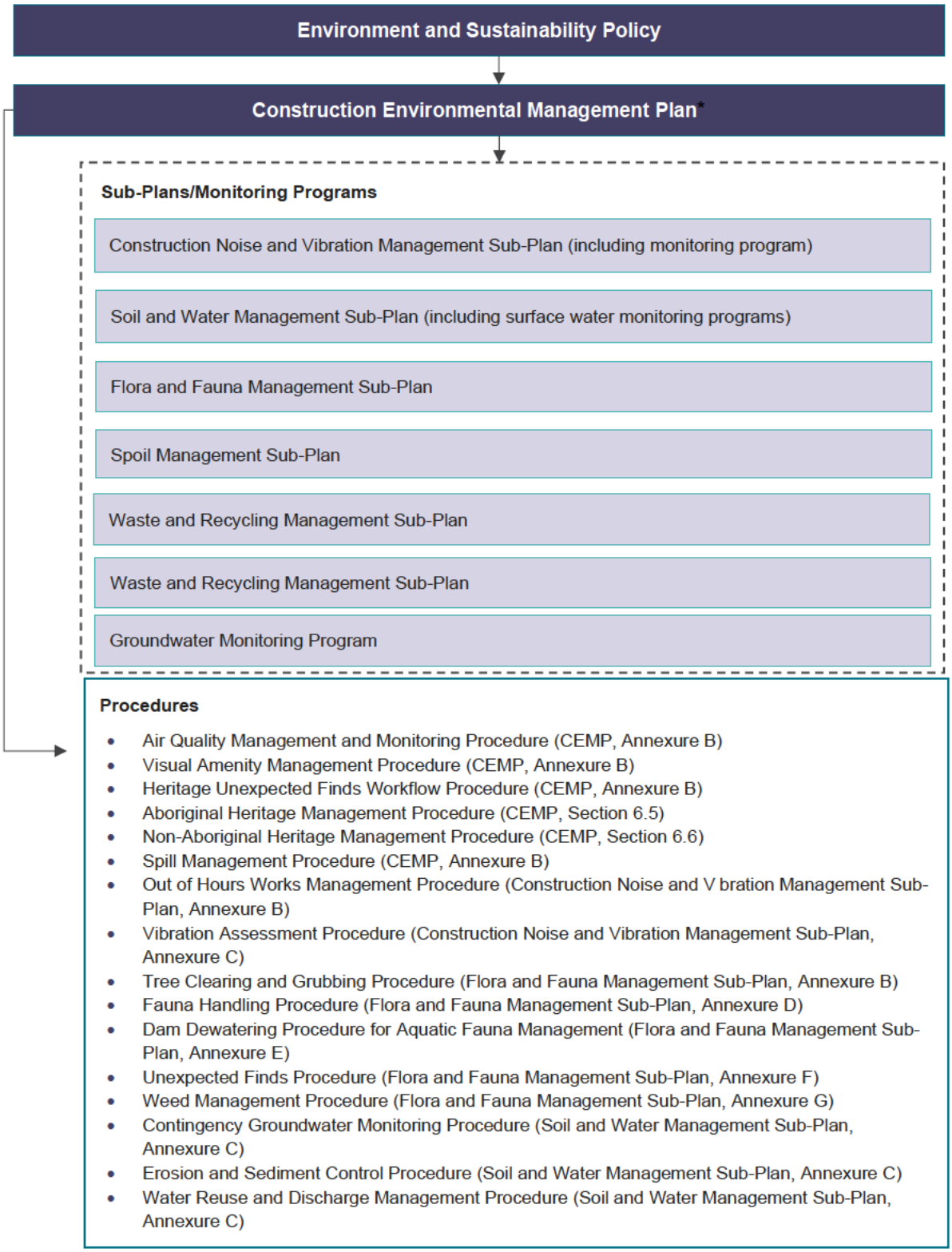

Figure 1: EMS Overview

1.3. Objectives and performance outcomes

The objectives and performance outcomes for soil and water management are to ensure:

- Compliance with the SSI 10051 Planning Approval, including
  - Minimising the demand for, and use of potable water
  - Maximising opportunities for water re-use from captured stormwater, wastewater and groundwater
- Compliance with the Environment Protection Licence (EPL) 21672 for the SBT Works
- Appropriate controls are implemented to minimise leaks and spills, prevent pollution of groundwater, minimise impacts on groundwater dependent ecosystems (GDEs) and maintain the existing water quality of the receiving environment
- Appropriate erosion and sediment controls are implemented to minimise pollution of surface water
- Adequate processes are implemented to managed contaminated land and/or potentially contaminated groundwater in accordance with Detailed Site Investigations (DSIs) and Remediation Action Plans (RAPs) where applicable
- Reasonable and feasible measures are implemented to maximise water recycling, use of non-potable water and water reuse on site
- Reasonable and feasible measures are implemented to reduce the potential for drawdown of surrounding groundwater resources.

1.4. Consultation and approval

Reflecting the requirements of Conditions A6, C5(c), C13(b), C13(c), Revision 1 of this Sub-Plan and associated monitoring programs (Groundwater Monitoring Program (GWMP) now a standalone document (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404) and Surface Water Quality Monitoring Program (SWQMP), Annexure A) was prepared in consultation with DPE Water, DPI Fisheries, Environment Protection Authority (EPA) (SWQMP only), Penrith City Council and City of Liverpool Council.

Per the requirements of the Staging Report, Revision 1 of this Sub-Plan (including the GWMP and SWQMP) was submitted to the Planning Secretary of the DPE for approval of the GWMP (Table 1). Approval was received on 7 October 2022, prior to the commencement of Bulk Excavation. ER endorsement of Revision 1 of this Sub-Plan (including SWQMP) was received on 26 September 2022.

This Sub-Plan (Revision 2) has been updated to remove the GWMP and update references to it as a standalone document (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404). Other minor updates to the Sub-Plan and SWQMP have also been made. Due to the minor nature of the updates, Revision 2 of the Sub-Plan is provided to the ER for endorsement. Consultation has not been required for the revision to this Plan.

Future updates to the GWMP will be under separate endorsement/approval specifically for that document, including any necessary consultation.

Table 1: Sub-Plan, GWMP and SWQMP consultation and approval requirements

Document	CPBG Internal Review	Sydney Metro Review	Agency/Stakeholder Consultation	ER Review and Endorsement	Planning Secretary Approval	ER Approval of Minor Amendments
Soil and Water Management Sub-Plan	✓	✓	✓	✓		✓
Groundwater Monitoring Program (GWMP) (standalone document)	✓	✓	✓	✓	✓	✓
Surface Water Quality Monitoring Program (Annexure B)	✓	✓	✓	✓		✓

1.5. Sub-Plan structure

Part A: Overview	• Section 1: An introduction to the Sub-Plan • Section 2: Overview of the SBT Works • Section 3: Legal and other requirements • Section 4: Existing environment • Section 5: Environmental aspects and impacts • Section 6: Surface water quality and groundwater monitoring programs • Section 7: Management strategy • Section 8: People and collaboration • Section 9: Systems and tools
Part B: Implementation	• Element 1: Training • Element 2: Monitoring and reporting • Element 3: Auditing, review and improvement • Element 4: Package specific requirements
Part C: Annexures	• Annexure A Not used • Annexure B Surface Water Quality Monitoring Program • Annexure C Procedures • Annexure D: Not used

2. Project overview

2.1. Background

The Sydney Metro Western Sydney Airport will become the transport spine for Greater Western Sydney, connecting communities and travellers with the new Western Sydney International (Nancy-Bird Walton) Airport (referred to as Western Sydney International) and the growing region.

The Sydney Metro Western Sydney Airport EIS was prepared in October 2020 to assess the impacts of construction and operation of the Project and was placed on public exhibition between 21 October 2020 and 2 December 2020. The Project was declared a Critical State Significant Infrastructure (CSSI) Project and is listed in Schedule 5 of State Environmental Planning Policy (State and Regional Development).

The Sydney Metro Western Sydney Airport was approved by the Minister for Planning and Public Spaces on 23 July 2021 (SSI 10051) under section 5.19 of the *Environmental Planning and Assessment Act 1997* (EP&A Act).

2.2. Project description

The Project forms part of the broader Sydney Metro network. It involves the construction and operation of a 23km new metro rail line that extends from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The alignment includes a combination of tunnels and civil structures, including viaduct, bridges, surface and open-cut troughs between the two tunnel sections (

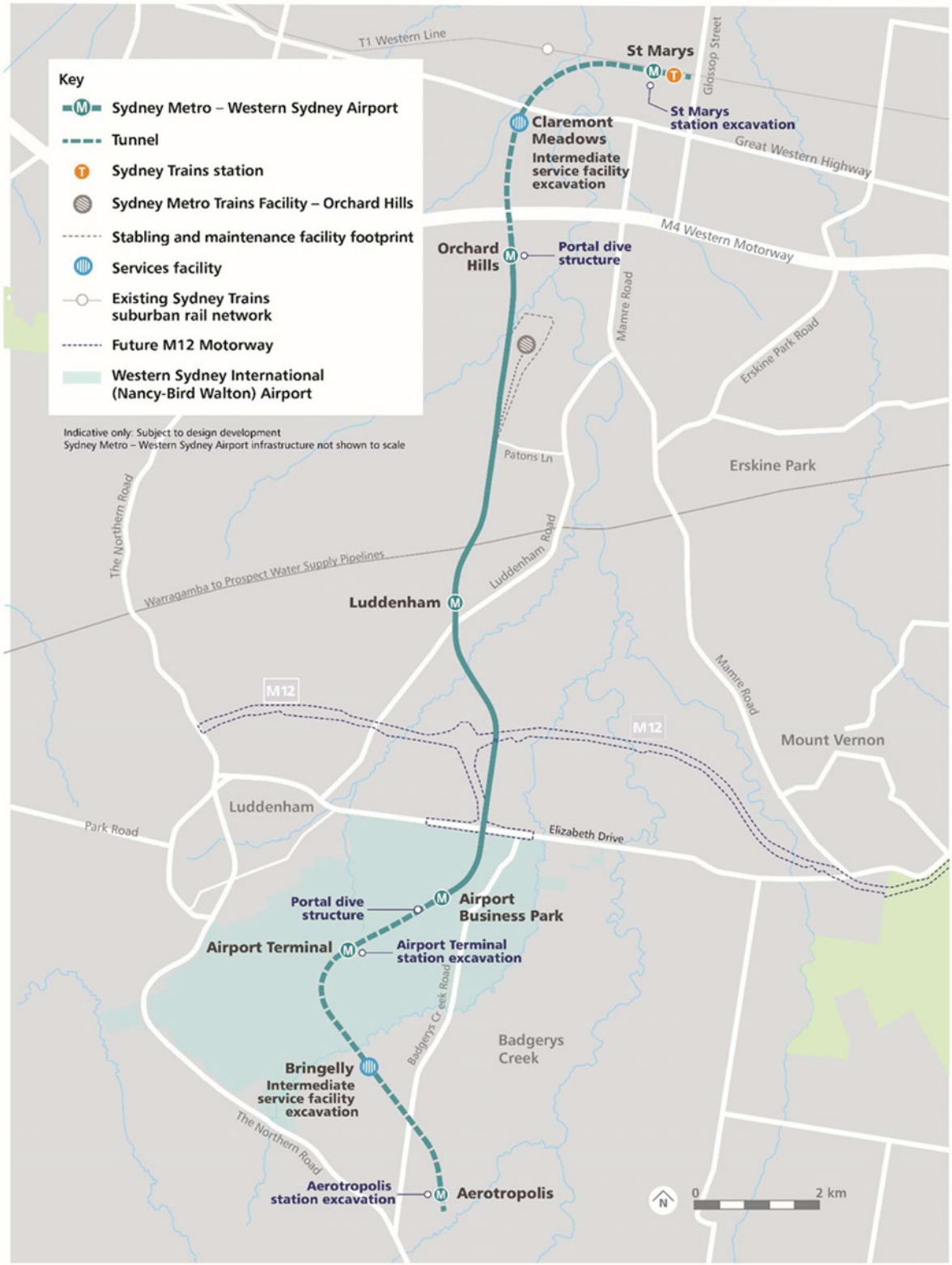
Key
Sydney Metro – Western Sydney Airport
Tunnel
Sydney Trains station
Sydney Metro Trains Facility – Orchard Hills
Stabling and maintenance facility footprint
Services facility
Existing Sydney Trains suburban rail network
Future M12 Motorway
Western Sydney International (Nancy-Bird Walton) Airport
Indicative only: Subject to design development
Sydney Metro – Western Sydney Airport infrastructure not shown to scale
T1 Western Line
St Marys
St Marys station excavation
Glossop Street
Claremont Meadows
Intermediate service facility excavation
Great Western Highway
M4 Western Motorway
Orchard Hills
Portal dive structure
Mamre Road
Erskine Park Road
Erskine Park
Patons Ln
The Northern Road
Warragamba to Prospect Water Supply Pipelines
Luddenham Road
Luddenham
M12
Mount Vernon
Park Road
Elizabeth Drive
Portal dive structure
Airport Business Park
Airport Terminal
Airport Terminal station excavation
Badgerys Creek Road
Badgerys Creek
Bringelly
Intermediate service facility excavation
Aerotropolis station excavation
Aerotropolis
N
0
2 km

Figure 2)

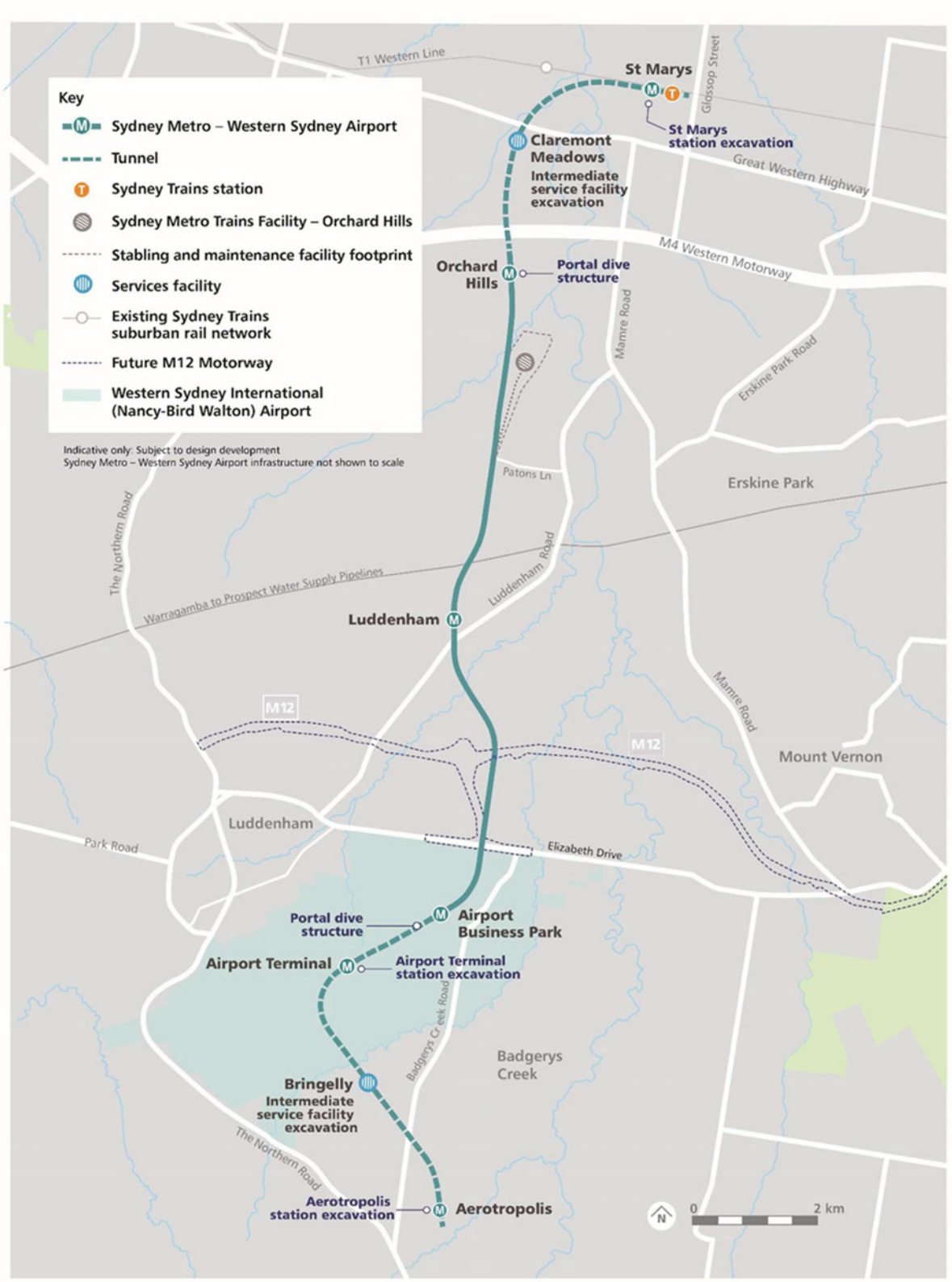

Figure 2: Project Overview

2.3. Project Staging

2.3.1. Overview

As detailed in the Staging Report, the Project will be delivered through the following stages:

- Advanced and Enabling Works – Site investigations, modification of the existing transport network, power and water supply for construction sites, utility and stormwater diversions and some demolition works.
- SBT Works – delivered through the following sub-stages:
  - Preparatory Works – Including NSW (off-airport) demolition works, site levelling/grading, site access and parking, utility and temporary services works, erection of demountable buildings and noise barriers, tunnelling preparatory works and use of ancillary facilities including onsite parking.
  - Bulk Excavation and Tunnelling Works (the subject of this Sub-Plan) – Preparatory Works (works not completed prior to approval of this CEMP), bulk excavation, acoustic shed installation, tunnelling and cross passage installation.
- Surface and Civil Alignment Works – Construction of bridges and viaducts to cross floodplains, watercourses and existing and proposed permanent infrastructure.
- Stations, Systems, Trains, Operations and Maintenance – Station design and fit-out, testing and commissioning, and operation of the Western Sydney Airport metro service
- Finalisation Auxiliary Works.

2.4. SBT Works Scope

2.4.1. Station Boxes and Tunnelling Works

The SBT Works include the design and construction of:

- Two sections of twin tunnels with a total combined length of approximately 9.8km, including associated portal structures; Orchard Hills to St Marys (off-airport) and Western Sydney International (WSI) airport to the new Aerotropolis Station (off-airport)
- Excavations at either end to enable trains to turn back and stub tunnels to enable future extensions
- Station box excavations with temporary ground support for four stations at St Marys (off-airport), Orchard Hills (off-airport), Airport Terminal (on-airport) and Aerotropolis (off-airport)
- Excavations for two intermediate service facilities, one in each of the tunnel sections at Claremont and Bringelly (both off-airport).

An overview of the SBT Works at each worksite is provided in Table 2.

Table 2: SBT Works overview

Jurisdiction	Worksite	Indicative scope of works
NSW	St Marys	• Preparatory CEMP scope (not completed prior to approval of the CEMP) • Demolition of existing industrial premises • Offices, amenities, car parking and access roads • Piling and station box excavation using rippers and rock hammers • Stub tunnel excavation using roadheaders • TBM retrieval • Operation of water treatment plant and discharge of water
NSW	Claremont Meadows	• Preparatory CEMP scope (not completed prior to approval of the CEMP) • Offices, amenities, car parking, and access roads • Piling and services facility shaft excavation using ripper and rock hammers

Jurisdiction	Worksite	Indicative scope of works
		• Construction of part of the cast-in-situ permanent shaft • Tunnelling support • Cross passage construction support • Invert construction support (pouring of an invert concrete slab in the tunnel) • Operation and discharge of tunnel ventilation system • Operation of water treatment plant and discharge of water
NSW	Orchard Hills	• Preparatory CEMP scope (not completed prior to approval of the CEMP) • Demolition of existing buildings and removal of septic tanks • Offices, amenities, car parking, and access roads • Lansdowne Road temporary diversion and construction of the permanent road bridge • Piling and portal, station box and dive excavation using rippers and rock hammers • Construction of cast-in-situ permanent portal structure • TBM assembly, launch and tunnelling support works • Cross passage construction support • Precast segment storage • Operation and discharge of tunnel and acoustic enclosure ventilation system • Operation of water treatment plant and discharge of water
On-Airport	Airport Portal Dive Structure	• Offices, amenities, car parking and access roads • Piling and portal excavation using rippers and rock hammers • Open cut dive excavation using rippers and rock hammers • Construction of cast-in-situ permanent dive structure • TBM assembly, launch and tunnelling support works • Cross passage construction support • Operation of water treatment plant and discharge of water
On-Airport	Airport Terminal and TBM shaft	• Offices, amenities, car parking and access roads • Piling and station box and shaft excavation using rippers and rock hammers • TBM re-launch and tunnelling support works • Cross passage construction support • Operation of water treatment plant and discharge of water
On-Airport	Primary Spoil Receival	• Access road • TBM spoil conveyor set up • Earthworks in accordance with Sydney Metro Specifications
NSW	Bringelly	• Preparatory CEMP scope (not completed prior to approval of the CEMP) • Offices, amenities, car parking and access roads • Piling and services facility shaft using rippers and rock hammers • Construction of part of the cast-in-situ permanent shaft • Cross passage construction support • Invert construction support (pouring of an invert concrete slab in the tunnel) • Operation and discharge of tunnel ventilation system • Operation of water treatment plant and discharge of water
NSW	Aerotropolis	• Preparatory CEMP scope (not completed prior to approval of the CEMP) • Offices, amenities, car parking and access roads • Piling and Station box excavation using rippers and rock hammers • Stub tunnel excavation using roadheaders • TBM retrieval • Operation and discharge of tunnel ventilation system • Operation of water treatment plant and discharge of water

Note: Worksites shown in grey are within the boundary of the Western Sydney International (On-Airport), are regulated under the Commonwealth Airports Act 1996 and are outside the scope of this Sub-Plan.

2.4.2. Construction methodology

The construction methodology for the SBT Works entails:

- Utility works including removal, diversion, protection and connection to SBT worksites
- Local area works including provision of site accesses and some road upgrades
- Site establishment works including:
  - Fencing
  - Installation of environmental mitigation including erosion and sediment controls, noise barriers, and acoustic enclosures
  - Clearing and grubbing of existing vegetation
  - Demolition of existing buildings and structures
  - Site levelling and drainage works
  - Establishment of internal access roads, hardstand areas and onsite parking
  - Erection of demountable buildings including offices and amenities
  - Other ancillary facility works including the erection of sheds, establishment of materials laydown and stockpiling areas and Tunnel Boring Machines (TBMs) support works including spoil conveyors.
- Construction of station, shaft and dive excavations predominately completed by piling and excavators with rippers and hammers. A roadheader will also be used at St Marys and Aerotropolis to complete the stub tunnels
- Four TBMs will be used to construct the mainline tunnels as follows:
  - Two earth pressure balance TBMs will be launched from Orchard Hills tunnel approximately 4.3 km north to St Marys, including traversing the Claremont Shaft, and be retrieved from the St Marys Station Box.
  - Two double shield TBMs will be launched from the Airport Dive and tunnel south, traverse the Airport Terminal Station Box and Shaft, whereupon tunnelling will cease, and the conveyor and backend equipment will be demobilised from the Airport Dive and re-established at Airport Terminal Shaft. The TBMs will recommence tunnelling including traversing the Bringelly Shaft and be retrieved from the Aerotropolis Station Box (a distance of 5.5 km from the Airport Dive, with 2.5 km of the southern tunnels located off-airport within NSW).
  - Cross passages will be constructed using concrete saws and excavators with hammers.

It is anticipated that the shaft and station excavations will be completed in advance of TBM tunnel construction. The TBMs will be delivered via oversize heavy vehicles to Orchard Hills and the Airport Dive site and retrieved from St Marys and Aerotropolis, subject to relevant approvals.

The SBT Works do not include any surface works between the northern and southern tunnel sections, which are to be undertaken by another contractor as part of the Surface and Civil Alignment Works stage.

Tunnelling, including station box, shaft and dive excavation, and associated support activities, will be undertaken 24 hours a day, seven days per week. Utility and local area works which cannot be completed during standard daytime hours due to Road Occupancy Licence (ROL) requirements or utility authority requirements will also be undertaken outside of standard hours.

Completed sections of the SBT Works, including established construction worksites, will be progressively handed over to Sydney Metro to enable follow-on contractors to commence works.

Changes to the SBT Works scope may be required to facilitate constructability, amenity and staging. This may include but is not limited to refinement of site layouts based on detailed construction planning and safety assessment. For example:

- Relocation of internal access roads to allow for refinements in heavy vehicle/light vehicle movements
- Separation of people and plant
- Alteration to car parking/container and laydown areas to allow for safe working distances
- Movement of portable site offices, workshops and containers for construction staging.

As detailed in CEMP (Section 7.12.2), any changes to SBT Work scope will be provided to the ER for endorsement in accordance with Condition A32(j).

3. Legal and other requirements

3.1. Legislation

This Sub-Plan has been prepared in accordance with the:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Contaminated Land Management Act 1997* (CLM Act)
- *Water Management Act 2000* (WM Act)
- National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013) (NEPC, 2013).

3.2. Guidelines

Guidelines and standards relating to the management of construction soil and water risks on the SBT Works include:

- Guidelines for Consultants Reporting on Contaminated Land (EPA, 2020)
- Guidelines for the NSW Site Auditor Scheme (3rd edition) (EPA, 2017)
- Guidelines for the Assessment and Management of Groundwater Contamination (DEC, 2007)
- Managing Urban Stormwater: Soils and Construction (Volume 1 of the Blue Book) (Landcom, 2004)
- Managing Urban Stormwater: Soils and Construction – Volume 2D: Main Road Construction (Volume 2D of the Blue Book) (DECC, 2008)
- National Environment Protection (Assessment of Contamination) Measure amendment 2013 (NEPM 2013)
- Industrial Waste Resources Guidelines (EPA Victoria)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (collectively known as the ANZECC Guidelines) (ANZECC/ARMCANZ, 2000a)
- Australian and New Zealand Guidelines for Water Quality Monitoring and Reporting (collectively known as the ANZECC Guidelines) (ANZECC, 2000)
- Acid Sulphate Soil Manual. Acid Sulphate Soil Management Advisory Committee, NSW (ASSMAC, 1998)
- Fisheries Guidelines for Fish-friendly Structures (QLD DPI & Fisheries, 2006)
- Policy and guidelines for fish habitat conservation and management (NSW DPI, 2013)
- PFAS National Environmental Management Plan Version 2.0 (National Chemicals Working Group of the Heads of EPAs Australia and New Zealand, 2020).

3.3. Other environmental requirements

Other environmental requirements relevant to managing construction soil and water issues that are addressed in or by this Sub-Plan include the conditions of EPL 21672 (refer to Element 4: Project Specific Requirements).

4. Existing environment

4.1. Soil types

Soil Landscape Mapping sourced from the NSW Government eSpade portal reveals that the off-airport areas of the Project lie on the Blacktown and South Creek Soil Landscapes:

- The Blacktown Soil Landscape occurs on broad rounded crests and ridges with gently inclined slopes and undulating rises on Wianamatta Group shales. Local relief ranges to about 30 m and slopes are usually >5%. Soils include red and brown duplex soils on crests and midslopes, grading to yellow duplex soils on lower slopes and around drainage lines. Soils are commonly acidic, with low permeability, low wet bearing strength and low to moderate fertility. Subsoils are often moderately reactive. Subsoils are often dispersive (sodic) and salinity occurs sporadically.
- The South Creek Soil Landscape comprises the present active floodplain of numerous drainage networks of the Cumberland Plain. Slopes are typically less than 5%. Soils include deep, layered sandy to clayey sediments deposited by the present South Creek drainage network. The soils are characterised by seasonal waterlogging, localised permanently high water tables, localised salinity, and localised dispersive soils (sodicity).

4.2. Salinity

Salinity is caused by the accumulation of salts within soil, surface water and groundwater from natural conditions that has been accelerated in areas by anthropogenic activities. In Western Sydney, salinity issues are mostly associated with dryland salinity. The Salinity Potential in the Western Sydney Map (Department of Infrastructure, Planning and Natural Resources, 2002) shows areas of known salinity, and high and moderate salinity potential in parts of the off-airport study area. The known areas within the off-airport environment are:

- The riparian zone and unnamed creek just south of Patons Lane
- Badgerys Creek at Bringelly.

There is high salinity potential for the areas around all watercourses (Department of Infrastructure, Planning and Natural Resources, 2002). The remainder of the study area is mapped as having moderate salinity potential. The salinity risk is shown on Figure 3.

4.3. Contamination

Review of previous environmental assessment reports for the alignment identified a number of Areas of Environmental Concern (AEC) within the project alignment that may warrant further consideration. The following sub-sections summarise the previously identified contamination issues within the project alignment.

4.3.1. St Marys

The EIS has identified numerous potential sources of contamination in the vicinity of St Marys Station including but not limited to former service stations, dry cleaners, ammunition factories, and underground storage tanks (USTs).

Previous investigations beneath the former dry cleaner located at 1-7 Queen Street identified the presence of chlorinated hydrocarbons including elevated concentrations of tetrachloroethene (PCE) in soil. Tricholoethene (TCE) which is a degradation product of PCE is also present in soil. PCE and TCE are also present in groundwater and there is the potential for phase separated (i.e. not mixed with groundwater) PCE to be present beneath this site as well as in dissolved phase. At this stage, the extent and maximum concentrations of PCE and TCE in both soil and groundwater have not been confirmed beneath the footprint of the former dry cleaners and in materials to be intersected during tunnel boring.

4.3.2. Claremont Meadows

Review of the information indicates that this portion of the project area has historically been largely characterised by agricultural land use. While currently vacant, residential houses have previously been situated on the property, with some stockpiling of building materials and soil also observed.

To date, very little sampling has been undertaken within this portion of the project, and while there have been some detectable concentrations of Contaminants of Concern (CoC) most notably PFAS, with the exception of concentrations of nickel which were slightly above the CT1 threshold in one sample and concentrations of TRH C16-C34 of 750 mg/kg which exceeds ESL of 300 mg/kg, concentrations of CoC were less than the adopted human health and ecological criteria and less than CT1 criteria.

While not confirmed, given the age of former structures at the site, it is considered that there is a potential for bonded asbestos-containing materials (ACM) to be present in fill materials associated with poor demolition practices and/or due to the importation of poor-quality fill historically.

Based on the available data, it is expected that fill would be classified as General Solid Waste, with portions of fill soils likely requiring management as Special Waste (Asbestos Waste). However additional assessment is required to confirm this classification and weather natural soils meet the definition of VENM or ENM.

To date, no significant indication of contamination being present within groundwater has been identified within the single available monitoring location. While service stations have been noted to the east of the proposed Claremont Meadows service facility, it is estimated that groundwater flow direction in the vicinity of the service stations is to the east away from the alignment. In addition, it is considered that drawdown in the vicinity of the service stations is likely to be minor and therefore, although the groundwater gradient to the east toward South Creek it may flatten or possibly reverse during excavation. It is considered that significant migration of petroleum hydrocarbons in groundwater through the Bringelly Shale aquifer back to the excavation is considered unlikely.

4.3.3. Orchard Hills

Review of available information indicates that the Orchard Hills Project Area has largely been characterised by agricultural landuse, both historically and currently (potential AEC's include workshops and storage sheds, waste storage areas, and soil stockpiles etc.). Site investigations had previously identified a suspected cattle dip. Further investigations have noted that this may have been an old farm storage shed rather than a dip site however will be subject to further investigation.

To date, there is no site investigation data collected directly from within the Orchid Hills Station footprint and limited data within the Orchid Hills Project Area. Based on the limited available information, concentrations of CoC were less than commercial/industrial landuse criteria, with fill likely being classified as GSW. While not identified, given the landuse setting it is considered that there is a potential for ACM to be present in fill soils, attributed to either poor historic demolition practices or associated with importation of fill of a poor or unknown quality.

As there is no existing relevant soil data for the Station Box and the broader Orchard Hills Project Area, it is not possible to quantify the waste categories of materials to be disturbed or determine their suitability for reuse.

A review of analytical data identified concentrations of TRH and toluene in samples collected from four groundwater wells indicated that there may be a potentially unknown source(s) of hydrocarbon contamination in the area. Chloroform and dichloromethane were also detected however at this stage it is considered these detections may be a by-product of a leaky potable water pipe. Detectable concentrations of PFAS and select pesticides were also identified in groundwater samples.

4.3.4. Bringelly

A review of the available information indicates the Bringelly site footprint has been characterised by rural/agricultural landuse with a large, centrally located dam with soil mounds observed surrounding the dam. Review of Google Earth images also identified several structures including sheds and debris footprints to the east, and a residential building in the south-east corner of the site.

To date there is very little sampling data for the site, however there were no exceedances of concentrations in CoC's identified, although it is noted that detectable concentrations of PFAS and polychlorinated byphenyls (PCBs) were observed in fill material within the station box.

While not confirmed, given the likely age of former structures at the site and the debris observed in satellite images, it is considered that there is a potential for bonded ACM to be present in and on fill materials associated with poor demolition practices or due to the importation of poor-quality fill historically.

Based on the available data, it is likely that fill would be classified as General Solid Waste, with portions of fill soils likely requiring management as Special Waste (Asbestos Waste). Additional assessment is required to confirm classification and whether natural soils meet the definition of VENM or ENM, however it is estimated that natural soils likely meet the definition of VENM.

There is also currently only limited groundwater data collected from one well at the site.

4.3.5. Aerotropolis

Review of the available information indicates the Aerotropolis site footprint has been characterised by rural/agricultural landuse. There are a number of structures on the site including a residential house and sheds. An underground storage tanks (UST) was previously identified at the property adjacent to the north-eastern corner of the main building. Soil samples collected from four boreholes drilled in close proximity to the UST did not identify concentrations of CoC in excess of the adopted criteria and concentrations of BTEX and TRH were less than the laboratory limit of reporting (LOR).

A septic system is also present to the north of the main building. Concentrations of CoC[1] collected from 3 boreholes around the septic system were less than the adopted criteria and largely less than the laboratory LOR.

Fill material surrounding existing structures has also been observed to contain bonded ACM. The source of ACM is expected to be associated with debris from existing buildings, poor historic demolition practices, and/or importation of poor-quality fill in the past. ACM is anticipated to be randomly distributed throughout the fill.

It is expected that the majority of fill will be GSW with some volumes possibly classified as Restricted Solid Waste or Hazardous Waste and some volumes of fill also requiring management as Special Waste / Asbestos Waste.

4.3.6. Tunnel Section: St Mary's Station to Claremont Meadows

The EIS has identified numerous potential sources of contamination in the vicinity of St Mary's Street Station as outlined in Section 4.3.1.

Near the interface with the station box the tunnel passes directly beneath a former dry cleaner at 1-7 Queen Street (approximately Chainage 17,850) where previous investigations have identified the

[1] Not including biological pathogens such as coliforms.

presence of chlorinated hydrocarbons. A review of the available contamination data for 1-7 Queen St and the potential implications for the design and construction of the Station Box and tunnel has been undertaken.

At this time, it is not known whether contamination from chlorinated hydrocarbons extends to the tunnel alignment, and what the maximum concentrations of PCE/TCE are in soil/groundwater across this former dry cleaner property as well as materials to be intersected during tunnel boring.

From approximately Chainage 18,100 to South Creek at the Kingsway athletic/rugby fields (Blair Oval, Chainage (18,750) the EIS describes historic excavations and trenches. However, the EIS does not describe whether any contaminated materials have been buried at these locations and if present, whether these could potentially impact materials to be tunnelled.

Between Chainage 17,800 and Chainage 18,750 there is one borehole with sampling data. This location (BH-A203) is at approximately Chainage 18,250 and is not located in areas where potential sources of contamination have been identified in the EIS along the tunnel alignment (i.e. the dry cleaners and the historic excavations and trenches). Soil samples from this borehole at tunnel bore excavation depths did not identify potential contaminants of concern. The pH of natural materials to be bored however was above the pH range which could preclude classification as ENM, and this finding was also observed at BH-A322 at Chainage 18,800.

Between Chainage 17,800 and Chainage 18,750 groundwater monitoring has been undertaken at Blair Oval (BH-A105/BH-A105S) and Chainage 18,100 (BH-A103). Groundwater sampling from these wells has predominately focussed on metals and anions/cations with limited sampling (one event) for other important potential contaminants of concern including PFAS, hydrocarbons and organic compounds. Positive detection of toluene was reported in BH-A105. PFAS was not detected in the groundwater samples collected from these monitoring wells however this was limited to one sampling event. PFAS has been detected in groundwater at St Marys Station and in the monitoring well next to South Creek (BH-A011) at Chainage 18,800 and is expected to be found in this area.

Between Chainage 18,750 and Chainage 19,900 landuse is largely characterised by playing fields and grassed areas, with some light commercial/industrial landuse noted east of the tunnel alignment near Chainage 19,900 and a service station further east (also at Chainage 19,900). Laboratory data for this length of tunnel alignment is largely absent with only one sample location positioned in the area, although noting that it is north of the alignment and not situated within its footprint.

4.3.7. Tunnel Section: Claremont Meadows to Orchard Hills

There are currently no boreholes/test pits which have directly investigated the material to be bored in the tunnel between Claremont Meadows to the Orchard Hills Project Area. The depth of tunnel from these locations is from approximately 12.5 m AHD to 7.5 m AHD at Claremont Meadows to 32.5 m AHD to 27.5 m at Orchard Hills.

The boreholes closest to this section of tunnel (outside of the Orchid Hills Project Area and Claremont Meadows Shaft Area) where contaminated land soil samples were collected include BH-A121 and BH-A019. These boreholes are located near Claremont Meadows (approximately 40-100 m from the tunnel) however sample depths which included analysis for PFAS was limited to approximately 40 m AHD (i.e. these locations did not include sampling at depths of materials to be intersected by the tunnel).

Between Chainage 20,300 and Chainage 20,800, the tunnel passes alongside the closed Gipps Street Landfill. There is currently no soil data to confirm whether materials to be excavated for the tunnel have been impacted from the former landfill, and no environmental sampling was undertaken from the two wells installed adjacent to the landfill. BH-A019 is the monitoring well

which has been sampled and is located approximately 115 m from the tunnel. Impact consistent with the landfill was found in this monitoring well.

Previous investigation of the Gipps Street Landfill described in the EIS reported contamination in groundwater derived from landfill leachate including but not limited to ammonia, metals, pesticides, and other organic compounds. Impact in the shale aquifer beneath the landfill was also reported in the EIS. From the EIS it has been noted that the landfill received domestic and industrial wastes and was in use through to the mid-1980s. Accordingly there would be potential for contaminants such as PFAS which have not thus far been investigated in association with the landfill site.

Between Chainage 20,800 to approximately 21,400, the tunnel passes alongside former poultry farms located on the western and eastern sides of Kent Road. There is currently no existing data to investigate potential impacts from these historical farms.

Detailed site investigation will be required in advance of construction to determine areas of contamination, management measures (including any remediation requirements and health and safety controls which need to be implemented during construction), waste disposal classification, and excavated material re-use options.

4.3.8. Tunnel Section: Airport Dive Tunnel to Aerotropolis

This portion of the alignment is largely characterised by rural/agricultural landuse. Review of laboratory data indicated there were a small number of exceedances in fill of CT1 criteria, namely PFAS, and concentrations of select heavy metals in natural material which exceeded CT1 criteria. It was also noted that there were detectable concentrations of PFAS in both fill and natural material.

Given the predominantly agricultural landuse of the area, it is likely that some fill will be impacted by ACM, likely attributed to poor demolition practices or importation of fill of an unknown or poor quality.

It is considered that most fill material in this portion of the alignment would likely be classified as GSW, with some volumes likely requiring management as Special Waste / Asbestos Waste. Natural soils would likely be classified as VENM or ENM, although the detections of concentrations of PFAS would preclude a quantum of soil from satisfying those definitions.

One groundwater well is positioned within the area, although not in the tunnel alignment footprint. Review of analytical results from that well indicated that there were some exceedances of dissolved metals and ammonia, and a detection of chloroform in one sample. Concentrations of PFAS were not identified.

Further sampling of groundwater is required to adequately characterise the quality of groundwater within the tunnel alignment footprint.

4.4. Acid sulfate soils

Acid sulfate soils (ASS) is the common name given to a range of soil types that react when exposed to air to form sulfuric acid, which can damage built structures and harm animals and plants. The NSW (Off-Airport) environment is considered to have a low probability of ASS. The likelihood of ASS from coastal processes is low given elevation is >10m AHD and the SBT Works is not within a coastal area. Inland ASS can form within saline waterlogged soils with high quantities of organic matter. These may occur in large dams, drainage channels, riparian zones and wetlands within the study area. The areas mapped as high potential or known salinity risk on Figure 3 have the potential to form ASS.

Review of the available information relating to the risk for Acid Sulfate Soils (ASS) to be present in relation to tunnelling areas is low. The underlying geology of the area is largely comprised of Bringelly Shale. Acid generation in the Bringelly Shale appears to be limited to isolated pockets and the overall acid neutralising capacity of the formation is likely to overcome acid that is

generated. Mixing and crushing of rock that is inherent in the tunnel excavation process will further improve the neutralisation.

Soil investigations will be undertaken prior to construction to assess the identified potential areas of inland ASS areas where tunnelling excavations are to be undertaken. ASS would be assessed in accordance with ASSMAC[2] (1998) guidelines (and national guidelines where applicable) if greater than one tonne of ASS would be disturbed. An ASSMP will be prepared if the action criteria are exceeded to control earthworks and re-use, and appropriate receiving sites would be selected for excess spoil.

[2] NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC), 1998. Acid Sulfate Soil Assessment Guidelines. August, 1998.

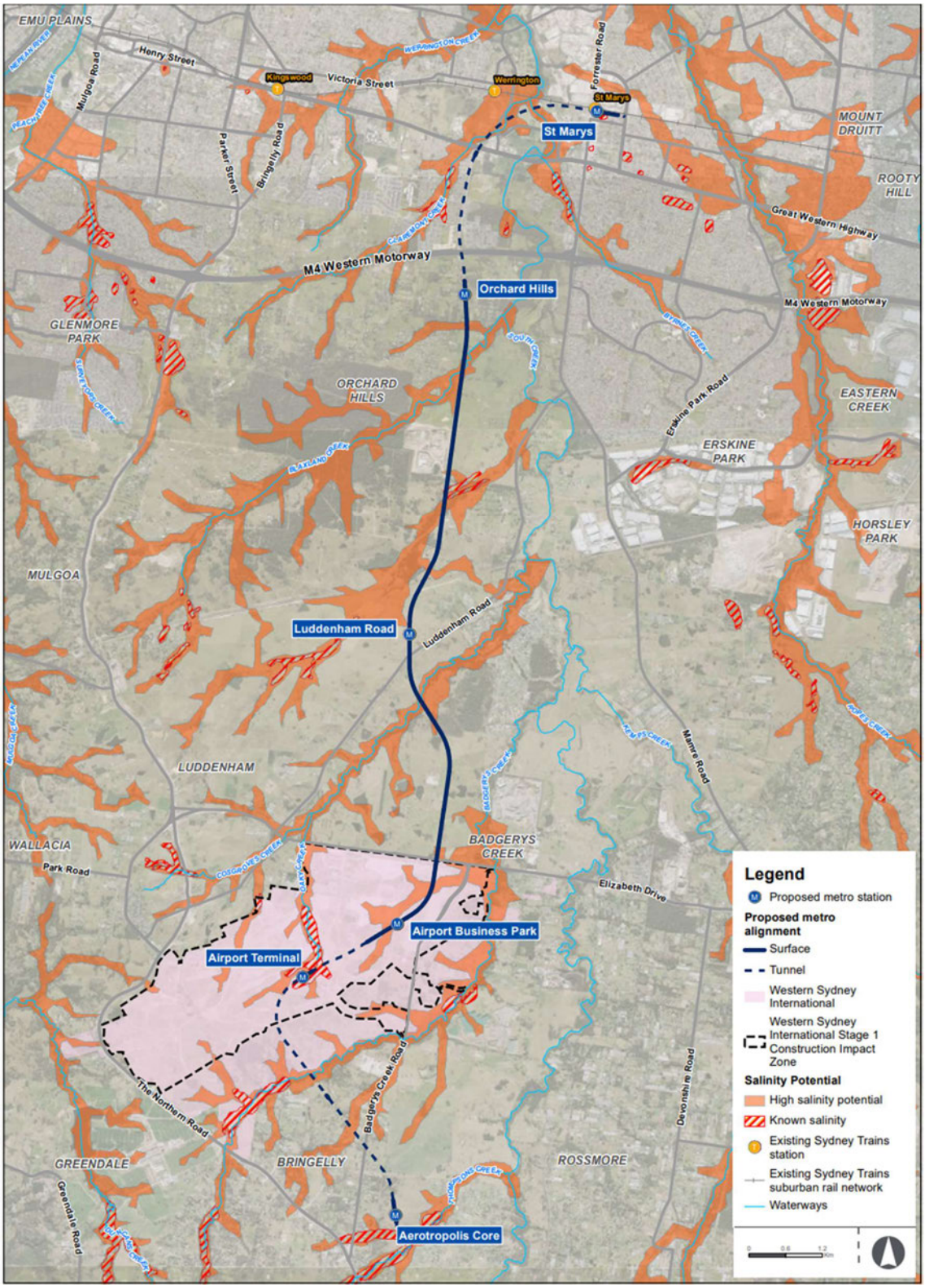

Figure 3: Areas of salinity potential in the project area (EIS Figure 16-1)

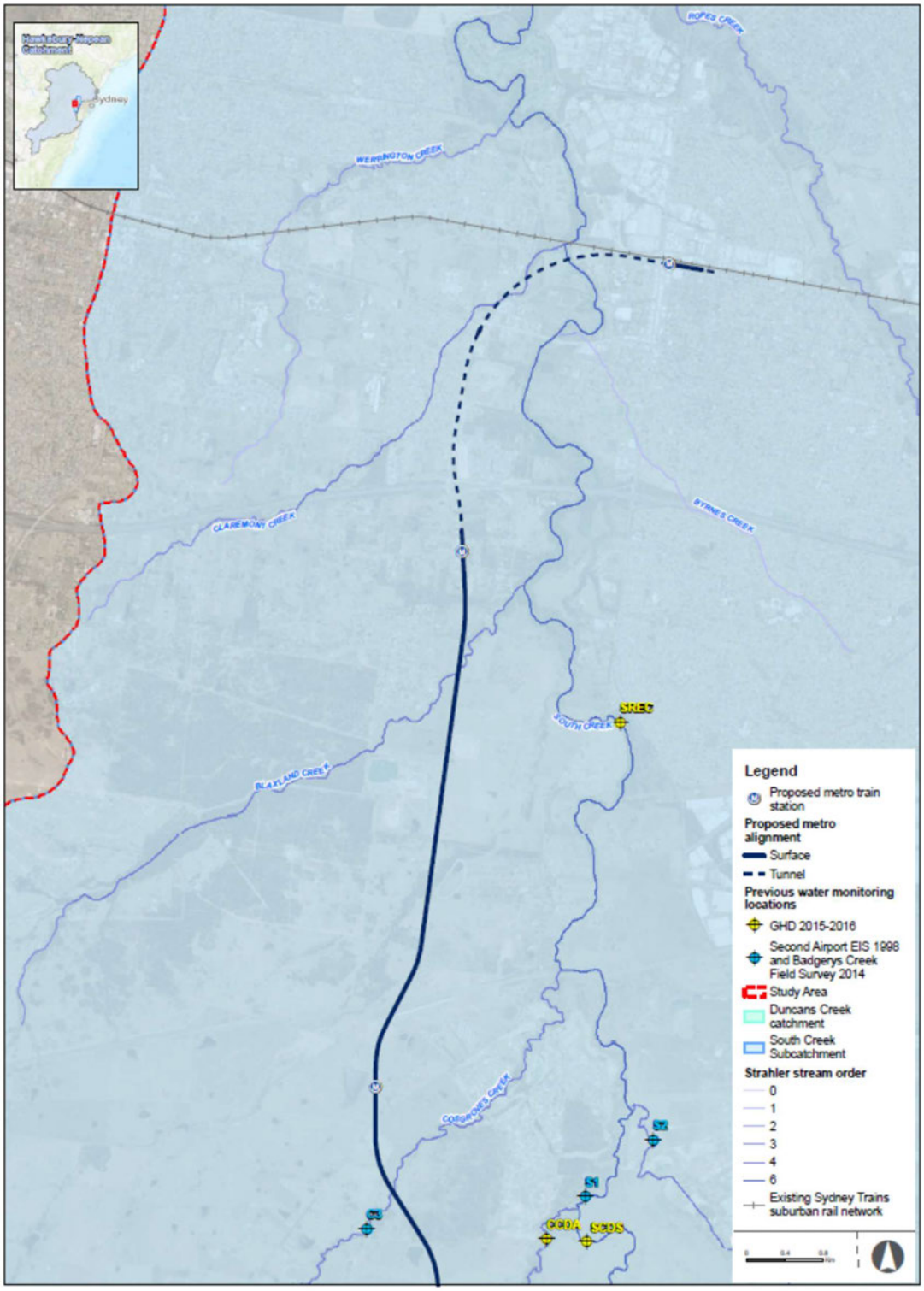

Figure 4: Hydrology of the Project area

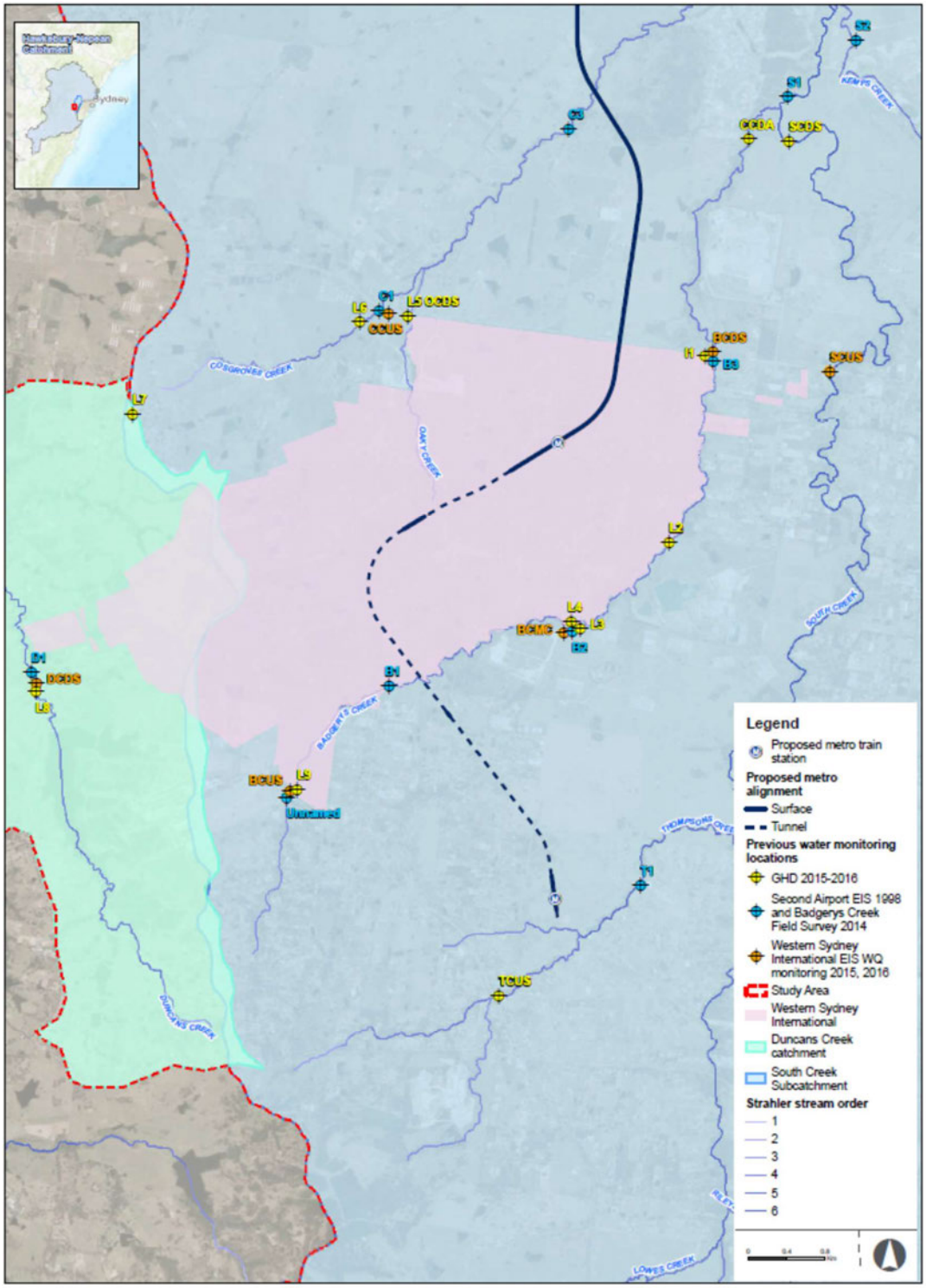

Figure 5: South Creek catchment (EIS Figures 14-1 a and b)

4.5. Surface water

The SBT Works footprint lies entirely within the South Creek catchment. South Creek, a major tributary of the Hawkesbury-Nepean catchment, flows in a generally northerly direction from its headwaters near Narellan through to Windsor where it joins the Hawkesbury River. Figure 2 shows an overview of the Project and the main tributaries within the South Creek catchment around the Project.

Table 3 provides a summary of the waterways located within the vicinity of the SBT Works alignment within NSW.

Table 3: Waterways along the SBT Works alignment within NSW

Waterway	Worksites
South Creek	All
Claremont Creek	St Marys Claremont Meadows Service Facility
South Creek	Orchard Hills
Badgerys Creek	Bringelly Service Facility
Thompsons Creek	Aerotropolis Core

South Creek is the receiving waterway for all creeks within the study area.

4.6. Groundwater

4.6.1. Groundwater levels

Groundwater in the off-airport environment was identified predominantly within the Bringelly Shale bedrock at varying depths along the project alignment. Table 4 provides a summary of groundwater levels at key locations along the off-airport sections of the SBT Works.

Table 4: Groundwater levels in the SBT Works area

Location	Groundwater Level (mbgl)	Groundwater elevation (mAHD)
St Marys Station	3.2 to 9.7	24.5 to 33
Claremont Meadows Services Facility	1.6 to 2.4	24.9 to 26
Orchard Hills Station	4.9 to 6.1	66.8 to 68.3
Bringelly Services Facility	2.8 to 7.4	66.2 to 68.7
Aerotropolis Core Station	3.2 to 9.7	24.5 to 33

4.6.2. Groundwater quality

Groundwater sampling results from the geotechnical investigations carried out for the SBT Works and from historical geotechnical investigation reports were used to assess groundwater quality. Groundwater testing was undertaken at the five NSW (Off-Airport) locations of St Marys Station, South Creek, Werrington, Gipps Street landfill and Orchard Hills Station as part of the geotechnical investigations for the SBT Works.

The results of groundwater quality testing indicate that groundwater across the SBT Works may be expected to have elevated salinity (electrical conductivity) and contain elevated concentrations of heavy metals and nutrient load. The pH of the groundwater in the region is observed to be generally acidic to neutral. The pH of groundwater samples ranged from 4.2 to 9.2. However, most samples collected had a pH in the range of 5 to 7.5.

Elevated ammonia and phosphorous was observed in most samples and is likely due to the semi-rural setting of the study area. Agricultural land uses introduce fertilisers and other organic material to the soils over a wide area, which can migrate into underlying groundwater. A range of elevated heavy metals were detected in the groundwater. Given the wide distribution of groundwater samples, it is unlikely that heavy metals within the groundwater are from a point source, and could be naturally elevated.

Groundwater salinity as measured from groundwater samples shows a range from fresh (less than 1,000mg/l) to saline (greater than 5,000mg/l). The maximum observed salinity was in alluvial deposits along Badgerys Creek, south of Western Sydney International (WSI) airport. This location corresponds to known locations of soil salinity. Most of the groundwater samples (85%) are considered saline (greater than 5,000mg/l). In approximately 50% of the samples, the salinity is greater than the maximum that can be used for watering of livestock (about 13,000mg/l).

4.6.3. Groundwater dependent ecosystems

Groundwater dependent ecosystems (GDEs) are defined as *"ecosystems that require access to groundwater to meet all or some of their water requirements to maintain their communities of plants and animals, ecological processes and ecosystem services"* (Department of Planning, Industry and Environment, 2020).

GDEs within 10km of the off-airport study area comprise:

- Cumberland Plain Woodland in the Sydney Basin Bioregion listed as Critically Endangered under the BC Act (PCT 849)
- River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and south-east Corner Bioregions listed as Endangered under the BC Act (PCT 835)
- Shale Gravel Transition Forest in the Sydney Basin Bioregion listed as Endangered under the BC Act (PCT 724)
- Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and south-east Corner Bioregions listed as Endangered under the BC Act (PCT 1800).

GDEs are receptors that rely wholly or partially on groundwater to provide all or some of their water needs. GDEs relevant to this Project can broadly be categorised as:

- Terrestrial GDEs: Ecosystems reliant on the subsurface presence of groundwater (i.e. vegetation that is accessing the water table and/or capillary fringe)
- Aquatic GDEs: Ecosystems reliant on the surface expression of groundwater (i.e. wetlands and baseflow fed watercourses).

Terrestrial GDEs are ecosystems with vegetation that rely on the availability of shallow groundwater, which is within reach of the root zone. Mature, large trees are likely to have the deepest root systems and are the most likely vegetation type in a given ecosystem to access groundwater. Two classifications of terrestrial GDEs are recognised:

- Obligate groundwater dependency – where vegetation (or some vegetation in a wider ecosystem) sources most, or all of its water requirements from groundwater or the capillary fringe.
- Facultative groundwater dependency – where groundwater may be used periodically either only when it is available, or only when it is required.

Subterranean GDEs have not been mapped in the vicinity of the proposed alignment and as such are not considered further. There are also no Ramsar or nationally important wetlands within the study area.

A desktop search of groundwater dependent ecosystems within a 1 km buffer of the project alignment identified several aquatic and terrestrial ecosystems listed as having moderate or high potential for groundwater dependence.

5. Aspects and impacts

Table 5: Soil and water quality aspects and potential impacts

Aspect	Potential impact
• Sediment laden runoff during the establishment of site compounds and excavation works • Material stockpiles • Discharge of sediment laden water from wheel wash facilities.	• Sediment laden/contaminated runoff entering drainage systems and/or directly into receiving waters, causing pollution.
• Storage and use of chemicals near stormwater systems and waterways.	• Potential for soil contamination as a result of a spill • Potential for pollutants to wash into site drainage and into receiving waters.
• Impacts on groundwater levels and groundwater quality.	• Potential reduction in groundwater levels resulting in impacts on other groundwater users • Potential for dewatering of surrounding aquifers during station excavation resulting in impacts on GDEs • Potential for groundwater drawdown induced ground settlement impacts on to properties and infrastructure.
• Impacts on surface water quality.	• Potential for turbid water, metals, sewage and other contaminants to enter drainage systems and result in degradation of aquatic habitat and water quality • Failure to adequately manage runoff and leachate from contaminated areas, including stockpiles, resulting in off-site pollution • Failure to adequately manage ASS stockpiles and treatment resulting in low pH water entering local surface waters.
• Sediment tracking onto public roads from vehicles leaving SBT construction worksites.	• Potential road user safety risks from sediment and gravel on roads • Potential for sediment to be washed into drainage systems and/or directly into receiving waters, causing pollution • Potential for dust to be generated off site through tracking.
• Flooding impacting on SBT worksites.	• Potential for contamination of stormwater by sewerage, fuels and/or chemicals during large rainfall events • Potential for floodwaters to drain into station or shaft excavations, endangering the workforce and damaging equipment.
• Concreting and grouting.	• Potential for water quality impacts on surface water and groundwater resulting from runoff from waste concrete • Potential for spills of excess or waste concrete • Potential for concrete to enter stormwater systems or surface water.
• Construction or modification to stormwater systems.	• Potential for accidental discharge of sediment-laden runoff into stormwater systems.

Aspect	Potential impact
• Unexpected finds of contaminated spoil or groundwater during excavation at the SBT worksites.	• Potential for contaminated soils to be encountered during excavation at the SBT worksites • Potential for encountering contaminated groundwater • Potential for unexpected contamination finds, including asbestos,
• Known contaminated sites and spoil	• Potential for contaminated soils to be encountered during excavation at the SBT worksites • Potential for encountering contaminated groundwater • Potential for unexpected contamination finds, including asbestos • Potential for contaminants to enter drainage systems and result in degradation of aquatic habitat and water quality

6. Monitoring programs

6.1. Surface water quality monitoring program

Under CSSI Condition C13(b) and REMM WQ1, surface water quality must be monitored for the duration of construction, taking into consideration existing water quality monitoring data collected during the delivery of the Western Sydney Airport Bulk Earthworks and for the M12 Road Project.

CPBG will implement SWQMP (Annexure B) to monitor potential impacts on water quality as well as the effectiveness of the mitigation measures to be applied as part of the SBT Works. Water quality management during construction will focus on minimising the risk of polluted, sediment-laden or contaminated water leaving the premises by implementing a comprehensive management and monitoring regime on site.

Pre-construction monitoring will commence immediately once the SWQMP is endorsed by the ER. Where possible, locations that have previously been monitored prior to construction have been used to provide continuity of the dataset and allow for ongoing comparison with the baseline data.

Surface water quality monitoring during the construction phase will occur quarterly and focus on receiving waters downstream of project sites that will potentially receive runoff or discharges. In addition, up to four wet weather monitoring events will be undertaken within a 12-month period. A wet weather event is when at least 20mm of rain is received in the catchment in a 24-hour period. Sampling will be completed when flows are reasonably constant and access is safe.

Physio-chemical parameters will be monitored both upstream and downstream of discharge locations, and heavy metals will be monitored at downstream locations during the pre-construction period.

Weather monitoring will be conducted using rainfall gauges at CPBG compounds, as well as data from the Badgerys Creek weather station, accessed via the Bureau of Meteorology website (http://www.bom.gov.au). The Badgerys Creek weather station is located near the southern extent of the SBT Works alignment, and provides weather updates every half hour.

Surface water quality monitoring in any particular area could be extended if potential impacts attributable to the SBT Works are identified, and work method and management practices will be assessed and revised or adapted if necessary. Potential mitigation measures could include:

- Additional water treatment measures, e.g. replacing filters
- Enhanced use of soil stabilisers and agents to minimise erosion
- Additional sediment control measures
- Revision of CPBG environmental processes and procedures
- Review of design and construction procedures to ensure ongoing minimal impact
- Investigation and advice from subject matter experts
- Additional training and/or awareness for CPBG personnel and subcontractors.

The SWQMP includes site-specific trigger values and nominates management responses and investigations should a trigger be exceeded. If an investigation determines that impacts are attributable to the SBT Works, a trigger response action plan would be developed detailing the appropriate response and actions to be undertaken.

The SWQMP includes reporting requirements in addition to the reporting requirements under the EPL.

6.2. Groundwater monitoring program

Reflecting the requirements of Conditions C13 and C16, CPBG have developed a GWMP to monitor the extent and nature of potential impacts to the groundwater level and quality during the SBT Works (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404). The GWMP, a standalone

document, will also monitor the effectiveness of mitigation measures and ensure a comprehensive management regime can be implemented to address potential impacts and maintain groundwater quality.

The primary objective of the GWMP is to demonstrate compliance with the SSI 10051 Planning Approval, EPL 21672 and relevant legislation. This objective will be achieved by:

- Establishing monitoring parameters that enable comparison of the actual construction performance against the predicted performance of mitigation measures
- Identifying thresholds for monitoring parameters that if exceeded will trigger the need for management responses
- Scheduling and assignment of monitoring responsibilities.

The GWMP will aim to confirm no adverse impacts on the receiver during construction or to effectively manage any impacts with the implementation of appropriate mitigation measures. Monitoring at any specific location will be subject to the status of the water supply work and agreement with the landowner.

The results of the GWMP will inform detailed hydrogeological and geotechnical models for the SBT Works which will be developed and progressively updated during design and construction (refer to the Hydrogeological Interpretation Report in Section 7.2). The models will identify predicted changes to groundwater levels, including at nearby water supply works and at groundwater dependent ecosystems or other sensitive groundwater receptors.

Where changes to groundwater levels are predicted at nearby water supply works, groundwater dependent ecosystems or other sensitive groundwater receivers, the GWMP will be reviewed and, if necessary, revised.

Where changes to groundwater level are close to the ground surface, dryland salinity monitoring will be implemented to allow for management of any identified impacts.

7. Management strategy

7.1. Overview and lessons learnt

This section details the soil and water management strategy, and is structured as follows:

- Potential for groundwater drawdown and management is addressed in Section 7.2
- Approach to minimising water usage and maximising reuse is addressed in Section 7.3
- Erosion and sediment control planning is set out in Section 7.4
- Water discharge criteria and targets are set out in Section 7.5
- Water treatment plant specifications are set out in 7.5
- The design and management of sediment basins is set out in 7.6
- Management of chemical and refuelling including spill management is addressed in Section 7.7
- Management of sewerage is set out in Section 7.8
- Contamination management is addressed in Section 7.9.

Environment Procedures apply across the SBT Works and document process flow charts, roles and responsibilities and relevant checklists and forms including internal hold points and required environmental permits. They include:

- Contingency Groundwater Monitoring Procedure (SMWSASBT-CPG-SWD-SW000-WA-PRO-000001)
- Erosion and Sediment Control Procedure (SMWSASBT-CPG-SWD-SW000-LD-PRO-000001)
- Water Reuse and Discharge Management Procedure (SMWSASBT-CPG-SWD-SW000-WA-PRO-000003)
- Spill Management Procedure (SMWSASBT-CPG-SWD-SW000-CT-PRO-000002)
- Contamination and Acid Sulfate Soils Management Procedure (SMWSASBT-CPG-SWD-SW000-CT-PRO-000001).

These Environment Procedures are referenced in relevant Sections of this Sub-Plan and provided in Annexure C.

Over many years of successfully delivering tunnelling projects in Sydney there are a number of key lessons learnt which have been incorporated into developing this Sub-Plan including:

- Water Treatment Plants:
  - Better understanding of the characteristics (volume, physical and chemical) of the in-feed wastewater stream anticipated to be encountered throughout the project life-cycle. This will ensure that the design of the water treatment process can adequately treat water to meet the required water quality criteria
  - Implementation of a solids handling component based on the likely characteristics (quantity, physical and chemical) of the water treatment process to enable appropriate classification of the material for reuse/ disposal
  - Use of an experienced local equipment supplier that is readily available to undertake scheduled maintenance and repair work
  - Dedicated and trained operators for day, night and weekend shifts
  - Ability to reintroduce water that does not meet the discharge specification back into the process at different stages to reduce retreatment and resource usage
  - Ensuring that when maintenance or repair work is required that adequate water storage (pre and post treatment) is available
  - Appling management techniques which increase water segregation during rain events detailed in the Controlled Water Overflow Management Strategy (to be developed prior to the commencement of construction).

- Surface Water Management:

– Engaging a soil conservationist during the worksite layout planning phase to help identify issues and address them accordingly so as to remove the potential for ongoing issues and maintenance during construction
– Engaging a soil conservationist to review plans for erosion and sediment controls and advising on the proposed strategy for erosion and sediment control and use of new technologies (where appropriate) regarding construction phase soil and water management
– The worksite drainage design needs to better consider existing clean water drains within active worksites regarding better isolation, with adequate mitigation measures designed and installed in accordance with the Blue Book
– Clean stormwater i.e. downpipes or up slope runoff to be directed around open work areas where possible to reduce volumes requiring treatment. Sediment basin design to consider safe access to undertake maintenance and the proposed dewatering mechanism to reduce safety and environmental risks associated with dewatering activities.

CPBG will implement these lessons in delivering the SBT Works where relevant.

7.2. Potential groundwater drawdown and management

Groundwater management undertaken as part of the SBT Works will identify the potential for drawdown of surrounding groundwater resources, including GDE's, and monitor potential impacts.

Existing groundwater levels are summarised in Section 4.6.1 and the GWMP (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404). Groundwater levels will change with seasonal variation and rainfall as well as due to construction activity and excavation.

A detailed assessment of existing groundwater levels along the SBT Works alignment using hydrogeological models calibrated to groundwater monitoring data is included in the Hydrogeological Interpretation Report (HIR). This provides an assessment of the baseline groundwater environments observed over the monitoring period and predicts potential drawdown induced by the tunnel, station and shaft excavations for the SBT Works including:

- A summary of the applicable Particular Specification to the groundwater environments at each SBT Works Site including maximum design inflow rates and groundwater control criteria
- A summary of the data sources used to inform the conceptual and numerical models
- An overview of the geological and hydrological setting of the SBT Works
- Discussion of the conceptual hydrogeological models for each SBT Works site, defining aquifer systems based on the local lithology, stratigraphy and structure.

Should groundwater monitoring identify potential impacts to GDEs, the HIR includes additional contingency mitigation measures that could be implemented if required.

The following provides a brief summary of the groundwater level changes that may occur as a result of construction of the SBT Works:

- Tunnel excavation can cause groundwater to seep into excavations
- The running tunnel is tanked using TBM construction (segmental lining with grout injection immediately following installation) and is predicted to result in a minimal level of groundwater inflow. The period of inflow of any excavation is a short period as the TBM moves along sealing the excavation shortly after excavation.
- Short-term drawdown, 3 to 7 months drained duration, resulting from excavation of the cross-passages prior to completion of the undrained cross passage lining. Average inflow to the cross-passage excavations is estimated at ~5 m^3/day.
- Long-term drawdown resulting from construction of the drained structures (e.g. dives, station boxes and shafts). The expected groundwater changes may result in settlement of

the surrounding ground at worksites. Based on previous project experience this settlement is likely to be insignificant due to the relatively thin soil layers present along the majority of the route, combined with the relatively stiff consistency of the soils.

As detailed in the GWMP (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404), additional piezometers will be installed along the alignment (particularly at the station boxes and shafts) to monitor groundwater levels, and to replace some existing instruments located within the proposed excavations which will be removed. Trigger levels have been nominated in the GWMP for piezometers in vicinity of the stations and shafts which are related to the predicted groundwater draw down.

Potential impacts on groundwater dependent ecosystems include changes to groundwater level and flow resulting from groundwater drawdown during excavation works. The EIS includes conservative modelling of these impacts and has identified potential drawdown of between one and four metres, with the zone of greatest predicted change (more than two metres) located within around 230 metres of Orchard Hills Station. The EIS concludes that this maximum change, if it eventuated, would occur at the base of the excavation and moving away from the excavation, the magnitude of the change in groundwater level would reduce.

Based on CPBG's assessment, even with the drained Orchard Hill Station excavation, the extent of the groundwater drawdown is less than what the EIS predicted. The contours in Figure 6 Figure 6: EIS Predicted groundwater drawdown at Orchard Hills (EIS Figure 15-5) compared to CPBG's predicted groundwater drawdown

compare the EIS and the SBT Works drawdown extent, where the SBT Works predicted 2m drawdown is around 180m from the excavation. Based on this, CPBG concludes that the drained design included in the Particular Specification will have an impact on the GDE at Orchard Hills consistent with that predicted in the EIS.

The EIS indicates that there are 10 groundwater supply wells within the study area listed on the National Groundwater Information System (NGIS) (BoM, 2019). The majority of the bores are drilled very deep into the Hawksbury Sandstone unit to access the more readily available fresher water more than 2km to the west of St Marys Station box and more than 1km to the southwest from the Aerotropolis Station box. There is no groundwater use near the SBT Works alignment due to the presence of low permeability shale and no impact on groundwater uses is predicted.

Monitoring of groundwater inflows will be undertaken by Project Engineers in accordance with the Contingency Groundwater Monitoring Procedure (**Error! Reference source not found.**.

Groundwater inflow cannot be separated from tunnel process water. All water within the tunnels and excavations will be collected in sumps and pumped to the surface. Table 6, which details CPBG's predicted groundwater outflow as a percentage of total discharge, demonstrates that groundwater outflow as a percentage of total water discharge volume is very low. The captured water will be reused on site in preference to offsite discharge (see Section 7.5).

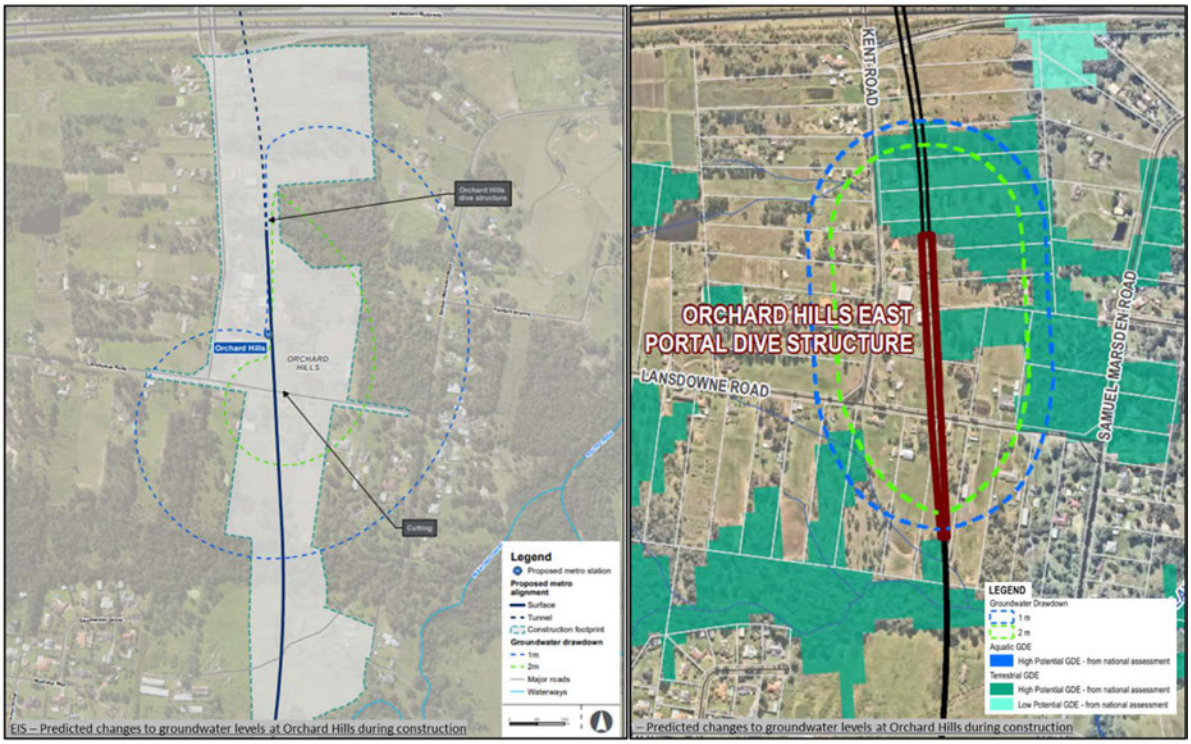

Figure 6: EIS Predicted groundwater drawdown at Orchard Hills (EIS Figure 15-5) compared to CPBG's predicted groundwater drawdown

7.3. Minimising water usage and maximising reuse

Further detail on water reuse is provided in the Water Reuse Strategy (SMWSASBT-CPG-1NL-NL000-WA-RPT-000001).

CPBG will minimise water usage and maximise reuse by:

- Reducing the volume of water required during delivery through use of:
  - Efficient systems, such as misting systems, fog cannons, trigger hoses for washdown and maintaining handstand, and installing acoustic sheds
  - Site amenities fitted with water efficient fixtures.
- Replacing potable water with sustainable non-potable sources, where feasible, by:
  - Reuse of treated water for construction activities
  - Rainwater harvest from acoustic sheds for reuse
  - TBM water recirculation.

CPBG will monitor and measure water consumption during project delivery; refer to the Sustainability Management Plan for details on potable and non-potable water consumption monitoring and reporting.

7.4. Erosion and sediment control

Details on Erosion and Sediment Control Plans are addressed in Section 9.2.

Erosion and sediment controls will be designed, constructed, operated and maintained in accordance with:

- Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road Construction (DECC, 2008), to be read and used in conjunction with Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom, 2004)
- Best Practice Erosion and Sediment Control (IECA 2008)
- Ether industry best practice documents if it can demonstrate the guidance will provide improved or equivalent outcomes for the environment and meet the requirements of Condition L1.1 of EPL 21672.

The Indicative Erosion and Sedimentation Control Strategy for the SBT Works includes the following measures and techniques:

- Clean water approaching the site from external catchments beyond the construction worksites will be managed via clean water drains and diversion berms to minimise run-on into the site. Impacts on adjacent land users will be considered to ensure that localised flooding or excessive run-on does not occur.
- Sediment basins will be designed, installed and managed as per the requirements of the Blue Book and EPL 21672.
- Clearing of vegetation will be minimised and runoff from vegetated areas will be directed off-site.
- Unstable areas will be regularly stabilised with a biodegradable soil polymer or similar proactive ground cover to reduce the amount of sediment mobilised during rainfall.
- Vegetation removed as part of the SBT Works will be reused on site for erosion and/or sediment control purposes where feasible.
- Stormwater flow velocities through work areas will be controlled using temporary berms, checks or other suitable devices and directed to appropriate locations.
- The extent of exposed soils will be minimised, with no-go (exclusion) areas clearly marked on ESCPs, delineated and signposted.
- Rainfall forecasts will be actively monitored and used to trigger inspections and, where required, implementation of additional measures such as the application of soil binder.
- All exposed stockpiles will have sediment controls downslope and be provided with adequate temporary cover if they will remain for more than 10 days. Stockpiles will be situated above the 20-year ARI flood level unless they are short-term (i.e. less than 10 days) and significant rainfall is not forecast.
- At vehicle access points from SBT Worksites, washdown bays, rumble grids and/or stabilised laybacks or other solutions will be constructed, maintained and stabilised to minimise vehicles tracking materials onto public roads as much as is reasonable and feasible
- Vehicle, motorised plant and equipment movements onto or off SBT Worksites will minimise the deposition of any material onto public roads
- Mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer, motorised plant and equipment leaving the SBT Worksite, will be removed to the greatest extent practicable
- Road surfaces subject to any tracking of material by vehicles leaving the SBT Worksites will be cleaned as required to remove soils or debris
- All erosion and sediment controls will be inspected at least weekly, before a site closure of more than two days, and after rainfall exceeding 10 mm in 24 hours if safe to do so. Maintenance will be carried out as required prior to the next forecast rainfall event.
- Concrete washout will be confined to designated concrete washout bays or using a Concrete Waste Separation Unit (CWSU), which allows for recycling of concrete waste and treatment of wastewater.
- Sediment collected from sediment basins or other traps will be transported to nominated stockpile sites.

- Dust generation will be minimised through the use of water carts, sprinklers, soil stabilisers, reduced traffic speeds and application of temporary ground covers.
- Any discharge to waterways will include appropriate scour protection/dissipation.
- Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions will be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.

7.5. WTP Discharge criteria, targets and testing

The discharge of treated wastewater from construction water treatment plants (WTPs) has the potential to impact on receiving environment water quality if not adequately managed. Groundwater management will be required during station box and tunnel excavation and discharge will be required from each of the SBT worksites during construction.

Groundwater inflow into tunnels cannot be separated from tunnel process water. All water within the tunnels and excavations will be collected in sumps and pumped to the surface.

Reuse of wastewater will be maximised, but the volume of tunnel process water generated means discharge of large volumes of treated water is required.

The CSSI must be designed and constructed so as to maintain the NSW Water Quality Objectives (NSW WQO) where they are being achieved as at the date of this approval, and contribute towards achievement of the NSW WQO over time where they are not being achieved as at the date of this approval, unless an EPL in force in respect of the CSSI contains different requirements in relation to the NSW WQO, in which case those requirements must be complied with. To this end, water treatment plants will be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that bioaccumulate unless other discharge criteria are agreed with relevant authorities.

A Discharge Impact Assessment has been completed for the Project and has recommended the site-specific discharge criteria in Table 6. The DIA process is discussed further in Section 9.1.

Table 6: Predicted groundwater inflows, discharge volumes and locations

Parameter	Unit of Measure	50th Percentile Concentration Limit	90th Percentile Concentration Limit	100th Percentile Concentration Limit
pH [2]	pH Units	-	-	6.5 – 8.5
Electrical Conductivity [2]	µs/cm	-	-	125 – 2,200
Turbidity [2]	NTU	-	-	6.0 - 50.0
Oil and Grease	-	-	-	No Visible
Total Phosphorous	µg/L	50	100	-
Total Nitrogen	µg/L	500	1,200	-
Total Ammonia	µg/L	900	1,430	2,300
Aluminium	µg/L	55	80	150
Arsenic (As V) [1]	µg/L	13	42	140
Arsenic (As III) [1]	µg/L	24	94	360
Cadmium [1]	µg/L	0.2	0.4	0.8

Parameter	Unit of Measure	50th Percentile Concentration Limit	90th Percentile Concentration Limit	100th Percentile Concentration Limit
Cobalt [1]	µg/L	1.4	-	4.2
Chromium (Cr VI) [1]	µg/L	1.0	6.0	40
Chromium (Cr III) [1]	µg/L	3.3	7.7	27
Copper [1]	µg/L	1.4	1.8	2.5
Iron [1]	µg/L	300	-	900
Lead [1]	µg/L	3.4	5.6	9.4
Manganese [1]	µg/L	1,900	2,500	3,600
Mercury [1 B]	µg/L	0.06	0.6	1.9
Nickel [1]	µg/L	11	13	17
Vanadium	µg/L	6	-	18
Zinc [1]	µg/L	8	15	31
Endosulfan (µg/L) [B]	µg/L	0.03	0.2	0.6
Methoxychlor (µg/L)	µg/L	0.005	-	0.015
TPH C10-C36 Fraction	µg/L	<100	<100	<100
TPH C6-C9 Fraction	µg/L	<100	<100	<100

7.6. Sediment basins

Where feasible, on-site detention of stormwater would be introduced where stormwater runoff rates are increased. The design and construction of the sediment basins will be undertaken in accordance with the Blue Book Volumes 1 and 2D (Landcom, 2004 and DECC, 2008). Prior to construction, the design calculations and locations will be determined by the Project Soil Conservationist.

Sediment basin locations and sizes will be further refined during detailed design. The sediment basins have been designed to retain a 5-day 85th percentile rainfall event prior to overtopping, which equates to a rainfall depth of 27.6mm. This is the rainfall depth after which it is commonly expected that other erosion and sediment controls will be overtopped.

The design storage capacity of each sediment basin will be reinstated within the design management period following the cessation of a rainfall event that causes runoff to occur on or from the SBT Worksite. Records of the available water and sediment storage capacities in each sediment basin will be maintained by the Environmental Coordinator and provided to the EPA on request.

As part of the commissioning phase, a Water Detention and Settlement Basins Checklist will be developed and completed. An administrative process to update discharge points will be agreed with the EPA to enable timely processing.

Where there is insufficient space for the provision of sediment basins, the upgrade of downstream infrastructure will be implemented where feasible and reasonable. At all locations where stormwater is discharged, water quality measures such as gross pollutant traps, bio-retention

swales and Water Sensitive Urban Design features will be investigated and implemented where feasible and reasonable.

7.6.1. Sediment basin discharge monitoring

All water will be tested (and treated if required) prior to discharge from the site in order to determine compliance with the appropriate approvals and EPL 21672. Except as may be expressly provided by EPL 21672, CPBG will comply with section 120 of the POEO Act 1997.

No water will be discharged from the site without written approval of the Environment Manager (or delegate). A dewatering and discharge permit must be issued and signed by all relevant parties prior to discharge and constitutes a hold point.

As per Condition P1.1 of EPL 21672, discharge of water is permitted from clearly identified and accessible points detailed in Table 7. Discharge and monitoring points must be approved by the EPA in accordance with the process detailed in Condition P1.2 of EPL 21672.

Table 7: EPA discharge and monitoring points

EPA ID No.	Type	Location description
1	Discharge and monitoring	The outlet(s) of the sediment basin(s) on the Orchard Hills site discharging to South Creek referred to in Condition P1.2
2	Discharge and monitoring	The outlet(s) of the sediment basin(s) on the Claremont site discharging to South Creek referred to in Condition P1.2
3	Discharge and monitoring	The outlet(s) of the sediment basin(s) on the St Marys site discharging to South Creek referred to in Condition P1.2
4	Discharge and monitoring	The outlet(s) of the sediment basin(s) on the Bringelly site discharging to Badgerys Creek referred to in Condition P1.2
5	Discharge and monitoring	The outlet(s) of the sediment basin(s) on the Aerotropolis site discharging to Thompson Creek referred to in Condition P1.2
6	Discharge and monitoring	The outlet of the water treatment plant on the Orchard Hills site discharging to South Creek
7	Discharge and monitoring	The outlet of the water treatment plant on the Claremont site discharging to South Creek

For each discharge and monitoring point detailed in Table 7, the concentration of a pollutant discharged must not exceed the concentration limits specified in Table 8 unless:

- The discharge occurs solely as a result of rainfall measured at the premises exceeding the design rainfall depth value for the corresponding discharge point; and
- The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance with Condition O4.2 of EPL 21672.

Table 8: Water concentration limits

Pollutant	Units	100 percentile concentration limit	Sampling method*	Frequency
Oil and grease	Visible	Not visible	Visual inspection	• Less than 24 hours prior to a controlled discharge and daily for any continued

Pollutant	Units	100 percentile concentration limit	Sampling method*	Frequency
pH	pH	6.5 – 8.5	Probe	controlled discharge, when it is safe to do so • When rainfall causes a discharge from a sediment basin which has not been emptied within the design management period following cessation of a rainfall event, when it is safe to do so.
Turbidity	Nephelometric turbidity units	50	Probe	

* Monitoring must be done in accordance with the EPA Approved Methods Publication.

7.6.2. Water Treatment Plant Sampling

The water treatment plants will be sampled for Physicochemical and metal parameters listed in Table 9 when discharging (or as specified in the EPL). The frequency of this sampling will be undertaken in accordance EPL E3.1 as listed below.

i. daily on the first 3 days of discharges
ii. weekly for the first month of discharges
iii. fortnightly for the first 3 months
iv. As per condition M2.2, following this sampling frequency or as directed by the EPA

Table 9: Water quality monitoring parameters

Category	Measured	Parameters
Physicochemical parameters	In-field using a calibrated multi parameter probe	• pH • Visible oil and grease • Dissolved Oxygen (% Saturation) • Turbidity
Metals	Laboratory testing	• Aluminium • Ammonia • Chromium VI • Copper • Electrical conductivity • Nitrogen (total) • Phosphorus (total) • Total suspended solids (TSS) • Zinc

7.7. Chemicals, refuelling and spill management

Chemicals, hazardous substances and dangerous goods will be stored and used on site in accordance with existing procedures and the following protocols:

- Hazardous substances will be stored on site in lockable containers, in their original receptacles
- All chemicals and fuels will be clearly labelled and will have Safety Data Sheets affixed or available nearby
- All chemical storage facilities will be designed and constructed in accordance with:
  - All relevant Australian Standards
  - For liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund
  - Storing and Handling Liquids: Environmental Protection - Participants Manual
  - Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management - Part B Review of Best Practice and Regulation
- Storage locations for non-liquids must be identified that are away from stormwater drains and easily accessible for maintenance and spill clean-up in the event of a rupture
- Bunding maintenance must be undertaken to ensure capacity is maintained.

Chemicals will be stored and handled in accordance with relevant Australian Standards, namely:

- AS 1940-2004 The storage and handling of flammable and combustible liquids
- AS/NZS 4452:1997 The storage and handling of toxic substances
- AS/NZS 5026:2012 The storage and handling of Class 4 dangerous goods
- AS/NZS 1547:2012 On-site domestic wastewater management.

Spill kits will be provided and regularly maintained at high-risk areas, including workshops, fuel storage areas, batch plants and WTPs.

7.8. Management of sewage

Sewage and grey water from all site facilities except St Marys will be directed to on-site storage tanks where it will be regularly removed by a licensed truck for transport and disposal at a licensed facility. The expected volumes of wastewater to be generated will be calculated based on the size of the workforce and the tank storage capacity, and frequency of truck movements calculated accordingly to prevent overflow. St Marys will connect into the local sewerage network for site sewage discharge.

7.9. Contamination, salinity and acid sulfate soils

7.9.1. Contamination

The SBT Works involve the excavation and dewatering of stations, dives and services facilities shafts and tunnels along the alignment. The stratigraphy of the excavations along the SBT Works alignment generally consists of fill overlying residual soil and alluvium, with rock underneath.

The area on and around the SBT Works footprint has a diverse range of current and former land uses, including industrial, commercial, residential and agricultural land uses. Industrial uses include a range of potentially contaminating activities, such as dry cleaning, bus depots, railway activities, mixed industrial and nearby service station and landfilling at Claremont Meadows. In general (depending on the presence or absence of local contamination sources), fill soil is expected to contain low level contamination.

Before commencement of any construction that would result in the disturbance of medium to high risk contaminated sites as identified in the EIS or Submissions Report (referred to as an Area of Environmental Concern or AEC), a Detailed Site Investigation (DSI) will be prepared to determine the full nature and extent of the contamination. Reflecting the outcomes of the sampling and analytical testing, a medium or high-risk area of environmental concern may be reassessed as low risk. As detailed in REMM SC1, this would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal.

To inform the risk rating, a Technical Memo will be prepared by a certified consultant on completion of sampling and analytical testing. The intent of the memo is to assess the results of the DSI field work to determine if an area of environmental concern (or a portion of the area) can be reassessed as low risk based on the level and characteristics of identified contamination. The Technical Memo will be reviewed by the Site Auditor prior to submission to Sydney Metro for information. Works will be undertaken in accordance with the mitigation measures identified in the Technical Memo, and the results of waste classification incorporated into the DSI Report.

The DSI Reports and the subsequent report(s), will be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The DSI Reports will be undertaken in accordance with:

- Guidelines made or approved under section 105 of Contaminated Land Management Act 1997 (CLM Act) (NSW)
- Sampling, Analysis and Quality Plans (SAQPs) which will facilitate the establishment of contamination management requirements before excavation commences. Reflecting the requirements of the Deed, in-situ classification of solid waste will be undertaken at sampling densities not less than that specified within the NEMP (2013) and the Industrial Waste Resources Guidelines, Sampling and Analysis: Soil Sampling (EPA Victoria 2010), except for VENM and ENM which are to be classified in accordance with the requirements of the POEO Act.

Should remediation be required to make land suitable for the final intended land use, a Remedial Action Plan (RAP) will be prepared, or reviewed and approved, by consultants certified under either the CEnvP(SC) or the CPSS CSAM scheme. The RAP will be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the CLM Act and will include measures to remediate the contamination to ensure the site will be suitable for the proposed use when the RAP is implemented. Reflecting the requirements of clause 12.20 of the Deed, each RAP will include:

- Objectives of the RAP and the extent of the site to which it applies

- Define what will constitute practical completion of remediation
- Construction methodology
- Describe the nature and extent of contamination based on the DSI
- Include details of any remediation completed during performance of any preliminary works
- Review of the remediation options and rationale for the selected remediation strategy(s), including appropriateness, practicality, durability, sustainability, cost effectiveness, environmental impact and compliance with the Deed
- Stockpile management plan to prevent cross contamination
- Detailed risk assessment to determine and describe the requirements for remediation of contamination (including soil, groundwater, ground gas and vapour), including migration of contamination via groundwater, ground gas and odour into the areas of excavation or disturbance
- Consider and plan to mitigate the migration of contamination from the SBT worksite
- Site management requirements to protect workers, adjacent site users and the environment
- Waste classification of soils (as defined by in situ waste classification completed as part of the detailed site investigations) to be removed from the site to a licensed waste facility or under an EPA-approved resource recovery order/exemption
- Requirements for record-keeping, including vehicle movements, disposal dockets and receival sites
- An unexpected finds protocol for unidentified contamination, e.g. underground storage tanks, asbestos
- Sampling, assessment and waste classification of soils from ancillary excavations outside of the bulk excavation that need to be disposed of off site
- Validation plan, including sampling frequency and methods, analytical suite, quality assurance and control, and reporting requirements.

In addition to the above requirements, each RAP will contain sufficient detail and justification to enable determination of any agreed remediation scope, including:

- A classification and excavation map that accurately identifies the location of any samples taken and mapping (lateral and vertical) of remaining solid waste and its respective waste classification
- A detailed excavation plan and register that is consistent with the classification and excavation map describing the quantities in tonnes and cubic metres of each material proposed to be excavated and to be reused and/or disposed offsite
- Details of any other elements of remediation that are required to mitigate risks to the construction, operation and maintenance of Sydney Metro Wester Sydney Airport.

Before commencing remediation, the DSI and RAP will be submitted to Sydney Metro in accordance with the requirements of the Deed. A Section B Site Audit Statement(s) will also be prepared by an NSW EPA-accredited Site Auditor that certifies that the RAP(s) is/are appropriate and that the site can be made suitable for the proposed use. In the event that RAP proposes the retention of contaminated material onsite, requirements for a Long Term Environmental Management Plan will be detailed in the RAP.

The RAP(s) will be implemented and any changes to the RAP(s) will be approved in writing by the NSW EPA-accredited Site Auditor. Where possible, sustainable remediation principles will be adopted and the requirement for long-term monitoring following remediation will be minimised.

On completion of remediation, Validation Report(s) will be prepared in accordance with Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA, 2020) and relevant guidelines made or approved under section 105 of the CLM Act.

A Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan) and its accompanying Site Audit Report, which state that the contaminated land disturbed by

the work has been made suitable for the intended land use, will be submitted to the Planning Secretary and the relevant council(s) after remediation and before the commencement of operation of the CSSI.

The EPA contaminated land audit process, which applies to contamination investigation, remediation, validation and management, will be combined with a review by Sydney Metro, the Certified Contaminated Land Consultant and the ER. This process will ensure that these stakeholders are fully informed of the scope of investigations, progress of testing, and findings.

A copy of DSI Report(s), RAP(s), Validation Report(s), Site Audit Report(s) and Site Audit Statement(s) will be submitted to the Planning Secretary and the relevant council(s) for information.

7.9.2. Salinity

Prior to ground disturbance in high probability salinity areas (Figure 3), testing would be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils would not be reused or would be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC 2008), and in consultation with the Project Soil Conservationist (see 8.2.1). Erosion controls would be implemented in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004).

7.9.3. Acid sulfate soils

As outlined in Section 4.4, there is a low probability of ASS being encountered in the off-airport SBT Works area. Prior to ground disturbance in areas of PASS, relevant mapping will be reviewed and testing will be undertaken to determine the actual presence of acid sulfate soils. If acid sulfate soils are encountered, management will occur in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998). Possible management strategies include:

- Modifying location of temporary facilities to avoid the area of known PASS
- Delineation and removal to a suitably licenced facility
- Preparation and implementation of an on-site treatment procedure to neutralise the PASS, including adequate controls to mitigate potential environmental impacts

The management of any PASS will include appropriate erosion and sediment controls to minimise the potential for pollution of waters.

7.9.4. Unexpected Finds Protocol

An unexpected find is defined as potential contaminated land or asbestos that was not previously identified in the EIS, DSI or RAP. Unexpected finds that may be encountered during the SBT Works are summarised in Table 10.

Table 10: Potential unexpected finds

Unexpected Find	Description
Fuels or oils	Fuel or oil contamination may be identified by odour, coloured sheen or staining/discolouration of soils. The 'oily' odour can vary in strength from weak (just detectable) to very strong.
Buried waste	Buried waste includes construction and demolition materials (e.g. wood, plastic, metal, bricks, etc) as well as landfill material (domestic putrescible waste).

Unexpected Find	Description
Buried Asbestos Containing Material (ACM), asbestos fines/friable asbestos	Cement-bound ACM may be present in building waste or conduits. Friable asbestos is more commonly associated with lagging and insulation. Laboratory analysis is typically required to identify asbestos fines and fibres.
Storage tanks or conduits	Underground storage tanks and former pipelines are typically metal, concrete or plastic. Storage tanks may be full, partially full or decommissioned. Indications of contamination (staining or odour) may be present in the surrounding soils.
Ash or slag	Ash material is typically light weight, grey and white sand. Slag varies in consistency (loose or cemented) and colour (grey, blue, green).
Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)	Group of over 4000 chemicals Manufactured chemicals that are widely used to make fire-fighting foam, stain and water protection, paper coating, metal plating, photographic materials, aviation hydraulic fluid, cosmetics and sunscreen, and medical devices.

Where unexpected contamination or asbestos is identified or suspected, the Unexpected Finds Protocol will be implemented as detailed in Table 11.

Table 11: Unexpected finds protocol

Action	Description
Unexpected contamination or ACM	• **Hold Point:** If observations indicate the presence of potential contamination, stop all work in the immediate area. Notify the Site Supervisor, Environmental Coordinator and Health and Safety Advisor. Make the area safe and contact a certified contaminated land consultant. • Assess the potential risk to worker health and the surrounding environment; evacuate or contact emergency services if required
Health, safety and environmental controls	• Site Supervisor to establish an exclusion zone around the impacted area with para-webbing and appropriate signage • Refer to the Work Health and Safety Plan for Personal Protective Equipment requirements • Use water sprays to dampen ACM unexpected finds • Cover potential ACM with weighted plastic sheeting or geofabric • Divert clean water from the area of excavation in accordance with this Sub-plan
Notification	• Site Supervisor to notify the Environment Manager who will: Immediately notify Sydney Metro Principal's Representative in writing Within 10 business days after becoming aware of the unexpected find, provide a notice to the Sydney Metro Principal's Representative detailing the type, location, nature and extent of the contamination, detailed particulars on claim entitlements, proposed remediation activities and estimate of costs likely to be incurred Notify the ER Notify the Site Auditor (for audited sites) Notify the EPA where required in accordance with the 'Guidelines on the Duty to Report Contamination under the CLM Act 1997' (Office of Environment and Heritage, 2009) Log the find on Synergy, including photographs and location information

Action	Description
Assessment	• Environment Manager to engage a Contaminated Land Consultant to: Conduct a preliminary assessment of the nature of the contamination and the immediate management controls Collect samples for chemical or asbestos analysis by a NATA accredited laboratory Assess the results against applicable land use or waste classification criteria in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority Manage the contamination in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority
Management and reporting	• Environment Manager to implement necessary management and/or mitigation actions to minimise risk to human health and the environment, and ensure the site will be suitable for the proposed use • If ACM is confirmed, the Health and Safety Advisor is to: Install warning signs on the barricades to prevent unauthorised entry to the site Engage a SafeWork Licenced Asbestos Removalist to remove and dispose of the ACM to an appropriately licenced facility Engage an Occupational Hygienist to conduct air monitoring as required and issue an Asbestos Clearance Certificate on completion of remediation works Upload air monitoring results and Asbestos Clearance Certificate to Synergy Provide briefings to workers during Toolbox meetings or Pre-Start meetings
Recommence works	• Recommence works at the direction of the Environment Manager when the following criteria have been satisfied: Site is safe to access Management and/or mitigation actions have been implemented Site has been validated as suitable for the proposed use

7.10. Flood Management

The SBT Works will be designed and constructed with the objective of not exceeding the flood impacts presented in the EIS or the flood impact criteria in Table 5 of the SSI 10051 Planning Approval, whichever is greater (Condition 15). This objective is applicable to within and in the vicinity of the approved project boundary for all flood events up to and including the one per cent Annual Exceedance Probability (AEP) flood event.

Measures identified in the EIS and Submissions Report to limit flooding impacts or measures that achieve the same outcome will be incorporated into the detailed design of the SBT Works. This will include the development of flood compatible design for the permanent spoil placement areas (off-airport) to ensure compliance with applicable land use criteria.

Updated modelling that incorporates these measures and is calibrated and validated with consideration of the results of the Wianamatta-South Creek Catchment Flood Assessment prepared by Infrastructure NSW as part of Stage 2 of the South Creek Sector Review will be prepared by a suitably qualified flood consultant. The modelling will identify changes in post-development flood behaviour including cumulative flood impacts associated with WSA and the M12, where this information is available, prior to detailed design being finalised.

Where flooding characteristics exceed the levels identified in Condition E15, CPBG will consult with the NSW State Emergency Service (SES) and relevant council(s) regarding the management

of any continuous and residual flood risk from rarer flood events larger than the 1 per cent AEP and up to the probable maximum flood.

Sydney Metro will undertake consultation with affected landowners for properties adversely flood affected as a result of the SBT Works. In the event that Sydney Metro and the affected landowner cannot agree on the measures to mitigate the impact as described in Condition E15, Sydney Metro will engage a suitably qualified and experienced independent person to advise and assist in determining the impact and relevant mitigation measures.

Flood information including flood reports, models and geographic information system outputs will be provided to the DPE Place, Design and Public Spaces Division (PDPS), relevant council(s), DPE Environment and Heritage, and the SES (Nominated Parties) in order to assist in preparing relevant documents and to reflect changes in flood behaviour as a result of the SBT Works. Each of the Nominated Parties will be notified in writing that the information is available no later than one month following the completion of the SBT Works.

Information requested by the Nominated Parties will be provided no later than six months following the completion of SBT Works or within another timeframe agreed with the relevant Nominated Party. The project flood models and data will be uploaded to the NSW Flood Data Portal and access will be provided to the Nominated Parties no later than one month following the completion of the SBT Works.

7.11. Groundwater modelling

CPBG will submit a revised Groundwater Modelling Report to the Planning Secretary for information before bulk excavation at the relevant construction location. The Groundwater Modelling Report will include:

- For each construction site where excavation will be undertaken, cumulative (additive) impacts from nearby developments, parallel transport projects and nearby excavation associated with the SBT Works
- Predicted incidental groundwater take (dewatering) including cumulative project effects
- Potential impacts of the SBT Works or detail and demonstrate why the SBT Works will not have lasting impacts to the groundwater system, ongoing groundwater incidental take and groundwater level drawdown effects
- Actions required to minimise the risk of inflows (including in the event the SBT Works are delayed or do not progress) and a strategy for accounting for any water taken beyond the life of the operation of the SBT Works
- Saltwater intrusion modelling analysis, from saline groundwater in shale, into metro station sites
- A schematic of the conceptual hydrogeological model.

8. People and collaboration

8.1. Our team

The roles and responsibilities of key CPBG personnel with respect to soil, water and groundwater management are detailed in Table 12.

Table 12: Key roles, authority and responsibility

Role	Authority and responsibility
Construction Director	• Manage the delivery of the SBT Works, including overseeing planning approval and environmental management • Hold authority to direct personnel and/or subcontractors to carry out actions to avoid or minimise unintended environmental impacts • Act as the Contractor's Representative.
Approvals, Environment & Sustainability Manager (Environment Manager)	• Prepare and implement this Sub-plan • Oversee soil, water and groundwater monitoring, inspections and auditing • Hold authority to direct personnel and/or subcontractors to carry out actions to avoid or minimise unintended environmental impacts.
Commercial Manager	• Ensure that relevant soil, water and groundwater management requirements are considered in the procurement of materials and services.
Design Manager	• Ensure relevant soil, water and groundwater requirements are addressed in design development.
Construction Managers and delegates	• Manage the delivery of the construction process in relation to soil, water and groundwater management for their work activity in conjunction with the Environment Manager and Environmental Coordinators • Ensure compliance with this Sub-Plan and associated procedures.
Sustainability Manager	• Track and report soil and water elements against sustainability targets.
Environmental Coordinators	• Manage the on-ground application of soil and water management measures during construction (e.g. erosion and sediment control, water treatment and monitoring) • Monitor and report on soil and water management during construction.
Superintendents	• Work with the Environment Manager to ensure construction is carried out in compliance with environmental controls • Hold authority to direct personnel and/or subcontractors to carry out actions to avoid or minimise unintended environmental impacts.
Project Managers, Project Engineers, Site Supervisors	• Work with the Environment Manager to implement and monitor on-site environmental management and compliance measures across all sites • Undertake site inspections.

8.2. Specialist consultants

8.2.1. Soil conservationist

Strategic Environmental and Engineering Consulting (SEEC) has been engaged to provide expert advice which has been incorporated into this plan. SEEC will continue to provide specialist advice and services in the development and implementation of this Sub-Plan to ensure that impacts can be avoided, minimised or appropriately mitigated, including:

- Providing input into the selection and design of erosion and sediment controls
- Reviewing plans for erosion and sediment controls and advising on the proposed strategy for erosion and sediment control and use of new technologies (where appropriate) regarding construction phase soil and water management
- Conducting regular site inspections with environmental and construction personnel to review performance, recommend improvements and advise on potential enhancements
- Providing training to all key personnel regarding erosion and sediment control. This will include legislative requirements, the application of best practice (i.e. Blue Book Volumes 1 and 2), correct use and maintenance, and installation of erosion and sediment control techniques.

8.2.2. Contamination specialist

Coffey, a consultancy specialising in the fields of geotechnical, environmental and groundwater engineering, has been engaged to undertake Phase 2 contamination investigations, develop RAPs, conduct validation assessments, and provide advice on contamination management. Coffey will also be responsible for the Hydrogeological Interpretive Report and providing assistance with groundwater contamination aspects.

8.2.3. EPA accredited auditor

CPBG has engaged the services of Ramboll Environ, which employs a number of EPA accredited site auditors to provide Interim Audit Advice and Site Audit Statements, where triggered.

9. Systems and tools

9.1. Discharge Impact Assessment

Building on the water quality monitoring undertaken by Sydney Metro (see Section 6.1), CPBG has prepared a Discharge Impact Assessment (Wastewater Pollution Impact Assessment). The purpose of this assessment was to identify:

- The existing water quality in each receiving environment
- The water quality objectives for each catchment
- Whether the water quality objectives are being met in each catchment
- The predicted impact of water discharged from sediment basins and from the project WTPs

Recommended discharge limits from sediment basins and from the WTPs are contained in the Discharge Impact Assessment and will be incorporated into the EPL.

9.2. Site Detailed Erosion and Sedimentation Control Plans

Site-specific Erosion and Sediment Control Plans (ESCPs) will be progressively developed for each of the SBT worksites in accordance with Section 7.4. Initial ESCPs will be developed with input from the Project Soil Conservationist and will be regularly updated by the Soil Conservationist or CPBG environmental personnel following changes in the site layout or phase of works. All ESCPs will require sign-off by the Environment Manager and Site Supervisor prior to implementation. The Soil Conservationist will conduct regular reviews of all ESCPs developed for the SBT Works, and site inspections where necessary, to ensure they meet best practice (i.e. the Blue Book).

ESCPs will be posted on site noticeboards and requirements regularly communicated to the relevant workforce through toolbox training.

9.3. Training

Environmental training requirements for key personnel and workforce positions will be identified through a Training Needs Analysis and implemented throughout the SBT Works. Key elements of the training program will include:

- Site induction for all new starters addressing legal requirements, site-specific environmental risks and incident reporting
- Toolbox talks to reinforce key environmental risks for the stage of the works and to communicate incidents and lessons learnt from other sites or projects. Toolbox talks will be used to communicate daily weather forecasts that may result in an increased ERSED risk
- Aspect-specific training to be provided to key work teams which include topics such as erosion and sediment control, water treatment and legal requirements. This will include legislative requirements, the application of best practice (i.e. Blue Book Volumes 1 and 2), correct use and maintenance, and installation of erosion and sediment control techniques.

External training providers will be used where required to ensure a high level of training.

9.4. Reporting, review, auditing and continual improvement

CPBG will regularly review the SBT Works to ensure compliance with project requirements. A regular inspection program for soil and water will be conducted as follows:

- Details of daily inspections undertaken by Site Supervisors will be logged in their respective site diaries or online systems
- Routine weekly inspections are to be conducted by Environmental Coordinators to monitor erosion and sediment controls in active worksites. Weekly inspections will be documented in the CPBG electronic system

- Site inspections of active SBT worksites will be carried out by the ER
- Environmental inspection will be completed prior to and following significant rainfall events (i.e. >10 mm/24 hours) by the Environmental Coordinator and/or Superintendent/Site Supervisor
- Inspections by the Soil Conservationist will be conducted to review site progress and compliance with ESCPs.

CPBG will develop and implement an audit program which will address both internal and external audits, including compliance with this Sub-plan. Additional details on the audit program are provided in Section 7.13.1 of the CEMP.

CPBG will seek to continuously improve performance with regards to soil and water management. This is achieved through the use of new and innovative methods and technologies for erosion and sediment control (as driven by the Infrastructure Sustainability Council rating process) and by implementing lessons learnt from other CPB Contractors and Ghella projects.

9.5. Records

The following compliance records will be retained by CPBG on SharePoint for a minimum of seven years:

- Copies of current ESCPs for all active construction sites
- Records of soil and water inspections undertaken
- Records of testing of any water prior to discharge
- Dewatering and discharge permits.

Part B: Implementation Systems and Tools

Part B of this Sub-Plan explains how the soil and water impacts of the SBT Works will be minimised. All relevant mitigation measures from the CEMF and REMMs identified in Section 7 of the Submissions Report, are addressed in this section of the Sub-Plan. Compliance with all elements of these systems and tools is required at all times to minimise the likelihood of causing unauthorised environmental harm and maximise the uptake of opportunities to reduce environmental impact.

Part B contains the following:

- **Environmental Elements and Expectations**: These describe what is required of the SBT Works in order to implement the objectives of CPBG's Environment and Sustainability Policy:
  - **Element** – Key aspects for managing this function in delivering the SBT Works
  - **Intent** – A one-line statement describing the overall purpose of the Element
  - **Expectation** – The outcomes achieved as part of each Element.
- **Requirements**: These are the specific actions performed in order to demonstrate compliance with the Elements and Expectations.
- **Responsibility and Key Contributor**: This information is included to ensure absolute clarity as to those people responsible for achieving compliance with the stated Expectation, as well as those that will need to assist/contribute to achieving compliance.
- **Deliverables**: This column of the table lists the tangible outcomes to be produced in order to demonstrate compliance with the environmental Elements and Expectations.

Element 1: Training

All staff, employees and subcontractors will actively drive continuous improvement in the environmental performance of the SBT Works

Expectations	How will JHCPBG meet the Expectation?	Responsible Key Contributor	Deliverables
1.1. All personnel have completed an induction containing relevant environmental information before they are authorised to work on the SBT Works	All personnel working on the SBT Works will undertake a site induction, which will provide initial training on various environmental aspects, including soil and water management. It will cover: • Protecting the site from erosion and sedimentation • Potential soil and water Impacts to the environment and surrounding community • Mitigation measures • Hold Points (inspection of erosion and sedimentation controls)	**Human Resources Manager** Environment and Sustainability Manager Environment Coordinators	Induction presentation Induction records Hold point register
1.2. Toolbox talks are used to reinforce key management requirements and lessons learnt	Tool boxing will be undertaken to reinforce and reiterate information from inductions and where procedures are amended or new procedures are introduced or to communicate lessons learnt/incidents from other Projects. In particular, toolboxes will be undertaken periodically on upcoming inclement weather, erosion and sedimentation controls, fuel and chemical management and other topical soil and water issues.	**Environment and Sustainability Manager** Site Supervisor Environment Coordinators	Toolbox records Toolbox topic schedule

Element 2: Monitoring and reporting

All staff, employees and subcontractors will actively drive complaint environmental performance of the SBT Works

Expectations	How will CPBG meet the Expectation?	Responsible Key Contributor	Deliverables
1.3. Worksites are regularly inspected to ensure the adequacy of controls	Site Supervisor to undertake daily inspections of worksite to ensure management of soil and water quality controls and will undertake adaptive management where required. Weekly inspections of soil and water quality controls will be undertaken as part of Joint Environment Inspections. Pre-and post-rainfall inspections to be undertaken to ensure adequacy of site controls. A regular inspection program for soil and water quality monitoring will be conducted as follows: • Details of daily inspections undertaken by the Site Supervisor will be recorded • Routine weekly inspections are to be conducted to monitor soil and water quality mitigation measures in active worksites. Weekly inspections will be documented and summarised in monthly reports. • ER inspections will include review of implementation of erosion and sedimentation management and mitigation measures • Effectiveness of soil and water quality controls and chemical storage areas will be monitored and adapted progressively.	**Environment and Sustainability Manager** Superintendents Site Supervisors	Site Diary entries Environment Inspection Reports Monthly reports
1.4. Monitoring is performed to establish baseline data and ensure compliance is maintained	CPBG will monitor trends in environmental data including: • Pre-construction water quality monitoring / testing for baseline data • Effectiveness of site controls • Meteorological conditions • Identification of near-by, non-project related sedimentation sources	**Environment and Sustainability Manager** Environment Coordinators	Visual air quality records Inspection Reports
1.5. Monitoring records are maintained	Compliance records will be retained by CPBG and will include: • Environmental inspection reports and register • Stop work register	**Senior Environment Coordinators** Environment Coordinators	Environmental inspection register Stop works register

Expectations	How will CPBG meet the Expectation?	Responsible Key Contributor	Deliverables
	• Erosion and sedimentation control plan register • Sediment basin capacity The monthly environmental report will include a summary erosion and sedimentation mitigation effectiveness and the specific controls which were implemented for each work zone. Water sample records must include the date and time that the sample was collected, the collection point and the name of the person who collected the sample. All monitoring records will be kept in a legible form for a minimum of four years after the monitoring event.		

Element 3: Auditing, review, and improvement

We will continually improve our environmental systems and environmental performance by monitoring and reviewing their effectiveness

Expectations	How will CPBG meet the Expectation?	Responsible Key Contributor	Deliverables
1.6. Review this Sub-Plan to ensure compliance	Review of this Sub-Plan will be undertaken in accordance with the final CEMP (SMWSASBT-CPG-1NL-EV-PLN-000002). If required, this Sub-Plan will be updated and provided to the ER under SSI 10051 Planning Approval Condition A32(j) for endorsement.	**Environment Manager** Environmental Coordinator	AQMP updates
1.7. Audits are undertaken to ensure compliance with the requirements of this Plan	Audits will be performed in line with the CEMP (SMWSASBT-CPG-1NL-EV-PLN-000002), and we will update this Sub-Plan and/or procedures if required. Procedures for corrective actions are addressed in the CEMP (SMWSASBT-CPG-1NL-EV-PLN-000002).	**Environment Manager** Environmental Coordinators	Audit Reports Corrective Action Reports
1.8. All non-compliances are reported and actioned	A non-conformance can generally be defined as a failure to comply with SSI 10051 Planning Approval or the EPBC Approval 2020/8687 Where a non-conformance is raised as part of an audit or an incident or complaint investigation the audit, incident or complaint report may be used to close out the non-conformance and it is not necessary to raise a separate non-conformance reporting process. Procedures for corrective actions are addressed in the CEMP (SMWSASBT-CPG-1NL-EV-PLN-000002).	**Environment Manager** Environmental Coordinators	Corrective Action Reports Complaint Reports Incident Reports Audit Reports

Element 4: Package specific requirements

SSI 10051 Planning Approval

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
Flooding					
E15	The CSSI must be designed and constructed with the objective of not exceeding the flood impacts presented in the documents listed in Condition A1 or the flood impact criteria in Table 5, whichever is greater, within and in the vicinity of the CSSI for all flood events up to and including the one (1) per cent Annual Exceedance Probability (AEP) flood event. Measures identified in the documents listed in Condition A1 to limit flooding impacts or measures that achieve the same outcome must be incorporated into the detailed design of the CSSI.	The SBT works will be designed and constructed with the objective of not exceeding the flood impact criteria detailed in this condition (Section 7.10) Measures to minimise the impacts of construction on flood conditions are detailed in the CEMP (Section 6.8)	**Design Manager** **Construction Managers**	Flood reports Flood models Geographic information system outputs	During Construction
E16	Updated modelling that incorporates these measures and is calibrated and validated with consideration of the results of the Wianamatta-South Creek Catchment Flood Assessment prepared by Infrastructure NSW as part of Stage 2 of the South Creek Sector Review must be prepared by a suitably qualified flood consultant. The modelling must identify changes in post-development flood behaviour including cumulative flood impacts associated with Western Sydney International Airport and the M12, where this information is available, prior to detailed design being finalised.	Updated flood modelling will be prepared in accordance with the requirements of this condition (Section 7.10).	**Design Manager**	Flood reports Flood models Geographic information system outputs	During Construction
E17	Where flooding characteristics exceed the levels identified in Condition E15 above the Proponent must undertake the following: (a) consult with affected landowners for properties adversely flood affected as a result of the CSSI regarding appropriate mitigations; and	Where flooding characteristics exceed the levels identified in Condition E15, CPBG will undertake required consideration with	**Design Manager**	Flood reports Flood models	During Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	(b) consult with the NSW State Emergency Service (SES) and Relevant Council(s) regarding the management of any continuous and residual flood risk from rarer flood events larger than the 1 per cent AEP and up to the probable maximum flood. In the event that the Proponent and the affected landowner cannot agree on the measures to mitigate the impact as described in Condition E15, the Proponent must engage a suitably qualified and experienced independent person to advise and assist in determining the impact and relevant mitigation measures.	the SES and relevant council(s) (Section 7.10). Consultation with affected landowners will be undertaken by Sydney Metro.		Geographic information system outputs	
E18	Flood information including flood reports, models and geographic information system outputs must be provided to the DPIE PDPS, Relevant Council(s), DPIE EES 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 DPIE PDPS, Relevant Council(s), DPIE EES 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 DPIE PDPS, Relevant Council(s), DPIE EES or the SES must be provided no later than six (6) months following the completion of construction or within another timeframe agreed with the DPIE PDPS, Relevant Council(s), DPIE EES and the SES. The project flood models and data must be uploaded to the NSW Flood Data Portal and access must be provided to the DPIE PDPS, Relevant Council(s), DPIE EES and SES no later than one (1) month following the completion of construction.	Flood information will be provided to the DPE PDPS, relevant councils, DPE EES and the SES in accordance with the requirements of this condition (Section 7.10).	**Design Manager**	Flood reports Flood models Geographic information system outputs	During Construction
Contamination					
E92	Before commencement of any construction that would result in the disturbance of medium to high risk contaminated sites as identified in the documents identified in Condition A1, Detailed Site Investigations	A DSI Report will be prepared in accordance with the requirements of this	**Environment Manager**	DSI Report(s)	Prior to Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	(for contamination) must be conducted to determine the full nature and extent of the contamination. The Detailed Site Investigation Report(s) and the subsequent report(s), must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Detailed Site Investigations must be undertaken in accordance with guidelines made or approved under section 105 of Contaminated Land Management Act 1997 (NSW). Note: Nothing in this condition prevents the Proponent from preparing individual Detailed Site Investigation Reports (for contamination) for separate sites.	condition before commencement of any construction that would result in the disturbance of medium to high risk contaminated sites as identified in the EIS and Submissions Report. Refer to Section 7.9.1 for further details.			
E93	Should remediation be required to make land suitable for the final intended land use, a Remedial Action Plan must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Remedial Action Plan must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997 (NSW) and must include measures to remediate the contamination at the site to ensure the site will be suitable for the proposed use when the Remedial Action Plan is implemented. Note: Nothing in this condition prevents the Proponent from preparing individual Remedial Action Plans for separate sites.	As detailed in Section 7.9.1, remediation, where required, will be undertaken in accordance with the requirements of this Condition.	**Environment Manager**	RAP(s)	Prior to Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
E94	Before commencing remediation, a Section B Site Audit Statement(s) must be prepared by an NSW EPA-accredited Site Auditor that certifies that the Remedial Action Plan(s) is/are appropriate and that the site can be made suitable for the proposed use. The Remedial Action Plan(s) must be implemented and any changes to the Remedial Action Plan(s) must be approved in writing by the NSW EPA-accredited Site Auditor. Note: Nothing in this condition prevents the Proponent from engaging an NSW EPA-accredited Site Auditor to prepare individual Site Audit Statements for Remedial Action Plans for separate sites.	A Section B Site Audit Statement(s) will be prepared in accordance with the requirements of this condition prior to commencement of remediation (Section 7.9.1).	**Environment Manager**	Section B Site Audit Statement(s)	Prior to remediation
E95	Validation Report(s) must be prepared in accordance with Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA, 2020) and relevant guidelines made or approved under section 105 of the Contaminated Land Management Act 1997 (NSW). Note: Nothing in this condition prevents the Proponent from preparing individual Validation Reports for separate sites.	Validation Report(s) will be prepared for remediated sites in accordance with the requirements of this condition (Section 7.9.1).	**Environment Manager**	Validation Report(s)	On completion of remediation
E96	A Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan) and its accompanying Site Audit Report, which state that the contaminated land disturbed by the work has been made suitable for the intended land use, must be submitted to the Planning Secretary and the Relevant Council(s) after remediation and before the commencement of operation of the CSSI. Note: Nothing in this condition prevents the Proponent from obtaining Section A Site Audit Statements for individual parcels of remediated land.	Site Audit Statement(s) will be prepared for remediated sites in accordance with the requirements of this condition (Section 7.9.1).	**Environment Manager**	Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan)	Prior to commencement of operation of the CSSI
E97	A copy of Detailed Site Investigation Report(s), Remedial Action Plan(s), Validation Report(s), Site Audit Report(s) and Site Audit Statement(s) must be submitted to the Planning Secretary and the Relevant Council(s) for information	The requirements of this Condition are addressed in Section 7.9.1.	**Environment Manager**	Document transmittals	Prior to commencement of operation of the CSSI

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
E98	An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared before the commencement of construction and must be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during construction.	The Unexpected Finds Protocol is detailed in Section 7.9.4.	**Environment Manager** Environmental Coordinator Site Supervisor	Unexpected Finds Protocol	During construction
E99	The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout construction.	The Unexpected Finds Protocol is detailed in Section 7.9.4.	**Environment Manager** Environmental Coordinator Site Supervisor	Unexpected Finds Protocol	During construction
Water					
E126	The CSSI must be designed and constructed so as to maintain the NSW Water Quality Objectives (NSW WQO) where they are being achieved as at the date of this approval, and contribute towards achievement of the NSW WQO over time where they are not being achieved as at the date of this approval, unless an EPL in force in respect of the CSSI contains different requirements in relation to the NSW WQO, in which case those requirements must be complied with.	The requirements of this Condition are addressed in Section 7.5. A Discharge Impact Assessment has been developed and outlines how the NSW Water Quality Objectives will be maintained. EPL 21672	**Environment Manager** Environmental Coordinator Site Supervisors	Environmental inspection register Stop works register Periodically reviewed SWMP (this plan)	During Construction
Construction Requirements					
E127	The Proponent must consider the Guidelines for controlled activities on waterfront land riparian corridors (Department of Industry 2018) when carrying out work within 40 metres of a watercourse, including its bed.	The requirements of this Condition are not triggered by the SBT Works.	**N/A**	N/A	N/A

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
E128	Before undertaking any work and during maintenance or construction activities, erosion and sediment controls must be implemented and maintained to prevent water pollution consistent with Managing Urban Stormwater: Soils and Construction Vol 1 4th ed. by Landcom, 2004 (The Blue Book).	Erosion and sediment controls will be implemented as outlined in Section 7.4 and Section 9.2.	**Environment Manager** Environmental Coordinator Site Supervisors	Environmental inspection register Stop works register Periodically reviewed SWMP (this plan)	During Construction
E129	Unless an EPL is in force in respect to the CSSI and that licence specifies alternative criteria, discharges from construction wastewater treatment plants to surface waters must not exceed: (a) the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018 (ANZG (2018)) default guideline values for toxicants at the 95 per cent species protection level; (b) for physical and chemical stressors, the guideline values set out in Tables 3.3.2 and 3.3.3 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (ANZECC/ARMCANZ); and (c) for bio accumulative and persistent toxicants, the ANZG (2018) guidelines values at a minimum of 99 per cent species protection level. Where the ANZG (2018) does not provide a default guideline value for a particular pollutant, the approaches set out in the ANZG (2018) for deriving guideline values, using interim guideline values and/or using other lines of evidence such as international scientific literature or water quality guidelines from other countries, must be used.	Water Treatment Plants will be designed and operated to meet the discharge criteria proposed in the Discharge Impact Assessment and as specified in Section 7.5 & 7.6 EPL 21672	**Environment Manager** Environmental Coordinator Site Supervisors	Discharge permits Periodically reviewed SWMP (this plan)	During Construction
E130	If construction stage stormwater discharges are proposed, a Water Pollution Impact Assessment will be required. Any such assessment must be prepared in consultation with the EPA and be consistent with the National Water Quality Guidelines, with a level of detail commensurate with the potential water pollution risk.	A Water Pollution Impact Assessment has been developed as outlined in Section 9.1	**Environment Manager** Environmental Coordinator Site Supervisors	EWMS Discharge permits Periodically reviewed SWMP (this plan)	During Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	Note: If an EPL is required the Water Pollution Impact Assessment will be required to inform licensing consistent with section 45 of the POEO Act.				
E131	Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.	Drainage feature crossings will be designed by a suitably qualified and experienced person (refer to Section 7.4).	**Environment Manager** Environmental Coordinator Site Supervisors	ESCPs	During Construction
Groundwater					
E133	Make good provisions for groundwater users must be provided in the event of a material decline in water supply levels, quality or quantity from registered existing bores associated with groundwater changes from either construction and/or ongoing operational dewatering caused by the CSSI.	The GWMP (Section 2.4 and Section 3.2) addresses the requirement for make good provisions for groundwater users in the event of a material decline in water supply levels.	**Environment Manager** Environmental Coordinator Site Supervisors	Groundwater Monitoring Plan	During Construction
E134	The Proponent must submit a revised Groundwater Modelling Report to the Planning Secretary for information before bulk excavation at the relevant construction location. The Groundwater Modelling Report must include: (a) for each construction site where excavation will be undertaken, cumulative (additive) impacts from nearby developments, parallel transport projects and nearby excavation associated with the CSSI; (b) predicted incidental groundwater take (dewatering) including cumulative project effects;	The updated Groundwater Modelling Report will be provided to the Planning Secretary for information prior to commencement of bulk excavation (refer to Section 7.11).	**Environment Manager** Environmental Coordinator	Hydrogeological Interpretation Report Groundwater Model	During Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	(c) potential impacts of the CSSI or detail and demonstrate why the CSSI will not have lasting impacts to the groundwater system, ongoing groundwater incidental take and groundwater level drawdown effects; (d) actions required to minimise the risk of inflows (including in the event the CSSI are delayed or do not progress) and a strategy for accounting for any water taken beyond the life of the operation of the CSSI; (e) saltwater intrusion modelling analysis, from saline groundwater in shale, into metro station sites; and (f) a schematic of the conceptual hydrogeological model.				

Revised Environmental Mitigation Measures

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
HYD1	Construction planning would consider flood related mitigation, including: • Staging construction works to reduce the duration of works within the floodplain • Daily and continuous monitoring of weather forecasts and storm events, rainfall levels and water levels in key watercourses to identify potential flooding events and related flood emergency response • Consultation with NSW State Emergency Services and relevant local councils to ensure consistent approaches to the management of flood events (off-airport only)	The requirements of this REMM are reflected in the CEMP (Section 6.8 and in the indicative site layout plans in Annexure C).	**Construction Managers** Site Supervisors Environmental Coordinator Stakeholder and Community Engagement Manager and delegates	Consultation records Weather monitoring records Construction Area Plans	Pre-construction During Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	• Provide flood-proofing to excavations at risk of flooding during construction, where reasonable and feasible, such as raised entry into shafts and/or pump-out facilities to minimise ingress of floodwaters into shafts and the dive structure • Review of site layout and staging of construction works to avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required.				
WQ1	A surface water quality monitoring program would be implemented to monitor water quality during construction. The program would be developed in consultation with (as relevant) Western Sydney Airport, NSW Environment Protection Authority, relevant sections of Department of Planning, Industry and Environment and relevant local councils. The program would consider monitoring being undertaken as part of other infrastructure projects such as the M12 Motorway and Western Sydney International On-airport, the water quality monitoring program would ensure that works meet the requirements under Schedule 2 of the Airports (Environment Protection) Regulations 1997 The program would monitor all construction discharge locations.	Refer to the SWQMP (Annexure B, Section 2.3 and 3.2).	**Environment Manager** Environmental Coordinators	Surface Water Monitoring Report (every six months) EPL Monitoring Reports (per EPL) and Annual Returns Monthly ER Environmental Report EPL surface water monitoring report (fortnightly or as required by EPL)	Various as noted in the Deliverables column (or as directed in EPL)
WQ2	Water treatment plants would be designed to ensure that wastewater is treated to a level that is compliant with the ANZECC/ ARMCANZ (2000), ANZG (2018) and draft ANZG (2020) default guidelines for 95 per cent species protection and 99 per cent species protection level for toxicants that	Water treatment plants will be designed in accordance with the requirements of this REMM (Section 7.5)	**Construction Managers** Environment Manager	Groundwater Review Report Groundwater Monitoring Report (six monthly)	Six monthly during construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	bioaccumulate unless other discharge criteria are agreed with relevant authorities.		Environmental Coordinators	EPL Monitoring Reports (as required)	
WQ3	The design and construction of the project would take into account the former NSW Office of Water's Guidelines for controlled activities on waterfront land.	The Guidelines for controlled activities on waterfront land will be considered during the pre-clearing inspection process prior to undertaking works. Refer to the Flora and Fauna Management Sub-Plan.	**Environment Manager** Environmental Coordinator Site Supervisors	Environmental inspection register Stop works register	During Construction
OHYD1	The flood model for the project would be updated with regard to flood modelling undertaken for the South Creek Sector Review (anticipated to be released in 2021) and would include updated calibration and validation. The updated flood modelling would be used to inform design development including but not limited to, addressing potential residual flood impacts identified at the following locations: • The viaduct and earthworks in the vicinity of Blaxland Creek so as to minimise the extent of the project within the floodplain • The earthworks arrangement at the stabling and maintenance facility in the area affected by the Probable Maximum Flood. The flood model for the project would be updated in consultation with relevant stakeholders.	The flood model for the project will be prepared by Sydney Metro. CPBG will provide Sydney Metro with any information or documentation it requires to comply with this REMM.	Design Manager	Flood reports Flood models Geographic information system outputs	During Construction
OHYD2	Develop localised stormwater management plans at St Marys Station and Aerotropolis Core Station to ensure these stations are protected from localised flooding.	The requirements of this REMM are reflected in the CEMP (Section 6.8).	**Construction Managers** Site Supervisors	Stormwater management plans	Pre-construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
OHYD3	Flood compat ble design would need to be demonstrated for the permanent spoil placement areas to ensure compliance with applicable land use criteria.	The SBT works will be designed and constructed with the objective of not exceeding the flood impact criteria detailed in this condition (Section 7.10)	Design manager	Flood reports Flood models Geographic information system outputs	During construction
OWQ1	Design batter slope gradients and surface treatments to minimise erosion risk.	The requirements of this REMM are addressed in the Erosion and Sediment Control Procedure (Annexure C).	**Project Engineers** Site Engineers Environmental Coordinators Site Supervisors	ESCP	During construction
OWQ3	Suitably designed scour and erosion controls should be included at drainage and sedimentation basin outlet discharge points.	The requirements of this REMM are addressed in the Erosion and Sediment Control Procedure (Annexure C).	**Project Engineers** Site Engineers Environmental Coordinators Site Supervisors	ESCP	During construction
OWQ5	Where feasible, on-site detention of stormwater would be introduced where stormwater runoff rates are increased. Where there is insufficient space for the provision of on-site detention, the upgrade of downstream infrastructure would be implemented where feasible and reasonable.	The requirements of this REMM are addressed in Section 7.6	**Project Engineers** Site Engineers Environmental Coordinators Site Supervisors	ESCP Design drawings	During construction
OWQ6	At all locations where stormwater is discharged, water quality measures such as gross pollutant traps, bio-retention swales and Water Sensitive Urban Design features would be	The requirements of this REMM are addressed in Section 7.6	**Design Manager** Project Engineers	ESCP Design drawings	During construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	investigated and implemented where feasible and reasonable.		Site Engineers Environmental Coordinators Site Supervisors		
GW5	Detailed hydrogeological and geotechnical models for the project would be developed and progressively updated during design and construction. These models would: • Be informed by the results of groundwater monitoring undertaken before and during construction • Identify predicted changes to groundwater levels, including at nearby water supply works and at groundwater dependent ecosystems or other sensitive groundwater receptors. Where changes to groundwater levels are predicted at nearby water supply works, groundwater dependent ecosystems or other sensitive groundwater receivers, an appropriate groundwater monitoring program would be developed and implemented. Where changes to groundwater level are close to the ground surface, dryland salinity monitoring would be implemented to allow for management of any identified impacts. The groundwater monitoring program would aim to confirm no adverse impacts on the receiver during construction or to effectively manage any impacts with the implementation of appropriate mitigation measures. Monitoring at any specific location would be subject to the status of the water supply work and agreement with the landowner.	The requirements of this REMM are addressed in Section 6.2.	**Design Manager** Environment Manager Environmental Coordinators	Hydrogeological and geotechnical models	During construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
GW6	A Groundwater Management Plan would be prepared and implemented. The plan must include the following trigger-action response measures in relation to groundwater levels in areas identified as subject to potential drawdown (at groundwater dependent ecosystems or other sensitive receivers) but outside the construction footprint and Western Sydney International Stage 1 Construction Impact Zone: a. target criteria, set with reference to relevant standards and site specific parameters b. trigger values and corresponding corrective actions to prevent recurring or long-term exceedance of the target criteria described in (a) c. corrective actions to compensate for any recurring or long-term exceedance of the target criteria described in (a) Response measures may include: • Targeted ground improvement and grouting to limit groundwater inflows into station excavations, tunnels and cross-passage to reduce groundwater drawdown • Design of undrained temporary retention systems to minimise groundwater inflow into station excavations and reduce groundwater drawdown • Supplementing groundwater supply at affected groundwater dependent ecosystems or watercourses • Make good provisions for groundwater supply wells impacted by changes in groundwater level or quality.	The requirements of this REMM are addressed in the GWMP (SMWSASBT-CPG-SWD-SW000-GE-RPT-040404 - Section 6.1.1 and Section 6.2.1 and 8.3)	**Environment Manager** Environmental Coordinator Project Engineers Site Engineers	Groundwater Monitoring Report (six monthly)	Six monthly during construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
SC1	The Soil and Water Management Plan would incorporate the following measures: • for low risk areas of environmental concern, worker health and safety measures, waste management and tracking for contamination would be outlined. • for medium and high risk areas of environmental concern, detailed site investigations and review of further available information would be undertaken prior to the start of construction	For off-airport sites, site inspections, DSI Reports will be prepared in accordance with Condition E92 of the Planning Approval and REMMs SC1, SC2 and SC3. If a previously identified medium or high-risk area is reassessed as low risk (in accordance with the process detailed in Section 7.9.1), the site would be managed in accordance with this plan. For areas that are moderate or high risk, DSI Reports will be prepared and the results used to determine if remediation is required. If remediation is required, a RAP will be developed and implemented to address the SBT Works. Refer to Section 7.9.1 and Annexure C of this Sub-Plan for further detail.	**Environment Manager** Environmental Coordinator	DSI Report(s)	Prior to Construction
SC2	Based on outcomes of SC1: • if a medium or high risk area of environmental concern is reassessed as low risk, the site would be managed in accordance with the Soil and Water Management Plan. This would typically occur where there is minor, isolated contamination that can be readily remediated through standard construction practices such as excavation and off-site disposal • for areas of environmental concern that remain or change to medium risk, visual inspections and monitoring would be performed during earthworks. If suspected contamination is encountered, the materials would be subject to sampling and analysis to assess management requirements in accordance with statutory guidelines made or endorsed by the	As per SC1, refer to Section 7.9.1 and Annexure C of this Sub-Plan for further detail.	**Environment Manager** Environmental Coordinator	Unexpected find reporting DSI Report(s) SAQP(s)	Prior to Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	NSW Environment Protection Authority statutory guidelines • for areas of environmental concern that remain or change to high risk, a Sampling, Analysis and Quality Plan would be prepared for Detailed Site Investigations or data gap investigations. The results from the site investigations would be assessed against criteria contained within the National Environment Protection (Assessment of Site Contamination) Measure (2013) and other applicable NSW statutory guidelines to assess whether remediation is required. Remediation works would be performed in accordance with the hierarchy of preferred strategies in the Guidelines for the NSW Site Auditor Scheme (NSW Environment Protection Authority, 2017) and other guidelines made or endorsed by the NSW Environment Protection Authority. Where practical, remediation works would be integrated with excavation and development works performed during construction				
SC3	Where information gathered from investigations for medium and high risk areas of environmental concern (as per mitigation measure SC1) is insufficient to determine the risk of contamination, a detailed site investigation would be carried out in accordance with the National Environment Protection Measure (2013) and other guidelines made or endorsed by the NSW Environment Protection Authority Where data from the additional data review (mitigation measure SC1) or the detailed site investigation (mitigation measure SC2) confirms that contamination would require remediation, a Remediation Action Plan would be developed for the area of the construction footprint.	As per SC1, refer to Section 7.9.1 of this Sub-Plan for further detail.	**Environment Manager** Environmental Coordinator	DSI Report(s) RAP(s)	Prior to Construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	If a Remediation Action Plan is required, it would be developed in accordance with NSW Environment Protection Authority statutory guidelines and a Site Auditor would be engaged. Remediation methodologies would be undertaken in accordance with Australian Standards and other relevant government guidelines and codes of practice Remediation would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land				
SC4	If a duty to report to the NSW Environment Protection Authority under Section 60 of the Contaminated Lands Management Act 1997 is triggered, or where a medium to high risk of contamination is identified, an accredited Site Auditor would review and approve the Remediation Action Plan (including issue of interim audit advice) and would develop a Site Audit Statement and Site Audit Report upon completion of remediation	As per Section 8.2.3, CPBG has engaged the services of Ramboll Environ, which employs a number of EPA accredited site auditors to provide Interim Audit Advice and Site Audit Statements, where triggered	**Environment Manager** Environmental Coordinator	Site Audit Statement(s) Site Audit Report(s)	During construction
SC5	An unexpected finds procedure would be developed and implemented as part of the project Soil and Water Management Plan, outlining a set of potential contamination issues which could be encountered, and detailing the management actions to be implemented. The unexpected finds procedure would include a process for chemical and asbestos contamination and would generally include: • cessation of works within the affected area until inspection of the suspected contamination by a qualified contaminated lands consultant (verification by a certified contaminated land practitioner) • collection of soil samples for chemical or asbestos analysis, where required, based on observations	Unexpected finds will be managed in accordance with the Unexpected Finds Protocol detailed in Section 7.9.4.	**Environment Manager** Environmental Coordinator Site Supervisor	Unexpected find reports	Prior to and during construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	• assessment of results against applicable land use or waste classification criteria in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines • management of the contamination in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority statutory guidelines • the unexpected finds procedure for on-airport construction would be consistent with the Western Sydney Airport unexpected finds procedure detailed in the Soil and Water Construction Environmental Management Plan (Western Sydney Airport, 2019)				
SC6	Post construction, an inspection of construction, stockpiling and laydown sites and soil validation of redundant sedimentation/water quality basins would be undertaken to assess if further investigation and remediation is required. Investigation and remediation (if required) would be undertaken in accordance with the Soil and Water Management Plan (off-airport) and a project specific Remediation Action Plan that would be prepared in a manner consistent with the Western Sydney Airport Remediation Action Plan (2019) (on-airport). All inspections, investigations and remediation would be undertaken by a qualified contaminated lands consultant with reports prepared or reviewed by a Certified Contaminated Land Consultant.	The EPA contaminated land audit process, which applies to contamination investigation, remediation, validation and management, will be combined with a review by Sydney Metro, the Certified Contaminated Land Consultant and the ER. See Section 7.9.1 for further detail.	**Environment Manager** Environmental Coordinator	RAP(s) Validation Report(s)	Post construction
SC7	Prior to ground disturbance in areas of potential acid sulfate soil occurrence, testing would be carried out to determine the	Soil investigations will be undertaken prior to construction to assess the identified	**Environment Manager**	PASS testing reports	Prior to construction

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	actual presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998)	potential areas of inland ASS areas where tunnelling excavations are to be undertaken. ASS would be assessed in accordance with ASSMAC3 (1998) guidelines (and national guidelines where applicable) if greater than one tonne of ASS would be disturbed. An ASSMP will be prepared if the action criteria are exceeded to control earthworks and re-use, and appropriate receiving sites would be selected for excess spoil. See Section 7.9.3 for further detail.	Environmental Coordinator		
SC8	Prior to ground disturbance in high probability salinity areas testing would be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils would not be reused or would be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC 2008). Erosion controls would be implemented in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004)	Soil investigations will be undertaken prior to construction to assess the identified potential areas of salinity. If salinity is found the material would be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC 2008) (Section 7.9.2). These areas will be included in an updated SEP.	**Environment Manager** Environmental Coordinator	Salinity testing reports	Prior to construction
SC9	Targeted groundwater investigations would be undertaken prior to construction to identify high salinity areas at risk from rising groundwater. Where high saline areas (>1000 µS/cm) are identified, measures such as planting, regenerating and maintaining native vegetation and good ground cover in	The requirements of this REMM are addressed by Sydney Metro.	N/A	N/A	N/A

[3] NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC), 1998. Acid Sulfate Soil Assessment Guidelines. August, 1998.

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
	recharge, transmission and discharge zones would be implemented where possible				
SC10	Where the construction footprint is not used as part of the operational footprint (residual land), an assessment of the suitability of the site for the proposed land use would be undertaken in accordance with statutory guidelines made or endorsed by the NSW Environment Protection Authority	The requirements of this REMM are addressed by Sydney Metro.	N/A	N/A	N/A
SC11	For works within Western Sydney International: • A review of further available information from Western Sydney Airport would be undertaken prior to the commencement of construction, which may include review of investigations, the Western Sydney Airport Remediation Action Plan and validation reports Any remediation works (for contamination encountered by The Principal that has not been remediated by Western Sydney Airport) would be undertaken in accordance with the Principal Remediation Action Plan, developed in a manner consistent with the Western Sydney Airport Remediation Action Plan (Department of Infrastructure and Regional Development, 2019)	To be assessed in the On-Airport SWMP	N/A	N/A	N/A

Sydney Metro General Specification

No.	Requirement	How will CPBG meet this Requirement?	Responsible Key Contributor	Deliverables	Timing
2.11.6 (a)	Road Conditions (a) The SBT Contractor must ensure that any road, footpath, shared path or cycleway which is open to the public is at all times kept free of mud, dirt, dust, deleterious material, debris, obstructions and trip hazards arising from the SBT Contractor's Activities. [SM-WSA-SBT-GS-1638]	Roads, footpaths and shared areas will be routinely inspected for quick identification of issues and rectification. A sweeper cart will be on standby in the event of spilled materials and potential safety issues will also be identified by the safety team. See Section 7.4.	**Environment Manager** Environmental Coordinator Site Supervisors	Environmental inspection reports Safety inspection reports	Pre-construction Construction
2.11.6 (b)	The SBT Contractor must cover all construction vehicles to prevent any loss of fuels, lubricants, load or other substances, whether in the form of dust, liquids, solids or otherwise. [SM-WSA-SBT-GS-1639]	As per Section 7.4, all loads are to be covered to prevent material spill.	**Environment Manager** Environmental Coordinator Site Supervisors	Prestart discussions Toolboxes SWMS Environmental inspection reports Safety inspection reports	Pre-construction Construction

Environmental Protection Licence

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
P1.1	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point. ***Water and land*** **EPA Identification no.** / **Type of Monitoring Point** / **Type of Discharge Point** / **Location Description** 1 – Discharge and Monitoring – Discharge and Monitoring – The outlet(s) of the sediment basin(s) on the Orchard Hills site discharging to South Creek referred to in Condition P1.2 2 – Discharge and Monitoring – Discharge and Monitoring – The outlet(s) of the sediment basin(s) on the Claremont site discharging to South Creek referred to in Condition P1.2 3 – Discharge and Monitoring – Discharge and Monitoring – The outlet(s) of the sediment basin(s) on the St Marys site discharging to South Creek referred to in Condition P1.2 4 – Discharge and Monitoring – Discharge and Monitoring – The outlet(s) of the sediment basin(s) on the Bringelly site discharging to Badgerys Creek referred to in Condition P1.2 5 – Discharge and Monitoring – Discharge and Monitoring – The outlet(s) of the sediment basin(s) on the Aerotropolis site discharging to Thompson Creek referred to in Condition P1.2 6 – Discharge and Monitoring – Discharge and Monitoring – The outlet of the water treatment plant on the Orchard Hills site discharging to South Creek 7 – Discharge and Monitoring – Discharge and Monitoring – The outlet of the water treatment plant on the Claremont site discharging to South Creek	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
P1.2	All licensed monitoring and discharge points referred to in condition P1.1, must be approved by the EPA and identified: a) in the premises map(s) most recently submitted and approved in writing by the EPA under condition A2.2; and b) in a schedule submitted to the EPA. The schedule, including any proposed updates, must: i. be submitted to the EPA in electronic format no less than 5 days prior to any changes;	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit EPL Premises maps	Construction

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
	ii. include unique identifiers consistent with the map(s) required by this condition; and iii. include easting and northing coordinates for all licensed monitoring and discharge points.				
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
L2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
L2.4	Water and/or Land Concentration Limits	The requirements of this condition are addressed through the Dewatering	**Environment Manager**	Dewatering and Discharge Permit	Construction

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
		and Discharge Permit process (Section 7.6.1).	Environmental Coordinators		

POINT 1,2,3,4,5,6,7

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	Visible				Not visible

POINT 1,2,3,4,5

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
pH	pH				6.5-8.5
Turbidity	nephelometric turbidity units				50

POINT 6,7

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Aluminium	milligrams per litre				0.08
Ammonia	milligrams per litre				0.9
Chromium (VI) Compounds	milligrams per litre				0.001
Copper	milligrams per litre				0.0014

POINT 6

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Electrical conductivity	microsiemens per centimetre				7000

POINT 6,7

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Nitrogen (total)	milligrams per litre				1.72
pH	pH				6.5-8.0
Phosphorus (total)	milligrams per litre				0.14
TSS	milligrams per litre				50
Zinc	milligrams per litre				0.015

POINT 7

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Electrical conductivity	microsiemens per centimetre				8,000

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
L2.5	Exceeding the limits specified in Condition L2.4 of this licence for discharges from the discharge point(s) identified by conditions P1.1 is only permitted if: a) the discharge occurs solely as a result of rainfall measured at the premises exceeding the design rainfall depth value for the corresponding discharge point; and b) The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance with condition O4.2 of this licence.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
O4.1	The licensee must implement all feas ble and reasonable erosion and sediment controls as may be necessary throughout the life of works and activities to minimise sediment leaving the premises.	Erosion and sediment controls will be established and maintained in accordance with the requirements of this Condition (refer to Section 7.4)	**Site Supervisor** Environmental Coordinators	Environmental Inspection Checklists	Construction
O4.2	The licensee must ensure erosion and sediment controls are designed, constructed, operated and maintained consistent with the principle and practices of industry best practice, including: a) Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road Construction (DECC, 2008), to be read and used in conjunction with Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom, 2004);	Erosion and sediment controls will be established and maintained in accordance with the requirements of this Condition (refer to Section 7.4)	**Site Supervisor** Environmental Coordinators	Environmental Inspection Checklists	Construction

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
	b) Best Practice Erosion and Sediment Control (IECA 2008); and c) other industry best practice documents if it can demonstrate the guidance will provide improved or equivalent outcomes for the environment and meet the requirements of condition L1.1 of this licence.				
O4.3	The licensee must ensure: a) all vehicular access points to the premises are designed, constructed, maintained and stabilised to minimise vehicles tracking materials onto public roads and roads outside the premises as much as is reasonable and feasible; b) vehicle, motorised plant and equipment movements onto or off the premises minimise the deposition of any material onto the surface of roads outside of the premises; c) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer, motorised plant and equipment leaving the premises, is removed to the greatest extent practicable before it leaves the premises; and d) road surfaces subject to any tracking of material by vehicles leaving the premises must be cleaned as required to ensure compliance with a) and b) of this condition and condition L1.1 of this licence.	Erosion and sediment controls will be established and maintained in accordance with the requirements of this Condition (refer to Section 7.4)	**Site Supervisor** Environmental Coordinators	Environmental Inspection Checklists	Construction
O4.4	The licensee must: a) ensure the design storage capacity of any sediment basin installed on the premises is reinstated within the design management period following the cessation of a rainfall event that causes runoff to occur on or from the premises; and	Sediment basins will maintained in accordance with the requirements of this Condition (refer to Section 7.6).	**Site Supervisor** Environmental Coordinator	Sediment basin storage capacity register	Construction

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
	b) keep records of the available water and sediment storage capacities in each sediment basin and provide to an authorised officer upon request.				
O4.5	The licensee must ensure that sampling point(s) for water discharged from the sediment basin(s) are provided and maintained in an appropriate condition to permit: a) the clear identification of each sediment basin and discharge point; b) the collection of representative samples of the water discharged from the sediment basin(s); and c) access to the sampling point(s) at all times by an authorised officer of the EPA.	Sampling points will be maintained in accordance with the requirements of this Condition (refer to Section 7.6.1)	**Site Supervisor** Environmental Coordinator	Environmental Inspection Checklist	Construction
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	Refer to Element 2: Monitoring and Reporting	**Environmental Coordinator**	Environmental monitoring records	Construction
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a leg ble form to any authorised officer of the EPA who asks to see them.	Refer to Element 2: Monitoring and Reporting	**Environmental Coordinator**	Environmental monitoring records	Construction
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken;	Refer to Element 2: Monitoring and Reporting	**Environmental Coordinator**	Environmental monitoring records	Construction

<table>
<tr><th>No.</th><th>Requirement</th><th>How will CPBG meet the Expectation?</th><th>Responsibility</th><th>Deliverables</th><th>Timing</th></tr>
<tr><td></td><td>b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>M2.1</td><td>For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:</td><td>The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).</td><td>Environment Manager
Environmental Coordinators</td><td>Dewatering and Discharge Permit</td><td>Construction</td></tr>
<tr><td>M2.2</td><td>Water and/ or Land Monitoring Requirements

POINT 1,2,3,4,5
<table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Oil and Grease</td><td>Visible</td><td>Special Frequency 1</td><td>Visual Inspection</td></tr><tr><td>pH</td><td>pH</td><td>Special Frequency 1</td><td>Probe</td></tr><tr><td>Turbidity</td><td>nephelometric turbidity units</td><td>Special Frequency 1</td><td>Probe</td></tr></table>POINT 6,7
<table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Aluminium</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Ammonia</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Chromium (VI) Compounds</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Copper</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Electrical conductivity</td><td>microsiemens per centimetre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Nitrogen (total)</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Oil and Grease</td><td>Visible</td><td>Monthly during discharge</td><td>Visual Inspection</td></tr><tr><td>pH</td><td>pH</td><td>Monthly during discharge</td><td>Probe</td></tr><tr><td>Phosphorus (total)</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Zinc</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr></table></td><td>The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).</td><td>Environment Manager
Environmental Coordinators</td><td>Dewatering and Discharge Permit</td><td>Construction</td></tr>
</table>

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
M2.3	For the purposes of Condition M2.2 and the Table thereto, 'Special Frequency 1' means: a) less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge, when it is safe to do so; and b) when rainfall causes a discharge from a sediment basin which has not been emptied within the design management period following cessation of a rainfall event, when it is safe to do so.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
M3.1	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	The requirements of this condition are addressed through the Dewatering and Discharge Permit process (Section 7.6.1).	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit	Construction
E2.1	The licensee must undertake weekly surface water monitoring of receiving waterways at locations upstream, downstream and adjacent to each discharge point: 6 and 7 identified in Condition P1.1. This monitoring must be undertaken for a minimum of 6 months from the date that the licensee discharges from points 6 or 7. Fortnightly monitoring results must include: a) quality and quantity of all parameters that are identified in the table in M2.2 for each discharge point: 6 and 7; and	Refer to Section 7.6	**Environmental Coordinator**	Dewatering and Discharge Permit Environmental Monitoring Records (as required by EPL)	Construction

No.	Requirement	How will CPBG meet the Expectation?	Responsibility	Deliverables	Timing
	b) results must be submitted to the EPA no more than 2 weeks after each monitoring event has occurred for a minimum of 6 months from the date that the licensee discharges from points 6 or 7.				
E3.1	Water Treatment Plant (WTP) Performance Reporting A) The licensee must undertake water quality sampling of all discharges from the WTPs (as identified as Point 6 and 7 under condition P1.1) and submit to the EPA a WTP Performance Report within 10 business days of each sample result being taken. Sampling must be undertaken: i) daily on the first 3 days of discharges ii) weekly for the first month of discharges iii) fortnightly for the first 3 months iv) As per condition M2.2, following this sampling frequency or as directed by the EPA B) The WTP Performance Report i) include results of all discharge quality monitoring with a comparison to all pollutants listed in conditions L2.4 and M2/2 for Points 6 and 7. ii) include results of all WTP influent quality, and iii) be emailed to the EPA to info@epa.nsw.gov.au. Note: The purpose of this condition is to allow proof of performance testing to assist the EPA in setting accurate discharge limits for the WTP. The EPA will review the limits against the performance of the WTP and revise them as appropriate in consultation with the licensee.	The requirements of this condition are addressed in Sections 7.5 & 7.6. WTP Performance Report (if triggered)	**Environment Manager** Environmental Coordinators	Dewatering and Discharge Permit WTP Performance Report (if triggered)	Construction

Annexure A Not used

Annexure B Surface Water Quality Monitoring Program

Surface Water Quality Monitoring Program

Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works

Project number	WSA-200-SBT
Document number	SMWSASBT-CPG-1NL-NL000-WA-PRG-000001
Revision date	20 February 2024
Revision	2

Document approval

Rev	Date	Prepared by	Reviewed by	Remarks	Signature
A	22/04/2022	A. Macleod (SEEC)	S. Anstee	Nil	
B	24/05/2022	A. Macleod (SEEC)	D. Corish	Nil	
0	11/08/2022	D. Corish	E. Kline	Nil	
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1.A	6/12/2023	J.Cosier	J. Slattery	Nil	
2	20/02/2024	J Cosier	J Slattery	Nil	Updated to reflect ER comments

Table of contents

Table of tables

Table of figures

Annexures

Glossary

Abbreviation	Meaning
CEMP	Construction Environmental Management Plan
Condition	Condition of Approval
CPBG	CPB Contractors Ghella Joint Venture
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DPE (Water))
DPE	NSW Department of Planning and Environment (now DPHI)
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly DPE)
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPL	Environment Protection Licence
ER	Environmental Representative
Project	Sydney Metro Western Sydney Airport
REMM	Revised Environmental Management Measures
SBT Works	Station Boxes and Tunnelling Works
SSTV	Site Specific Trigger Values
SWMP	Soil and Water Management Sub-Plan
SWQMP	Surface Water Quality Monitoring Program (this document)
TBM	Tunnel boring machine
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
WSA	Western Sydney International Airport
WTP	Water Treatment Plant

1.Introduction

1.1. Project overview

This NSW (Off-airport) Surface Water Quality Monitoring Program (SWQMP) is applicable to the Station Boxes and Tunnelling Works (SBT Works) Package of the Sydney Metro Western Sydney Airport (the Project) and is an Appendix of the Soil and Water Management Sub-Plan (SWMP). This SWQMP describes how the CPB Contractors Ghella Joint Venture (CPBG) will monitor the surface water impacts of the SBT Works in NSW.

The Project forms part of the broader Sydney Metro network. It involves the construction and operation of a new 23km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The alignment includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections (Figure 1).

The Project will be delivered through several works packages including the SBT Works, which includes the design and construction of:

- Two sections of twin tunnels with a combined length of approximately 9.8km, plus associated portal structures, one from Orchard Hills to St Marys and the other under Western Sydney International (WSI) airport to the new Aerotropolis Station
- Excavations at either end to enable trains to turn back, and stub tunnels to enable future extensions
- Station box excavations with temporary ground support for four stations at St Marys, Orchard Hills, Airport Terminal and Aerotropolis
- Excavations for two intermediate services facilities, one in each of the tunnel sections at Claremont and Bringelly.

1.2. SBT Works scope

The construction methodology for the SBT Works entails:

- Utility works including removal, diversion, protection and connection to SBT worksites
- Local area works including provision of site accesses and some road upgrades
- Site establishment works including:
  - Fencing
  - Installation of environmental mitigation measures including erosion and sediment controls, noise barriers and acoustic enclosures
  - Clearing and grubbing of existing vegetation
  - Demolition of existing buildings and structures
  - Site levelling and drainage works
  - Establishment of internal access roads, hardstand areas and onsite parking
  - Erection of demountable buildings including offices and amenities
  - Other ancillary facilities including the erection of sheds, establishment of materials laydown and stockpiling areas and Tunnel Boring Machine (TBM) support works including spoil conveyors.
- Construction of station, shaft and dive excavations predominately completed by piling and excavators with rippers and hammers. Roadheaders will also be used at St Marys and Aerotropolis to complete the stub tunnels
- Construction of mainline tunnels using four TBMs, as follows:
  - Two earth pressure balance TBMs will be launched from Orchard Hills and tunnel north to St Marys a distance of approximately 4.3km, including traversing the Claremont Shaft. The TBMs will be retrieved from the St Mary's station box.

- Two double shield TBMs will be launched from the Airport Dive and tunnel south, traverse the Airport Terminal station box and shaft, where tunnelling will stop and the conveyor and backend equipment will be demobilised from the Airport Dive and re-established at the Airport Terminal Shaft. The TBMs will then recommence tunnelling, including traversing the Bringelly Shaft, and will be retrieved from the Aerotropolis station box (5.5km from the Airport Dive, with 2.5km of the southern tunnels located within NSW).
- Cross passages will be constructed using concrete saws and excavators with hammers.

It is anticipated that the shaft and station excavations will be completed in advance of TBM tunnel construction. The TBMs will be delivered via oversize heavy vehicles to Orchard Hills and the Airport Dive site and retrieved from St Marys and Aerotropolis, subject to relevant approvals.

The SBT Works do not include any surface works between the northern and southern tunnel sections, which are to be undertaken by another contractor.

Tunnelling, including station box, shaft and dive excavation and associated support activities will occur 24 hours a day, seven days a week. Utility and local area works that cannot be completed during standard daytime hours due to Road Occupancy Licence or utility authority requirements will also be undertaken out of hours.

Completed sections of the SBT Works, including established construction worksites, will be progressively handed over to Sydney Metro to enable follow-on contractors to commence works. The exception is the temporary precast facility, where the site will be decommissioned following the completion of segment manufacture and storage, and hydroseeded.

An overview of works at each SBT worksite is provided in Table 1.

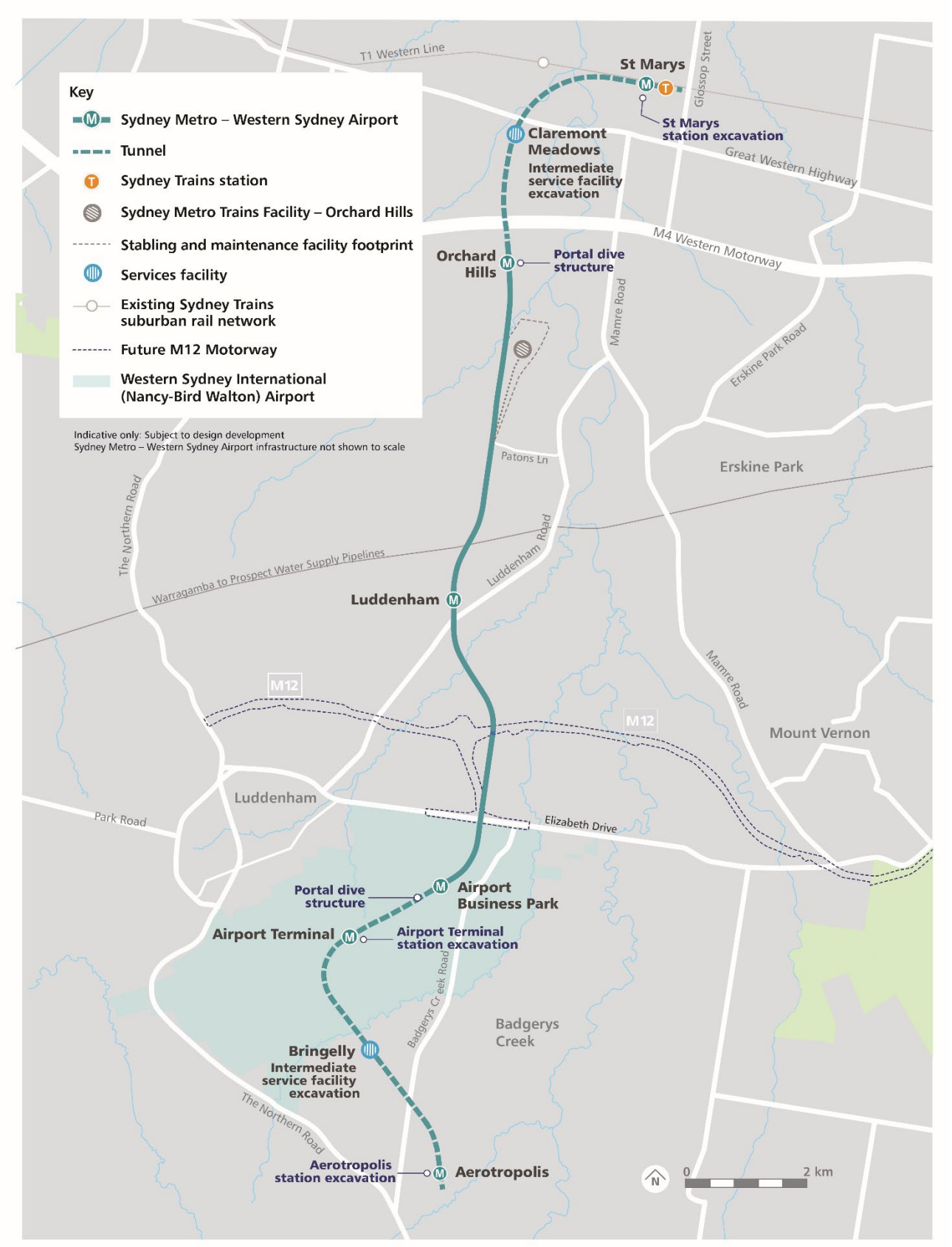
Table 1: SBT Worksite overview

Jurisdiction	Worksite	Indicative scope of works
NSW	St Marys	• Demolition of existing industrial premises • Offices, amenities, car parking and access roads • Piling and station box excavation using rippers and rock hammers • Stub tunnel excavation using road headers • TBM retrieval.
NSW	Claremont Meadows	• Preparatory CEMP scope • Offices, amenities, car parking, and access roads • Piling and services facility shaft excavation using ripper and rock hammers • Construction of part of the cast-in-situ permanent shaft • Tunnelling support • Cross passage construction support • Invert construction support (pouring of an invert concrete slab in the tunnel) (subject to Sydney Metro approval) • Operation and discharge of tunnel ventilation system • Operation of water treatment plant and discharge of water
NSW	Orchard Hills	• Preparatory CEMP scope • Demolition of existing buildings and removal of septic tanks • Offices, amenities, car parking, and access roads • Lansdowne Road temporary diversion and construction of the permanent road bridge • Piling and portal, station box and dive excavation using rippers and rock hammers • Construction of cast-in-situ permanent portal structure • TBM assembly, launch and tunnelling support works • Cross passage construction support • Precast segment storage

Jurisdiction	Worksite	Indicative scope of works
		• Operation and discharge of tunnel and acoustic enclosure ventilation system • Operation of water treatment plant and discharge of water
On-Airport	Airport Portal Dive Structure	• Offices, amenities, car parking and access roads • Piling and portal excavation using rippers and rock hammers • Open cut dive excavation using rippers and rock hammers • Construction of cast-in-situ permanent dive structure • TBM assembly, launch and tunnelling support works • Cross passage construction support.
On-Airport	Airport Terminal and TBM shaft	• Offices, amenities car parking and access roads • Piling and station box and shaft excavation using rippers and rock hammers • TBM re-launch and tunnelling support works • Cross passage construction support.
		•
On-Airport	Primary Spoil Receival	• Access road • TBM spoil conveyor set up • Earthworks in accordance with Sydney Metro Specifications.
NSW	Bringelly	• Offices, amenities, car parking and access roads • Piling and services facility shaft using rippers and rock hammers • Construction of part of the cast-in-situ permanent shaft • Cross passage construction support • Invert construction support (subject to Sydney Metro approval).
NSW	Aerotropolis	• Offices, amenities, car parking and access roads • Piling and station box excavation using rippers and rock hammers • Stub tunnel excavation using roadheaders • TBM retrieval

Note: Worksites in grey are within the boundary of the Western Sydney International (On-Airport) and regulated under the *Commonwealth Airports Act 1996*.

Figure 1: Overview of the Project



1.3. Scope of this Monitoring Program

This Surface Water Quality Monitoring Program (SWQMP or Program) forms Appendix B of the Soil and Water Management Sub-Plan (SWMP).

The scope of this Program is to describe how CPBG will monitor potential impacts to surface water during the SBT Works. Operational monitoring and operation measures do not fall within the scope of the construction phase and therefore are not included within the processes contained within this Program.

1.4. Updates to this Monitoring Program

This Surface Water Quality Monitoring Program (SWQMP or Program) has been developed to reflect the changes in surface water monitoring requirements for the Project since the SBT scope of works commenced.

On May 30 2023 CPBG received an Environment Protection Licence (EPL) 21672 from the Environment Protection Authority (EPA) which reflects and determines the surface water management requirements for the Project. On receipt of the EPL, the Project surface water management requirements, while meeting the CSSI 10051 conditions of approval, have been updated to meet the EPL conditions. As such, the following updates have been made for this revision of the SWQMP:

- Discharge points have been identified
- The locations for monitoring at each discharge point have been identified to monitor adjacent to the discharge point (A), Upstream of the discharge point (U) and downstream (D)
- The criteria being measured are as per EPL 21672

The changes are presented in Sections 3, and 5 of this procedure.

2. Purpose and objectives

2.1. Purpose

The purpose of the Program is to describe how CPBG will monitor surface water quality during SBT Works.

The Program will be implemented to monitor the effectiveness of mitigation measures applied during the SBT Works. Monitoring of surface water will be undertaken to identify potential impacts and ensure an appropriate management regime can be implemented to address those impacts and manage local surface water quality.

This Program provides details of the surface water monitoring network, frequency of monitoring, and test parameters. This Program supplements the SWMP, which is an appendix of the Construction Environmental Management Plan (CEMP).

This Program is based on baseline studies developed for the EIS (NSW Government, 2020).

2.2. Objectives

The key objective of this Program is to demonstrate compliance with:

- State Significant Infrastructure (SSI) 10051 Planning Approval (dated 23 July 2021)
- Sydney Metro Western Sydney Airport – CSSI Staging Report (Staging Report)
- Sydney Metro Construction Environmental Management Framework (CEMF)
- EIS and the Submissions Report, including the Revised Environmental Mitigation Measures (REMMs)
- Environment Protection Licence (EPL) (21672)
- Contractual requirements, including the SBT Design and Construction Deed and General and Particular Specifications
- Applicable legislation.

2.3. Consultation

Reflecting the requirements of Conditions A6 and C13(b), this SWQMP will be prepared in consultation with Department of Planning and Environment (DPE) Water, DPI Fisheries, Environment Protection Authority, Penrith City Council and City of Liverpool Council. A detailed consultation report, including matters raised by stakeholders and CPBG responses will be provided in Annexure D of the SWMP.

In accordance with the Staging Report, this SWQMP will be updated to address any relevant comments prior to submission to the Environmental Representative (ER) for endorsement. The submission of this Program to the ER for endorsement will occur no later than one month before the commencement of the Bulk Excavation and Tunnelling Works.

Construction will not commence until this SWQMP has been endorsed by the ER. This Program, as endorsed by the ER, including any minor amendments approved by the ER, will be implemented for the duration of the SBT Works.

2.4. Compliance

The Conditions and REMMs relevant to this Program are detailed in Table 2.

Table 2: Conditions and REMMs of relevance to this Program

ID	Type	Detail	How addressed
Conditions of Approval			
C13(b)	CoA	The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies (as required by Condition A6) identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP. Where a government agency(ies) request(s) is not included, the Proponent must provide the Planning Secretary / ER (whichever is applicable) justification as to why.	Refer to Section 2.3 for consultation details.
		No / **Required Construction Monitoring Programs** / **Relevant government agencies to be consulted for each Construction Monitoring Program**	
		(b) / Surface water quality / DPIE Water, DPI Fisheries, and Relevant Councils	
C14	CoA	Each Construction Monitoring Program must provide: (a) details of baseline data available including the period of baseline monitoring; (b) details of baseline data to be obtained and when; (c) details of all monitoring of the project to be undertaken; (d) the parameters of the project to be monitored; (e) the frequency of monitoring to be undertaken; (f) the location of monitoring; (g) the reporting of monitoring results and analysis results against relevant criteria; (h) details of the methods that will be used to analyse the monitoring data; (i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicated unacceptable project impacts; (j) a consideration of SMART principles; (k) any consultation to be undertaken in relation to the monitoring programs; and (l) any specific requirements as required by Conditions C15 to C16.	This document
C17	CoA	With the exception of any Construction Monitoring Programs expressly nominated by the Planning Secretary to be endorsed by the ER, all Construction Monitoring Programs must be submitted to the Planning Secretary for approval.	Refer to Section 2.3 for consultation details.

ID	Type	Detail	How addressed
C18	CoA	The Construction Monitoring Programs not requiring the Planning Secretary's approval must obtain the endorsement of the ER as being in accordance with the conditions of approval and all undertakings made in the documents listed in Condition A1. Any of these Construction Monitoring Programs must be submitted to the ER for endorsement at least one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage.	Refer to Section 2.3 for consultation and approvals process.
C19	CoA	Any of the Construction Monitoring Programs which require Planning Secretary approval must be endorsed by the ER and then submitted to the Planning Secretary for approval at least one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage.	Refer to Section 2.3 for consultation and approvals process.
C20	CoA	Unless otherwise agreed with the Planning Secretary, construction must not commence until the Planning Secretary has approved, or the ER has endorsed (whichever is applicable), all of the required Construction Monitoring Programs and all relevant baseline data for the specific construction activity has been collected.	Refer to Section 2.3 for consultation and approvals process.
C21	CoA	The Construction Monitoring Programs, as approved by the Planning Secretary or the ER has endorsed (whichever is applicable), including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary or the ER (whichever is applicable), whichever is the greater.	Refer to Section 2.3 for consultation and approvals process.
C22	CoA	The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, ER and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program.	Section 5.5
REMMs			
WQ1	REMM	A surface water quality monitoring program would be implemented to monitor water quality during construction. The program would be developed in consultation with (as relevant) Western Sydney Airport, NSW Environment Protection Authority, relevant sections of Department of Planning, Industry and Environment and relevant local councils. The program would consider monitoring being undertaken as part of other infrastructure projects such as the M12 Motorway and Western Sydney International. On-airport, the water quality monitoring program would ensure that works meet the requirements under Schedule 2 of the Airports (Environment Protection) Regulations 1997 The program would monitor all construction discharge locations.	This document. Refer to Section 2.3 for consultation and approvals process. Refer to Section 3.2 for monitoring locations.

3. Surface water monitoring

3.1. Baseline monitoring

3.1.1. Overview

Baseline surface water monitoring in waterways surrounding the Project has been undertaken over the past 20 years as reported in the EIS. This includes results from the following:

- Western Sydney Airport – Surface Water Quality Assessment (GHD, 2016)
- Environmental Field Survey of Commonwealth Land at Badgerys Creek (SMEC, 2014)
- Geology, Soils and Water Technical Paper – Proposal for a Second Sydney Airport at Badgerys Creek or Holsworthy Military Area (PPK, 1997).

In addition to the above data sets, water quality monitoring was also conducted for the M12 Motorway project (GHD, 2020) at a series of sites in Cosgroves, Badgerys, South, Kemps and Ropes Creeks.

Monitoring of water quality within the watercourses surrounding the WSA has been undertaken by Cardno (2021) as required by the WSA Soil and Water Construction Environmental Management Plan (SWCEMP) and builds on the previous water quality monitoring initiated in 2015 by GHD (GHD, 2016).

CPBG undertook baseline surface water monitoring for both flow and water quality to provide an assessment of existing conditions prior to potential impacts from construction activities. A total of five (5) surface water monitoring locations were chosen to represent the hydraulically upgradient and downgradient conditions of each discharge point within the catchment to inform the Wastewater Discharge Impact Assessment (DIA) (SMWSASBT-CPG-1NL-ENV-PLN-000005), which was used to apply for the Project's Environment Protection Licence (EPL).

3.1.2. Monitoring network

3.1.2.1. Available data

Baseline water quality monitoring locations were located in various local waterways both upstream and downstream of the SBT Works alignment as shown in Figure 2 to Figure 5 and listed in Table 3.

Note that numerous monitoring locations shown on Figure 2 to Figure 5 are associated with other projects and are not relevant to the monitoring program for the SBT Works. Those sites are omitted from Table 3. No data has historically been collected from downstream of the SBT Works area at St Marys.

Table 3: Baseline surface water monitoring locations relevant to the SBT Works

Position	Sample ID	Sample Location	Source	Refer to Figure
Upstream of Project alignment (North: Orchard Hills to St Marys)	SREC	South Creek	GHD, 2016	Figure 2
	S1	South Creek	PPK, 1997	Figure 3
	S3	South Creek	PPK, 1997	Figure 3
Upstream of Project alignment (South: WSA to Aerotropolis Station)	BCUS	Badgerys Creek	GHD, 2016	Figure 3
	B1	Badgerys Creek	PPK, 1997 and SMEC, 2014	Figure 3
	TCUS	Thompsons Creek	GHD, 2016	Figure 3
	L9	Badgerys Creek	GHD, 2016	Figure 3

Position	Sample ID	Sample Location	Source	Refer to Figure
	D/S Badgerys	Badgerys Creek	Cardno, 2021	Figure 6
	U/S Airport 2	Badgerys Creek	Cardno, 2021	Figure 6
Downstream of Project alignment (South: WSA to Aerotropolis Station)	BCMC	Badgerys Creek	GHD, 2016	Figure 3
	BCDS	Badgerys Creek	GHD, 2016	Figure 3
	B2	Badgerys Creek	PPK, 1997 and SMEC, 2014	Figure 3
	B3	Badgerys Creek	PPK, 1997 and SMEC, 2014	Figure 3
	T1	Thompsons Creek	PPK, 1997 and SMEC, 2014	Figure 3
	L5	Oaky Creek	GHD, 2016	Figure 3
	C3	Cosgroves Creek	PPK, 1997 and SMEC, 2014	Figure 3
	L1	Badgerys Creek	GHD, 2016	Figure 3
	L2	Badgerys Creek	GHD, 2016	Figure 3
	L3	Badgerys Creek	GHD, 2016	Figure 3
	L4	Badgerys Creek	GHD, 2016	Figure 3
	BADUS	Badgerys Creek	GHD, 2020	Figure 5
	D/S Basin 3	Badgerys Creek	Cardno, 2021	Figure 6
	D/S Basin 2	Badgerys Creek	Cardno, 2021	Figure 6
Downstream of the Project alignment	SBT-1	South Creek	CPBG, 2022	Figure 4
Downstream of the Claremont Meadows Facility (CMF) site	SBT-2	Claremont Creek	CPBG, 2022	Figure 4
Downstream of the Project Alignment	SBT-3	South Creek	CPBG, 2022	Figure 4
Downstream of Bringelly Discharge	SBT-4	Badgerys Creek	CPBG, 2022	Figure 4
Downstream of Aerotropolis Discharge	SBT-5	Thompsons Creek	CPBG, 2022	Figure 4

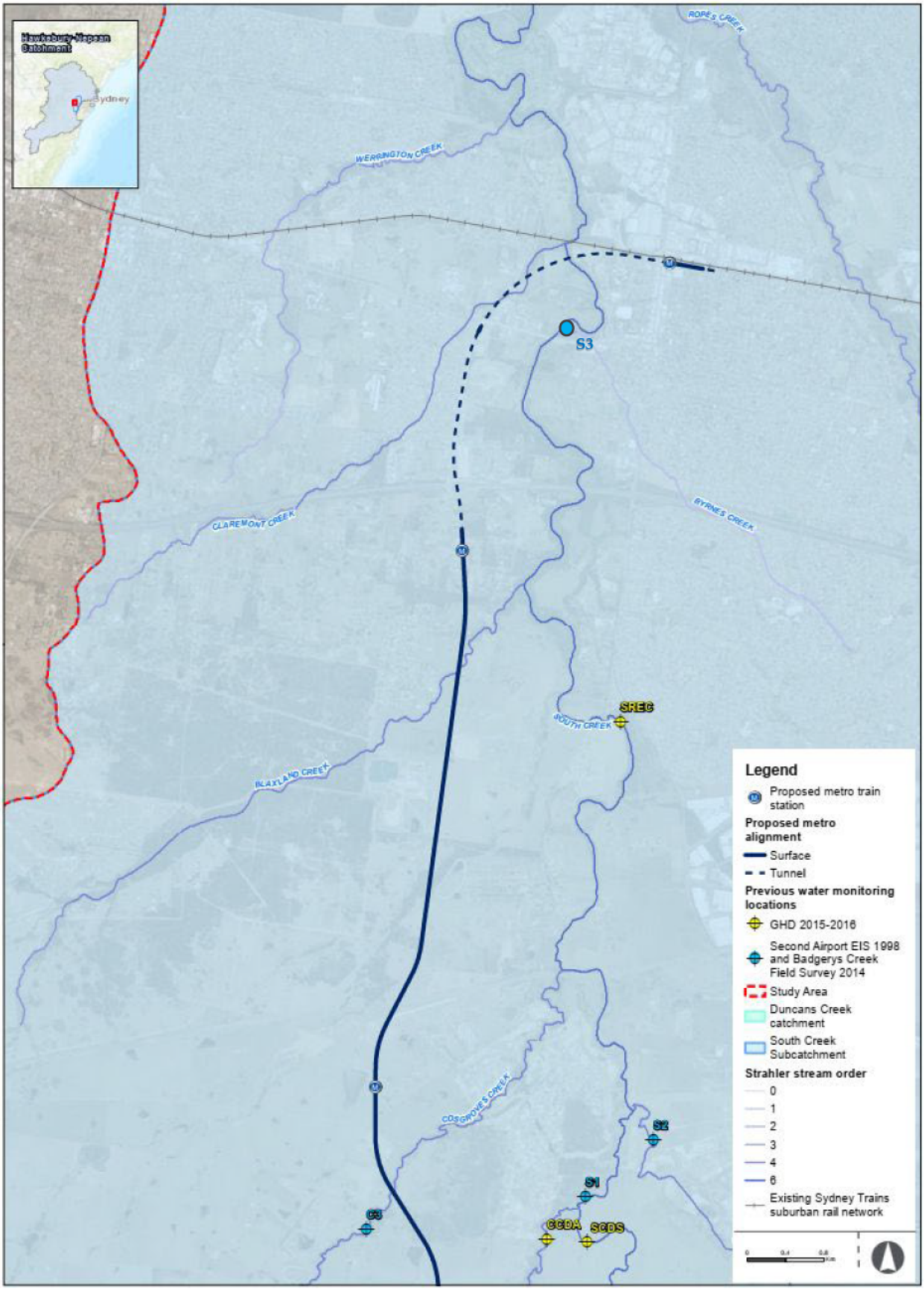


Figure 2: Project alignment (north) showing baseline monitoring locations from previous studies and reports

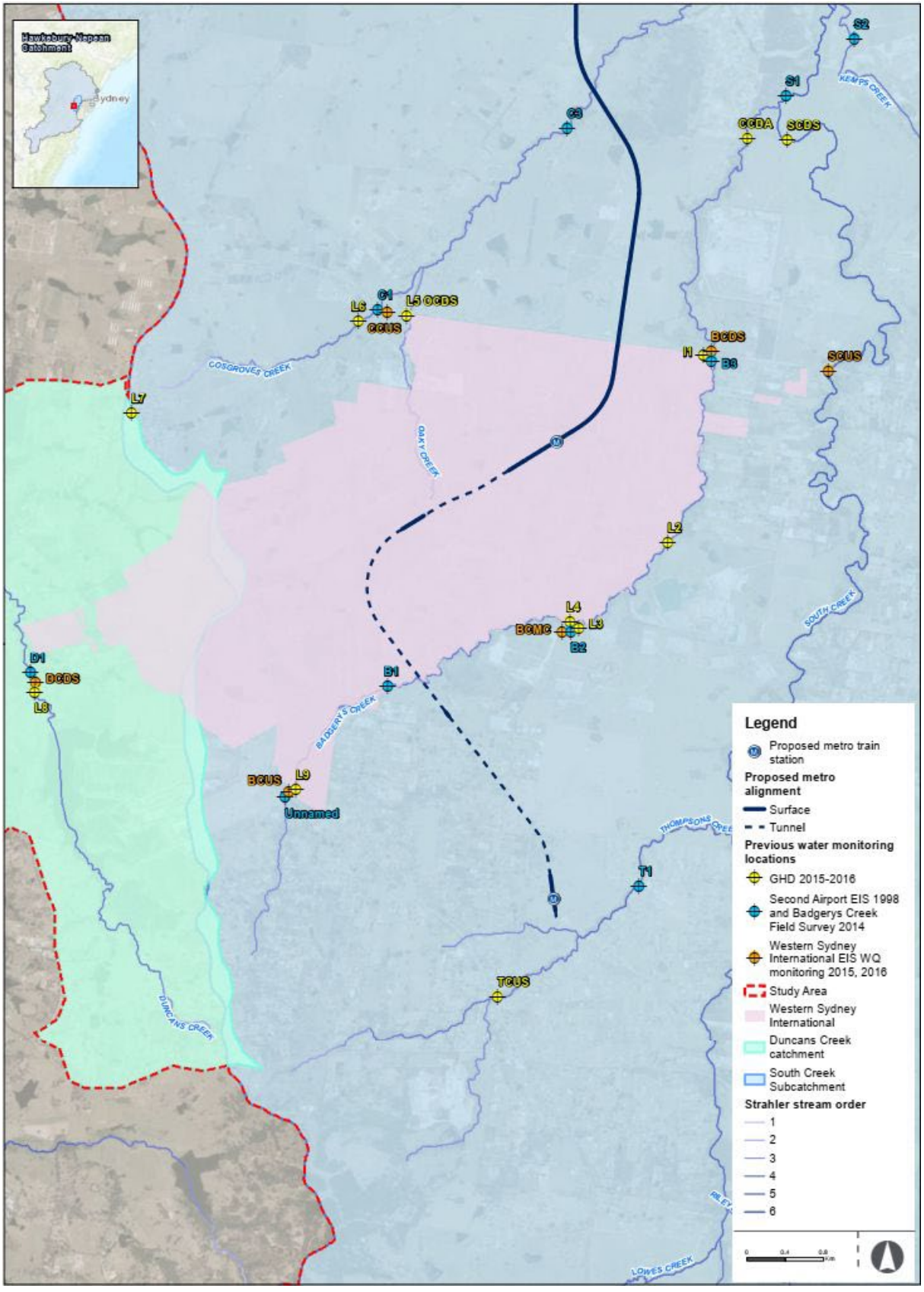


Figure 3: Project alignment (south) showing baseline monitoring locations from previous studies and reports

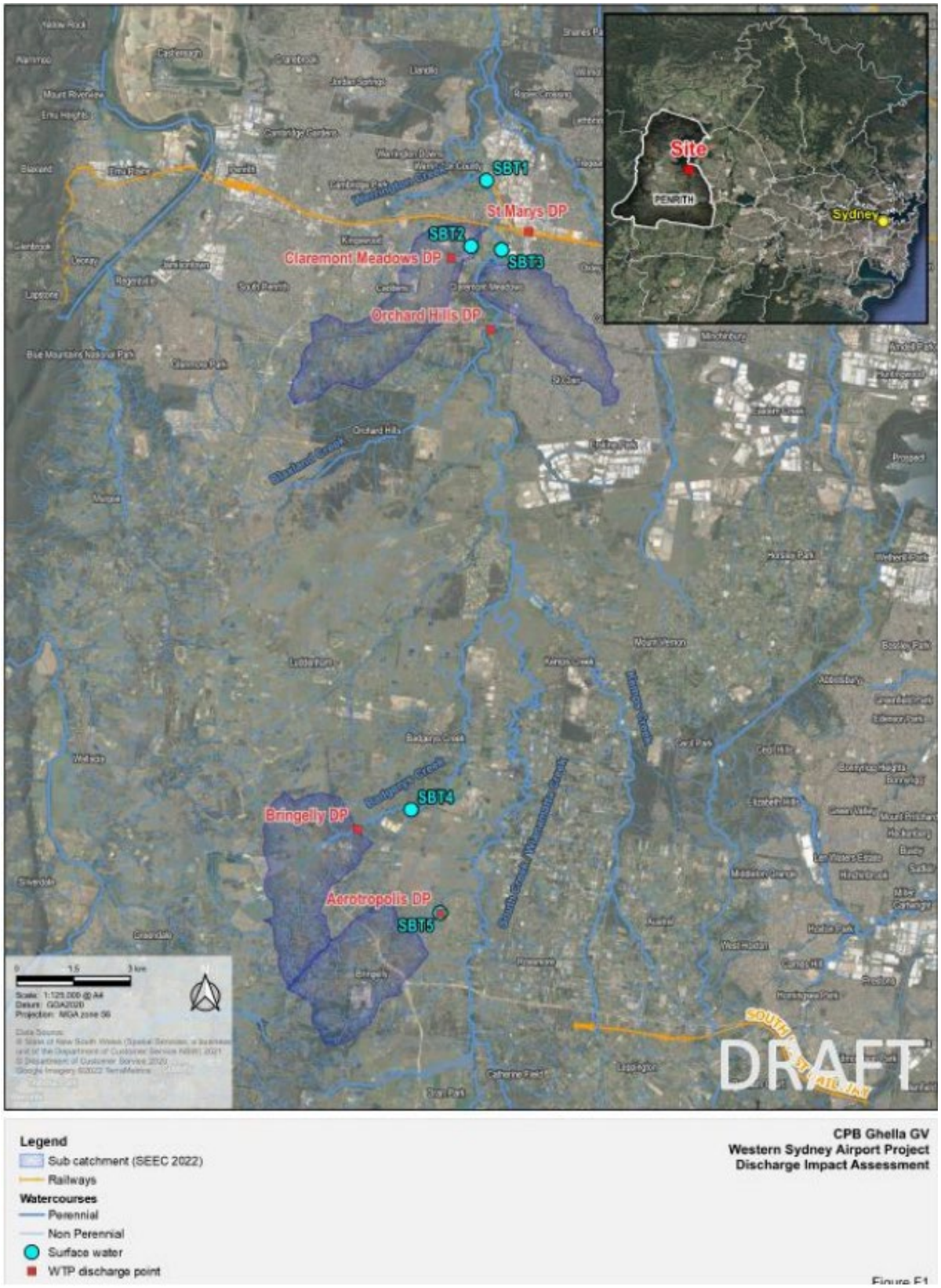


Figure 4: Discharge Impact Assessment Sampling Locations

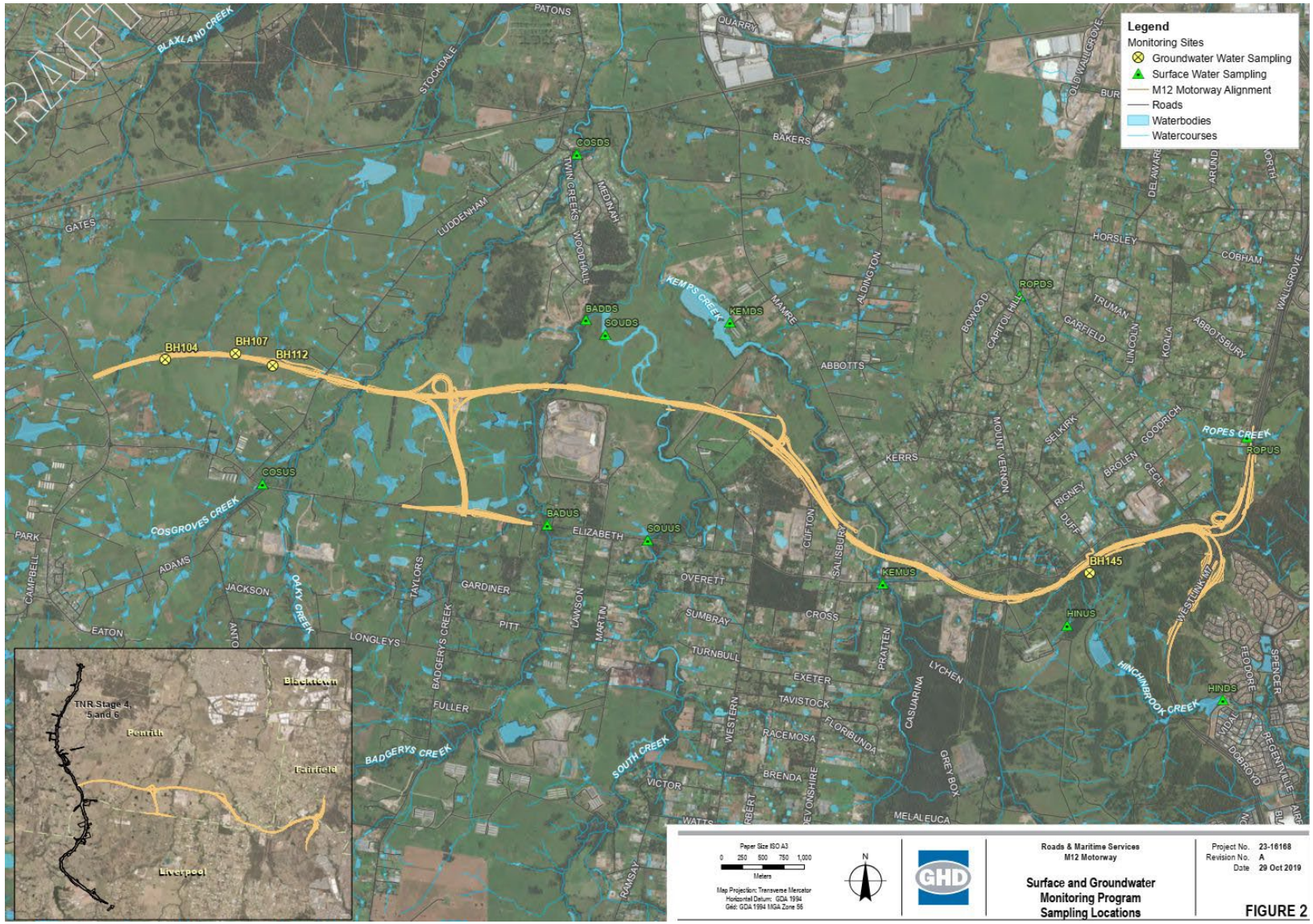


Figure 5: M12 Motorway water monitoring locations (GHD, 2020)

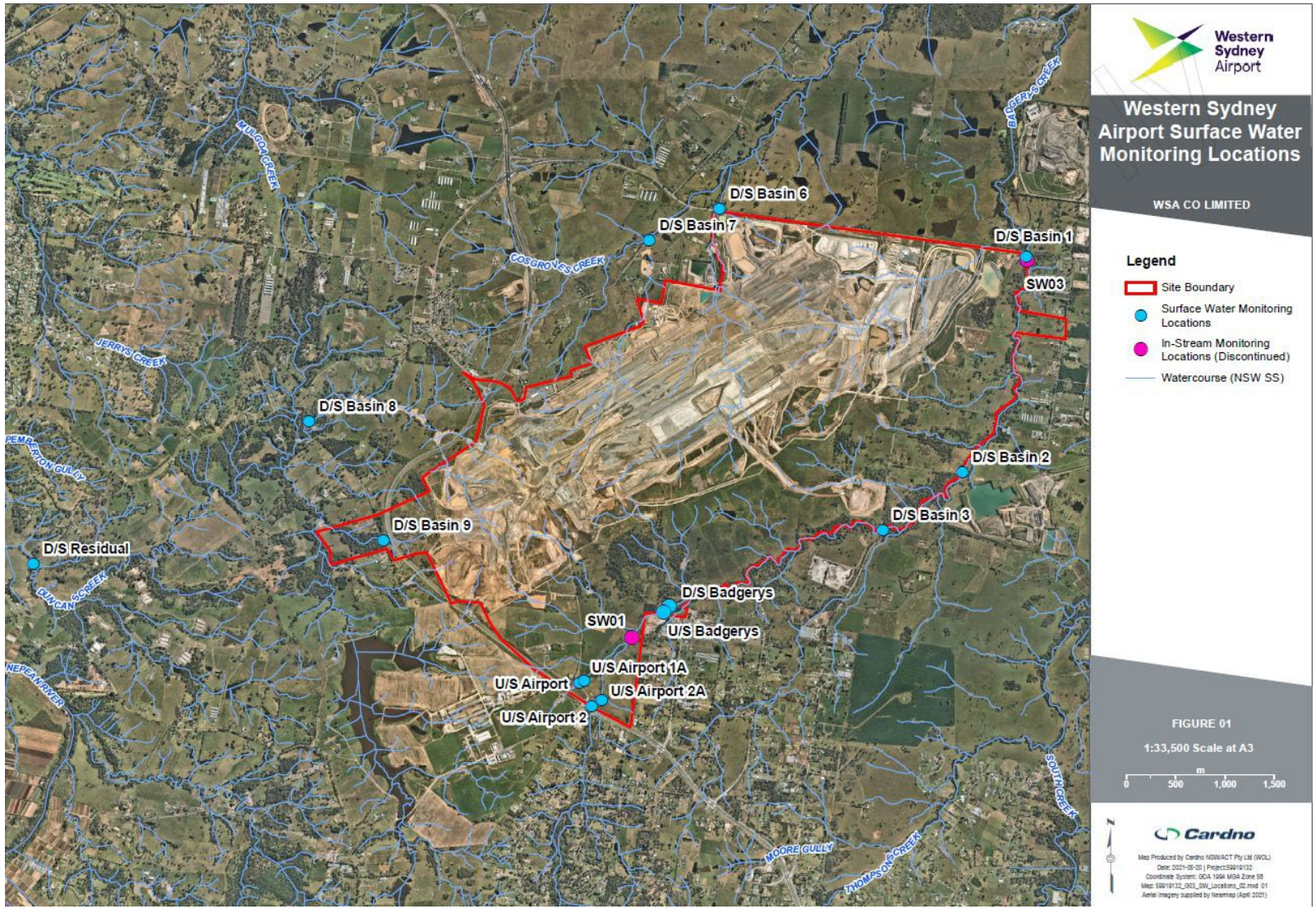


Figure 6: WSA surface water monitoring sites (Cardno, 2021)

3.1.2.2. Selected sites for baseline analysis

As noted in Table 3, there are numerous locations that have been subject to water quality monitoring over the past few decades. Table 4 details the historic sites selected to inform the baseline water quality data in South Creek, Badgerys Creek and Thompsons Creek. These have been selected based on the proximity of the sites to the SBT Works, and data quality/quantity.

Table 5 details the sites selected by CPBG for the baseline data to inform the DIA.

Refer to Section 3.2.3 for details of the SBT Works monitoring locations.

Table 4: Selected upstream and downstream surface water monitoring locations for baseline analysis.

Position	Sample ID	Sample Location	Source	Refer to Figure
Upstream of Project alignment (North: Orchard Hills to St Marys)	S1	South Creek	PPK, 1997 and SMEC, 2014	Figure 3
Upstream of Project alignment (North: Orchard Hills to St Marys)	S2	South Creek	PPK, 1997 and SMEC, 2014	Figure 3
Downstream of Project alignment (South of Claremount Meadows)	SBT 2	Claremont Creek	CPBG, DIA 2022	Figure 4
Upstream of Project alignment (South: WSA to Aerotropolis Station)	D/S Badgerys	Badgerys Creek	Cardno, 2021	Figure 6
Downstream of Project alignment (South: WSA to Aerotropolis Station)	D/S Basin 3	Badgerys Creek	Cardno, 2021	Figure 6
	T1	Thompsons Creek	PPK, 1997 and SMEC, 2014	Figure 3

3.1.3. Surface water quality

South Creek Catchment in Western Sydney is one of the most heavily degraded catchments in Australia (Hawkesbury-Nepean CMA, 2007). The catchment has suffered from high pollution loads, increased impervious surfaces from urbanisation, and long-term clearing of vegetation resulting in a rise of saline groundwater into streams and increased sediment and pollutant runoff (Boon, 2017).

Monitoring of water quality within the watercourses surrounding the WSA has been undertaken by Cardno (2021) as required by the WSA Soil and Water Construction Environmental Management Plan (SWCEMP) and builds on the previous water quality monitoring initiated in 2015 by GHD (GHD, 2016). Water quality parameters that have been tested include:

- Total recoverable hydrocarbons (TRH)
- Polycyclic aromatic hydrocarbons (PAHs) and trace phenols
- Volatile organic compounds (VOCs)
- Benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
- Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn)
- Trace organochlorine and organophosphorus pesticides

- Nutrients (nitrate, nitrite, ammonia, total Kjeldahl nitrogen, total phosphorous, reactive phosphorous, total nitrogen)
- Total suspended solids (TSS)
- Turbidity
- Thermotolerant coliforms and Chloropyhll-a).

As noted above, the baseline surface water quality dataset is derived from a range of sampling programs. As such, there is some variance in the analytes that were sampled and tested.

Table 5 provides a summary of the baseline water quality data for the five historic monitoring sites with Table 6 providing a summary for the more recent CPBG monitoring sites, with detailed tables included in Annexure A where such data are available. Interpretation of the baseline surface water monitoring data is summarised in Table 7.

Table 5: Baseline surface water quality averages (from PPK, 1997, SMEC, 2014, GHD, 2016 and Cardno, 2021)

Parameter	ANZG (2018) and ANZECC (2000)	Historic monitoring location				
		S1	S3	D/S Badgerys	D/S Basin 3	T1
DO % sat	85-110	83 to 105	39 to 79	53.99	60.44	15 to 50
Conductivity (µs/cm)	125-2,200	nt	<500 to 3,200	1075.92	7857.92	nt
pH	6.5-8.0	7 to 7.2	6.9 to 7.4	7.74	7.5	6.4 to 7.3
Turbidity (NTU)	6-50	15 to 65	12 to 40	41.08	49.16	4.9 to 17
TSS (mg/L)	3-25 (see note 2)	9 to 56	4 to 14	44.7	42.12	5 to 31
TN (mg/L)	0.5	0.49 to 1.6	0.8 to 1.52	3.46	3.6	0.02 to 1.14
TP (mg/L)	0.05	0.01 to 0.14	0.05 to 0.5	0.52	0.6	0.01 to 0.07
Arsenic	0.013	nt	nt	0.0017	0.0027	nt
Cadmium	0.0002	nt	nt	<0.0002	0.0002	nt
Chromium (VI)	0.0033 (III) and 0.001 (VI)	1.7	nt	0.0025	0.004	nt
Copper	0.0014	3.6	nt	0.0076	0.0083	nt
Lead	0.0034	1.61	nt	0.0024	0.0032	nt
Mercury	0.0006	nt	nt	<0.0001	<0.0001	nt
Nickel	0.011	nt	nt	0.0026	0.0035	nt
Zinc	0.008	9.1	nt	0.0125	0.0147	nt

* 95th percentile species protection.

1. Average taken from CPBG Discharge Impact Assessment monitoring
2. TSS is conservatively assumed to be at a ratio of 1:2 with Turbidity.

Table 6: Baseline surface water quality averages (from CPBG 2022)

Parameter	ANZG (2018) and ANZECC (2000)	DIA monitoring location				
		SBT 1	SBT 2	SBT 3	SBT 4	SBT 5
DO % sat	85-110	98.2 to 115	90.5 to 117	96.9 to 110	85.1 to 123	93.8 to 111
Conductivity (µs/cm)	125-2,200	786 to 1430	1180 to 3190	768 to 3020	757 to 2760	754 to 3060

Parameter	ANZG (2018) and ANZECC (2000)	DIA monitoring location				
		SBT 1	SBT 2	SBT 3	SBT 4	SBT 5
pH	6.5-8.0	7.1 to 8	7.89 to 8.26	7.62 to 8.14	7.71 to 8.1	7.29 to 8.09
Turbidity (NTU)	6-50	15 to 184	3.2 to 170	15.7 to 229	17.4 to 163	12.1 to 64.8
TSS (mg/L)	3-25 (see note 2)	8 to 92	1 to 85	8 to 115	8 to 82	6 to 32
TN (mg/L)	0.5	1.33	1.01	1.36	2.39	0.64
TP (mg/L)	0.05	0.14	0.09	0.091	0.16	0.04
Arsenic	0.013	nt	Nt	Nt	nt	nt
Cadmium	0.0002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Chromium (VI)	0.0033 (III) and 0.001 (VI)					
Copper	0.0014	0.008	0.018	0.006	0.005	0.003
Lead	0.0034	0.004	0.008	0.002	0.001	<0.001
Mercury	0.0006	<0.0004	0.0018	0.0003	<0.0004	0.0003
Nickel	0.011	0.007	0.007	0.003	0.002	0.002
Zinc	0.008	0.030	0.116	0.014	0.009	0.010

(i) Average taken from CPBG Discharge Impact Assessment monitoring

(ii) TSS is conservatively assumed to be at a ratio of 1:2 with Turbidity.

Table 7: Summary of interpretation of baseline water quality conditions in the Project area

Waterway	Baseline data obtained	Description of water quality
South Creek	Samples collected at S1 and S3 (PPK, 1997).	Generally elevated concentrations of nutrients (nitrogen and phosphorous) and depleted dissolved oxygen. Heavy metals exceed guideline values (Chromium VI, copper and zinc). Turbidity exceeds guideline levels following heavy rainfall. Electrical conductivity (salinity) is above guideline levels during dry weather when the dilution effect of additional inflows is absent.
Claremont Creek	Samples collected at SBT 2	The results from laboratory testing of surface water samples have detected elevated concentrations of a range of toxicant compounds and physico-chemical stressors at values exceeding the adopted screening criteria, including: • stressors: pH, salinity, turbidity, oxidised nitrogen • toxicants: aluminium, cobalt, copper, lead, manganese, mercury, zinc

Waterway	Baseline data obtained	Description of water quality
Badgerys Creek	Samples collected at D/S Badgerys and D/S Basin 3 by GHD (2016) and Cardno (2021).	Heavy metals all lower than guideline levels. Generally elevated concentrations of nutrients (nitrogen and phosphorous) and depleted dissolved oxygen. Turbidity exceeds guideline levels following heavy rainfall. Electrical conductivity (salinity) is above guideline levels, especially during dry weather when the dilution effect of additional inflows is absent.
Thompsons Creek	Samples collected at T1 (PPK, 1997 and SMEC, 2014).	Depleted dissolved oxygen. pH occasionally outside guideline values.

3.2. Surface water quality construction monitoring

3.2.1. Overview

The discharge of sediments and pollutants during the SBT Works is identified as a potential impact on surface water within the disturbed catchments and waterways of South Creek, Badgerys Creek and Thompsons Creek. CPBG has engaged SEEC (Strategic Environmental and Engineering Consulting), a soil conservation specialist to provide design input on erosion and sediment control. In addition, Water Treatment Plants (WTPs) are in use to treat groundwater inflows into tunnels and station boxes prior to release.

Table 8 contains the parameters to be tested as part of this Program. Site Specific Trigger Values (SSTVs) are identified in Table 9 and will be used to assess potential impacts on waterways.

Variation in physio-chemical parameters (Table 9) provides an indication of a change to overall water quality triggering the assigned performance criteria and further impact assessment.

Groundwater inflows intercepted during tunnelling and station boxing will be discharged via WTPs. The EPL (on receipt) may authorise discharge of water from specific locations or premises and establish criteria that differ from those given in this Program. In such circumstances the EPL, and any conditions and criteria of that EPL, take precedence and this Program will be revised as necessary.

3.2.2. Rainfall monitoring

To provide data to assess water quality trends, rainfall is being monitored during the construction phase via Penrith Lakes Automatic weather station (AWS) and Badgerys Creek Automatic weather station (AWS) or via rain gauges which have been installed onsite and are being checked on each workday or automated using an electronic weather station.

3.2.3. Monitoring locations

Surface water quality monitoring will be carried out during construction at fifteen sites, listed in Table 8 and shown in Figures 5, 6 and Figures 7, 8. The monitoring program commenced prior to any ground disturbance. Background monitoring from previous studies (see Section 3.1) comprises the baseline monitoring of this program. Construction phase monitoring commenced following ER endorsement of this Program.

Initial monitoring sites were selected to capture potential areas of impact from the site sediment basin discharge points as well as reflecting the baseline data captured prior to the Project commencing. Since starting construction, preparing the DIA and receiving the EPL, new monitoring locations were assigned.

Monitoring sites were strategically selected to reflect the requirements of the EPL, which requires that monitoring is undertaken to assess the potential impacts from discharges from sediment basins and WTPs at each of the Project's 5 off-airport site locations. There is a requirement for monitoring to occur at the point of discharge of the water treatment plants as well as both upstream and downstream. This approach effectively assesses any potential influence that the treated water from these plants might exert on the parameters of the existing creek. These new sites replace the 5 sites initially designated.Monitoring allows for the assessment of trends in water quality, including natural variations, and will enable assessment of any potential impacts during construction. The surface water quality monitoring locations were also monitored during the baseline monitoring period that informed the EIS (as discussed in Section 3.1).

Table 8: Construction phase surface water monitoring program

Sample ID	Equivalent historic monitoring location(s) (Table 4)	Sample location	Analysis suite	Sampling frequency
SBT 6U	S1 and S3	Unnamed tributary of South Creek, West of Kent Road Orchard Hills	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 6A	S1 and S3	Unnamed tributary of South Creek, East of Kent Road Orchard Hills	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672
SBT 6D	S1 and S3	Unnamed tributary of South Creek, West of Samuel Marsden Road Orchard Hills	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 7U	SBT 2	Claremont Creek, Great western highway, East of Water Street, Werrington	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 7A	SBT 2		Physicochemical parameters (see note 2) parameters and heavy metals (see note 2)	As per requirements of EPL 21672
SBT 7D	SBT 2		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 8U	S1 and S3	South Creek, East of Werrington Road, under railway bridge, St Marys	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 8A	S1 and S3		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672

Sample ID	Equivalent historic monitoring location(s) (Table 4)	Sample location	Analysis suite	Sampling frequency
SBT 8D	S1 and S3		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 9U	D/S Badgerys	Badgerys Creek, West of Badgerys Creek bridge crossing, Badgerys Creek	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 9A	D/S Badgerys		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 9D	D/S Badgerys		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 10U	T1	Thompsons Creek, 34 Kelvin Park Drive, Bringelly	Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 10A	T1		Physicochemical parameters,heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)
SBT 10D	T1		Physicochemical parameters, heavy metals and nutrients (see note 2)	As per requirements of EPL 21672 Quarterly /wet weather (see note 2)

Notes:

1. Physico-chemical (field) parameter analysis and heavy metals as detailed in Table 7
2. Quarterly wet weather monitoring (at least once every 3 months following 20mm of continuous rainfall – see Sampling frequency in Section 3.2.4).

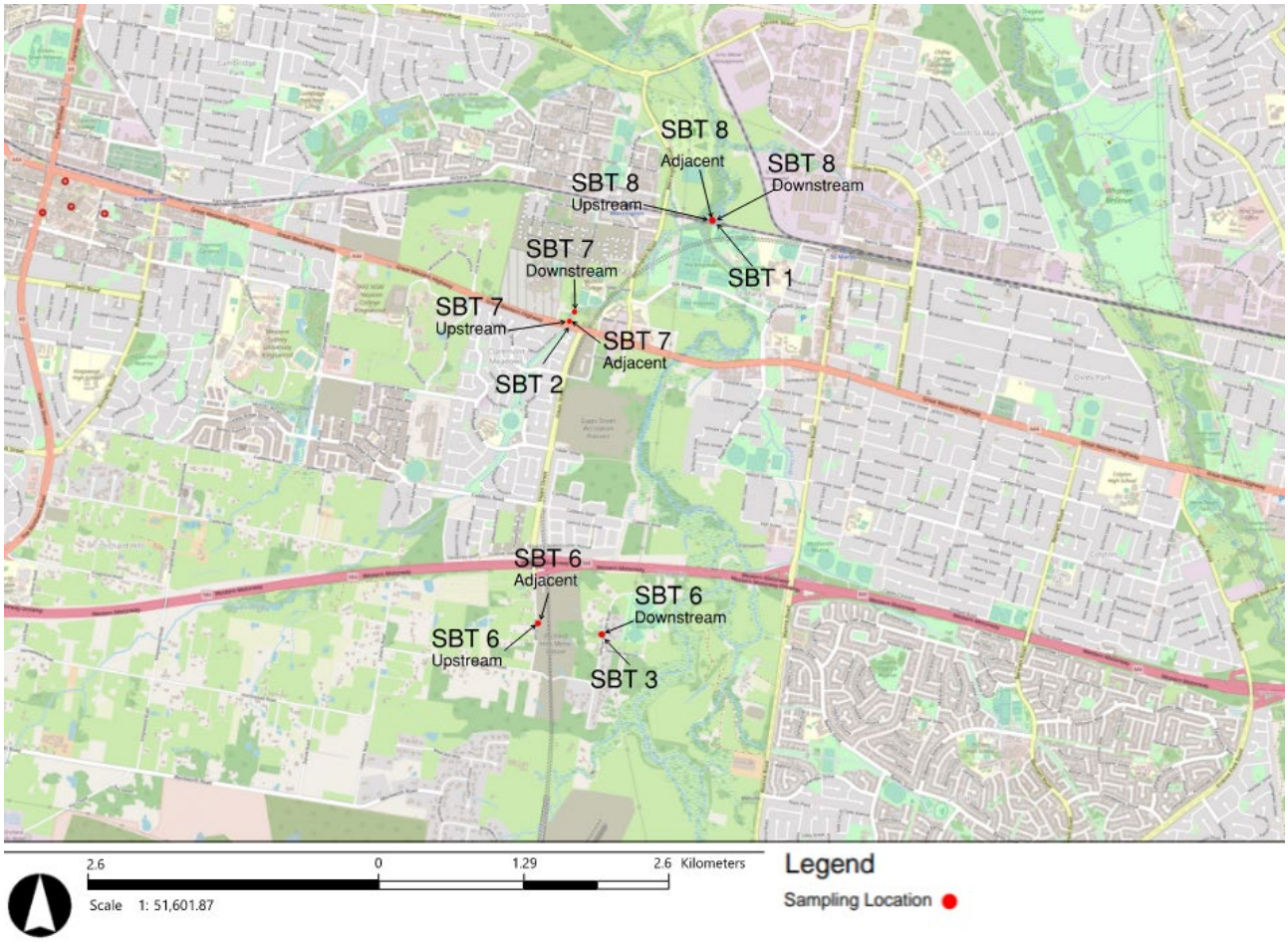


Figure 7: Project alignment (north) showing SBT Works monitoring locations.

Figure 8: Project alignment (south) showing SBT Works monitoring locations.

3.2.4. Sampling frequency

During the SBT Works, water quality sampling will be undertaken quarterly and in accordance with any relevant EPL conditions which include:

- Weekly surface water monitoring of receiving waterways at locations upstream, downstream and adjacent to each discharge point: 6, 7, 8, 9 and 10 for at least 6 months after 30 May 2023
- less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge, when it is safe to do so; and
- when rainfall causes a discharge from a sediment basin which has not been emptied within the design management period following cessation of a rainfall event, when it is safe to do so.

Wet weather monitoring will be carried out:

- A minimum of once per 3 months where rainfall does not exceed 25mm, and
- When a continuous rainfall event of >20mm is received in the local catchment during a 24-hour period (as recorded at the SBT Works rain gauge(s) or nearby weather station) and has generated runoff from site.

For safety reasons, sampling will not be undertaken during peak storm-flows. Sampling will be completed when flows are reasonably constant and monitoring points can be safely accessed. Monitoring locations will be selected where possible to enable a safe monitoring location during all weather conditions.

This Program will continue for the duration of the SBT Works.

3.2.5. Surface water quality parameters

Table 9 details the analytes that will be monitored during the SBT Works, at the locations listed in Table 8 and shown in Figure 7 and Figure 8. Initially there were more parameters required, however after negotiations with the EPA, the following parameters only were required to be measured to reflect potential impacts from the sediment basins and the WTP from each site.

Table 9 Surface water quality monitoring parameters

Category	Measured	Parameters
Physio-chemical parameters	In-field using a calibrated multi parameter probe	• pH • Turbidity (NTU) • Visible oil and grease • Electrical conductivity (µS/cm) • Total suspended solids (TSS)
Metals	Laboratory testing	• AluminiumChromium (VI) • Copper • • Zinc
Nutrients	Laboratory testing	• Ammonia • Total Phosphorous • Total Nitrogen

Surface water quality analysis results will be, where applicable, assessed and compared to baseline conditions, rainfall records, upstream monitoring results, and the performance criteria described below.

3.2.6. Performance criteria

3.2.6.1. Site specific trigger values

Baseline monitoring shows that some surface water quality parameters exceed the default ANZECC (2000a) water quality trigger values for slightly to moderately disturbed ecosystems.

This is not unexpected given the highly disturbed catchment area and receiving waterways surrounding the project.

Location specific performance criteria have been developed for downstream (impact) surface water monitoring locations (see Table 10) by the EPA and conditioned on the EPL in response to the findings of the DIA.

Table 10 Site specific trigger values (SSTV)

Parameter	Units	ANZECC guidelines	SBT 6D	SBT 7D (see note 1)	SBT 8D	SBT 9D (see note 1)	SBT 10D
SBT SITE			**Orchard Hills**	**Claremont Meadows**	**St Marys**	**Bringelly**	**Aerotropolis**
pH	pH	6.5-8.0	6.5-8.0	7.78	6.5-8.0	6.5-8.0	6.5-8.0
Electrical Conductivity	µS /cm	125-2,200	2,200	1130	2,200	2,200	500
Turbidity	NTU	6-50	40	46	40	46	17
TSS	mg/L	3-25 (see note 2)	25	N23	25	23	9
DO	% sat	85-110	40-110	9.2 – 11.2	40-110	60-110	50-110
Nitrogen (total)	mg/L	1.72	1.33	1.33	1.33	1.36	0.64
Phosphorus (Total)	mg/L	0.14	0.14	0.14	0.14	0.091	0.04
Aluminium	mg/L	0.055	0.08	0.0001	0.08	1.46	0.81
Ammonia	mg/L	0.9	0.02	0.02	0.02	0.018	0.09
Chromium VI	mg/L	0.001 (VI)	0.006		0.006	0.001 (VI)	0.001
Copper	mg/L	0.0014	0.006	0.008	0.006	0.0014	0.003
Zinc	mg/L	0.008	0.014	0.030	0.008	N/A	0.010

Notes:

1. SBT2 and SBT4 do not have SSTV, so are all marked N/A (not applicable). SBT2 and SBT4 are upstream of the SBT Works and will be monitored to allow for upstream versus downstream comparisons. In the event a SSTV is triggered at SBT1 or SBT3, it can be compared against the corresponding upstream location to determine if the trigger is potentially caused by the Project.
2. TSS is conservatively assumed to be at a ratio of 1:2 with Turbidity.
3. .

The SSTVs provide an easily identifiable indication of a potential change in water quality. A management response would be initiated if any of the following occurs:

- A parameter exceeds the SSTV for any single monitoring event by more than 30%
- A parameter downstream exceeds the corresponding parameter upstream for any single monitoring event by more than 20%
- A parameter exceeds the SSTV for two consecutive monitoring events
- A parameter exceeds the SSTV for half of the sampling events in a twelve-month period.

In the event that any of the above triggers are observed, a review will be initiated immediately to determine the significance of the exceedance(s) and possible causes. The review will assess the baseline data for the relevant waterway, recent rainfall records, other activities within the catchment and recent activities or recorded erosion/sediment control incidents occurring in the catchment.

If the exceedance is determined to be attributable to SBT Works, the event will be treated as an environmental incident and managed in accordance with the requirements of Section 7.10 of the CEMP. Corrective and preventative actions will be identified and implemented as part of that process.

3.2.6.2. Upstream vs downstream comparisons

Sampling points SBT 6, 7, 8, 9, and 10 are strategically chosen with three sampling locations each. These sampling points are designed to include both upstream and downstream adjacent areas, creating an effective mixing zone for accurate data collection and analysis.

4. Monitoring methodology / Sampling protocol

4.1. Sampling collection

Grab samples will be collected manually from the sampling locations identified in Table 8and Figure 7. The volume of sample collected will be sufficient for the required physio-chemical (field) parameter analysis using a multi-probe water quality meter(s).

4.2. Field measures

Field physio-chemical parameters including EC, pH, DO, and turbidity will be measured at each sampling location using a fully calibrated multi-probe water quality meter(s) or provided for laboratory analysis. Other observations including odour and colour may 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.

4.3. Recording of field results

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.

4.4. 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 De-Con 90 (a phosphate free detergent), or equivalent
- Rinse again with tap water
- Rinse three times with de-ionised water
- Allow to dry.

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

4.5. Quality Assurance and documentation

Any sample to be sent to a laboratory will be subject to quality assurance protocols.

Quality assurance and control protocols during sampling and recording of physio-chemical (field) parameters will be undertaken (each sampling event) in accordance with ANZECC/ARMCANZ (2000b) to ensure the integrity of the dataset.

As part of sampling the following will be undertaken:

- 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.

5. Compliance management

5.1. Roles, responsibility, and training

The CPBG organisational structure and overall roles and responsibilities are outlined in Section 4 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 8 of the SWMP.

All employees, contractors and utility staff working on site will undergo site induction and targeted training relating to surface water management issues, detailed in the SWMP and CEMP.

Further details regarding staff induction and training are outlined in Section 7.8 of the CEMP.

5.2. Monitoring and inspection

This Program details the monitoring requirements for surface water. Additional soil and surface water inspection requirements (including weekly site inspections) are detailed in the SWMP (Element 2: Monitoring and Reporting).

In accordance with Section 4 of the CEMP, the Environment Manager will be responsible for ensuring monitoring activities are undertaken.

Additional requirements and responsibilities in relation to inspections are documented in Section 7.4.2 of the CEMP.

5.3. Data analysis and management response

Monitoring results for surface water quality will be compared against SSTVs (Table 9), and reported in the construction compliance monitoring reports (Section 5.5). If a trigger is observed (see Section 3.2.6), a review will be initiated to determine the significance of the exceedance(s) and possible causes. The review will assess available surface water data, baseline data for the relevant waterway, recent rainfall records, and recent activities or recorded erosion/sediment control incidents occurring in the catchment. If the exceedance is determined to be attributable to the SBT Works, the event will be treated as an environmental incident and managed in accordance with the requirements of the CEMP. Corrective and preventative actions will be identified and implemented as part of that process.

5.4. Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this Program, the SSI 10051 Planning Approval, and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 7.13 of the CEMP.

5.5. Reporting

During construction, surface water quality data will be collected, tabulated and assessed against baseline conditions and performance criteria. Monitoring reports will be submitted to the DPE and the EPA within 30 days of the reporting period unless otherwise agreed with DPE.

Reporting requirements associated with the Program are presented in Table 11.

Table 11 Reporting requirements

Schedule (during construction)	Requirements	Recipient (relevant authority)
Surface Water Monitoring Report (every six months)	Data summary reports presenting tabulated surface water monitoring data collected during the reporting period. Surface water quality results will be presented and performance criteria exceedances will be highlighted. Applicable management responses will be documented.	Sydney Metro, ER, DPHI
EPL Monitoring Reports and Annual Returns	EPL monitoring reports will be prepared in accordance with the requirements of the EPL. An EPL Annual Return will be prepared in respect of each EPL reporting period (typically 12 months).	EPA ER
Monthly Environmental Report (every month)	Monitoring program performance will be documented in the Monthly Environmental Report where applicable. Any incidents and key environmental issues will be documented.	ER
EPL surface water monitoring Report (Fortnightly as required)	EPA fortnightly which includes quality and quantity of all parameters that are identified in the table in M2.2 for each discharge point: 6, 7, 8, 9 and 10; and results must be submitted to the EPA no more than 2 weeks after each monitoring event has occurred for a minimum of 6 months from the date that points 6, 7, 8, 9 and 10 were added to the licence.	EPA

6. Review and improvement

6.1. Continuous improvement

Monitoring data will be reviewed throughout the construction period to provide potential requirements to increase, or decrease, the number of sampling locations and/or the analytical suites. SSTVs will be reviewed for appropriateness following 12 months of construction monitoring. Alterations to SSTVs, monitoring locations, analytical suites, or frequencies will be reported in the Water Monitoring Reports (Section 5.5).

Continuous improvement of this Program will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets (detailed in Section 2.2), and the Project performance outcomes of the EIS for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances 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.

6.2. SWQMP update and amendment

The processes described in Section 7.13.3 of the CEMP may result in the need to update or revise this Program.

Revisions of this Program will be in accordance with the process outlined in Section 7.12.2 of the CEMP.

A copy of the updated Program and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure.

7. References

Acid Sulfate Soil Management Advisory Committee (ASSMAC) (1998). Acid Sulfate Soil Manual

ANZECC/ARMCANZ (2000a). Australian and New Zealand Guidelines for Fresh and Marine Water Quality

ANZECC/ARMCANZ (2000b). Australian Guidelines for Water Quality Monitoring and Reporting.

ANZG (2018): Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines.

EPA (2004). Approved Methods for the Sampling and Analysis of Water Pollutants in NSW.

GHD (2016). Western Sydney Airport EIS Surface Water Quality Assessment. For Department of Infrastructure and Regional Development. August 2016.

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NSW Government (2020). Sydney Metro – Western Sydney Airport. Environmental Impact Study. NSW Government, Sydney.

PPK (1997). Geology, Soils and Water Technical Paper – Proposal for a Second Sydney Airport at Badgerys Creek or Holsworthy Military Area. PPK, Concord West.

RTA, 1999. Guideline for Construction Water Quality Monitoring. NSW Road and Traffic Authority

SMEC (2014). Environmental Field Survey of Commonwealth Land at Badgerys Creek. SMEC, Sydney.

Annexure A Baseline surface water monitoring results

Table 12: Baseline Surface Water Monitoring SBT3 (from D/S Basin 3, Cardno, 2021)

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
2/11/2015	6.9	540.2	44.1	21.87	88.3	30	1.6	0.36	0.002	<0.0001	0.002	0.01	0.002	<0.0001	0.003	0.014
8/12/2015	7.12	8620	21.9	22.2	12	21	2	0.9	0.004	<0.0001	<0.001	0.001	<0.001	<0.0001	0.003	<0.005
5/01/2016	7.45	1529	58.6	19.59	216	76	29.3	2.7	0.004	<0.0001	0.003	0.024	0.003	<0.0001	0.009	0.036
4/02/2016	7.43	832	65.8	22.25	15.5	<5	1.9	0.88	0.002	<0.0001	<0.001	0.003	<0.001	<0.0001	0.002	<0.005
2/03/2016	7 58	1474	42.5	22.17	17	10	1.4	0.52	0.005	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	0 01
7/04/2016	6 88	23134	93	20.69	11.9	29	0.8	0.31	0.002	<0.0001	<0.001	0.001	<0.001	<0.0001	<0.001	<0.005
5/05/2016	7.41	30315	57.5	7.89	6.4	<5	0.7	0.2	0.003	0.0002	<0.001	0.002	<0.001	<0.0001	<0.001	0.007
17/06/2016	7 08	923	53	10.08	29.7	5	3.6	0.22	<0.001	<0.0001	<0.001	0.005	<0.001	<0.0001	0.003	0.013
20/06/2016	7.48	872	76.5	13.36	102	19	8.9	1.19	0.002	<0.0001	<0.001	0.011	0.001	<0.0001	0.002	0.015
8/07/2016	7 04	1087	57.9	10.52	52	7	2.4	0.26	0.002	0.0002	<0.001	0.005	<0.001	<0.0001	0.002	0.007
5/08/2016	7 28	1278	81	10.67	40.2	10	4.3	0.41	0.001	<0.0001	<0.001	0.006	<0.001	<0.0001	0.003	0.008
12/09/2016	7 09	1058	64.9	14.61	28.3	11	1.9	0.46	0.001	<0.0001	0.001	0.014	0.001	<0.0001	0.003	0.008
7/10/2016	7.7	1924	49.6	15.37	14.9	7	1.4	0.3	0.002	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	0.007
4/11/2016	8	26837	59	16	6	16	<0.2	<0.02	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	<0.005
12/12/2016	8.48	35009	59.5	23.48	5.5	16	0.7	0.16	0.003	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
12/01/2017	7 34	39053	49.7	14.96	9.3	10	1.2	0.38	0.004	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
2/02/2017	8 03	35941	81.6	22.78	26.7	33	2.1	0.96	0.009	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
8/02/2017	7 87	37055	53.9	21.96	50.4	19	3.8	1.81	0.008	<0.0001	<0.001	0.006	<0.001	<0.0001	0.004	0.014
13/03/2017	7.15	3626	52.3	21.92	16.9	10	4.4	0.44	0.002	<0.0001	<0.001	0.016	<0.001	<0.0001	0.01	0.02
10/04/2017	7 83	816.9	90.9	19.28	18.4	8	2.1	0.94	0.002	<0.0001	0.002	0.004	<0.001	<0.0001	0.003	0.006
8/05/2017	7 37	1691	38.7	11.46	32.2	<5	2	0.34	0.003	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.003	<0.005
5/06/2017	7 35	26086	53.9	12.03	13.3	9	<0.5	0.15	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
13/07/2017	7.48	2975	62.6	7.29	59.8	8	1.6	0.14	<0.001	<0.0001	<0.001	0.001	<0.001	<0.0001	0.002	<0.005
8/08/2017	7.47	2370	47.1	9.46	10.8	<5	2.3	0.06	<0.001	<0.0001	<0.001	0.003	<0.001	<0.0001	0.002	0.009
8/09/2017	7 34	27507	64	9.42	25	10	<0.2	0.03	<0.001	<0.0001	0.001	<0.001	<0.001	<0.0001	0.002	<0.005
5/10/2017	6 97	1319	50.9	16.58	62.9	16	3.2	0.59	0.002	<0.0001	0.008	0.022	0.002	<0.0001	0.005	0.02
6/04/2018	7 96	35556	66.2	18.7	0.8	10	<0.5	0.33	0.003	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.004	<0.005
11/05/2018	7.64	18735	30	11.3	5	30	1.8	1.01	0.003	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	0.007
28/06/2018	7.65	35370	106	11.5	0.4	12	0.8	<0.05	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	0.01
20/07/2018	7 22	451.6	61.4	7.5	73	39	18	0.42	0.001	<0.0001	0.001	0.014	0.002	<0.0001	0.004	0.017
17/08/2018	7.4	930	66.8	8.4	235.6	225	10.7	1.07	0.005	<0.0001	0.015	0.039	0.014	<0.0001	0.015	0.068
21/09/2018	7 08	611	49.4	10.6	25.9	46	12	0.63	0.001	<0.0001	<0.001	0.013	0.001	<0.0001	0.003	0.015
26/10/2018	6.5	1840	49.9	19.5	-	31	3.6	0.53	0.003	<0.0001	<0.001	0.014	<0.001	<0.0001	0.008	0.019

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
26/11/2018	7.15	4551	43.6	16.6	23.5	26	5.5	0.36	0.002	<0.0001	<0.001	0.005	<0.001	<0.0001	0.008	0.008
17/12/2018	7 08	1100	46.5	23.8	218.9	52	6.8	1.34	0.004	<0.0001	0.007	0.021	0.006	<0.0001	0.009	0.038
30/01/2019	8.76	1222	6.3	23.8	57.5	54	3.6	1.73	0.008	<0.0001	0.001	0.005	0.002	<0.0001	0.005	0.011
2/04/2019	7 22	1712	35.9	16.1	116.6	230	4.3	1.41	0.004	<0.0001	0.003	0.009	0.002	<0.0001	0.007	0.018
17/09/2019	7 97	116.7	84.6	10.99	-	230	2.3	0.78	0.002	<0.0002	<0.001	0.006	<0.001	<0.0001	<0.001	<0.005
13/02/2020	7.2	507	50	25	-	46	4.5	0.45	0.002	<0.0002	<0.001	0.005	<0.001	<0.0001	0.002	0.008
16/03/2020	7.5	1177	41	22	-	12	2.24	0.05	0.002	<0.0002	<0.001	0.002	<0.001	<0.0001	0.002	<0.005
15/04/2020	7.5	862	67	17.4	-	5.1	1.82	0.43	0.002	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
13/05/2020	7.4	680	45	11	-	3.3	1.64	0.41	0.001	<0.0002	<0.001	0.012	<0.001	<0.0001	0.002	0.006
18/06/2020	7.4	688	41	11	-	480	1.26	0.76	0.002	<0.0002	<0.001	0.018	<0.001	<0.0001	0.004	0.013
15/07/2020	7.7	866	108	12	-	8.6	1.5	0.78	0.001	<0.0002	<0.001	0.013	<0.001	<0.0001	0.004	0.01
13/08/2020	8	422	72	12	-	30	1.69	0.38	0.001	<0.0002	<0.001	0.004	<0.001	<0.0001	0.002	0.006
17/09/2020	7.7	628	91	20	-	7.6	1.2	0.24	<0.001	<0.0002	<0.001	0.002	<0.001	<0.0001	<0.001	<0.005
15/10/2020	8	1000	-	-	-	8.8	0.5	0.21	0.001	<0.0002	<0.001	0.004	<0.001	<0.0001	<0.001	<0.005
12/11/2020	7.7	809	81	22	-	20	1	0.43	0.001	<0.0002	<0.001	0.003	<0.001	<0.0001	<0.001	-
14/12/2020	7.8	630	95	-	-	50	0.8	0.67	0.002	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.002	0.006
21/01/2021	7.7	1161	52	24	-	18	1.3	0.62	0.002	<0.0002	<0.001	0.017	0.002	<0.0001	0.004	0.022

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
18/02/2021	8	1300	100	-	-	14	3.4	0.68	0.002	<0.0002	<0.001	0.014	<0.001	<0.0001	0.004	0.01
29/03/2021	7	727	55	19	-	56	1.87	<0.5	0.002	<0.0002	<0.001	0.002	<0.001	<0.0001	0.001	<0.005
21/04/2021	7.3	1287	43	13	-	11	1.8	0.45	<0.001	<0.0002	<0.001	0.001	<0.001	<0.0001	0.001	<0.005
27/05/2021	7.3	1485	65		-	8	2.48	0.24	<0.001	<0.0002	<0.001	0.003	<0.001	<0.0001	0.002	<0.005
23/06/2021	7.5	1889	81	11	-	4.7	<0.2	0.13	<0.001	<0.0002	<0.001	0.001	<0.001	<0.0001	<0.001	<0.005

Table 13: Baseline Surface Water Monitoring SBT4 (from D/S Badgerys, Cardno, 2021

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
2/11/2015	7.42	2764	37.2	20.42	66.6	12	0.5	0.04	0.002	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
8/12/2015	7 83	1847	31.5	19.85	4.2	5	0.8	0.05	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
5/01/2016	7.76	1720	49.9	19.78	62.4	26	3.2	0.44	0.001	<0.0001	<0.001	0.004	<0.001	<0.0001	0.004	0.012
4/02/2016	7.7	851	58.6	24.19	26.6	<5	1.2	0.11	0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	<0.005
2/03/2016	7.64	19.73	19.1	21.9	9	6	0.5	0.04	0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
7/04/2016	7 89	1516	47	18.66	3.67	7	0.4	0.03	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
5/05/2016	7.72	1797	18.2	14.77	0.3	<5	0.2	0.01	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
17/06/2016	7.45	1033	66.3	10.09	53	6	1.2	0.12	<0.001	<0.0001	<0.001	0.006	<0.001	<0.0001	0.002	0.008
20/06/2016	7 54	698	77.9	12.88	72	16	1.6	0.2	0.001	<0.0001	<0.001	0.003	<0.001	<0.0001	0.002	0.006
8/07/2016	7.48	1136	74.8	11.14	38.2	17	0.9	0.07	0.001	<0.0001	<0.001	0.003	<0.001	<0.0001	0.002	<0.005
5/08/2016	7 59	847	86.1	12.55	34.5	8	1.2	0.09	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	0.005
12/09/2016	7.9	1463	89.9	15.86	14	21	2.9	0.51	0.002	<0.0001	<0.001	0.003	<0.001	<0.0001	0.004	0.006
7/10/2016	8 23	2222	63.1	17.54	22.8	13	1.3	0.07	0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.002	<0.005
4/11/2016	8	2427	55	16	8	9	0.9	0.01	0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.004	<0.005
12/12/2016	7.4	1484	63.2	17.31	10.2	11	0.9	0.06	0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
12/01/2017	7 23	1516	65.4	23.36	12.1	5	0.8	0.08	0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
2/02/2017	7.7	1691	35.7	22.47	4.6	12	0.4	0.09	0.003	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
8/02/2017	7 91	749.4	54.2	23.8	370.6	116	2	0.26	0.002	<0.0001	0.003	0.007	0.002	<0.0001	0.003	0.013
13/03/2017	8 31	766.3	30.9	19.13	35	13	0.9	0.04	<0.001	<0.0001	<0.001	0.001	<0.001	<0.0001	0.002	<0.005
10/04/2017	7.74	963	74.4	17.98	41.2	16	1.5	0.2	0.002	<0.0001	0.001	0.003	0.001	<0.0001	0.003	0.006
8/05/2017	7.77	1734	47.4	12.28	18.3	<5	0.9	0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
5/06/2017	7 82	2183	55	11.13	19	8	0.6	0.03	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
13/07/2017	7 82	2284	73	7.34	10.4	5	0.7	0.01	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005
8/08/2017	8.13	2520	77.7	9.04	18.6	<5	0.7	0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005
8/09/2017	8.2	1882	76.5	10.5	3.6	6	0.2	0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	0.002	<0.005
5/10/2017	7 85	1783	109.1	15.5	2.6	<5	<0.1	0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005
6/04/2018	7.6	476	48.8	18.1	17.1	14	0.8	0.05	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005
11/05/2018	7 86	423.8	88.7	9.9	167.2	627	4.2	0.46	0.003	<0.0001	0.004	0.009	0.005	<0.0001	0.006	0.03
28/06/2018	7 91	366.1	91	10	5.3	52	1.7	0.08	0.001	<0.0001	0.002	0.007	0.002	<0.0001	0.005	0.023
26/10/2018	7.49	129.3	72.5	18.5	7.6	27	1.1	0.03	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.003	0.007
17/12/2018	6.61	480.4	3.4	20.8	26.9	33	1.9	0.33	<0.001	<0.0001	<0.001	0.005	<0.001	<0.0001	0.003	0.01
30/01/2019	8.67	134.1	31.5	24.1	55.6	20	1.3	0.14	0.002	<0.0001	<0.001	0.006	<0.001	<0.0001	0.002	0.006
2/04/2019	7.64	110.5	20.5	15.5	5.1	11	1.3	0.13	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.001	<0.005

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
20/06/2019	7 99	101.8	69.8	9.96	8.9	9	0.93	0.02	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	0.001	<0.005
16/07/2019	7.7	59.2	80.8	9.25	-	9.3	0.64	0.03	<0.001	<0.0002	<0.001	0.003	<0.001	<0.0001	<0.001	<0.005
17/09/2019	7.66	39.6	91.5	10.76	-	21	0.68	0.05	<0.001	<0.0002	<0.001	0.001	<0.001	<0.0001	<0.001	<0.005
16/10/2019	7 39	70.3	42.9	15.1	-	13	0.45	0.04	<0.001	<0.0002	<0.001	<0.001	<0.001	<0.0001	<0.001	<0.005
13/02/2020	7.1	470	32.1	24	-	25	2.7	0.03	0.001	<0.0002	<0.001	0.005	<0.001	<0.0001	0.002	<0.005
16/03/2020	7.9	417	13	19	-	8.1	0.91	0.09	0.001	<0.0002	<0.001	0.002	<0.001	<0.0001	<0.001	<0.005
15/04/2020	8	293	22	15.1	-	4.1	1.1	0.16	<0.001	<0.0002	<0.001	0.03	<0.001	<0.0001	0.004	0.012
13/05/2020	7.9	196	32	11	-	1.4	0.98	0.1	<0.001	<0.0002	<0.001	0.026	<0.001	<0.0001	0.003	0.008
18/06/2020	7.5	358	35	12	-	280	1.18	0.08	<0.001	<0.0002	<0.001	0.016	<0.001	<0.0001	0.003	0.011
15/07/2020	7.9	262	67	12	-	20	0.7	0.04	<0.001	<0.0002	<0.001	0.015	<0.001	<0.0001	0.003	0.009
13/08/2020	7.8	1031	40	12	-	470	51.1	3.3	0.002	<0.0002	<0.001	0.009	<0.001	<0.0001	0.004	0.011
17/09/2020	7.7	1223	42	14	-	30	12.2	1.1	0.003	<0.0002	<0.001	0.007	<0.001	<0.0001	0.004	<0.005
15/10/2020	8.1	1600	-	-	-	11	5.83	1.5	0.003	<0.0002	<0.001	0.004	<0.001	<0.0001	0.003	<0.005
12/11/2020	7.7	888	52	19	-	7.9	4.7	0.28	0.001	<0.0002	<0.001	0.006	<0.001	<0.0001	0.003	-
14/12/2020	8	800	98	-	-	8.5	1.47	0.31	0.002	<0.0002	<0.001	0.004	<0.001	<0.0001	0.001	0.011
21/01/2021	7.9	957	15	19	-	14	1.44	0.14	<0.001	<0.0002	<0.001	0.044	0.002	<0.0001	0.005	0.049
18/02/2021	7.8	860	100	-	-	15	0.6	0.11	0.001	<0.0002	<0.001	0.014	<0.001	<0.0001	0.003	0.013

Sampled Date	pH (Field)	Electrical conductivity (field)	DO (%S) (Field)	Temperature (Field)	Turbidity (Field)	Total Suspended Solids	Nitrogen (Total)	Phosphorus (Total)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
29/03/2021	7.6	1493	21	20	-	56	23.1	8.6	0.004	<0.0002	<0.001	0.004	<0.001	<0.0001	0.003	0.007
21/04/2021	7.7	2271	9	14	-	22	26.4	6.4	<0.01	<0.001	<0.01	<0.01	<0.001	<0.0001	<0.01	<0.05
27/05/2021	7.2	1231	39		-	29	6.1	1.3	0.002	<0.0002	<0.001	0.005	<0.001	<0.0001	0.003	0.011
23/06/2021	7.8	1462	66	10	-	14	1.5	0.51	<0.001	<0.0002	<0.001	0.004	<0.001	<0.0001	0.002	<0.005

Annexure C Procedures

CONTINGENCY GROUNDWATER MONITORING PROCEDURE

MANAGEMENT AND RESPONSIBILITY

DAILY VISUAL ASSESSMENT OF GROUNDWATER INFLOW

Is the inflow volume of groundwater significant enough that there is the potential it cannot be managed in accordance with the Water Reuse and Discharge Management Procedure (SMCSWTSE-JCG-TSE-EM-MPR-003002) and will need to be pumped out and transported to an appropriate licenced facility?

Site Supervisor
Site Engineer

Y / N

GROUNDWATER INFLOW CALCULATION

- The Site Supervisor or Site Engineer will immediately contact the Project Engineer and the Environment Coordinator.
- The Project Engineer will immediately undertake a calculation of groundwater inflow and notify the Environment Coordinator and Site Supervisor of the results.

NO FURTHER ACTION

Site Supervisor
Project Engineer
Environmental Coordinator

Does the assessment confirm there is the potential that inflow volumes cannot be managed in accordance with the Water Reuse and Discharge Management Procedure (SMCSWTSE-JCG-TSE-EM-MPR-003002)?

Project Engineer

Y / N

NOTIFICATION

Immediately notify Project Manager, Construction Manager, and Environment Manager. Environment Manager to notify Crown Lands and Water Division - Department of Industry (formerly DPI Water).

NO FURTHER ACTION

Project Engineer
Environment Manager

DEVELOP SITE SPECIFIC GROUNDWATER WATER MANAGEMENT STRATEGY

The Project Manager will liaise with the Project Environment Manager and Design Team Manager to determine measures to manage the groundwater including the need for a change in design and/or construction methodology.

Construction Director
Construction Manager
Project Manager
Project Engineer
Design Team Manager
Environment Manager

IMPLEMENT SITE SPECIFIC GROUNDWATER MANAGEMENT STRATEGY

The Project Engineer is to implement the site specific Groundwater Management Strategy in consultation with the Site Supervisor and Environment Coordinator.

Project Engineer
Site Supervisor
Environmental Coordinator

EROSION AND SEDIMENT CONTROL PROCEDURE

MANAGEMENT AND RESPONSIBILITY

Inform Environmental Coordinator of upcoming works. Have the works been included in a current Erosion Sediment Control Plan (ESCP)?

Project Engineer

N

ESCP to be compiled by site Environmental Coordinator in collaboration with the Site Engineer in accordance with "Landcom (2004) Soils and Construction Vol.1, 4th Edition, March 2004 Managing Urban Stormwater" (Blue Book). Environmental Coordinator and Site Engineer are to undertake a site inspection to obtain an understanding of any constraints and if any additional environmental controls are required.

Environmental Coordinator
Site Engineer

Y

Works can proceed in accordance with the ESCP.

HOLD POINT – Excavation works cannot commence / recommence until an ESCP is developed or reviewed and deemed appropriate by the Environmental Coordinator.

Does the ESCP take into consideration the following aspects?

- Clean/dirty water separation and water diversion; dirty water (onsite water) must be captured and treated or pass through appropriate controls
- Topography/slope/natural drainage lines; slope breaks are to be implemented on steep slopes to slow water movement and reduce erosion. Design batter slope gradients and surface treatments to minimise erosion risk
- Areas of unsealed ground; ground cover is to be implemented on unsealed ground/stockpiles using geofabric or polymer
- Discharge points and on-site detention of water; include suitably designed scour and erosion controls at drainage and sedimentation basin outlet discharge points
- Use of compostable or reusable temporary erosion and sediment control devices where practicable.

Project Engineer
Site Engineer
Environmental Coordinator
Site Supervisor

HOLD POINT – No runoff (sediment laden or otherwise) is permitted to leave site unless in accordance with the Water Reuse and Discharge Management Procedure

- Implement boundary controls at the site perimeters and surrounding storm water drains if works are being undertaken in close proximity
- Controls are to be inspected regularly including before and after rainfall and maintained as required.

Final version of the ESCP must be signed by the Site Engineer, Environmental Coordinator and Site Supervisor. Content to be included in Toolbox Talk and ESCP to be displayed on the site notice board.

WATER REUSE AND DISCHARGE MANAGEMENT PROCEDURE

MANAGEMENT AND RESPONSIBILITY

REDUCE THE VOLUME OF WATER IN EXCAVATIONS/CONCRETE WASH-OUTS
Divert surface runoff around excavations/ concrete wash-outs using cut-off drains, temporary pipe drains, earth mounds etc.

Site Supervisor

↓

IDENTIFY POTENTIAL SOURCES OF CONTAMINANTS
Potential sources of contaminants i.e. PASS, groundwater, hydrocarbons etc. to be identified. Limit opportunity for further contamination. Determine if further sampling, testing and treatment is required prior to discharge.

Site Supervisor
Environmental Coordinator

↓

Is water proposed to be discharged off-site, transferred to a sediment basins, or transferred between excavations?

Site Supervisor

Y

HOLD POINT
A Dewatering and Discharge Permit must be approved by the Environment Manager prior to discharge of water from the premises or transfer of water between excavations or basins. Testing and, where necessary, treatment of water must be undertaken prior to discharge/transfer. Testing may occur within an excavation, sediment basin or water treatment plant.

Environment Manager
Environmental Coordinator
Site Supervisor

↓

WATER DISCHARGE

- Appropriate scour protection of the offsite discharge location must be in place to minimise the risk of erosion. **Note:** no works to be undertaken off the premise without Environment Manager approval.
- Visual inspection is required for the duration of the discharge operation (excluding water treatment plants) to ensure sediment from the bottom is not discharged.
- Pump Inlet hoses are to be fixed in place to restrict movement minimise the risk of sediment being sucked in.
- Syphons/ water release valves may be used to dewater sediment basins to minimise reliance on pumps. Prior to release sediment levels to be inspected to ensure the level is below the syphon/ valve inlet.

↓

ONSITE REUSE
A Dewatering and Discharge Permit is not required to:

- Transfer water to water treatment plants
- Transfer water between sumps/fish tanks in tunnels/station box excavations
- Reuse treated water from water treatment plants
- i.e. water carts, street sweepers etc.
- Use rainwater from rainwater tanks

Washing down of hard surfaces is not permitted where there is a risk of water discharging to stormwater.

N

Site Supervisor

MONITORING

DISCHARGE OFF THE PREMISES

Parameter and Criteria	Sampling method
Sediment Ponds TSS (<50mg/L)	Sampling and laboratory testing and/or probe/ turbidity tube
pH (6.5 -8.5)	Probe
Oil and Grease (none visible)	Visual Inspection / 5mg/l

ADDITIONAL WATER TREATMENT PLANT DISCHARGE CRITERIA

Parameter	Criteria
Ammonia	1200 µg/L
Manganese	2500 µg/L
Iron	300 µg/L
Cadmium	5.5 µg/L
Chromium (VI)	20 µg/L*
Copper	3 µg/L
Nickel	200 µg/L
Lead	6.6 µg/L
Zinc	23 µg/L
Mercury	0.4 µg/L

* 90 percentile value. No 100% criteria (upper limit)

- Based on a 5-day rainfall depth (mm) for 85th percentile, should rainfall received within a 5 day period exceed 38.8 mm, it is expected that sediment basins may discharge naturally over their spillway without an opportunity to flocculate and test basins for TSS, pH or the presence of oil and grease. It should also be noted that other types of erosion controls may also fail during such an event and that repair work will be undertaken when it has been determined by the Site Supervisor that it is safe to do so.
- Erosion and Sediment Control Plans (ERSED) must be reviewed prior to commencing work if there has been significant rain (i.e. >10 mm/24hr). If the relevant sediment basin is at or near capacity, works that direct water towards the basin cannot be undertaken (see Erosion and Sediment Control Procedure).

Environmental Protection Licence

Prior to sediment basins or water treatment plants becoming active, the
Discharge Point Register must be updated and submitted to the EPA.

REUSE WITH THE PREMISES

Parameter and Criteria	Sampling method
Oil and Grease (none visible)	Visual Inspection
No potential for water to leave the premises	Visual Inspection
No surface runoff will be generated from the reuse (reuse includes dust suppression, watering retained vegetation etc.)	Visual Inspection
No potential for water to reach any watercourse	Visual Inspection
Concrete Washout Water only no visible fines (in addition to criteria above)	Visual Inspection
If transporting water to sediment basins, the sediment basin must not be overfilled	Visual Inspection

Safety and Sampling

- Use of calibrated water monitoring equipment and/or visual assessment will be undertaken for the below parameters during all discharges and reuse to ensure water criteria is met.
- Always wear appropriate PPE (refer to SWMS)
- Always ensure personal safety when sampling (refer to SWMS).
- DO NOT inhale gases or aerosols formed from sampled material or associated preservatives in sample bottles.
- Maintain high standards of personal hygiene when sampling, **DO NOT** eat or smoke when sampling and ALWAYS wash hands prior to and following sampling.
- **DO NOT** enter sediment basins during sampling.

Treatment of Water

pH Levels

- If pH of water is outside the range 6.5-8.5 it must be neutralised prior to discharge
- To **decrease** pH, dose with acid; 500ml of acid lowers 7000L of water by approximately 1.5 pH.
- To **increase** pH, dose with caustic (e.g. Builders Lime)

Turbidity

- Treating the water with Alum, Gypsum or other suitable water treatment process is required where turbidity is greater than 50mg/L.
- When treating in sediment basins or excavations, distribute chemicals across the water surface to maximise the effectiveness of the flocculant
- Application rates should be based on the Blue Book and/or product specifications.

Annexure D Not used

Annexure E Environmental Representative Endorsement

HBI Healthy Buildings International Pty Ltd
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Hugh Chapman
Director Sustainability Environment & Planning SMWSA
Sydney Metro
Transport for NSW
PO Box K659
HAYMARKET NSW 1240

15 August 2024

Ref: 201209(b)_SWMP_R02

Dear Hugh

RE: Approval of Minor Amendments to the Soil and Water Management Sub-Plan - Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Rev 1

Thank you for providing the following documents for Environmental Representative (ER) review and approval prior to implementation in accordance with Minister's Condition Of Approval (MCoA) A32(j) of the Sydney Metro Western Sydney Airport project (SSI – 10051 July 23, 2021):

- *NSW (Off-Airport) Soil and Water Management Sub-Plan- Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works,* Revision 02 dated 15/08/2024; and
- *Surface Water Quality Monitoring Program - Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works,* Revision 02 dated 20/02/2024 (together referred to hereafter as the CSWMP Rev 02).

As an approved ER for the Sydney Metro Western Sydney Airport project, I have reviewed the following proposed minor amendments in the CSWMP Rev 02:

1. **Compliance table** – References updated to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
2. **Figure 1** – Updated to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
3. **Section 1.4** – Updated to reflect that Construction has commenced and that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
4. **Section 1.5** – Updated to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
5. **Figure 2** – Changed to better reflect SBT's specific scope of works.

6. **Table 2** – Updated to delete "subject to Sydney Metro approval" in reference to invert construction support (pouring of an invert concrete slab in the tunnel) at Claremont Meadows Services Facility and Bringelly Services Facility, and add "Tunnel Support" at Claremont Meadows, reflecting Sydney Metro approval of these activities, after being assessed via Sydney Metro Environment Reviews, to be in accordance with Conditions A1 and A2 of the CSSI (SSI 10051).
7. **Section 6.2** – Updated to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
8. **Section 7.2** – Updated to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document.
9. **Section 7.6.2 Sediment basin monthly monitoring** – Deleted and replaced with "**Water Treatment Plant Sampling"** to reflect EPL 21672 current, as amended, Sediment Basin and Water Treatment Plant discharge monitoring requirements.
10. **Element 4: Package specific requirements** - Revised Environmental Protection Licence compliance table to reflect that the Groundwater Monitoring Program is no longer an Annexure of the CSWMP but a standalone document , and to resolve inconsistencies with the revised Surface Water Monitoring Program.
11. **Element 4: Package specific requirements** - Updated Environmental Protection Licence compliance table to reflect EPL 21672 current, as amended, requirements.
12. **Annexure B: Surface Water Quality Monitoring Program -** Revised to reflect EPL 21672 current, as amended, monitoring requirements, and clarify other monitoring and reporting obligations/commitments.

It is noted that:

- Previous versions of the documents have been reviewed and updated following comments from the ER
- Sydney Metro have also reviewed and commented on the documents

Based on the information reviewed, in my opinion, the proposed changes constitute a minor amendment pursuant MCoA A32 (j). Accordingly, as an approved ER for the Sydney Metro Western Sydney Airport project, I approve the amended CSWMP Rev 02.

The Project is reminded to ensure the most recently approved CSWMP (the CSWMP Rev 02) is made publicly available on the Project's website.

Yours sincerely

Rui Henriques
Environmental Representative