Prepared for
Macquarie Point Development Corporation
ABN: 92 657 409 841

Site Remediation Strategy Update 2024

Macquarie Point Development Project

17-Jun-2024

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Client: Macquarie Point Development Corporation

ABN: 92 657 409 841

Prepared by

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Acronyms

ACM	Asbestos Containing Material
AHD	Australian Height Datum
ANZG	Australian and New Zealand Guidelines
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
AST	Aboveground Storage Tank
ASS	Acid Sulfate Soil
Austral	Austral Tasmania Pty Ltd
bgl	below ground level
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene
CEMP	Construction Environmental Management Plan
CoPC	Chemicals of Potential Concern
CoPEC	Chemicals of Potential Ecological Concern
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
DIER	Department of Infrastructure Energy and Resources
DNAPL	Dense Non-Aqueous Phase Liquid
DSI	Detailed Site Investigation
EMPCA	Environmental Management and Pollution Control Act 1994
E. coli	*Escherichia coli*
EPA	Environment Protection Authority
EPP	Environment Protection Policy
ERS	Environment Reference Standard
GBFS	Ground Blast Furnace Slag
GHD	GHD Group Pty Ltd
GME	Groundwater Monitoring Event
ha	hectare
HCC	Hobart City Council
IB105	Information Bulletin No. 105, Classification and Management of Contaminated Soil for Disposal, Version 3, EPA Tasmania
ISS	*In Situ* Solidification
kPa	kilopascal
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit of Reporting
m	metres
MAH	Monocyclic Aromatic Hydrocarbons

mg/kg	milligrams per Kilogram
MPDC	Macquarie Point Development Corporation
NAPL	Non-Aqueous Phase Liquid
NSW	New South Wales
OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soil
PEV	Protected Environmental Value
PPE	Personal Protective Equipment
ppm	parts per million
POSS	Project of State Significance
QA	Quality Assurance
QC	Quality Control
RC	Remediation Criteria
RWP	Remediation Work Plan
SAQP	Sampling, Analysis and Quality Plan
SEMP	Site Environmental Management Plan
SPoWQM	State Policy on Water Quality Management 1997
SPR	Source-Pathway-Receptor
SPT	Standard Penetration Testing
SRS	Site Remediation Strategy
SVOC	Semi-Volatile Organic Compound
SWL	Standing Water Level
SWMS	Safe Work Method Statement
TBT	Tributyltin
TCC	Total Contaminant Concentration
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UPVC	Unplasticised Polyvinyl Chloride
UCS	Unconfined Compressive Strength
UPSS	Underground Petroleum Storage Systems
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compound
WHSP	Work Health and Safety Plan
WWTP	Wastewater Treatment Plant
µg/L	micrograms per Litre

Executive Summary

The Macquarie Point Development Corporation (the Corporation) has engaged the services of AECOM Australia Pty Ltd (AECOM) in the role of Project Remediation Consultant to assist with the development, implementation and ongoing oversight of a remediation strategy for the Macquarie Point site, and adjacent Regatta Point and Royal Engineers Building sites (intended to be added to the overall Macquarie Point site) in Hobart, Tasmania. The combined Macquarie Point, Regatta Point and Royal Engineers Building sites are referred to as "the Site" in this document.

The vision for future development of the Site was provided by the *Macquarie Point Strategic Framework and Masterplan 2015-2030* (the former Masterplan) (MPDC, 2015). In October 2023, the *Mac Point Draft Precinct Plan* (the Precinct Plan) (MPDC, 2023) was released by the Corporation for the redevelopment of the Site, which sets out a mixed-use precinct comprised of interconnected discrete zones.

At the request of the Corporation, AECOM has prepared this update to the 2017 Site Remediation Strategy (the SRS) to provide an up-to-date summary of environmental works completed at the Site and to detail potential future requirements (including potential remediation requirements) and implications associated with residual contamination at the Site (e.g. handling and management of contaminated material during construction activities), and any considerations which arise when the Precinct Plan is finalised and adopted as the planned future development scenario for the Site.

Environmental Audit

Under the *Macquarie Point Development Corporation Act 2012* (amended 2015), Mr David Lam of Tetra Tech Coffey has been appointed as the Environmental Auditor for the Site and has been accredited by EPA as an auditor recognised by the amended Act.

The role of the Auditor is to review the progression of investigation, and remedial planning and execution works at the Site. It is understood that the Auditor shall ensure that the works are carried out in compliance with local Tasmanian legislation and guidelines with consideration given to the requirements of the Victorian EPA Environmental Audit Framework where relevant Tasmanian legislation or regulation does not exist.

The ultimate outcome of the Environmental Audit is to obtain a Site Suitability Statement confirming the Site's suitability for intended future uses. It is noted that the Auditor can issue Site Suitability Statements for separate sub-areas of the Site, and to allow this, the Site has been divided into seven sub-areas (with Regatta Point and the Royal Engineers Building considered likely to be included as additional sub-areas) for assessment and remediation, based on the nature of identified contamination, historic activity, and the intended future uses of each area under the former Masterplan.

Assessment and Remediation Activities

Assessment and remediation of each sub-area has been, or is currently being, undertaken by a sequence of:

- Identification of potential contamination sources or impacts
- Assessment to measure and quantify levels of contamination and risk, or to identify and address data gaps
- Assessment of remediation and management options
- Implementation and validation of remediation or management techniques/measures appropriate to remove any unacceptable risks arise from contamination to current or future Site uses, neighbouring properties, or receiving ecological systems.

Remediation requirements to allow Site Suitability Statements to be sought have been guided by the development of Site-specific Remediation Criteria (RC). In addition, a Site Environmental Management Plan (SEMP) has been developed and updated based on the outcomes of assessment, remediation, and conditions of Site Suitability Statements issued to date to record known impacts and required

mitigation measures to be adopted for future development and management of residual contamination at the Site following remediation.

Remediation to date has included excavation and on-Site remediation or removal of contaminated soil and remnant infrastructure, extraction and removal of Light Non-Aqueous Phase Liquid (LNAPL) from Site groundwater, and *in situ* solidification (ISS) of gasworks contamination.

To date, Site Suitability Statements have been issued for four sub-areas, under the proposed future development in the former Masterplan. **Table E1** below details the status of each sub-area and future remediation or assessment activities which have been identified as required prior to seeking Site Suitability Statements. Overall review of Site data is also required when the Precinct Plan is finalised and confirmed as the future development scenario for the Site and may identify additional remediation or future management requirements.

Table E1 Status of Site Suitability Statements

Site Area	Approx. Area (ha)	Site Suitability Statement or Remaining Actions and Activities
Site Suitability Statement Issued		
The Goods Shed and Yard (Audit Area 1)	0.86	*Site Suitability Statement: Macquarie Point Development Project - Audit Area 1, Evans Street, Hobart*, issued by Tetra Tech Coffey Pty Ltd on 4 June 2019[1] *Contaminated Land Audit Report – Macquarie Point Development Project – Audit Area 1*, issued by Tetra Tech Coffey Pty Ltd on 5 June 2019
The Escarpment (Audit Area 4 West)	1.68	*Contaminated Land Audit Report – Macquarie Point Development Project – Audit Area 4 West*, issued by Tetra Tech Coffey Pty Ltd on 24 September 2020
The Promenade and Underground Carpark (Lot E and UGC)	1.73	*Contaminated Land Audit Report – Macquarie Point Development Project – Lot E and Underground Carpark*, issued by Tetra Tech Coffey Pty Ltd on 23 July 2021
The Precinct North (Lot B)	1.04	*Contaminated Land Audit Report – Macquarie Point Development Project – Lot B*, issued by Tetra Tech Coffey Pty Ltd on 22 November 2021
Site Suitability Statement Not Issued		
The Precinct South	1.40	No remaining remediation actions identified. A Site Suitability Statement issued by the Auditor is anticipated following preparation and acceptance of a Precinct South Clean Up to the Extent Practicable (CUTEP) Report by mid-2024.
The Gateway	1.46	Remediation (removal of remnant infrastructure and treatment of gasworks wastes) is currently being undertaken in the Gateway and is anticipated to be completed by mid-2024. Following remediation, further assessment of groundwater and potential soil vapour risks is required and is planned to occur in 2024. If no unacceptable risks or contamination requiring remediation are identified, the Gateway Detailed Site Investigation (DSI) will be updated, and a Gateway CUTEP Report will be prepared and submitted to the Auditor to inform a Site Suitability Statement in late 2024 or early 2025.

Site Area	Approx. Area (ha)	Site Suitability Statement or Remaining Actions and Activities
Audit Area 4 East	1.20	Remaining environmental impacts or potential impacts known to be present in Audit Area 4 East are: • A remnant fuel pipeline passes through the central portion of Audit Area 4 East. The southern sections of this pipeline were removed as part of remediation of the Precinct North and the Escarpment, however, the remaining pipelines should be removed and capped at the Site boundary. • Buried Asbestos Containing Material (ACM) was uncovered in a hillside in the western portion of the area and is temporarily capped with concrete to prevent disturbance or incidental contact. ACM and surrounding soil should be removed prior to future development. A timeline for remediation has not yet been specified. Following remediation and validation, the Audit Area 4 DSI will be updated, and an Audit Area 4 East CUTEP Report prepared and submitted to the Auditor to inform a Site Suitability Statement.
Regatta Point	0.7	This area is not yet included in the Macquarie Point Environmental Audit but is considered likely to be included in the future. No intrusive investigation of Regatta Point has been undertaken to date. An initial investigation to allow preparation of a DSI report for this area is scheduled for mid-2024. Any remediation or further investigation requirements to allow issue of a Site Suitability Statement will be identified in the DSI and inform future work requirements and timeline.
Royal Engineers Building	0.19	This area is not included in the Macquarie Point Environmental Audit. To date, no potentially contaminating land uses have been identified, or intrusive investigation undertaken, at the Royal Engineers Building. An initial investigation is scheduled for mid-2024 and will inform if any remediation or further investigation requirements are identified.

Notes: [1]The Site Suitability Statement and Audit Report for the Goods Shed and Yard (Audit Area 1) were issued as separate documents. For remaining areas, the Site Suitability Statement (where issued) is contained in the relevant Audit Report.

Future Management and Use

It is planned that, once assessment, remediation, and determination of any future management requirements has been completed for all Site areas, a final review and assessment of Site data will be undertaken in order to:

- Confirm that the data and assumptions inherent to assessment of each individual area are accurate and reflect the Site conditions and proposed future Site uses.
- Assess if any impacts requiring remediation or management remain and determine if any further remediation work is required or management conditions should be adopted in order to prevent any unacceptable level of risk to future Site users, or adjacent sites and ecological systems.

Additional activities may be required prior to or following this review, such as:

- Update of any aged data (for example, groundwater conditions) if a significant period has passed since previous assessments.

- Review and consideration of previous assessment data on any changes in future Site uses. For example, future Site uses under the Precinct Plan may differ than assessment assumptions or may have potential to introduce changes to Site conditions such as groundwater flow and behaviour.
- Further remediation of any identified impacts requiring remediation.

Following this review and completion of any identified additional works, the overall Site data will be submitted to the Auditor for issue of an overall Site Suitability Statement, if they are satisfied that the Site is suitable for the proposed future use and management controls.

Any future development of the Site must comply with the conditions on the Site Suitability Statements. Any changes in the future use of the Site which deviate from the Site Suitability Statements requires documented review and approval from an accredited Environmental Auditor.

The SEMP should be referenced when planning any future work at the Site and include any conditions for be future use documented in the Site Suitability Statements for each sub-area, or for the Site as a whole. The SEMP is intended as a living document to be maintained and updated on a regular basis, or if significant additional Site environmental data is uncovered or Site conditions/uses significantly change.

1.0 Introduction

The Macquarie Point Development Corporation (the Corporation) has engaged the services of AECOM Australia Pty Ltd (AECOM) in the role of Project Remediation Consultant to assist with the development, implementation and ongoing oversight of a remediation strategy for the Macquarie Point site, and adjacent Regatta Point and Royal Engineers Building sites (intended to be added to the overall Macquarie Point site) in Hobart, Tasmania. The Macquarie Point site, Regatta Point, and the Royal Engineers Building are referred to as "the Site" herein, and the location of these land packages are shown on **Figure F1**.

An initial Site Remediation Strategy (SRS) was issued on 15 March 2015 (AECOM, 2015), and reviewed and updated on 22 June 2017 (AECOM, 2017). The remediation requirements and strategies considered in the previous SRSs was based on proposed development of the Site as described in the *Macquarie Point Strategic Framework and Masterplan 2015-2030* (the former Masterplan) (MPDC, 2015).

The Tasmanian Government Department of State Growth announced in September 2022 that the Macquarie Point Site is the preferred location for a future multipurpose stadium. At the request of the Corporation, AECOM has prepared this update to the SRS, to review proposed changes to the planned future development of the Site and assess any changes or additional actions required to address contamination and prevent unacceptable risks to future on- or off-Site human or environmental receptors.

In October 2023, the *Mac Point Draft Precinct Plan* (the Precinct Plan) (MPDC, 2023) was released by the Corporation for the redevelopment of the Site, which sets out a mixed-use precinct comprised of interconnected discrete zones. The Precinct Plan has been submitted for ministerial approval and is expected to the finalised in the near future.

This update to the SRS has been prepared to provide an up-to-date summary of environmental works completed at the Site and to detail potential future requirements (including potential remediation requirements) and implications associated with residual contamination at the Site (e.g. handling and management of contaminated material during construction activities), and any considerations which arise when the Precinct Plan is finalised and adopted as the planned future development scenario for the Site.

1.1 Remediation and Assessment Approach to Date

Based on the former Masterplan, the Site was divided into seven sub-areas for assessment and remediation based on the nature of identified contamination, historic activity, and the intended future uses of each area, as shown on **Figure 1** below and on **Figure F2** in the **Figures** section.

It is noted that:

- The Site sub-areas were previously named Audit Area 1 to Audit Area 7 for environmental assessment purposes. The locations of the current assessment areas and former Audit Areas are shown on **Figure F3** in the **Figures** section for reference. Some historical reports reference these area names.
- The areas referred to as Regatta Point, to the north east, and as the Royal Engineers Building, to the west, were not previously considered part of the Site or included in the former Masterplan. These areas are included in the Precinct Plan, and are currently being transferred to the Corporation and added to the Site as part of the development proposed in the Precinct Plan.

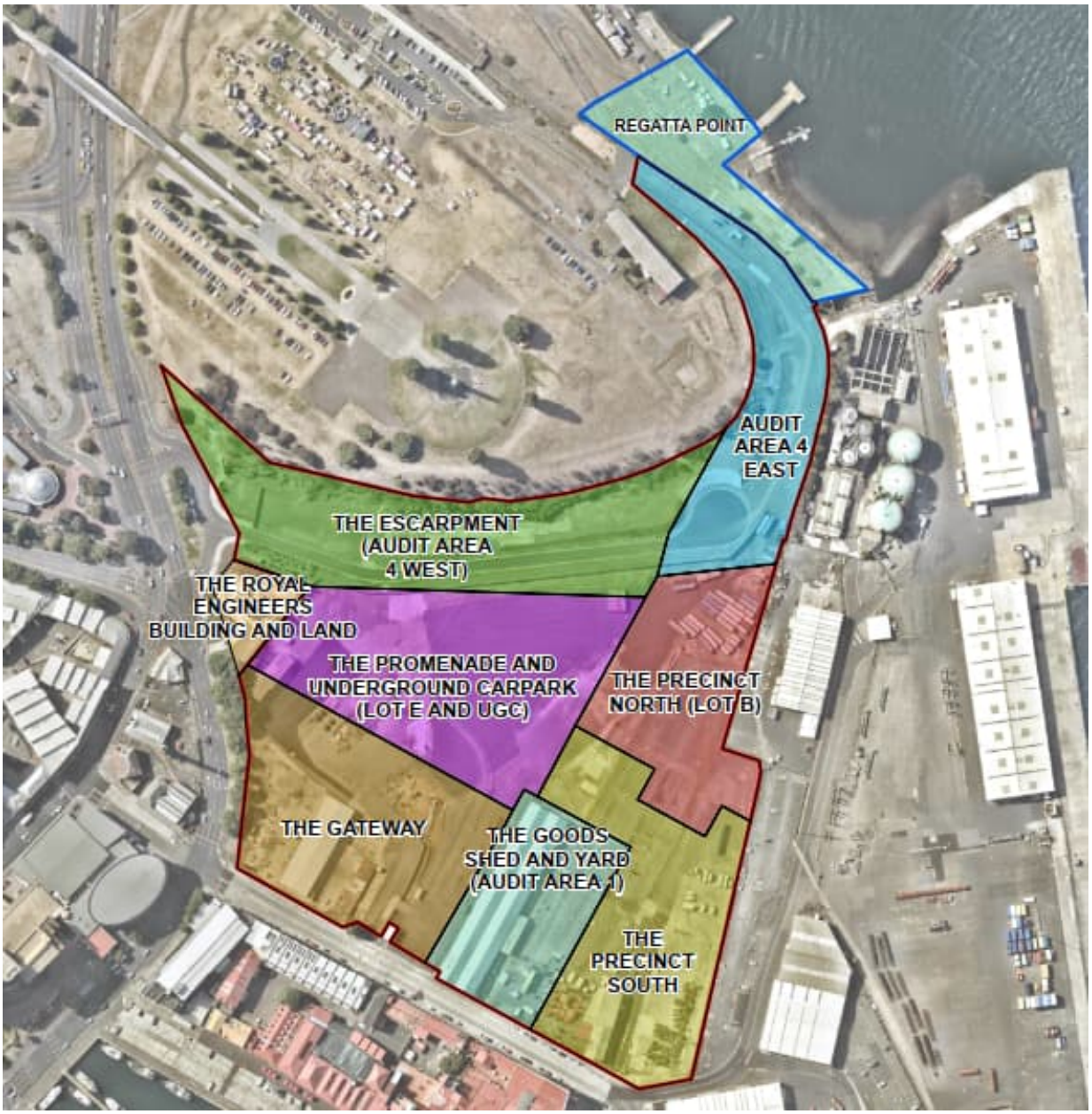

Figure 1 Site Sub-Areas

1.2 Remediation Goals, Strategic Drivers and Requirements

Historic contamination at the Site is a legacy of past land uses, in particular the former gasworks in the vicinity of the southwest area of the Site, fuel handling and transfer in the central portion of the Site, and historical bulk fuel storage facilities located in the general eastern portion of the Site.

The Corporation has a series of overarching and interrelated remediation objectives in relation to the Site. These include:

- Ensuring that there are no unacceptable risks to human health associated with the Site, both to on-Site and off-Site receptors.
- Ensuring there are no unacceptable risks to the off-Site environment / ecology from the Site.

- Remediating the Site to a suitable standard to allow for redevelopment for the intended future land uses.
- Remediating primary sources of contamination as these represent an ongoing source of pollution to groundwater.

These objectives are generally consistent with those adopted by regulatory authorities around Australia. The Corporation has engaged an independent Site Environmental Auditor to provide confidence to key stakeholders that environmental investigations and remedial planning activities have been completed to a level compliant with required standards.

In addition, the *Macquarie Point Development Corporation Act 2012* was amended in 2015 to enable the accreditation of an Environmental Auditor, which for the first time in Tasmania allows for a statutory audit of contaminated land to be undertaken.

1.3 Strategy Objectives

The updated SRS has been developed to be:

- Commensurate with the future redevelopment of the Site with minimal constraints
- Applicable to future development under either the former Masterplan, or development of the multipurpose stadium and surrounding proposed uses in the Precinct Plan.
- Of a standard that complies with relevant legislation, regulations, policies, standards, codes of practice and guidelines.

1.4 Strategy Development

The tasks undertaken to inform the SRS has included:

- Site Characterisation and development of a Conceptual Site Model (CSM)
  - Review of Site history and associated chemicals of potential concern (CoPC).
  - Review of the Site soil, soil vapour and groundwater dataset from past and ongoing environmental investigations and remediation.
  - Assessment of the location of subsurface structures and their impacts on groundwater flow.
  - Review of geotechnical and related subsurface investigations.
  - Development and use of a groundwater model.
  - Development of Tier 1 Assessment Criteria.
  - Identification of potential pathways for the exposure of people and aspects of the environment to Site-related contamination.
- Development of Site Specific Remediation Criteria (RC).

  In order to assist with future remedial planning for the Site, risk-based RC have been derived for soil and groundwater which are protective of human health under potential future land use conditions at the Site.
- Assessment of the potential for off-Site ecological impacts to occur from on-Site contamination.
- Assessment of assessment and remediation work completed and of Site Suitability Statements issued to date, and identification of planned or probable future activities required to achieve Site Suitability Statements for remaining areas of the Site and for the Site as a whole.
- Consideration of implications of adopted of the Precinct Plan and additional assessment or remediation which may be required to achieve Site Suitability Statements if implemented.
- Development of a Site Environment Management Plan (SEMP) for post-remediation management and reduction of risk. The SEMP is a living document which has been updated as further environmental information has been collected and remediation conducted at the Site.

1.5 Site Remediation Strategy – Approach Selection Process

The process used to determine the recommended SRS applied to Site to date and presented in the *Site Remediation Strategy* (AECOM, 2015) and the *Site Remediation Strategy Update* (AECOM, 2017) involved applying a framework which identifies the Corporation's objectives for remediation, followed by an assessment of the practical and proven remediation options that may potentially be implemented at the Site.

Selection of the remediation options was made following consideration of:

- The relevant State regulatory framework.
- AECOM's previous experience with regulators and accredited contaminated land auditors for similar projects.
- Site-specific sensitivities, including proximity to sensitive receptors.
- The nature and extent of contamination.
- Human and ecological receptors at, and surrounding, the Site.
- Potential impacts to the Corporation's image/reputation.
- Demonstrated long-term efficiency and proven technology.
- Ongoing liabilities associated with the selected strategy, including consideration of further remediation/management requirements, etc.
- Time and cost to implement.

The reviewed remediation options were not an exhaustive list but rather cover options that are practical, proven, aim to meet understood project time requirements, and have the potential to be accepted by regulatory authorities.

The adopted methodologies for various contaminated media or sources identified at the Site and implemented to date, and the process by which remediation requirements have been identified and selected, are discussed in **Section 6.0**. No additional information has been identified during assessment and remediation work to date which has indicated an alteration in the proposed remediation technologies or adoption of a new technology since the *Site Remediation Strategy Update* (AECOM, 2017).

2.0 Development Overview

The previous development plan for the Site is provided in *Strategic Framework and Masterplan 2015 – 2030* (the former Masterplan) (MPDC, 2015), which proposes the Site be developed for a mix of uses comprising:

- Residential, including medium to high density
- Commercial, including visitor accommodation, retail, arts and institutional
- Open space, including parks and recreations areas
- Transport, including roads, light rail, cycleway, and pedestrian access
- An Underground Carpark is proposed to be constructed in the Promenade and Underground Carpark Area.

Environmental assessment and remediation of the Site prior to 2023 was guided by the former Masterplan. However, in October 2023, the *Mac Point Draft Precinct Plan* (the Precinct Plan) was released for the redevelopment of the Site, which sets out a mixed-use precinct comprised of interconnected discrete zones.

This update to the SRS is intended to both identify remaining remediation activities and strategy, and to support the implementation of the Precinct Plan, if adopted, and may require update or adaptation if significant changes are made when the updated vision of the Site is finalised.

The Precinct Plan outlines the concept for the Site which comprises mixed use precincts including, but not limited to those summarised in **Table 1** below.

Table 1 Precinct Plan - Proposed Development Precincts

Precinct	Likely Land Use
Aboriginal culturally informed zone	Open space and commercial
Multipurpose stadium and associated concourse zone	Open space and commercial
Royal Engineers building and land	Open space and commercial
Complementary integrated mixed use zone, including restraints, cafes, hotels, medical facilities and commercial office space	Open space and commercial
Antarctic facilities zone including commercial spaces and connections with the complementary integrated mixed use zone	Commercial and underground car parking
Residential development and public foreshore zone accommodating a variety of tenures and housing opportunities, along with a new public promenade and food and beverage offerings	Medium to high density residential, commercial and open space
A transport corridor and roadway linking Regatta Point to the main areas of the Site	Open space / vehicle traffic / foot traffic
A vegetated area along the northern boundary of the Site, where the escarpment below the Hobart Cenotaph would prevent development or construction	Open space

Subsurface utilities and maintenance activities are anticipated to occur in all Site areas.

The concept layout of the Site in the Precinct Plan is shown in **Figure 2** below.

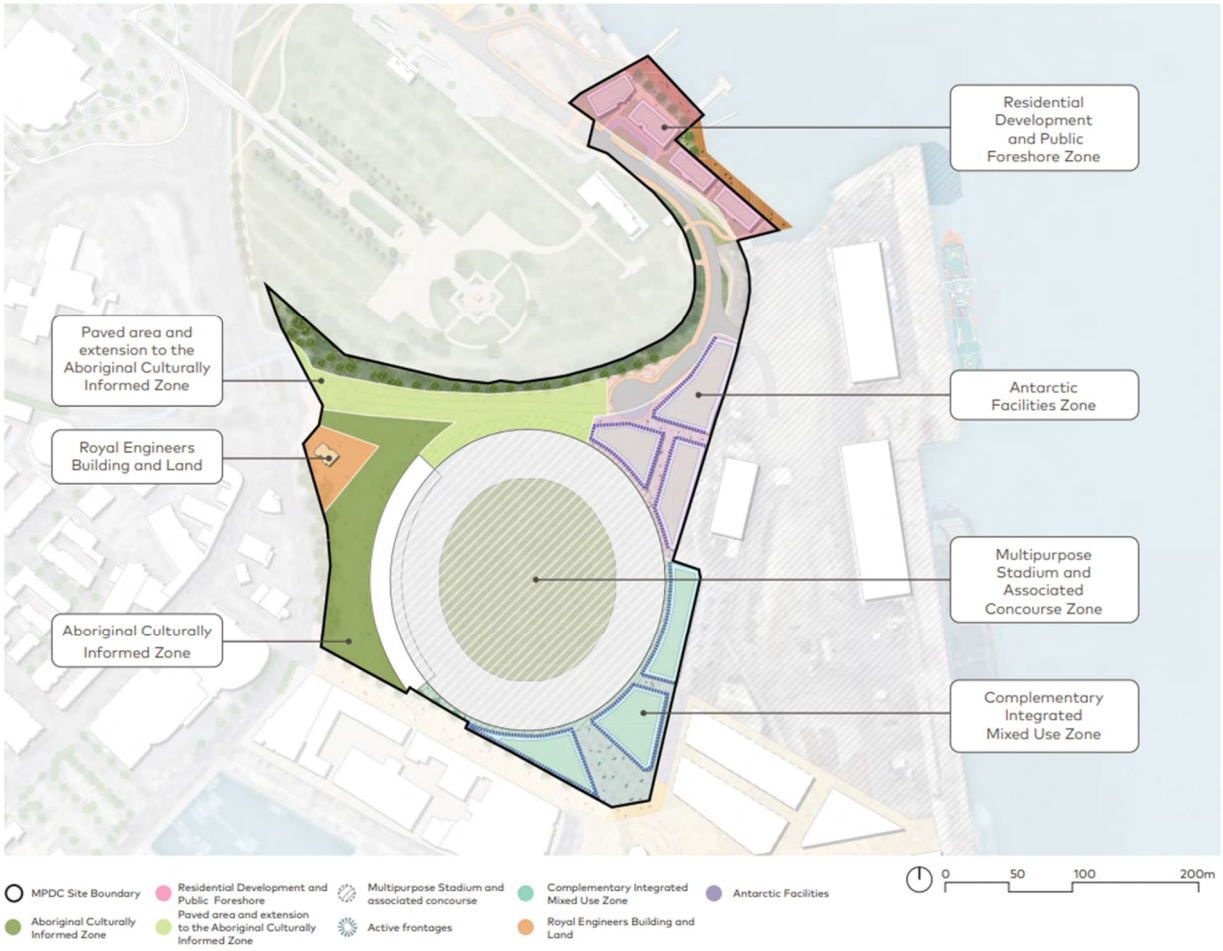

Figure 2 Mac Point Precinct Plan

The development or future use of the Site may interact with contamination at the Site through contact with potentially impacted soil or groundwater via:

- Excavation of soil.
- Construction of building foundations.
- Extraction of groundwater.
- Construction over or within contaminated soil and groundwater.
- Intrusive maintenance works such as installation or access to buried conduits or pipelines.
- Vapour intrusion into structures or conduits.

Identified contamination, and potential future receptors and contact pathways, are discussed and assessed in **Section 5.0**.

3.0 Regulatory Framework

3.1 Site Contamination

The *Environmental Management and Pollution Control Act 1994* (EMPCA) (updated 29 March 2022) is the primary environmental protection and pollution control legislation in Tasmania.

Regulations made under the EMPCA include:

- *Environmental Management and Pollution Control (Smoke) Regulations 2019*
- *Environmental Management and Pollution Control (General) Regulations 2017*
- *Environmental Management and Pollution Control (Noise) Regulations 2016*
- *Environmental Management and Pollution Control (Waste Management) Regulations 2020*
- *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2020*
- *Environmental Management and Pollution Control (Environmental Licences) Regulations 2019*.

Environment Protection Policies (EPPs), which have been made to give effect to the objectives of the EMPCA, include:

- *Environment Protection Policy (Air Quality) 2004*
- *Environment Protection Policy (Noise) 2009*.

On 31 March 2022, the Director of EPA issued a declaration under section 3(3) of the EMPCA defining the level of pollutants which should be considered for the identification and definition of clean fill type 1 and clean fill type 2.

Under the *State Policies and Project Act 1993* is the *State Policy on Water Quality Management 1997* (Water Quality Policy) which relates to surface and groundwaters in Tasmania.

The National Environment Protection Council (1999) *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM, as amended in 2013) is a measure made pursuant to section 14(1) of the Commonwealth *National Environment Protection Council Act 1994* and is referenced in the EMPCA. It is also the primary document referenced by EPA for the assessment of contamination and risk to human health and/ or the environment. As such, the ASC NEPM has been adopted as the overarching project guidance.

Environmental related guidelines to be considered as part of future remedial planning works at the Site should include (but are not limited to):

- *Environmental Management and Pollution Control (Waste Management) Regulations 2010*.
- *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal* (EPA, 2018).
- *Clean fill Type 1 and type 2 – Declaration of pollutant levels* (EPA, 2022)
- *National Remediation Framework* (the NRF) (CRC CARE, 2020)
- *Tasmanian Acid Sulfate Soil Management Guidelines* (DPIPWE, 2009)

3.1.1 Site Environmental Auditor

In 2015, the *Macquarie Point Development Corporation Act 2012* was amended to enable the accreditation of an environmental auditor under Tasmanian legislation. The amended Act enables the Director of the Tasmanian EPA to accredit an auditor. Mr David Lam of Tetra Tech Coffey has been appointed as the Environmental Auditor for the Site and has been accredited as an auditor recognised by the amended Act.

Where there is limited, or a lack of, suitable guidance in Tasmania for the audit, the amended legislation allows for the auditor to defer to other suitable interstate guidance. In this instance, the guidelines

supporting the Victorian EPA Environmental Audit Framework have been adopted, as it is the home state of the appointed Auditor.

It is noted that Victoria legislation which defines the Audit process was updated and superseded by the *Environment Protection Act 2017* (the EP Act), which came into effect on 1 July 2021, and contains significant changes to Audit methodology and terminology under the Victorian framework. Under Section 478 of the EP Act, existing Audits where an Auditor has been engaged prior to 1 July 2021, and the Audit has not been completed by 1 July 2021, can be conducted under either the EP Act or the previous framework. To maintain continuity with the portions of the Audit already completed, the Site Audit will continue under the previous framework and terminology.

The role of the Auditor is to review the progression of investigation, and remedial planning and execution works at the Site. It is understood that the Auditor shall ensure that the works are carried out in compliance with local Tasmanian legislation and guidelines with consideration given to the requirements of the Victorian EPA Environmental Audit Framework.

The ultimate outcome of the Environmental Audit is to obtain a Site suitability statement confirming the Site's suitability for intended future uses. It is noted that the Auditor can issue Site Suitability Statements for separate sub-areas of the Site, and the status of each identified sub-area and Site Suitability Statements issued to date is discussed in **Section 7.3**.

3.1.2 Clean Up to the Extent Practicable

The Audit will include consideration of Clean Up to the Extent Practicable (CUTEP), similar to that adopted by the Victorian audit scheme. Section 1.0 of Victorian EPA Publication 840.2 (2016) *The cleanup and management of polluted groundwater* (EPA Publication 840.2) notes that:

> '*Where polluted groundwater has been identified, EPA Victoria's role is to require clean up. If it is impracticable to clean up groundwater to the level needed to restore beneficial uses, EPA may accept that cleanup to the extent practicable has occurred and that, subject to appropriate ongoing management, further cleanup is not required*'.

Although remediation and assessment of the Site is being conducted under the previous Victoria Environmental Audit framework (as discussed in **Section 3.1.1**), this approach is also reflected in Part 2.2 - Non-aqueous phase liquids, Regulation 15 – Clean up of non-aqueous phase liquids in the Victorian *Environment Protection Regulations 2021*, which states:

> '*A person in management or control of land where a non-aqueous phase liquid is present in soil or groundwater must, so far as reasonably practicable-*
>
> *a. Clean up the non-aqueous phase liquid; and*
>
> *b. If the source of the non-aqueous phase liquid is located on the land, remove or control the source of the liquid.*

The CUTEP process recognises that polluted groundwater should be cleaned up such that the protection of beneficial uses is restored, and where considered acceptable (by the authority, in this case the independent Site Environmental Auditor in conjunction with the Tasmanian EPA), groundwater may be cleaned up to the extent practicable.

It is noted that a CUTEP determination needs to be made for the whole Site, not just individual remediation areas. However, interim agreement has been historically sought from the Site Environmental Auditor that individual areas have reached remediation end-points, so that active remediation works can cease.

3.2 Site Development and Project of State Significance

The development of the Macquarie Point site is managed under the *Macquarie Point Development Corporation Act* 2012.

On 16 October 2023, the Tasmanian Governor declared that the proposal for a multipurpose stadium is a Project of State Significance (POSS) in the *State Policies and Projects (Projects of State Significance) Order 2023.* This declaration order (the Order) was gazetted as Statutory Rule 2023, No. 66, on the

same day as declaration. The Order was approved by both Houses of the Tasmanian Parliament on 8 November 2023, and took effect on 9 November 2023.

Following the making of the Order, the Tasmanian Premier directed the Tasmanian Planning Commission (the Commission) to undertake an integrated assessment of the project addressing the environmental, social, economic and community impacts and other matters. *Guidelines - Macquarie Point Multipurpose Stadium Project of State Significance* (the Guidelines) (TPC, 2024) were issued by the Tasmanian Planning Commission on 16 February 2024, following public display and acceptance of submissions on a draft of the Guidelines between 4 December 2023 and 8 January 2024.

The following sections of the Guidelines are considered to be influenced or have input from this Site Remediation Strategy:

- Section 1.2 – Site Description
- Section 1.3 – Proposed Use and Development
- Section 1.4 – Design and Management Response
- Section 7.0 – Activity and Land Use
- Section 8.5 – Water Quality and Water Management
- Section 8.6 – Solid Waste and Hazardous Material Management
- Section 8.7 – Environmental Hazards
- Section 9.2 – Construction Management
- Section 9.3 – Utility Management

4.0 Site Description

4.1 Site Description and Features

The former Masterplan encompasses only the Macquarie Point site, while the Precinct Plan encompasses the Macquarie Point site, Regatta Point, and the Royal Engineers Building.

Details of each area are provided in **Table 2** below.

Table 2 Overall Site Details

Item	Description
Macquarie Point Site	
Site Address	10 Evans Street, Hobart, Tasmania (refer to the Site Location plan provided as **Figure F1** in the **Figures** section)
Site Area	Approximately 9.3 ha
Current Site Owners	State of Tasmania (Crown Land)
Title Details	Macquarie Point contains the following land title references: • The majority of Macquarie Point is within land title 113521/1 (formerly CT 114462/1) • A portion of the southwest area (within the Gateway area) is within land title 129483/1
Current Zoning (1)	In accordance with the Hobart City Council (HCC, 2021), the *Sullivans Cove Planning Scheme 1997* notes that the Macquarie Point site falls within the *Macquarie Point Mixed Use Zone* and is subject to the following use areas: • Commercial and Institutional • Mixed Use • Open Space.
Current Uses	The following is noted with regard to current Macquarie Point use and features: • The majority of Macquarie Point is currently vacant. Portions of the north and west of Macquarie Point are currently in use for remediation activities, including stockpiling of excavated materials. • The Corporation office building is located in the Goods Shed on the southern boundary of Macquarie Point. The Goods Shed has also been subject to intermittent uses including public events. • An occupied office building (8A Evans Street) is located on the western boundary of Macquarie Point. • The “Red Shed”, located in the south eastern portion of Macquarie Point, is currently used by a microbrewer and includes a public bar. • A warehouse (the SeaRoad Shed) was located in the south-east corner of Macquarie Point but was demolished in 2023. A large slab (the SeaRoad Slab) remains in place and has been used for intermittent storage of construction equipment. • Small retail outlets are located in the area adjacent to the Red Shed (Red Square) which is also used regularly for markets, music and other outdoor events with food vans. • A public car park is present in the south eastern and eastern portion of Macquarie Point.

Item	Description
	• A roadway (the Northern Vehicular Access) is present on the northern portion of Macquarie Point.
Closest Surface Water Body	• Sullivans Cove, approximately 150 m to the south. • River Derwent, approximately 280 m south-east (inferred direction of groundwater flow) and 25 m to the north-east.
Site Layout	**Figure F2** in the **Figures** section
Regatta Point	
Address	A street address is not allocated. Located adjacent to McVilly Drive, Queens Domain
Area	Approximately 0.7 ha
Current Land Owners	The land comprised within Regatta Point is under the authority of: • Department of Natural Resources and Environment Tasmania (DNRET) Property Services (Potential Property ID 2513934), under Crown lease Regatta Point is currently being transferred to the control of the Corporation.
Title Details	• Title details are not available for the public reserve (Potential Property ID 2513934).
Current Zoning	In accordance with the Hobart City Council (HCC, 2021), the *Sullivans Cove Planning Scheme 1997* notes that the Regatta Point site falls within the *Macquarie Point Wharf & River Zone B* and is subject to the following use areas: • Commercial • Mixed Use • Open Space.
Current Uses	The following is noted with regard to current Regatta Point use and features: • A public reserve in the southern portion of Regatta point is used for public open space and recreation. Carparking and access to the River Derwent (via two marine jetties and two boat ramps) are present in this area, and accessible via McVilly Drive. • A pumphouse (under Crown Licence) is present in this area. It is not known if this pumphouse is operational, what use is authorised under its licence, or what historical uses it may have had. • A small two-storey building of unknown use is in this area. • A disused rail line and corridor passes to the west of Regatta Point.
Closest Surface Water Bodies	• The River Derwent is located to the east, immediately adjacent to Regatta Point. • Sullivans Cove is located approximately 560 m to the south at the closest point. Recreational fishing restrictions apply in the waters adjacent to Regatta Point.
Site Layout	**Figure F2** in the **Figures** section
Royal Engineers Building	
Address	2 Davey St, Hobart, Tasmania
Area	Approximately 0.19 ha

Item	Description
Current Land Owners	State of Tasmania (Crown Land). The Royal Engineers Building is currently being transferred to the control of the Corporation.
Title Details	Land title 20552/2
Current Zoning	In accordance with the Hobart City Council (HCC, 2021), the *Sullivans Cove Planning Scheme 1997* notes that the Royal Engineers Building falls within the *Macquarie Point Mixed Use Zone* and is subject to the following use areas: • Commercial and Institutional • Mixed Use • Open Space. The Royal Engineers Building (described as the Royal Engineers Building and Stone Post) is also noted as a Place of Cultural Significance in Schedule 1 of the Sullivan's Cover Planning Scheme 1997.
Current Uses	The Royal Engineers Building is currently used as office/commercial space, with surrounding open grounds and garden spaces. Portions of the surface are sealed with bitumen or concrete, or cover in crushed rock, for foot and vehicle passage.
Closest Surface Water Bodies	• Sullivans Cove, approximately 400 m to the south. • River Derwent, approximately 380 m north-east.
Site Layout	**Figure F2** in the **Figures** section

4.2 Site History

This Site history summary has been informed by:

- The following Austral Tasmania Pty Ltd documents:
  - Macquarie Point Development Project, Historical Summary, dated 15 January 2013 (Austral, 2013)
  - Built Heritage Assessment for the Macquarie Point Site, dated 28 October 2014 (Austral, 2014)
  - Evans Street Historical Research Report, dated 11 June 2015 (Austral, 2015).
- Environmental assessments, investigations, and remediation conducted between 2015 and the present.
- Additional information regarding changes in Site use provided by the Corporation.

Prior to European settlement, Hobart and the surrounding areas, including the Site, were occupied and inhabited by the Muwinina people.

Since first European settlement circa 1804, the Site has been subject to land reclamation events, farming, quarrying and various construction and industrial activities. The Macquarie Point Development Corporation was formed under the *Macquarie Point Development Corporation Act* (2012) in order to assess and remediate the Site for future beneficial development.

A Site history summary, focussing primarily on potentially contaminating land uses or activities regarding Site remediation or changes in use, is presented on **Table 3** below.

Table 3 Site History Summary

Year	Site Use
Prior to and during settlement	• The Site and surrounding area occupied by the Muwinina people. Fishing, including fish traps, hunting, tool making, quarrying and construction of shelters are known to have occurred in the region.
1804 – 1806	• First European settlement and land grants at the Site.
1821	• Government acquires the Site, which was then used for a variety of purposes including a parade ground, accommodation for convicts and housing for veterans. The Government stockyard (and later slaughterhouse [1858]) was located nearby.
1824 – 1825	• Formation of the 'New Cut' to redirect the original course of the Hobart Rivulet. The 'New Cut' was channelled to enter the River Derwent behind the Hunter Street causeway along what is now Evans Street.
1826 – 1827	• Relocation of the government lumber yards to the Site including a slip for landing timber from the River Derwent.
1830s	• Period of land reclamation.
1836	• Royal Engineers take over the lumber yard.
1846	• Royal Engineers establish their headquarters at Macquarie Point. A new office building is constructed, and Edward Lord's former house is used as barracks.
1850s	Period of further land reclamation as follows: • 1852: The landing slip is replaced by a large stone structure known as the Engineers Jetty. • 1854: Hobart Gas Company established and later expanded around the mouth of the Hobart Rivulet during the latter part of the nineteenth century. • 1858: New slaughter yards constructed. It is noted that a substantial amount of land was reclaimed to create space for the facility.
1861	• Rifle Butts (used for target practice) established off the tip of Macquarie Point.
1864	• Former Engineers Yard converted to a Drill Yard. Sheds around the yard were converted for the storage of arms.
1872 – 1876	• Construction of the main rail line commenced in 1872 and was opened in 1876. The Hobart Terminus was located to the north of the Site.
Early 1880s	• Works undertaken to line a section of the Hobart Rivulet with timber retaining walls.
1886	• Kerosene store erected at the rear of the Hobart Gasworks.
1889	• A Sanitary Depot was constructed adjacent to the Hobart Gasworks for the treatment of sewage.
1880s – 1890s	• Construction of a sea wall off Macquarie Point as part of further land reclamation. It is noted that a refuse tip was located in the area.
1904 – 1910	• Septic tanks installed in the southwestern portion of the Site.
1909	• Slaughter yards closed.
1914 – 1915	• Tasmanian Government Railways undertake major expansions at the Site with a new goods shed, coal yards, Roundhouse and rail lines.
1913 – 1917	• Redirection of the Hobart Rivulet under the Domain.
1923 – 1924	• The original course of the Hobart Rivulet was backfilled to become Evans Street.
1924	• Major reconstruction of the Hobart Gasworks including further acquisition of land facing Evans Street for expansion including a tar and liquor tank and new purifiers.

Year	Site Use
1920s – 1937	• 6.5 acres of land acquired for bulk fuel/oil storage.
Pre 1940s – 1980s	• Fuel infrastructure servicing locomotives operated in the Roundhouse Refuelling Area prior to the 1940s and ceased operation in the 1980s.
1940s – 1950s	• New railways workshop established.
1950 – 1978	• Further reclamation works undertaken resulting in the current Macquarie Wharf complex.
1953	• The “Red Shed” was constructed and initially used as a goods shed.
1960s	• Concrete Batching Plant established in the north-western portion of the Site.
1965	• In 1965-1966 the gas manufacturing process at the Gasworks was changed to an oil reformer (from coal gasification), with installation of a 2000-ton storage tank and a pipeline laid to the oil wharf at Macquarie Point.
Early 1970s	• Bulk fuel storage ceased at Macquarie Point.
1978	• Hobart Gasworks closed. Town gas ended and much of the Gasworks infrastructure was demolished.
Late 1970s/ early 1980s – 2015	• Concrete Batching Plant moved approximately 100 m south of original location in the north western portion of the Site.
Early 1980s	• Roundhouse partially dismantled.
Late 1980s	• Roundhouse Refuelling Area decommissioned.
Circa 1995	• It is understood that the Cold Store building was constructed at approximately this time in the southwestern portion of the Site over a section of the former Hobart Gasworks footprint.
2014	• Rail freight and transport operations ceased operation at the Site.
Late 2015	• Concrete Batching Plant decommissioned to the north of the Gateway. • A public car park was constructed to the east of the Goods Shed.
Early 2016	• A microbrewer commenced operation within the Red Shed in the southeastern portion of the Site.
Late 2016	• The “Red Square” was constructed as a public open space area to the west of the Red Shed, in the southern portion of the Site, for use by small mobile businesses.
Late 2017	• The Cold Store was demolished. • The former rail lines that crossed the Site were removed, with the exception of the rail line along the eastern boundary of the Site. • A portion of the Goods Shed Annexe, which included a mechanics workshop, was demolished.
Late 2018	• A cycleway extending through the central portion of the Site in a general north to south direction was constructed as an interim use. • The “Longhouse” was constructed as an interim use. • An Edible Precinct was set up to the west of the Longhouse in raised garden beds.
2019	• The Environmental Auditor issued a Site Suitability Statement for Audit Area 1 (currently referred to as the Goods Shed and Yard) on 5 June 2019. • Remediation of soil impacts in the Northern Refuelling Area and the Concrete Batching Plant areas of Site (Audit Area 4) commenced in late 2019.

Year	Site Use
2020	• Remediation of soil impacts in the Northern Refuelling Area and the Concrete Batching Plant areas of Site (Audit Area 4) completed. • The Environmental Auditor issued a Site Suitability Statement for Audit Area 4 West (currently referred to as the Escarpment) on 24 September 2020. • Remediation of soil impacts in the Northern Refuelling Area and the Concrete Batching Plant areas of Site (Audit Area 4) and in Audit Areas 2 and 7 conducted. • Removal of remnant fuel and oil pipelines conducted in Audit Areas 2, 3, 4, 5 and 7. • Removal of former infrastructure from the Goods Shed Annexe. • Installation of the Northern Vehicular Access roadway in Audit Area 4.
2021	• Roundhouse excavation was undertaken in early 2021 for archaeological investigation. • Excavation of soil from the Roundhouse Refuelling Area, northeast of the former Roundhouse location. • The Environmental Auditor issued Site Suitability Statements for Lot B and the Underground Carpark (currently referred to as the Promenade and Underground Carpark) on 23 July 2021 and for Lot B (currently referred to as the Precinct North) on 22 November 2021. • The Edible Precinct was moved to the east of the Longhouse.
2022	• In Situ Solidification (ISS) remediation Pilot Trial was conducted in the Gateway between 14 June and 4 July 2022. • Demolition of the SeaRoad Shed in the southeast corner of the Site occurred in late 2022. The slab beneath this structure (the SeaRoad Slab) remained intact and in place.
2023	• Remediation of the southeast corner of the Site (the Precinct South) by removal of remnant fuel lines and excavation of impacted soil completed in 2023. • Preliminary (desktop) assessment of Regatta Point conducted.
2024	• Disassembly and removal of the Longhouse from the Gateway. • Remediation of the Gateway area commenced. • Acid sulfate soil assessment commenced.

4.3 Geology

4.3.1 Regional

Tasmania Department of Resources and Energy *Engineering Geology Greater Hobart Area, Map 1* (Hofto, 1990), describes the Site as being underlain by a combination of reclaimed land, Quaternary aged sediments and Dolerite of Jurassic age. Micaceous quartz sandstone and white felspathic sandstone and micaceous mudstone of Triassic age are located to the north and west of the Site.

4.3.2 Local

The Site has been subject to significant filling since the early 1800's with up to 600 m of land reclaimed from the original 1800's shoreline (Department of the Environment, *Australian Heritage Database*, 2007). Fill material has been encountered across the Site to depths of up to approximately 12.0 metres below ground level (m bgl).

Fill material has been described as generally containing a combination of clays, sands, gravels, cobbles and bricks. The thickness of fill is variable across the Site (0.2 – 12.0 m bgl), and generally increases from north to south across the Site consistent with historical land reclamation activities. Note that to date, no intrusive investigations have been completed at the Regatta Point site.

Deeper fill material generally consists of silty sands, similar to the underlying natural estuarine/ marine estuarine deposits, indicating that the deeper fill material may be associated with reworked natural material or dredged material.

Two main natural soil types have been encountered at the Site including estuarine/ marine deposits (silty sands) and weathered Dolerite including clays, gravels and cobbles.

Estuarine/ marine deposits have generally been encountered in the south eastern portion of the Site, ranging in depth from 3.7 -15.0 m bgl. Weathered Dolerite typically underlay the estuarine/ marine deposits (with the exception of the northern portion of the Site where the estuarine/ marine deposits are absent). The weathered Dolerite is encountered at near surface to 1.4 m bgl in the northern portion of the Site, and from 11.2 to 19.0 m bgl in the south eastern portion of the Site.

Dolerite bedrock underlies the fill and natural soils at the Site. Dolerite has been encountered at near surface in the northern portion of the Site and slopes down in a southerly and south-easterly direction to depths of up to 25.0 m bgl. The Dolerite has been described as of high strength and slightly to highly fractured (DP, 2015).

The Site is mapped as having a low probability (6-7%) of Potential Acid Sulfate Soils (PASS), as indicated on LISTmap's Coastal Acid Sulfate Soils (0 – 20m AHD) layer. No PASS or Acid Sulfate Soil (ASS) has been previously identified during investigations. However, this has not been specifically investigated to date. An assessment of PASS and ASS is currently underway (see **Section 7.4.2**), and while full assessment and reporting has yet to be conducted, , preliminary results indicate that PASS may be present in some natural soils below groundwater and may require management for future development.

4.4 Hydrogeology

4.4.1 Regional

Groundwater flow is inferred to be in a general easterly direction toward the River Derwent and is encountered in coastal deposits, alluvial sediment, sandstone and in fractured Dolerite (*Southeast Tasmania Groundwater Map*, DIER, 2006).

Groundwater yield generally ranges from 0.77 to 3.78 L/s in the varying aquifer types, and salinity ranges from 70 – 8,290 mg/L (*Southeast Tasmania Groundwater Map*, Dier, 2006).

4.4.2 Local

The Site is underlain by a single aquifer unit (within multiple lithological units) extending to depths greater than 25.0 m bgl (the maximum depth assessed). Groundwater has generally been encountered in fill material in the central, southern and eastern portions of the Site, extending into the underlying natural material including estuarine/ marine deposits, weathered Dolerite and fractured Dolerite.

The inferred groundwater flow direction in the shallow portion of the aquifer (i.e. monitoring wells installed at depths of ≤ 10 m bgl) is in a general southeast direction, towards the River Derwent (refer to **Figure F4** in the **Figures** section). Groundwater flow direction in the northern and western portions of the Macquarie Point site is inferred to be in a general south easterly direction and is likely to be influenced by the shallow bedrock. Groundwater flow beneath the Regatta Point site is inferred to be in a north easterly direction. Groundwater flow in the central and eastern portions of the Macquarie Point site is inferred to be in a general southerly direction, towards Sullivan's Cove.

The groundwater hydraulic gradient in the central and eastern portion of the Site is relatively flat, when compared to the northern portion of the Site. The difference in groundwater hydraulic gradient is likely a result of:

- Increasing depth to the low permeability bedrock towards the east of the Site, resulting in an increase in potential saturated thickness.
- The Sewer (Main Hobart Pipeline) which is aligned approximately north to south through the centre of the Site.

Groundwater modelling completed by GHD (2016) indicates groundwater flow to the south of the Site is in an easterly direction between the southern boundary of the Site and the location of Hunter Island. The easterly groundwater flow direction is considered to be influenced by Hunter Island, which is likely to be relatively low permeability when compared to the surrounding sediment, and the higher permeability sediment located in the former Hobart Rivulet (i.e. beneath Evans Street). The former Hobart Rivulet is considered to be a likely preferential pathway for groundwater flow.

There are a number of former sea walls located beneath and surrounding the Site (refer to **Figure F5** in the **Figures** section). The sea walls were used the progressive stages of land reclamation and are likely to influence localised groundwater flow direction.

Evidence of tidal influence on groundwater levels has been identified to the south of the Site. Tidal influence (i.e. increasing standing water level (SWL) variations) has been noted to increase toward Sullivans Cove.

Total Dissolved Solids (TDS) concentrations for shallow groundwater on Site are generally low (< 2,272 mg/L), indicating there is likely limited estuarine/ marine water intrusion on Site within shallow groundwater (<10.0 m bgl), however higher TDS is noted in the northern portion of the Site at groundwater well NR2 (measured up to 18,966 mg/L) and off Site, to the south and south east (measured up to 28,391 mg/L) at groundwater well PC08, which is located approximately 120 m further south-east of PC12, on TasPorts land, towards the wharf, where higher interaction with estuarine/ marine water is inferred to occur. Groundwater monitoring locations are shown on **Figure F4**.

Hydraulic conductivity testing undertaken on the southern portion of the Site (AECOM, 2016b) has estimated the hydraulic conductivity of the different lithological units as follows:

- Fill Material – 0.52 m/day
- Alluvial/ Marine Deposits – 0.59 m/day
- Slope Deposits – 0.26 m/day
- Bedrock – 5.3 x 10^{-3} m/day.

4.5 Subsurface Features

Table 4 below provides a summary of currently known subsurface features that may present contaminant source risks or influence subsurface hydrogeology/contaminant transport mechanisms. A plan showing the current known location of subsurface infrastructure is presented in **Figure F5**.

It should be noted that during Site investigations, the Corporation has encountered redundant pipe works and other abandoned services which are not on any records and the origin and purpose of which remains unknown. The potential for unidentified pipe networks or other features to be present below the Site should be considered during future excavation works.

Table 4 Subsurface Feature Summary

Feature	Comment
Gasworks Infrastructure	• Historical gasworks infrastructure is located beneath the Gateway area and former gasworks subsurface infrastructure has been backfilled as part of previous Site development. Remediation (via removal) and validation of identified infrastructure which represents a potential source of contamination in the Gateway, such as buried former process lines and pits, is currently underway.
Roundhouse	• A former Roundhouse was located in the western portion of the Site on the boundary of the Gateway and the Promenade and Underground Carpark areas, and subsurface infrastructure associated with the Roundhouse was backfilled as part of previous Site development. Parts of remaining Roundhouse infrastructure (the central turntable) were excavated and exposed by works in 2021.
Underground Storage Tanks (USTs)	• USTs have been formerly located at the Site. • The following is noted: - Two USTs and associated infrastructure were previously located in the central southern portion of the Precinct South and have been removed. A backfilled former UST pit, associated hydrocarbon

Feature	Comment
	odour and residual impact were identified during the target investigation undertaken in this area in 2014. - A UST and associated infrastructure were present in the south east corner of the Gateway and were removed in 2019. - A review of historical information indicates that potentially two USTs and associated infrastructure were planned for installation in the north western portion of the Escarpment. It is not known if this infrastructure was installed, however no evidence of these USTs was identified, and it is not considered likely that they were constructed. • There is the potential that more USTs are present at the Site that have not yet been identified.
Fuel Transfer Lines	• Disused fuel transfer lines are currently present in Audit Area 4 East and the Gateway areas. Removal of these line is planned prior to completion of the Environmental Audit of these areas. • Portions of fuel lines present in the Precinct North, the Precinct South, and in the eastern section of the Promenade and Underground Carpark area have been excavated and removed in between 2019 and 2023. Removal of pipeline excavations have been validated (noting that Auditor acceptance of validation of pipelines in the Precinct South is still pending)
Sewer (Main Hobart Pipeline)	• The Sewer (Main Hobart Pipeline) currently traverses the central portion of the Site from southwest to northeast. Lead impacts are known to be present in soil around this sewer in the Precinct North area. • A realignment of this sewer is planned to occur in 2024. • A sewer line also runs from the Main Workshop area connecting to the Sewer (Main Hobart Pipeline) in the general central portion of the Site.
Stormwater	• Stormwater infrastructure is located in the general central portion of the Site traversing the Site in a north-south and east–west direction.
Seawalls/ Engineers Jetty	• Seawalls: Historically established for land reclamation purposes. • Engineers Jetty: Constructed on the historical outer edge of the former slaughter yard. • GHD, 2014 identified the likely location of the Engineers Jetty in the general central portion of the Site and a seawall on the eastern Site boundary.
Former Building Footings	• Remnant infrastructure associated with former buildings (such as footings) located across the Site. • It is noted that select structures may have archaeological significance.
Telecommunication services	• Telecommunications enter the Site in the north western portion of the Escarpment. An exclusion zone of 2 m applies around this telecommunications cable, and works should not be completed within this radius without consultation with the asset owner (Telstra Tasmania). • Soil with lead impacts is known to be present within the exclusion zone. • The depths of these services are typically between 0.6 m – 1.2 m bgl.
Other Services	• Water, electricity, gas and communications services are located across the Site.

5.0 Nature and Extent of Contamination

Historical land uses noted on **Table 3** in **Section 4.2** are potential sources of impact to soil and groundwater at the Site.

Environmental investigations completed across the Site to date have identified contamination to soil and groundwater, which may have potential to generate soil vapour, which are summarised by medium below. Potential off-Site sources of contamination are also discussed in **Section 5.5**.

5.1 Chemicals of Potential Concern

Based on the known Site history, **Table 5** below presents a summary of the Chemicals of Potential Concern (CoPC) that may be present based on known historical activities or uncovered during investigation of the Site.

Table 5 Chemicals of Potential Concern Summary

Area	Historical Land Uses	Chemicals of Potential Concern
Goods Shed and Yard	• Freight storage and handling. • Vehicle Maintenance. • Fuel Storage and Handling.	• TPHs, BTEXN, PAHs and phenolic compounds associated with historical fuel storage and transfer activities. • Chlorinated solvents associated with vehicle maintenance activities.
The Escarpment	• Locomotive refuelling comprising fuel storage and transfer facilities. • Railway maintenance workshop. • Rail corridor and fuel transfer infrastructure historically located within the area. • Concrete batching plant.	• TPHs, BTEXN, PAHs and phenolic compounds associated with historical fuel storage and transfer activities. • Chlorinated solvents associated with locomotive maintenance activities and the storage of hazardous materials. • Heavy metals, chlorinated solvents and hydrocarbons associated with workshop and maintenance areas. • Phosphorus and sulphur associated with locomotive washing. • ACM sourced from historical structures (i.e. cladding). • Hydrocarbons associated with the truck wash. • Heavy metals, chlorinated solvents and hydrocarbons sourced from the historical incineration of paint/ solvents
The Promenade and Underground Carpark	• Locomotive refuelling comprising fuel storage and transfer facilities. • Locomotive maintenance. • Freight storage and handling.	• TPHs, BTEXN, PAHs and phenolic compounds associated with historical fuel (diesel) storage and transfer activities. • Chlorinated solvents associated with locomotive maintenance activities. • Heavy metals, asbestos and PAHs sourced from materials used to backfill Roundhouse structures.

Area	Historical Land Uses	Chemicals of Potential Concern
The Precinct North	• Freight storage and handling.	• TPHs, BTEXN, PAHs and phenolic compounds associated with historical fuel (diesel) storage and transfer activities. • Chlorinated solvents associated with locomotive maintenance activities.
The Precinct South	• Freight storage and handling.	• TPHs, BTEXN, PAHs, phenolic compounds, and lead associated with historical fuel storage and transfer activities undertaken adjacent to the Site's eastern boundary.
The Gateway	• Former Hobart Gasworks. • Locomotive refuelling comprising fuel storage and transfer facilities. • Railway maintenance workshop.	• TPHs, PAHs, BTEXN and phenols sourced from coal tar and tar oils, or from historical fuel storage and transfer activities. • Heavy metals, chlorinated solvents and hydrocarbons associated with workshop and maintenance areas. • Phosphorus and sulphur associated with locomotive washing. • ACM sourced from historical structures (i.e. cladding). • Chlorinated solvents associated with locomotive maintenance activities and the storage of hazardous materials. • Complex cyanides, free cyanides and metals sourced from spent oxides. • TPHs, PAHs and metals sourced from coke, coke breeze, ash and clinker residues. • TPHs and BTEX associated with light and drip oils. • Phenols, nitrates, sulphates, sulphides, ammonia and PAHs sourced from ammoniacal recovery wastes.
Audit Area 4 East	• Rail corridor and fuel transfer infrastructure historically located within the area.	• TPHs, BTEXN, PAHs and phenolic compounds associated with historical fuel storage and transfer activities. • Buried Asbestos Containing Material (ACM) has been identified in a section of Audit Area 4 East and is currently temporally capped with a concrete layer.
Regatta Point	• Public boating, yachting, and port activities. • Rail corridor • Fuel pipeline • Land reclamation	• Heavy metals, TPH/TRH, PAH, BTEXN, phenolic compounds, SVOC, VOCs, TBT, OCPs, cyanide, ammonia and ACM have all been identified as potential CoPCs in Regatta Point based on current and historical uses. No field assessment has been conducted to date.

Area	Historical Land Uses	Chemicals of Potential Concern
Royal Engineers Building	• Historic use as a lumberyard • The Royal Engineers Building was constructed in 1836 and has occupied this area since.	• No CoPC have been identified for the former uses of this land.

Notes: TPHs – total petroleum hydrocarbons; PAHs – polycyclic aromatic hydrocarbons; BTEXN – benzene, toluene, ethylbenzene, xylene, naphthalene; ACM – asbestos containing material; VOC – volatile organic compounds; SVOC – semi VOC; TBT – tributyltin; OCP – organochlorinated pesticides.

In additional, the Site is mapped as having a low probability of Potential Acid Sulfate Soils (PASS) and subsurface works, particularly work involving disturbance of soils below the water table, should consider the possibility of PASS being present. Preliminary review of results from investigation into the presence of PASS or actual Acid Sulfate Soil (ASS) current underway (discussed in **Section 7.4.2**) have indicated that PASS may be present in some geological units below the Site.

5.2 Soil

5.2.1 Fill Material

Shallow soil across the majority of the Site consists of fill material used for land reclamation or construction during the Site's history.

Soil samples collected during the investigation of the Site have been assessed against adopted Tier 1 Criteria for the following uses:

- Maintenance of Modified/Highly Modified Ecosystems
- Human Health
  - Low and Medium/High Density Residential
  - Recreation/Open Space
  - Commercial Industrial
  - Shallow Trench Worker
- Buildings and Structures
- Aesthetics.

The following CoPC have been detected in excess of one or more of the adopted Tier 1 Criteria in soil samples collected from the Site:

- TRH– C_6–C_{16}, C_{10}-C_{40}
- Benzene, naphthalene
- PAHs – benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, Sum of PAHs
- Metals – arsenic, cadmium, chromium, copper, lead, nickel, zinc
- Cyanide (Total).

While exceedances of the Tier 1 Criteria may remain present in some Site soil following completion of remediation, Site Specific Remediation Criteria, as discussed in **Section 7.1**, have been developed and implemented to identify soil to be remediated or removed from the Site as part of the SRS.

5.2.2 Natural Soil

The soil investigations undertaken between 2015 and 2020 identified a combination of copper, lead, nickel, zinc and TRH at concentrations in excess of the adopted Tier 1 Criteria for the assessment of risk to human health and ecological receptors in natural soils at select locations.

Preliminary indicators of PASS have been identified in some natural soils beneath the water table but require completion of assessment and analysis of results to determine any future management requirements.

5.2.3 Areas of Notable Impact

As part of the Environmental Audit process for sub areas of the Site, the following areas of notable impact to soil have been identified:

Table 6 Soil Impacts - Areas of Notable Impact

Area	CoPC	Description
The Promenade and Underground Carpark	Lead	Areas of lead-impacted soil which may present a risk to future Intrusive Maintenance Workers (i.e. workers installing or maintained subsurface conduits) are present in the Promenade and Underground Carpark Area, generally at a depth of >2 m bgl.
	Asbestos	Isolated fragments of Asbestos Containing Material (ACM) have been uncovered in fill in this area. Anecdotal evidence indicated that trenches and service pits associated with the former Roundhouse which was present in this area may have been backfilled with building rubble including ACM, although investigation to date has not uncovered any.
The Escarpment	Lead	Lead-impacted soil which may present a risk to future Intrusive Maintenance Workers (i.e. workers installing or maintained subsurface conduits) is present in the exclusion zone surrounding a telecommunications cable in this area.
The Precinct North	Lead	Lead impacted soil which may present a risk to future Intrusive Maintenance Workers is present: • On the eastern site boundary • In the soil surrounding the Main Hobart Sewer line
	Petroleum Hydrocarbons	Hydrocarbon impacted soil which may present a risk to future Intrusive Commercial Workers is present on the eastern site boundary.
The Precinct South	Lead	Lead-impacted soil which may present a risk to future Intrusive Maintenance Workers (i.e. workers installing or maintained subsurface conduits) is present on the boundary with the Precinct North. Impacts do not extend into the Precinct North at depths <2 m bgl, following remediation in 2020.
The Gateway	Coal Tar	Coal tar, associated with the historic Hobart Gasworks, has been detected in soil in the south and southwest sections of the of the Gateway area. Remediation of coal tar via in situ solidification was commenced in May 2024.

Area	CoPC	Description
Audit Area 4 East	Asbestos	Fragments of corrugated ACM roofing materials between 5 and 300 mm in size were detected within an embankment within Audit Area 4 East, adjacent to the boundary with the Escarpment.

These areas are shown on **Figure F5** Further detail on the location and extent of these impacts, and management controls required for safe future works in the vicinity of these impacts, can be found in the SEMP developed for the Site.

5.2.3.1 Asbestos

Asbestos or ACM fragments have previously been observed in the following locations at the Site soil:

- Isolated small ACM fragments have been observed at the surface and encountered in fill material in the Promenade and Underground Carpark, and the Escarpment areas and have been collected and removed by the Corporation or a licensed asbestos subcontractor.
- Larger ACM fragments (5 to 300 mm in size) have been encountered buried in the side of an embankment in Audit Area 4 East.
- Asbestos fibres were detected in a bituminous cladding on former fuel lines which were present beneath the Precinct North, Precinct South, and Gateway areas of the Site. Pipelines have been removed within the Precinct North and the Precinct South, and removal of the fuel line within the Gateway has been partially completed and is expected to be completed before the end of May 2024.

Asbestos is also known to be present within the Goods Shed building.

An Asbestos Register has been prepared for the Site, and this register should be referred to prior to undertaking works on the Site.

In the event that potential ACM is encountered in soil during subsurface works, all activities are to cease immediately in the immediate work area. A suitably experienced environmental practitioner should be consulted to provide advice regarding the removal and management of ACM in soils prior to works re-commencing.

5.3 Groundwater

Groundwater Monitoring Events (GMEs) were routinely conducted for monitoring groundwater wells located on-Site between January 2015 and November 2019. Targeted GMEs have been conducted in 2022 in the Gateway, and in 2023 in the Precinct South.

Groundwater sample analytical results have been assessed against adopted Tier 1 Criteria for the following uses:

- Drinking water
- Irrigation
- Industry
- Stock watering
- Ecosystem protection
- Recreation - Primary and Secondary Contact
- Aesthetics
- Buildings and Structures
- Vapour Intrusion – Residential and Commercial/Industrial.

The following CoPC have been detected in excess of one or more of the adopted Tier 1 Criteria in soil samples collected from the Site:

- TDS
- TPH C_{10}-C_{36},
- TRH C_{10}-C_{40}
- Benzene, naphthalene
- PAHs – anthracene, benz(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, pyrene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, dibenzofuran, phenanthrene, fluoranthene, 2.4-dimethylphenol
- Metals – aluminium, arsenic, boron, cobalt, copper, iron, lead, manganese, vanadium, zinc
- Ammonia (as N), chloride, sodium, phosphorus, sulphate
- Cyanide
- E. Coli
- pH.

While exceedances of the Tier 1 Criteria are in areas of Site groundwater, they may be managed by implementation of the safety and environmental control measures in this SEMP. Areas of non-aqueous phase liquid (NAPL) have been identified on the Site and are discussed in **Section 5.3.1** below.

5.3.1 NAPL

Environmental investigations completed at the Site to date have identified four areas with NAPL present in groundwater on Site, which are summarised on **Table 7** and shown on **Figure F5** in the **Figures** section.

Remediation, which has been or is being conducted, and current and/or future management requirements, for all identified NAPL areas are discussed in **Section 6.0** below.

Table 7 Contaminant Source Zones

ID	Location	Contaminants Identified	Inferred Contamination Source
LNAPL Plume A1	Central portion of the Site, Promenade and Underground Carpark	Metals, TPH, PAH	LNAPL (likely diesel) has been identified at the water table and is likely associated with locomotive refuelling activities (AECOM, 2017c).
LNAPL Plume A2	Central portion of the Site, Promenade and Underground Carpark		
LNAPL Plume B	South eastern portion of the Site, Precinct South		LNAPL (likely a combination of diesel and petrol) has been identified at the water table and is likely associated with locomotive refuelling activities (AECOM, 2017c).
Tar Plume A (DNAPL)	The location of a former horizontal retort in the south-west corner of the Site, the Gateway	Metals, TPH, PAH, BTEX, Phenolics	DNAPL impacted material in soil and groundwater has been identified to a maximum depth of 12 m bgl.

ID	Location	Contaminants Identified	Inferred Contamination Source
Tar Plume B (DNAPL)	The location of a former tar tank in the south-west portion of the Site, the Gateway		The DNAPL is associated with tar from the production of coal gas which was previously undertaken on the footprint of the Cold Store and off-Site to the west of the Cold Store. Four areas considered likely to have bulk DNAPL identified as Tar Plumes A to D. Remediation of Tar Plume A and B was commenced in April 2024. Tar Plumes C and D are currently inaccessible due to a high voltage power cable in soil above them, and require future controls on works in the area to mitigate potential risk to human health via vapour inhalation and potential soil impacts. t Limited DNAPL may be present in soil within the Gateway area, and it is also considered possible that DNAPL is present in underlaying dolerite bedrock beneath the former Gasworks area. Groundwater impact, likely associated with both on- and off-Site portions of the former Hobart Gasworks has been identified off-Site. (AECOM, 2024a).
Tar Plume C (DNAPL)	The western boundary of the Site, the Gateway		
Tar Plume D (DNAPL)	The western boundary of the Site, the Gateway		

5.4 Soil Vapour

Soil vapour monitoring events have been conducted across the Site between 2015 and 2019 at locations where concentrations of VOCs and SVOCs in soil or groundwater were in excess of the Tier 1 vapour intrusion criteria selected (as noted in **Section 5.2** and **5.2.3.1**), or in the vicinity of the LNAPL plumes (**Section 5.3.1**) to enable assessment of potential risks posed by soil vapour to potential future users of this area.

Assessment of potential vapour intrusion risks associated with the LNAPL plumes undertaken in *Soil Vapour and Indoor Air Investigations 2019* (AECOM, 2021h) surmised that soil vapour impacts associated with the LNAPL plumes do not present an unacceptable risk to the planned future uses of the Site.

Soil vapour investigations identified methane exists in potentially hazardous concentrations in the subsurface within the Precinct North and the Promenade and Underground Carpark Area. The risk from soil methane in the area assessed has been calculated as CS3 – Moderate Risk, as defined by *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (EPA NSW, 2020), and appropriate mitigation measures should be included in future building design in this area or when conducting works in potentially enclosed spaces, such as pits, trenches or conduits, in these areas.

No potentially hazardous soil vapour associated with impacts from the former Hobart Gasworks, a portion of which was located beneath the Gateway, has been identified. Previous assessment has been limited to potential vapour intrusion in the Longhouse, a structure previously present in the Gateway,

and further assessment is scheduled to be conducted following completion of remediation of DNAPL commenced in 2024.

5.5 Potential Off-Site Sources of Contamination

The following potential off-Site sources of impact are currently identified:

- Based on a review of available historical information, it is understood that the former Hobart Gasworks footprint extends west across Davey Street, and to a lesser degree south beyond Evans Street. As such, the potential exists for historical gas works infrastructure and related contamination to remain *in situ* to the west and south of the Gasworks (Cold Store) footprint which may be an ongoing source of groundwater impact. Further, historical information indicates that Evans Street was previously known as 'Gasworks Strait' in which discharge of wastes from the former Hobart Gasworks was potentially released.
- The location of former bulk fuel storage facilities located on the eastern boundary of the Site.
- Former fuel transfer lines entering the northern portion of the Site and along the eastern boundary of the Site at various locations.
- The Sewage Treatment Plant located on the north-eastern boundary of the Site.
- Historical land uses on the southern side of Evans Street.

It is noted that additional off-Site sources to those identified above may be present.

5.6 Contamination Transport Pathways

The Site subsurface comprises a number of features likely to have an effect on the transport of contaminants, including (but not limited to):

- Unconsolidated fill material.
- Historical subsurface features including the former Hobart Rivulet, Engineers Jetty and seawalls.
- Subsurface infrastructure including sewer, stormwater, historical fuel/oil transfer lines, electricity, water, gas and communications.
- Relatively shallow groundwater ranging from 0.46 m AHD and 6.86 m AHD.

Potential contaminant transport pathways are summarised in **Table 8** below.

Table 8 Potential Contaminant Transport Pathways

Source	Potential Pathway	Description
Soil	Direct contact and incidental ingestion	Direct contact with impacted soil
	On and offsite transport of soil	Offsite transport of potentially impacted soil in wind-blown dust or as run-off from stockpiled soil
Groundwater	Direct contact and incidental ingestion	Direct contact with impacted groundwater
	Migration of groundwater	Lateral and/or vertical transport and migration of impacted groundwater from onsite to offsite groundwater
	Discharge to surface water	Discharge of offsite groundwater to offsite surface water bodies

Source	Potential Pathway	Description
Soil Vapour	Vapour Intrusion	Vapour migration from soil or groundwater to nearby buildings or accumulation of vapour within buildings or excavations.

5.7 Potential Human and Ecological Receptors and SPR Linkage Assessment

Potential human and ecological receptors, and the exposure pathways by which they may come into contact with identified Site contamination, are identified on **Table 9** below.

The assessment has considered whether a Source-Pathway-Receptor (SPR) linkage is considered to be potentially complete, unlikely to be complete, not complete or requiring further assessment, based on the results of investigations to date. SPR linkages are considered to be potentially complete where an exposure pathway links a source of contamination to a receptor and may represent a risk to future receptors under the development of the Site proposed in either the former Masterplan or the Precinct Plan as described in **Section 2.0**.

Assessment of SPR linkages has assumed that the controls and management methods in the SEMP and the Site Suitability Statements prepared to date will be implemented, and that the current SEMP will be applied to the Site as a whole under future development. It has been assumed that remediation to a level suitable to achieve Site Suitability Statements under the SEMP will be completed.

No intrusive investigation of Regatta Point or the Royal Engineers Building has been conducted to date, and no assessment of potential SPR linkages for this area has been conducted.

A preliminary assessment of the status of potential SPR linkages if the development proposed in the Precinct Plan proceeds has been conducted under the assumptions that:

- The Site uses of the area considered will be open space or commercial/industrial, as described in **Section 2.0**.
- Excavation of soil to a depth of 1 m AHD may occur in the multipurpose stadium and concourse zone to allow for required roof heights and sub-stadium structures and conduits.
- Piles or footings to dolerite bedrock will be required for the multipurpose stadium.
- Underground carparking in the Antarctic Facilities zone will involve excavation below the shallow water table in the eastern portion of the Site.

The development scenario in the Precinct Plan requires further refinement, and SPR linkages presented below will require reassessment and re-evaluation as this occurs.

Table 9 Potential Receptors and SPR Linkage Assessment

Source	Pathway / Transport Mechanism	Receptor(s)	SPR Assessment		Comments
			Former Masterplan	Precinct Plan	
Onsite					
Soil	Direct contact or incidental ingestion	Commercial and recreational open space users and Site visitors	Pathway not complete		The SEMP requires establishment and maintenance of barriers between Site users and visitors and potentially impacted soil, which will be included in future development plans to prevent any contact with Site soil.
		Intrusive maintenance or construction workers	Pathway potentially complete		Intrusive maintenance or construction workers may come into contact with contaminated soil or PASS and will require documented safety and environmental management plans and mitigation methods for safe work, included in the SEMP.
		Terrestrial ecology	Pathway not complete		The SEMP requires establishment and maintenance of barriers between any potential future terrestrial ecology to be established at the Site, which will be included in future development plans to prevent any contact with Site soil.
Groundwater	Direct contact or incidental ingestion	Commercial and recreational open space users and Site visitors	Pathway not complete	Further investigation required	The SEMP prohibits extraction of groundwater for irrigation or recreational use, which will be implemented as part of overall Site management and development. The development scenario within the Precinct Plan includes excavation and underground carparks which may potentially introduce contact pathways to groundwater and may require additional assessment.
		Intrusive maintenance or construction workers	Pathway potentially complete		Intrusive maintenance or construction workers may come into contact with contaminated groundwater and human health and environmental risks should be managed by documented controls in the SEMP.
		Terrestrial ecology	Pathway not complete		The SEMP prohibits extraction of groundwater for irrigation use, which will be implemented as part of overall Site management and development.

Source	Pathway / Transport Mechanism	Receptor(s)	SPR Assessment		Comments
			Former Masterplan	Precinct Plan	
Soil Vapour	Inhalation, or accumulation to hazardous levels within structures, excavations or conduits, of vapours derived from contaminated soil and groundwater	Commercial and recreational open space users and Site visitors	Further investigation required		Potentially hazardous soil methane concentrations have been identified within the central and south-eastern areas of the Site and have mitigation and development requirements documented in the SEMP and Site Suitability Statements issued to date. No potentially hazardous soil vapour concentrations have been identified elsewhere on the Site, including where assessed in areas where soil or groundwater contamination concentrations indicate the potential for hazardous soil vapour generation. However, further assessment is required as: Limited assessment of potential soil vapours derived from gasworks impacts within the Gateway area has been conducted to date. Previous assessments of soil vapour have assumed limited or no change in Site elevation and have not accounted for potential modification to the Site surface which may arise under the Precinct Plan.
		Intrusive maintenance or construction workers	Further investigation required		
		Terrestrial ecology	Pathway not complete		It is considered unlikely that potentially hazardous vapours which migrate upwards from soil and groundwater impacts will have the potential to accumulate within any open air terrestrial ecology established at the Site following development.
Off-Site					
Soil	Direct contact or incidental ingestion	Adjacent site users	Pathway not complete		The SEMP requires: • Establishment and maintenance of barriers at the Site surface to prevent dust generation. • Adoption of soil handing and management procedures to prevent dust generation during any excavation or construction works.

Source	Pathway / Transport Mechanism	Receptor(s)	SPR Assessment		Comments
			Former Masterplan	Precinct Plan	
		Surrounding terrestrial and aquatic ecology	Pathway not complete		The SEMP requires: • Establishment and maintenance of barriers at the Site surface to prevent dust generation. • Adoption of soil handing and management procedures to prevent dust generation during any excavation or construction works.
		External sites receiving material (i.e., excavated Site soils)	Pathway not complete		The SEMP requires assessment and management of excavated soils in accordance with Tasmanian and Australian legislative and regulatory requirements for safe handling and disposal.
Groundwater	Direct contact or incidental ingestion	Adjacent site users	Pathway unlikely to be complete		Direct contact or use of groundwater by surrounding sites is considered unlikely based on the conditions of groundwater (saline in the inferred direction of groundwater flow from the Site) and readily available reticulated water supply.
		Recreational users of River Derwent and Sullivans Cove	Pathway unlikely to be complete	Further investigation required	While limited interaction between Site groundwater and Sullivans Cove has been previously identified, no direct pathway or potentially hazardous concentrations of contaminants could represent harm to recreational uses of water bodies has been identified. Changes to groundwater conditions and transport pathways may occur under the development scenario in the Precinct Plan, and further assessment and investigation may be required.
		Intrusive maintenance or construction workers	Pathway potentially complete		Intrusive maintenance or construction workers in off-Site areas may come into contact with contaminated groundwater migrating from the Site.

Source	Pathway / Transport Mechanism	Receptor(s)	SPR Assessment		Comments
			Former Masterplan	Precinct Plan	
		Aquatic organisms in River Derwent and Sullivans Cove	Pathway unlikely to be complete	Further investigation required	Potential ecological impacts to off-Site ecological receptors from Site groundwater under current conditions and the development with the former Masterplan have been assessed and are considered unlikely (AECOM, 2020b). Changes to groundwater conditions and transport pathways may occur under the development scenario in the Precinct Plan, and further assessment and investigation may be required.
		Terrestrial ecology	Pathway unlikely to be complete		Use of potentially contaminated groundwater for irrigation is considered unlikely due to the groundwater condition (saline) and the presence of readily available reticulated water supply.
Soil vapour	Inhalation, or accumulation to hazardous levels within structures, excavations or conduits, of vapours derived from contaminated groundwater	Adjacent site users	Pathway unlikely to be complete	Further investigation required	Groundwater concentrations indicative of potential generation of hazardous vapours have not been detected at the Site boundaries. Changes to groundwater conditions and transport pathways may occur under the development scenario in the Precinct Plan, and further assessment and investigation may be required.
		Intrusive maintenance or construction workers	Pathway unlikely to be complete	Further investigation required	
		Terrestrial ecology	Pathway unlikely to be complete		It is considered unlikely that potentially hazardous vapours which migrate upwards from soil and groundwater impacts will have the potential to accumulate within any open air terrestrial ecology established at the Site following development.

Notes: Cell shading – Green indicates that the pathway between a potential contamination source and receptors is not assessed as complete and no risk is likely to be present; Orange indicates a pathway has the potential to be complete and may require additional remediation or mitigation measures; Teal indicates that a pathway is unlikely to be complete, but assumes conditions in areas beyond the Site; Blue indicates that further investigation is required to assess if a pathway exists between potential contamination and receptors.

6.0 Site Remediation Strategy

6.1 Site Remediation Framework

The overall remediation strategy flowchart adopted for the Site is presented on **Plate 1** below. As noted in **Section 1.1**, the main Site area has been divided into seven sub-areas for the purpose of issue of Site Suitability Statements, with Regatta Point identified as potential additional area which will be assessed and, if required, remediated using the framework below.

The planned implementation of this framework for identified contaminated media is discussed below in **Sections 6.2 to 6.2.3**. Remediation and assessment completed to date, and identified or probable future remediation, is discussed in **Section 7.0**.

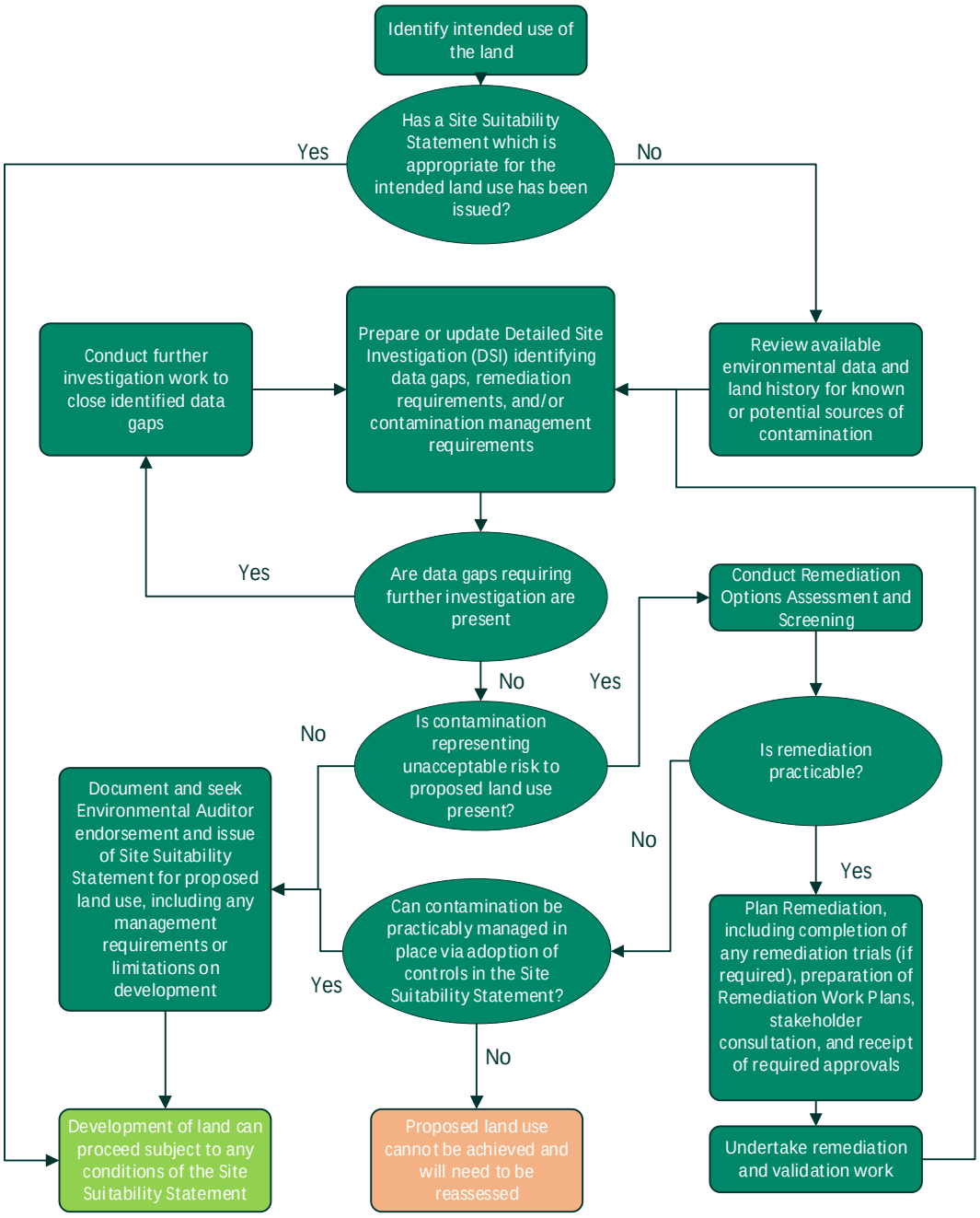

Plate 1 Site Remediation Strategy Flowchart

6.2 Soil

Soil impacts requiring remediation which have been identified to date have been primarily attributed to:

- Land reclamation and backfilling.
- Spills or leaks from previous industrial Site use, including fuel storage and gasworks use.

Other known or potential sources of contamination in soil are discussed in **Sections 6.2.1** to **6.2.3** below.

The process by which contaminated soil has been identified and remediated or had future management requirements identified is presented on **Plate 2** below.

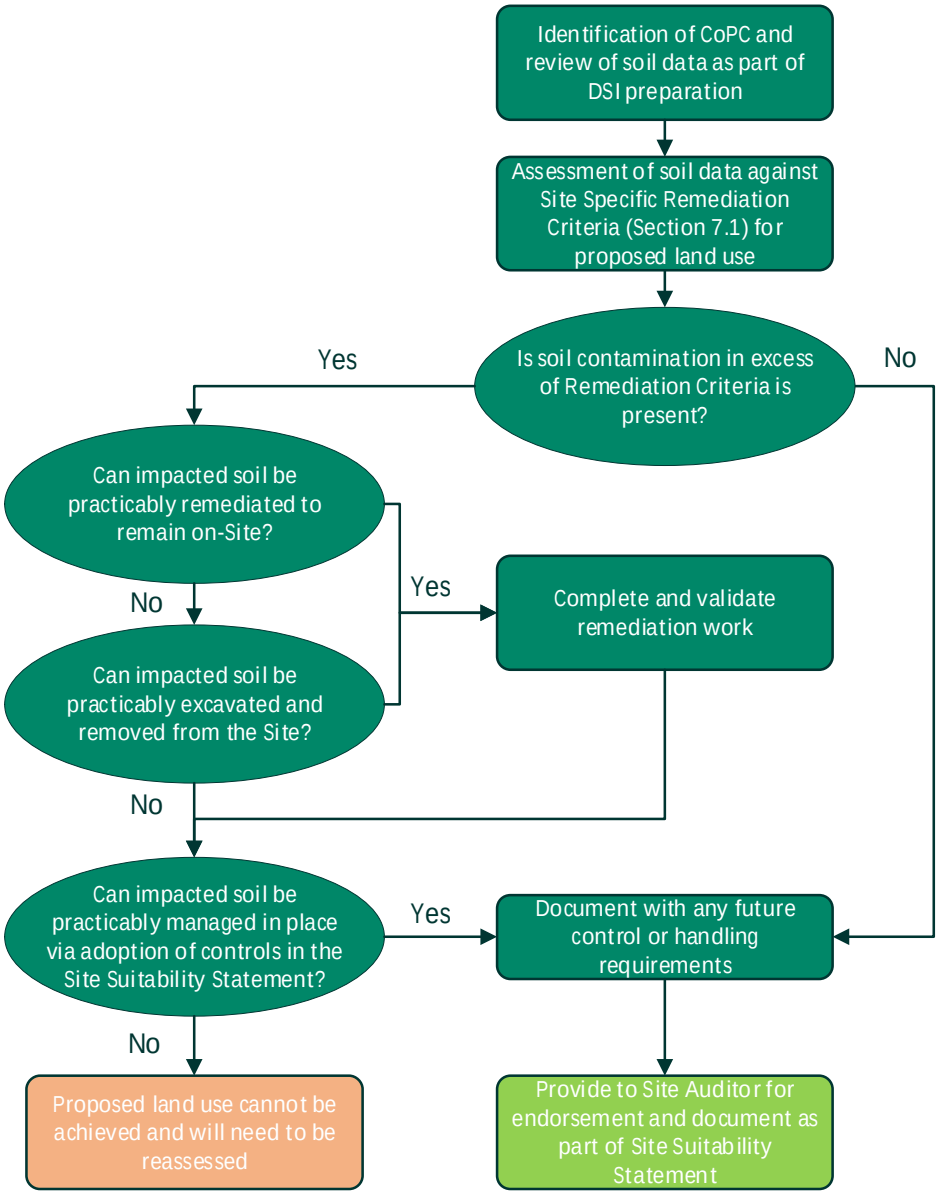

Plate 2 Soil Remediation Flowchart

6.2.1 Remnant Infrastructure and Pipelines

Buried remnant infrastructure (such as fuel tanks, process and transport pipelines, and sumps) have been located or potentially identified as present, in the Site subsurface.

Where remnant infrastructure has been identified, or if future work uncovers previously unknown infrastructure, assessment of remediation requirements has or will be conducted to consider if:

- The infrastructure is or could be a potential source of impact to Site soil or groundwater. E.g., has, or may have, been used for storage or transport of sources of impact, such as fuel oils, or for contaminating activities, such as engine maintenance work?
- Does the infrastructure indicate there may be other sources of current or future impact in the area? For example, a UST may have leaked and lead to NAPL impacts in surrounding soil or groundwater.

All identified contaminating or potentially contaminating infrastructure has or will be removed via excavation. Areas of soil where infrastructure was present have or will be documented, and surrounding soil assessed and validated for any residual contamination or impact.

In areas where buried infrastructure is present but does not represent an environmental risk (e.g., buried building footings which are not a source of contamination), may remain in place if not practicably removable or if it does not represent an impedance to future Site development.

6.2.2 Asbestos Containing Material (ACM)

ACM has been identified in Site soil in three primary types as described in **Section 5.2.3.1**:

- Isolated fragments in fill
- An area with a high concentration of larger buried fragments in fill in Audit Area 4 East
- Bituminous cladding on remnant fuel pipelines.

ACM is also noted to be present above the Site surface in existing buildings. Removal and disposal of this material will be undertaken and documented as part of demolition of structures.

The remediation strategy for ACM or suspected ACM adopted for the Site is:

- Asbestos presence/absence should be assessed via laboratory analysis. The size, abundance, and whether ACM is friable or non-friable should be recorded.
- Where identified, all ACM should be added to the Site Asbestos Register.
- ACM fragments uncovered should be safely packed and removed from Site where practicable, in accordance with relevant Codes of Practice and associated regulatory requirements. Further assessment, in accordance with the ASC NEMP, should be conducted to assess if fragments represent a risk to future Site users.
- ACM present in pipe cladding should be removed (with the pipe) and disposed off Site. Soil surrounding the pipe should also be excavated for off-Site disposal and considered as potentially ACM containing waste.

Any area where ACM or ACM-containing soil is removed should be validated as ACM-free by a suitably certified practitioner.

6.2.3 Acid Sulfate Soil

Identification, remediation and management of PASS or ASS identified on the Site is, and will be, conducted in accordance with the *Tasmanian Acid Sulfate Soil Management Guidelines* (DPIPWE, 2009).

Assessment of Site soils for PASS or ASS was commenced in April 2024 (see **Section 7.4.2**), and results of field samples have not yet been fully assessed or reported. However, preliminary review of sample analysis has identified potential PASS in some Site soil, and it considered likely that development and implementation of an ASS Management Plan will be required as part of any future Site activities or development.

While not yet developed, the ASS Management Plan should document procedures and controls to:

- Allow future Site users to identify ASS or PASS.
- Avoid or minimise the disturbance of PASS or ASS in Site modification and development.

- In the event that disturbance of PASS or ASS cannot be avoided, provide methodologies for the safe handling, neutralisation, and disposal of PASS and ASS without potential acidification of soil and impact to the Site or the disposal facility.

6.3 Groundwater

Groundwater impacts requiring remediation which have been identified to date have consisted of NAPL impacts:

- LNAPL plumes arising from historic fuel storage on the Site.
- DNAPL plumes arising from historic gasworks activities.

Specifics of the remediation strategies for LNAPL and DNAPL are provided in **Sections 6.3.1** and **6.3.2** below. No groundwater requiring direct remediation has been identified at the Site to date.

Plate 3, below, presents the process implemented for identification and remediation or identification of future management requirements of groundwater impacts.

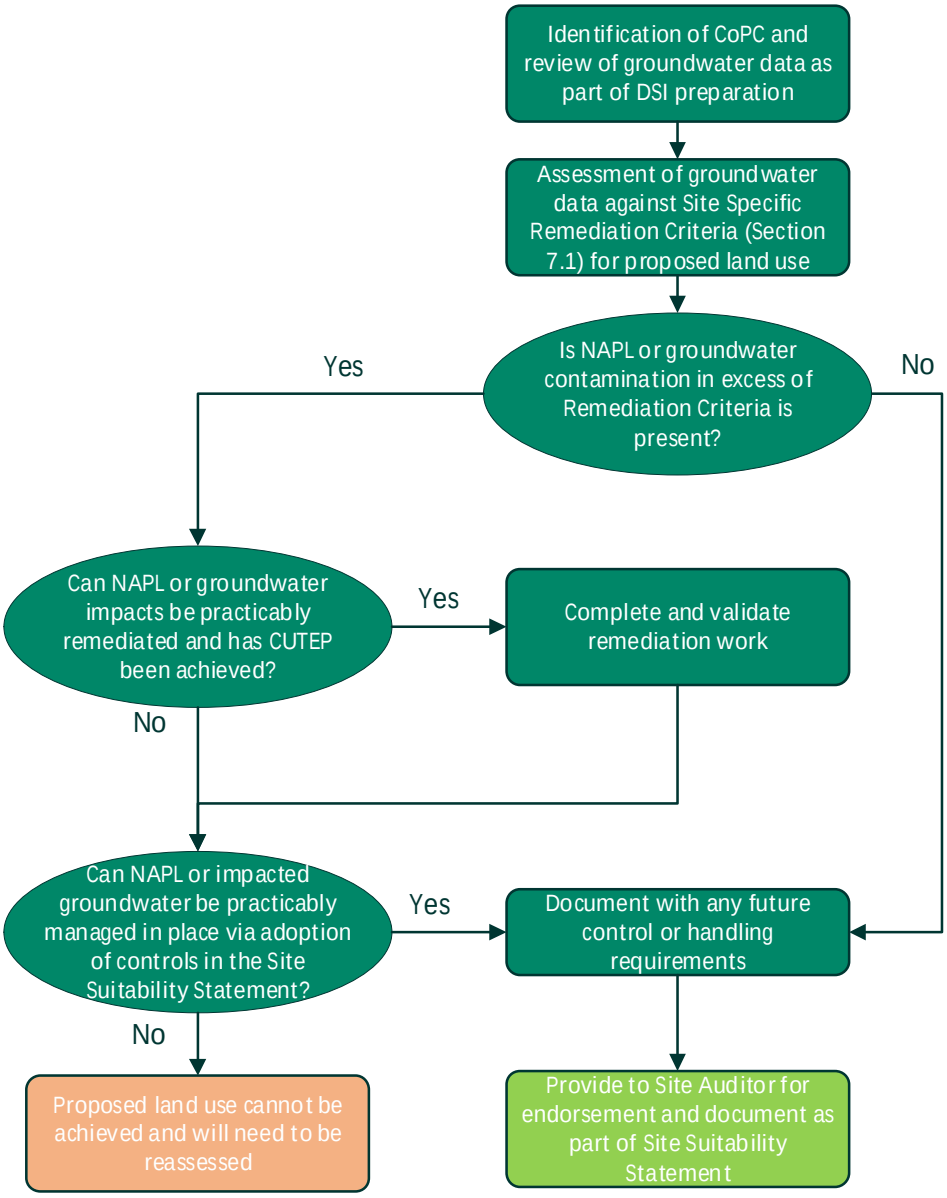

Plate 3 Groundwater Remediation Flowchart

6.3.1 LNAPL

Measurable LNAPL has been noted in the central and south-eastern portions of the Site, associated with LNAPL Plume A1, Plume A2 and Plume B (as described in **Section 5.3.1**). It is noted that LNAPL was previously detected at a location referred to Plume A3 in the Precinct North area but has not been detected since 2017.

An assessment of remediation technologies and methods for LNAPL remediation was conducted as part of the *Site Remediation Strategy* (AECOM, 2015a) and identified Total Fluids Extraction (TFE) as the most practicable method of LNAPL remediation.

The Corporation undertook remediation of LNAPL via a combination of TFE and LNAPL skimming extraction between 2015 and 2017, and a detailed assessment of LNAPL impacts and remediation conducted at Site has been reported in the *Assessment of LNAPL Remediation End-Points* (AECOM, 2020c).

This report concluded that:

- Further recovery of LNAPL is considered to be impracticable.
- The LNAPL plumes are sufficiently stable.
- Based on the current development plan for the Site, no unacceptable risks to current or future human or ecological receptors from LNAPL appears to be present, assuming that a SEMP or similar is implemented in order to minimise and manage potential risks for any interactions between groundwater, LNAPL and future Site users.

On this basis, further LNAPL remediation is not practicable considered practicable based on the outcomes of remediation and assessment conducted to date, and LNAPL plumes are not considered to represent a risk to users or ecological systems on the Site or in the surrounding area under the development proposed in the former Masterplan if Site groundwater is managed under the procedures documented in the SEMP. This assessment has been accepted by the Auditor.

It is noted that further LNAPL remediation may be required under the changes in development to the Site proposed in the Precinct Plan, if the proposed changes:

- Lower the Site elevation and present risk of contact with LNAPL or soil vapour risks.
- Have the potential to modify groundwater flow and mobilise LNAPL.

6.3.2 DNAPL

Coal tar and gross tar impacts (DNAPL) have been identified within, and in proximity to, the former Hobart Gasworks footprint in the Gateway area (as described in **Section 5.3.1**).

To inform the appraisal of potential techniques and technologies for remediation of former gasworks impacts in the Gateway area, an assessment of remediation technologies and methods was conducted as part of the *Site Remediation Strategy* (AECOM, 2015a). This report conducted a broad Remediation Technology Review to identify technologies that may warrant further consideration as part of a feasibility analysis, which were then assessed using a weighted screening criteria including technical, financial, logistical, sustainability and timing considerations.

The screening assessment rated ISS as the preferred remediation strategy. To assess and demonstrate the effectiveness of this remedial approach, a tiered process was defined in the *Interim Site Remediation Strategy – Cold Store* (AECOM, 2015b) consisting of:

- Conducting a laboratory bench scale trial to assess a suitable solidification reagent mix and soil mixing ratio for a future Pilot Trial and subsequent full-scale implementation. This was undertaken in 2015/2016 (AECOM, 2016c).
- Conducting an ISS Pilot Trial to assess if the outcomes from the bench trial can be translated to field application including if the preferred mixes can achieve the performance criteria and if there are any site specific considerations which may affect full scale implementation. This ISS Pilot Trial was undertaken in 2022 (AECOM, 2023b).

At the conclusion of the ISS Pilot Trial, it was concluded that ISS (via shallow soil mixing) was a suitable remediation technique for gasworks impacts (DNAPL) within the Gateway. The *Remediation Work Plan – The Gateway* (AECOM, 2023c) and *Technical Specification – The Gateway Remediation* (AECOM, 2023d) were issued and are currently being implemented on Site, and will be assessed and validated upon completion, based on field data collected during the work.

Following completion of ISS, an assessment of soil vapour and groundwater condition in the Gateway post-remediation will be conducted to assess any remaining risks or remediation and management requirements associated with DNAPL.

6.4 Soil Vapour

Soil vapour can arise from contaminants in soil or groundwater volatilising and migrating into ambient air or accumulating in enclosed spaces such as buildings and structures, or service conduits. Areas where impacts which represent an unacceptable risk of soil vapour generation have been identified and remediated or had future management requirements identified by the process shown on **Plate 4** below.

Soil vapour management and mitigation as part of future Site development has been identified due to soil methane concentrations in the central and eastern portion of the Site (the Promenade and Underground Carpark, the Precinct North and the Precinct South). Further assessment of potential soil vapour from gasworks impacts in the Gateway will be undertaken following completion of soil and groundwater remediation (ISS of DNAPL and removal of remnant buried infrastructure which may represent a source of contamination) currently underway in this area of the Site.

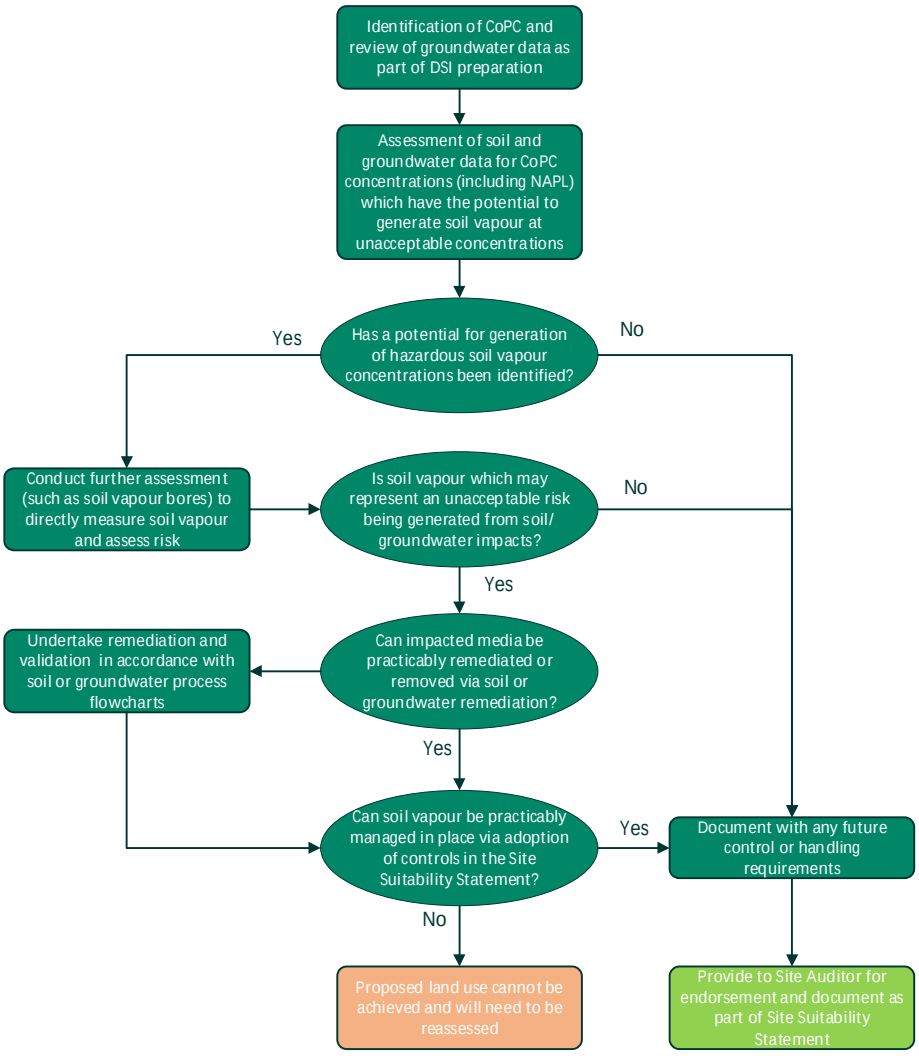

Plate 4 Soil Vapour Remediation Flowchart

7.0 Completed and Future Remediation Work

The sections below describe the work conducted to date, and any identified or potentially identified future work, required to remediate the Site for the proposed future use scenarios.

7.1 Development of Risk-Based Remediation Criteria

AECOM has prepared risk-based site-specific Remediation Criteria (RC) for soil and groundwater to inform potential remediation/ management works required at the Site for the protection of human health (*Macquarie Point Development Project – Derivation of Remediation Criteria* [AECOM, 2016a]). The following scenarios and land uses were considered in the development of the RC based on the previously-proposed development plans as per the former Masterplan*:*

- Residents of a High Density Development (slab-on-grade buildings and buildings with a communal basement car park)
- Recreation / Open Space Users
- Users of a Multi-Storey Car Park
- Commercial/Light Industrial Workers (slab-on-grade buildings and working within a basement car park)
- Outdoor maintenance Workers (including excavation to depths of up to 1 m bgl).

The risk-based Site RC were derived based on the generic exposure assumptions relevant to the modelled receptors and are protective of on-Site and off-Site human health under the above-mentioned potential future land use conditions at the Site.

The Precinct Plan, for redevelopment of the Site to accommodate the new multipurpose stadium, sets out a mixed-use precinct comprised of interconnected discrete zones. Land use is likely to include a combination of medium to high density residential use, open space use, commercial use, and underground car parking, as described in **Section 2.0**.

The potential land uses under the Precinct Plan were considered in the derivation of the Site RC, and the change in development plans is not considered to warrant an update of the risk-based Site RC. The Site RC for soil and groundwater are considered to be applicable to and protective of potential future development set out in the Precinct Plan. **Table 11** (**Section 8.1.1**) details the land uses associated with the RC that are applicable to each of the current development areas.

The Site RC are based on the following key assumptions regarding future land use and applicability of the:

- NAPL impacts at the Site will be remediated to the extent practicable and therefore risks associated with exposure to NAPL, and volatile contaminants derived from NAPL were not considered in the derivation of the RC. If residual NAPL is present at the Site following completion of remediation works, the associated risks to human health should be assessed at that time.
- An engineered break layer will be present at the ground surface to mitigate the potential for future Site users (with the exception of Maintenance Workers) to have direct contact with soils.
- A SEMP will be in place to maintain/manage surface cover.
- With regard to basements:
    - Use of any future basements is assumed to be limited to car parking. If basements are constructed for other purposes, a risk assessment specific to the intended use should be conducted.
    - Where basements are associated with future residential or commercial buildings, it is assumed that these will be communal areas for multiple properties, for example, as part of a strata scheme that is managed by a body corporate. Private basements will therefore not be associated with individual residences.

  - Where there is access to a basement car park, it is assumed that any groundwater seepage collects in floor drains and a physical barrier is present, and therefore, groundwater will not be directly contacted by basement users, with the exception of maintenance workers. It is assumed that individual tenants will not be involved in the maintenance of any associated services, including drainage pumps or sumps.

- Adjacent off-Site land uses include open space, commercial/industrial, and residential areas. As these potential land uses have been considered on-Site, the derived RC are considered to also be protective of potential exposures to off-Site receptors (e.g. via groundwater migration beyond the Site boundary).
- It is considered that potential exposure to workers undertaking remediation and/or development activities can effectively be mitigated through the implementation of an appropriate Construction Environmental Management Pan (CEMP). The CEMP should be prepared during the planning stage for any future remediation and/or development activities.

If future refinement of development plans results in land use scenarios that vary significantly from the scenarios and assumptions described above, an update of the Site RC may be warranted.

7.2 Site Environment Management Plan

SEMPs have been prepared to identify known areas of contamination on the Site and to provide an overview of appropriate management measures to address potential human health and environmental risks associated with subsurface contamination, and to maintain compliance with relevant environmental management requirements, and related safety management requirements.

Initial interim or area-specific SEMPs were issued between 2015 and 2021, consisting of:

- *Site Environment Management Plan* (AECOM, 2015d)
- *Site Environment Management Plan, Macquarie Point – Audit Area 1* (AECOM, 2019a)
- *Audit Area 4 - Site Environment Management Plan* (AECOM, 2020d)
- *Lot E and Underground Carpark - Site Environment Management Plan* (AECOM, 2021b)

These documents were combined into a Sitewide SEMP (AECOM, 2021a), which was most recently updated on 17 November 2021. It is expected that the SEMP will be updated in 2024, following completion of remediation of the Gateway and/or submission of CUTEP Reports for the Gateway and the Precinct South.

The SEMP is a living document, which has been updated as Site knowledge has increased, or remediation or modification to the Site has occurred, and which:

- Documents:
  - The current contamination status of the Site.
  - Environmental management measures (including contaminant management associated with intrusive works such as excavation/disposal of soil, dust and odour control, stormwater and sediment management, noise control and groundwater management).
  - Responsibilities for implementation of the SEMP and for managing identified environmental issues in accordance with the SEMP.
- Defines:
  - Preventative exposure measures for intrusive works (e.g. subsurface excavation) undertaken at the Site.
  - Roles and responsibilities for owner/managers and occupiers/contractors at the Site, or subsections thereof, when undertaking intrusive works.
- Provides a framework for the implementation of measures so that human health and environmental risks to Site users are low and acceptable where preventative exposure barriers and controls (including development controls) remain in place.

Ongoing implementation of the SEMP is a requirement of the Site Suitability Statements issued to date (discussed in **Section 7.3**), and it expected that the SEMP will remain in place for ongoing management of any residual contamination following completion of the Site Audit (**Section 7.6**).

7.3 Site Remediation and Site Suitability Status by Area

Since the Site Remediation Strategy was last prepared in 2017, work has progressed across the Site to further assess, and where required, remediate soil and groundwater contamination identified at the Site. The aim of the assessment and remediation works has been to obtain a Site Suitability Statements for specific areas of the Site (i.e. Audit Areas).

As noted in **Section 1.1**, for the purpose of assessment and completion of the Environmental Audits, the Site has been divided into seven sub-areas based on the nature of identified contamination, historic activity, and the intended future uses of each area under the former Masterplan, with Regatta Point and the Royal Engineers Building as additional areas for assessment. An overlay of the Audit Areas and the proposed future development under the Precinct Plan is shown on **Figure F2**.

Table 10, below, summarises the status of Site Suitability Statements obtained to date for each area. **Sections 7.3.1** to **7.3.8** below provide a summary of conditions of Site Suitability Statements issued to date, or the current remaining environmental impacts and proposed pathway to achieve Site Suitability Statements for remaining areas.

Table 10 Status of Site Suitability Statements

Site Area	Approx. Area (ha)	Site Suitability Statement or Remaining Actions and Activities
Site Suitability Statement Issued		
The Goods Shed and Yard (Audit Area 1)	0.86	*Site Suitability Statement: Macquarie Point Development Project - Audit Area 1, Evans Street, Hobart*, issued by Tetra Tech Coffey Pty Ltd on 4 June 2019[1] *Contaminated Land Audit Report – Macquarie Point Development Project – Audit Area 1*, issued by Tetra Tech Coffey Pty Ltd on 5 June 2019
The Escarpment (Audit Area 4 West)	1.68	*Contaminated Land Audit Report – Macquarie Point Development Project – Audit Area 4 West*, issued by Tetra Tech Coffey Pty Ltd on 24 September 2020
The Promenade and Underground Carpark (Lot E and UGC)	1.73	*Contaminated Land Audit Report – Macquarie Point Development Project – Lot E and Underground Carpark*, issued by Tetra Tech Coffey Pty Ltd on 23 July 2021
The Precinct North (Lot B)	1.04	*Contaminated Land Audit Report – Macquarie Point Development Project – Lot B*, issued by Tetra Tech Coffey Pty Ltd on 22 November 2021
Site Suitability Statement Not Issued		
The Precinct South	1.40	No remaining remediation actions identified. A Site Suitability Statement issued by the Auditor is anticipated following preparation and acceptance of a Precinct South CUTEP Report in mid-2024.

Site Area	Approx. Area (ha)	Site Suitability Statement or Remaining Actions and Activities
The Gateway	1.46	Remediation (removal of remnant infrastructure and treatment of gasworks wastes) is currently being undertaken in the Gateway and is anticipated to be complete by mid-2024. Following remediation, further assessment of groundwater and potential soil vapour risks is required and is planned to occur in 2024. If no unacceptable risks or contamination requiring remediation are identified, the Gateway DSI will be updated, and a Gateway CUTEP Report will be prepared and submitted to the Auditor to inform a Site Suitability Statement in late 2024 or early 2025.
Audit Area 4 East	1.20	Remaining environmental impacts or potential impacts known to be present in Audit Area 4 East are: • A remnant fuel pipeline passes through the central portion of Audit Area 4 East. The southern sections of this pipeline were removed as part of remediation of the Precinct North and the Escarpment, however, the remaining pipelines should be removed and capped at the Site boundary. • Buried ACM was uncovered in a hillside in the western portion of the area and is temporarily capped with concrete to prevent disturbance or incidental contact. ACM and surrounding soil should be removed prior to future development. A timeline for remediation has not yet been specified. Following remediation and validation, the Audit Area 4 DSI will be updated, and an Audit Area 4 East CUTEP Report prepared and submitted to the Auditor to inform a Site Suitability Statement.
Regatta Point	0.7	This area is not yet included in the Macquarie Point Environmental Audit but is considered likely to be included in the future. No intrusive investigation of Regatta Point has been undertaken to date. An initial investigation to allow preparation of a DSI report for this area is scheduled for mid-2024. Any remediation or further investigation requirements to allow issue of a Site Suitability Statement will be identified in the DSI and inform future work requirements and timeline.
Royal Engineers Building	0.19	This area is not currently included in the Macquarie Point Environmental Audit. To date, no potentially contaminating land uses have been identified, or intrusive investigation undertaken, at the Royal Engineers Building. An initial investigation is scheduled for mid-2024 and will inform if any remediation or further investigation requirements are identified.

Notes: [1]The Site Suitability Statement and Audit Report for the Goods Shed and Yard (Audit Area 1) were issued as separate documents. For remaining areas, the Site Suitability Statement (where issued) is contained in the relevant Audit Report.

At the completion of assessment, and of any required remediation, it is anticipated that a final review of data will be undertaken, and a submission made to the Auditor for issue of an overall Site Suitability Statement for Macquarie Point as a whole.

It is noted that the Site Suitability Statements issued to date have been intended for the future Site uses detailed in the former Masterplan, and if the future Site uses presented within the Precinct Plan are adopted, as part of the final review any change in the risk profile of the Site, and subsequent additional remediation or management requirements that may be identified, should be considered and assessed.

7.3.1 The Goods Shed and Yard (Audit Area 1)

The Goods Shed and Yard (Audit Area 1) is located in the south-western portion of the Site. The site has been subject to a Contaminated Land Audit following progressive site environmental investigations. Full details of identification and assessment of contamination within the Goods Shed and Yard can be found in:

- *Audit Area 1 – Detailed Site Investigation* (AECOM, 2019b)
- *Audit Area 1, Clean Up to the Extent Practicable Report* (AECOM, 2019c).

No soil or groundwater remediation has been undertaken; however, a Site Suitability Statement (Coffey, 2019a) and Contaminated Land Audit Report (Coffey, 2019b) have been issued for the site which states *the site is suitable for the site uses as follows: retail / commercial / recreational / public open space use and other less sensitive uses* subject to specific conditions which are detailed in Site Suitability Statement.

Of specific note, that Site Suitability Statement requires:

- The SEMP is implemented along with:
    - Maintenance of flooring and other hard surfaces both in the Goods Shed and in outside areas of Audit Area 1, to prevent human access to soil, or replacement by barrier layers agreed by and Environmental Auditor.
    - Any change of land use in areas external to the Goods Shed that incorporates enclosed buildings must only be undertaken following consideration of the need for remediation of contaminated soil exceeding specified Remediation Criteria.
    - Landscaping and gardening must be above the existing surface, or where in-ground, must incorporate barrier layers specified in the SEMP.
    - Specific requirements must be followed for managing excavated soil and for importation of Fill Material.
- Groundwater at the site is polluted with respect to use for Drinking Water, Irrigation, Stock Watering, and Primary Contact Recreation. Groundwater is not considered to preclude Ecosystem Protection or Buildings and Structures in Audit Area 1. Sulfate and chloride concentrations were elevated just outside the Audit Area 1 boundary. While these concentrations were not within the Audit Area 1 boundary, this indicates a possibility of seawater ingress in localised areas, and so design of construction materials should consider the need to account for possible saline intrusion for all buildings.
- As is the case with any site on which fill soils exist, small quantities of bonded asbestos cement (AC) fragments may remain within the soil and be uncovered during excavation works, despite not being identified within AA1 during site investigations. Such AC fragments are not anticipated to represent a health risk to occupiers of the completed development. If encountered during future development or use of the site, any fragments should be handled and disposed in accordance with the relevant regulations.
- There are suspected asbestos materials in site buildings, which should be managed in accordance with the relevant regulations. This environmental audit report addresses soil and groundwater (and associated) contamination and does not address built structures directly.

7.3.2 The Promenade and Underground Carpark (Lot E and UGC)

The Promenade and Underground Carpark area (Lot E and UGC) is located in the central western portion of the Site. The Promenade and Underground Carpark area has been subject to a Contaminated Land Audit following progressive site environmental investigations and remediation activities.

The Promenade and Underground Carpark consists of part or all of former Audit Areas 2 and 5, and full details of identification, assessment and remediation of contamination within this area can be found in:

- *Audit Area 2 – Detailed Site Investigation* (AECOM, 2020d)
- *Audit Area 5 – Detailed Site Investigation* (AECOM, 2021c)
- *Lot E and Underground Carpark – Clean Up to the Extent Practicable Report* (AECOM, 2021d)

Remediation actives were undertaken in the Promenade and Underground Carpark to date include:

- LNAPL and groundwater extraction and removal via a combination of skimming and TFE (AECOM, 2020e).
- Excavation and removal of pipelines and soil from a former workshop on the northern end of the Goods Shed in 2020 (AECOM, 2021e).
- Excavation and removal of remnant pipeline and impacted soil (AECOM, 2021f) in 2020, in conjunction with remediation of the Precinct North.

LNAPL remediation is briefly discussed in **Section 6.3.1**, however CUTEP was considered to be achieved and no further remediation required. It is considered likely that a final monitoring round to assess LNAPL condition will be undertaken as part of the overall review of Site condition discussed in **Section 7.5**.

Soil remediation conducted in 2020 included excavation and removal of approximately 210 m^3 of remnant infrastructure and soil from a former workshop referred to as the Goods Shed Annexe, and removal of 50 m of fuel line in the Promenade and Underground Carpark and immediate buffer area (i.e. 20 m from the boundary), with soil remediation excavations extending some 2,000 m^2 in the Promenade and Underground Carpark area (Coffey, 2021a). Coffey (2021a) noted that:

- The remediation works removed a range of former underground fuel lines and left them sealed off at the points where pipelines extending beyond the excavation areas were cut.
- A significant quantity of contaminated soil (total of approximately 8,500 m^3) was removed, disposed in accordance with Tasmanian requirements, and the excavations partially backfilled with approved soil.
- A number of exceedances of Tier 1 Criteria remain in situ, with a smaller number of exceedances for site-derived Remediation Criteria.

A Site Suitability Statement (Coffey, 2021a) has been issued for Lot E and Underground Carpark which states that *the site is suitable for the site uses as follows: residential (including medium to high density), commercial/industrial, recreational/public open space use, access way and transport (roads etc) and other less sensitive uses* subject to specific conditions which are detailed in Site Suitability Statement.

Of specific note, that Site Suitability Statement requires:

- The site shall be developed in accordance with the layout provided in Figure F3 of the SEMP prepared for Promenade and Underground Carpark (presented on **Figure F2**), with reference to the following details.
    - Nominated uses are to be limited to the areas indicated, and the Underground Carpark shall be built within the area nominated, such that assumptions regarding vapour risk remain valid.
    - Depth of the Underground Carpark is to be such that it does not intersect the water table. Should the design or changed conditions indicate potential for ingress of groundwater to any part of the underground carpark (including sumps or lift overruns), the SEMP must be reviewed for adequacy and approved by an Environmental Auditor, including any additional mitigation measures which may be required.
    - The Underground Carpark must include design, installation and maintenance of ventilation as per Building Code of Australia requirements for exhaust fumes, or other controls as specified in EPA NSW, 2020, to mitigate risks from potential methane infiltration.

  - Deep services below 2 m depth from the current surface level must be installed in protective shrouds or in trenches/corridors of clean fill to minimise the risk of contact with residual contamination for maintenance workers.

- The SEMP is implemented along with:
  - The Site area must be maintained with a hardstand or earthen cap seal or other engineered break layer to prevent direct human access to soil. Where the hardstand or earthen cap or other break layer is breached, such as for construction or maintenance works, it must be reinstated to achieve the same or better prevention of access to soil. Further details of layers or physical barriers must be adopted per Section 4 of the SEMP.
  - Garden plantings are to be in above ground planter boxes and not into the soil directly. Any proposal to plant into site soils must be confirmed as suitable by a Site Environmental Auditor.
  - Specified requirements must be followed for managing excavated soil and for importation of Fill Material.
  - Any subsurface works including for construction of the development or later maintenance must include a site specific workplace health and safety plan as detailed in Section 4 of the SEMP and allow for potential contaminant exposures.
- Groundwater at the site is polluted with respect to use for Drinking Water, Irrigation, Stock Watering, Industrial use, and Primary Contact Recreation. Groundwater is not considered to preclude Ecosystem Protection at a point of discharge to a surface water, or Buildings and Structures.
- Some fragments of asbestos containing materials have been identified during investigations on the site (with fibre bundles associated with a fragment at one location), and bonded ACM fragments may remain within the soil and be uncovered during excavation works, with potential for associated fines/fibres. Such ACM fragments are not anticipated to represent a health risk to occupiers of the completed development. It is noted that the SEMP attached to this Site Suitability Statement lists asbestos as a contaminant requiring management for any subsurface works. If encountered during future development or use of the site, any fragments should be handled and disposed in accordance with the relevant regulations.

7.3.3 The Escarpment (Audit Area 4 West)

The Escarpment (Audit Area 4 West) is located in the north-western portion of the Site. The Escarpment area has been subject to a Contaminated Land Audit following progressive site environmental investigations and remediation activities.

The Escarpment forms the western portion of the former Audit Area 4 West, and full details of identification, assessment and remediation of contamination within this area can be found in:

- *Audit Area 4 – Detailed Site Investigation* (AECOM, 2020g)
- *Audit Area 4 West – Clean Up to the Extent Practicable Report* (AECOM, 2020h).

Remediation actives undertaken in Escarpment (AECOM, 2020f) include the excavation of identified areas of impact for TRH and naphthalene above the Site-Specific remediation Criteria a primarily focusing on the former Concrete Batching Plant area and the Northern Refuelling Area, which was located within the Escarpment and Audit Area 4 East (refer to **Section 7.3.4**). the remediation works involved the excavation and off-Site disposal of 5,200 m^3 of impacted soil. The depth of excavation was generally down to dolerite rock and excavations were backfilled with Auditor-approved virgin excavated natural material (VENM).

A Site Suitability Statement (Coffey, 2020) has been issued for the Escarpment which states that *the site is suitable for the site uses as follows: residential, including medium to high density, retail, commercial, recreational/public open space use, transport (roads etc) and other less sensitive uses,* subject to specific conditions which are detailed in Site Suitability Statement.

Of specific note, that Site Suitability Statement requires:

- The SEMP is implemented along with:

  - The site area must be maintained with a hardstand or earthen cap seal to prevent direct human access to soil. Where the hardstand or earthen cap is breached, such as for construction or maintenance works, it must be reinstated to achieve the same prevention of access to soil.
  - Garden plantings are to be in above ground planter boxes and not into the soil directly. Any proposal to plant into site soils must be confirmed as suitable by a Site Environmental Auditor.
  - Specified requirements must be followed for managing excavated soil and for importation of Fill Material.

- Groundwater at the site is polluted with respect to use for Drinking Water and Primary Contact Recreation. Groundwater is not considered to preclude Ecosystem Protection or Buildings and Structures in Audit Area 4 West.
- Although asbestos was not identified on the Escarpment, asbestos was identified in Audit Area 4 East, and as is the case with any site on which fill soils exist, small quantities of bonded ACM fragments may remain within the soil and be uncovered during excavation works. Such ACM fragments are not anticipated to represent a health risk to occupiers of the completed development. If encountered during future development or use of the site, any fragments should be handled and disposed in accordance with the relevant regulations.

7.3.4 Audit Area 4 East

Audit Area 4 East is located in the north-eastern portion of the Site and was previously combined with the Escarpment (**Section 7.3.3**) as a single area for assessment referred to as Audit Area 4. These areas were split to allow a Site Suitability Certificate to be issued for the Escarpment, prior to the completion of further remediation in Audit Area 4 East.

Full details of identification, assessment and remediation of contamination within this area can be found in:

- *Audit Area 4 – Detailed Site Investigation* (AECOM, 2020g).

Remediation undertaken in Audit Area 4 East to date includes removal of hydrocarbon impacted soil from the western portion of this area referred to as the Northern Refuelling Area, in conjunction with remediation of the Escarpment (AECOM, 2020f), and of remnant pipelines in the southern portion in conjunction with remediation of the Precinct North and the Promenade and Underground Carpark (AECOM, 2021f). The following identified remediation requirements for Audit Area 4 East have not yet been conducted:

- Excavation and removal of the oil/diesel pipelines present in the eastern section of Audit Area 4 East.
- Excavation and removal of buried ACM in the north-western portion of Audit Area 4 East.

No Site Suitability Statement has been issued for Audit Area 4 East yet. However, it is anticipated that a future Site Suitability Statement for Audit Area 4 East will contain, at a minimum, the following requirements for the condition and implementation of future work in this area:

- As part of the future development scenario, Audit Area 4 East should be maintained with hardstand or an earthen cap to prevent direct human access to soil. In the event that the existing hardstand is partly or wholly removed, and/or changes to the configuration and/or penetrations are made, the following would be required:
  - Further assessment to evaluate potential impact to future users.
  - Reinstatement of hardstand, or placement of an earthen cap. It is noted that approval/ verification of the design of all proposed hardstand or earthen cap areas (i.e. thickness and material type) will be required by the Site Environmental Auditor prior to placement.
- Any on-Site gardens should be established in above ground planter boxes on hardstand and not directly over exposed soil. In the event that gardens are proposed in-ground, the following barrier system shall be installed:

  - Layer 1: Orange mesh para-webbing (or similar) placed as an indicator barrier over exposed soils to alert Site users
  - Layer 2: Earthen cover (minimum 0.5 m) certified as 'Fill Material' in accordance with Tasmanian EPA Bulletin 105 (2012) *Classification and Management of Contaminated Soil for Disposal*
  - Layer 3: Surface coverage (comprising shallow rooted vegetation).
- A CEMP will be prepared to support on-Site developments to manage any potential risks to workers, the public and the environment during construction works. The CEMP will be prepared during the planning stage for any future remediation and/or development activities.
- The SEMP will be updated to provide a framework for ongoing maintenance and management of Audit Area 4 during future use.
- A Work Health and Safety Plan (WHSP) to provide guidance with respect to the minimum personal protective equipment (PPE) requirements where workers are likely to come into contact with potentially contaminated materials. Specific Safe Work Method Statement (SWMS) for each task to be performed should also be included in the WHSP.

7.3.5 The Precinct North (Lot B)

The Precinct North (Lot B) is located in the central eastern portion of the Site. The Precinct North area has been subject to a Contaminated Land Audit following progressive site environmental investigations and remediation activities.

The Precinct North consists of part or all of former Audit Areas 5 and 7, and full details of identification, assessment, and remediation of contamination within this area can be found in:

- *Audit Area 5 – Detailed Site Investigation* (AECOM, 2021c)
- *Audit Area 7 – Detailed Site Investigation* (AECOM, 2020i)
- *Lot B – Clean Up to the Extent Practicable Report* (AECOM, 2021g).

Remediation actives were undertaken in the Precinct North to date include:

- LNAPL and groundwater extraction and removal via a combination of skimming and TFE (AECOM, 2020e).
- Excavation and removal of remnant pipeline and impacted soil (AECOM, 2021f) in 2020, in conjunction with remediation of the Promenade and Underground Carpark.

LNAPL remediation is briefly discussed in **Section 6.3.1**, however CUTEP was considered to be achieved and no further remediation required. It is considered likely that a final monitoring round to assess LNAPL condition will be undertaken as part of the overall review of Site condition discussed in **Section 7.5**.

Soil remediation actives undertaken in the Precinct North in 2020 include the removal of pipelines and associated impacted soil. The pipelines removed include a disused diesel pipe and a disused oil pipe, with a total of 50 m of pip removed from the Precinct North and the immediate 20 m buffer area with soil remediation excavation extending some 2,800 m^2 in the Precinct North.

A Site Suitability Statement (Coffey, 2021b) has been issued for the Precinct North which states that *site is suitable for the proposed site use of 'Arts and Institutional Area', which is considered to be a 'Commercial' use setting, involving commercial and cultural uses, including retail, (the site would also be suitable for high density residential uses above – but not on - the ground floor, and other less sensitive uses such as industrial use),* subject to specific conditions which are detailed in Site Suitability Statement.

Of specific note, that Site Suitability Statement requires:

- The site shall be developed in accordance with the layout provided in Figure F2 of the SEMP (presented on **Figure F2**), with reference to the following details.

  - Methane is present at significant concentrations across Lot B and must be designed to account for CS3 – Moderate Risk, as defined by Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (EPA NSW, 2020).
  - The entire site is to be covered by building footprint/hardstand in its final developed state.
- The SEMP is implemented along with:
  - The Site area must be maintained with a hardstand or earthen cap seal or other engineered break layer to prevent direct human access to soil. Where the hardstand or earthen cap or other break layer is breached, such as for construction or maintenance works, it must be reinstated to achieve the same or better prevention of access to soil. Further details of layers or physical barriers must be adopted per Section 4 of the SEMP.
  - Garden plantings are to be in above ground planter boxes and not into the soil directly, noting that this is a general requirement, and that the coverage of the Lot B area by building footprint means that this requirement is likely redundant. Any proposal to plant into site soils must be confirmed as suitable by a Site Environmental Auditor.
  - Specified requirements must be followed for managing excavated soil and for importation of Fill Material.
  - Any subsurface works including for construction of the development or later maintenance must include a site specific work health and safety plan as detailed in Section 4 of the SEMP and allow for potential contaminant exposures.
- Groundwater at the site is polluted with respect to use for Drinking Water, Irrigation, Stock Watering , Industrial use, and Primary Contact Recreation. Groundwater is not considered to preclude Ecosystem Protection at a point of discharge to a surface water, nor Buildings and Structures.
- While no fragments of asbestos have been noted on the Lot B area (nor has any asbestos been identified in analysis of soil samples), asbestos may be encountered wherever fill soils are present. The SEMP outlines requirements in the event that potential ACM is encountered in soil during subsurface works.
- Soil impacts are present in excess of the Future Maintenance Worker remediation criteria in the locations listed below, which will be managed by adherence to the SEMP for any future construction or maintenance works.
  - An exclusion zone surrounding the original Main Hobart Pipeline (Sewer).
  - Areas on the site boundary where further soil excavation could not be conducted.
  - Areas where impacted soil supported surrounding infrastructure.

7.3.6 The Precinct South

The Precinct South is located in the south-western portion of the Site. Environmental investigations completed for the Precinct South identified soil and groundwater contamination arising from historical activities including fuel storage, rail activities, and freight handling.

The Precinct South consists of part or all of former Audit Areas 3 and 5, and full details of identification, assessment, and remediation of contamination within this area can be found in:

- *Audit Area 3 – Detailed Site Investigation* (AECOM, 2022)
- *Audit Area 5 – Detailed Site Investigation* (AECOM, 2021c).

Remediation work was undertaken in the Precinct South to date consists of:

- LNAPL and groundwater extraction and removal via a combination of skimming and TFE (AECOM, 2020e).
- Removal of remnant pipelines and lead and hydrocarbon impacted soil in 2023 (AECOM, 2024b).

LNAPL remediation is briefly discussed in **Section 6.3.1**, however CUTEP was considered to be achieved and no further remediation required. During a targeted GME in 2023 (AECOM, 2024c), an

increase in LNAPL thickness was detected in two groundwater wells and the potential for further LNAPL recover was investigated in early 2024, and concluded not to be practicable (AECOM, 2024d). This assessment has been submitted to the Environmental Auditor for review, but final endorsement has not yet been received.

Soil and remnant infrastructure removal was conducted in 2023 and consisted of excavation of approximately 200 m of remnant pipelines, and 1,320 m^3 of potentially contaminated soil. In addition, during remediation, a previously unknown buried boiler and a railway were uncovered and excavated.

The remnant pipelines, boiler and railway were disposed of off-Site, while excavated soil was either:

- Reused as fill material where no potential unacceptable risk to future Site uses was detected (~270 m^3 of soil).
- Remediated on-Site to reduce hydrocarbon concentrations to a level where no potential unacceptable risk to future Site uses was detected (~210 m^3).
- Disposed off-Site as contaminated material due to the presence of lead or ACM (~855 m^3)

The validation of this remediation has been submitted to the Environmental Auditor for review, and no further remediation requirements have been identified for the Precinct South at this time. However, Auditor endorsement of this remediation has not yet been received.

No Site Suitability Statement has been issued for the Precinct South yet. However, it is anticipated that a future Site Suitability Statement for the Precinct South will contain, at a minimum, the following requirements for the condition and implementation of future work in this area:

- The SEMP will need to be updated to maintain the Site conditions associated with the assumptions which form the basis of the Site Specific RC adopted for assessment of this remediation, namely:
    - An engineered break layer will be present at the ground surface to mitigate the potential for future Site users (with the exception of intrusive maintenance workers [IMWs]) to have direct contact with soils. Agreement with the Environmental Auditor will likely be required when specifying an appropriate engineered break layer to mitigate potential direct contact with underlying soils. The engineered break layer may consist of, but not be limited to:
        - Paved surfaces (e.g., concrete, asphalt, etc.)
        - Building footings
        - Sufficient clean soil to mitigate potential direct access to underlying soil during incidental digging (e.g., 0.5 – 1.0 m topsoil)
        - Other suitable materials: e.g., geosynthetic materials that may provide a suitable physical barrier and may be able to be used as alternatives to a thicker earthen layer.

    The SEMP will need to be in place in the future to maintain/manage the surface cover and to specify the requirement for a WHSP for ground-breaking activities, including IMWs.
- The SEMP should also contain considerations of the following considerations:
    - Saturated soil (>2 m bgl) present in the Former UST Area and Northern Excavation Area excavations, may represent a risk to future Site users if exposed, excavated, or dewatered.
    - Areas of potential vapour intrusion near OL-EX-107 and OL-EX-110, and on the eastern boundary of the Former UST Area excavation, which may require further mitigation or investigation if the vapour control measures in the Audit Area 3 DSI (AECOM,2022) are not adopted.
    - If any changes to the assumptions of future use and conditions developed for the RC occur, for example a change in surface elevation, reassessment of identified impacts and exposure scenarios must be undertaken.

7.3.7 The Gateway

The Gateway area is located in the south-western corner of the Site. Environmental investigation completed in the Gateway area have identified soil and groundwater contamination relating to historical activities including the operation of the former Hobart Gasworks, which was partially located in the Gateway area.

The Gateway consists of part or all of former Audit Areas 5 and 6, and full details of identification, assessment, and remediation of contamination within this area can be found in:

- *The Gateway – Detailed Site Investigation* (AECOM, 2024a).

DNAPL (i.e. coal tar) has been identified along the southern and western boundaries of the Gateway, while other remnant infrastructure has also been identified which may represent an ongoing source of impacted within the Gateway Area.

As detailed in the *Remediation Work Plan – The Gateway* (AECOM, 2023c), remediation of the Gateway was commenced in 2024, and includes:

- Removal of remnant infrastructure which may represent an ongoing source of contamination.
- Excavation and levelling of the former Cold Store area.
- In Situ Solidification (ISS) remediation of inferred coal tar plumes which have potential to mobilise under future Site development.
- Remediation (if feasible) of excavated soils and on-Site reuse or off-Site disposal.

The proposed remediation methodology may not remove all residual vapour intrusion risks for the proposed future development of the Gateway for Commercial/Industrial and/or Open Space uses. Remediation to remove identified soil impacts which may represent a future vapour intrusion risk is considered impractical as:

- Concentrations reported in soil may not represent a vapour intrusion risk and will be further assessed following remediation.
- The potential exists for solidified material (following ISS) or for groundwater to generate soil vapour which will require mitigation methods.
- Vapour risks are likely to be able to be managed and mitigated via controls on construction within the SEMP.

Following remediation, an assessment of the risks from soil vapour and determination of required control or mitigation measures will be required. It is anticipated that these will include, at a minimum:

- The SEMP will need to be updated to maintain the Site conditions associated with the assumptions which form the basis of the Site Specific RC adopted for assessment of this remediation, namely:
    - An engineered break layer will be present at the ground surface to mitigate the potential for future Site users (with the exception of IMWs) to have direct contact with soils. Agreement with the Environmental Auditor will likely be required when specifying an appropriate engineered break layer to mitigate potential direct contact with underlying soils. The engineered break layer may consist of, but not be limited to:
        - Paved surfaces (e.g., concrete, asphalt, etc.)
        - Building footings
        - Sufficient clean soil to mitigate potential direct access to underlying soil during incidental digging (e.g., 0.5 – 1.0 m topsoil)
        - Other suitable materials: e.g., geosynthetic materials that may provide a suitable physical barrier and may be able to be used as alternatives to a thicker earthen layer.

    The SEMP will need to be in place in the future to maintain/manage the surface cover and to specify the requirement for a WHSP for ground-breaking activities, including IMWs.

- Controls around any works which may disturb or come into contact with known DNAPL areas to prevent any unacceptable risks to human health and/ or environment, or potential mobilisation of impacted materials.
- Potential controls around building design and construction if residual soil vapour risks to human health are detected.

Following the completion of remediation of the Gateway area a Contaminated Land Audit will be required along with a Site Suitability Statement issued by the Contaminated land Auditor.

7.3.8 Regatta Point

Regatta Point (also refer to as the Regatta Grounds) are located outside of the previously defined Audit Areas and no field assessment has been completed to date, however a Preliminary Site Investigation (PSI) (AECOM, 2023a) has been completed to identify potential contamination sources and/ or risks that may impact the future development of Regatta Point.

It is noted that the PSI assessed two additional land parcels, consisting of rail corridors under title reference 26915/2 and 26915/3, which were considered as potential inclusions in future development of this area. However, the final boundaries of Regatta Point on the Precinct Plan only included the land parcel under Potential Property ID 2513934, described on **Table 2** in **Section 4.0**.

The PSI has been provided to the Auditor, but no comment has been sought until Regatta Point is formally included in the overall environmental audit of Macquarie Point.

A summary of the findings of AECOM (2023b) are provided below:

- The land comprised within Regatta Point is under the authority of Department of Natural Resources and Environment Tasmania (DNRET) Property Services and State Rail Network. It is currently used as a public reserve which allows access to the River Derwent and includes a roadway and carparking, and a former rail corridor, which is not in use.
- The general environmental setting at Regatta Point is summarised below:
  - No known soil data is available from within Regatta Point, but the lithology is likely to comprise fill underlain by clay of medium- to high-plasticity and weathered dolerite.
  - ‘Low’ probability of occurrence of Coastal Acid Sulfate Soil (CASS) is recorded for the land to the south of Regatta Point. Based on investigations at the Macquarie Point Site, groundwater is likely to be within the underlying dolerite aquifer and no soil which may PASS is present. Further investigation may identify areas of soil submerged under groundwater which may be PASS, and any development works which include or potentially include disturbance of soil beneath the water table would require consideration of PASS.
  - Depth to groundwater beneath Regatta Point is not known. Groundwater adjacent to Regatta Point, from within Audit Area 4 East has been encountered at approximately 4.1 – 4.7 m bgl).
  - Known subsurface features within Regatta Point include telecommunication lines and a fuel pipeline running along the railway lines and entering the Macquarie Point Site. Sewer services owned by TasWater, and potential stormwater services owned by City of Hobart also appear to be present.
  - The foreshore at Regatta Point has been described as being artificial, of ‘highly-modified’ geomorphic condition, ‘extreme ecological disturbance’, ‘minimal natural value’ and ‘minimal biological value’.
- Potentially contaminating ongoing and historical land uses at Regatta Point include activities associated with public boating/yachting; transport, maintenance, freight storage and handling at the former rail corridor; use of the fuel pipeline; historical land reclamation and unknown nature of fill.
- Potentially contaminating historical land uses in areas surrounding Regatta Point include discharges associated the Hobart Rivulet and the wastewater treatment plant (WWTP); activities associated with the Port of Hobart, the Shipyard, TasPorts, former Derwent Rowing Club, former

Naval Depot and Naval/Cattle Jetties, the helipad, Queens Battery, former Bulk Fuel Terminals, former Rail Yards; historical land reclamation and unknown nature of fill.

- No known environmental assessments within Regatta Point have been undertaken. In the absence of data from within Regatta Point, data related to historical and current features and from areas of the Macquarie Point Site within 35 m of the Regatta Point boundary have been considered to assess potential contamination at Regatta Point. The data suggest that:
  - There is potential for asbestos or ACM to be present within the fill at Regatta Point.
  - Groundwater and shallow soil impacts associated with concentrations of metals and TRH may be present.
  - Potential risk of vapour intrusion from contaminated soil or groundwater is considered low. Should future soil and groundwater assessments within Regatta Point indicate potential risk of vapour intrusion associated with CoPC, soil vapour assessments must be considered.

Based on the Preliminary Site Investigation, the following recommendations were made.

- **Engagement of an Accredited Contaminated Land Auditor**

  An accredited Contaminated Land Auditor would need to be engaged to undertake a Contaminated Land Audit for Regatta Point in accordance with the *Macquarie Point Development Corporation Act 2012*. A Site Suitability Statement from the Auditor certifying Regatta Point as suitable for the proposed residential redevelopment would need to be obtained prior to redevelopment.

- **Contaminated Land Assessment Works**

  The following approach is recommended for assessment of Regatta Point:

  - Soil assessment, including advancement of 25 soil bores.
  - Groundwater assessment, including installation of three groundwater wells, and undertaking of groundwater monitoring events (GMEs) using new wells at Regatta Point and existing wells at the Macquarie Point Site.

  The following additional assessment may be required, based on results of initial investigations:

  - If soil and groundwater impacts are identified to any material degree, or an unexpected contaminant source is identified, additional assessment works may be required to further delineate and/or characterise impacts.
  - Assessment of soil vapour risks if field measures or analytical results from soil or groundwater indicate a potential risk of vapour infiltration for proposed future site uses.
  - Following contaminated land assessment works, if contamination is identified at Regatta Point, a review may be recommended to identify the potential ecological receptors associated with Regatta Point, and if required, an ecological risk assessment be undertaken to evaluate the potential for risks posed to these receptors from impacts associated with Regatta Point.

  Assessments must consider the recommended approach to assessing contaminated sites outlined in published state and national guidelines and standards.

- **Potential Remediation and Management Requirements**

  The following remediation and management measures may be required at Regatta Point, depending on results of contaminated land assessment works and the proposed future development plan:

  - Remediation or excavation (disposal) of impacted soil (if identified to be present) which may present an unacceptable risk to future users of the Regatta Point or adjacent offsite locations.
  - Removal of the remnant fuel pipeline passing through the railway corridor and roadway within Regatta Point and continuing into Audit Area 4 East, as well as potential removal of any additional remnant subsurface infrastructure (if identified during proposed assessment works) which may represent an ongoing source of contamination.

- A soil validation sampling program should be implemented to verify the removal of contamination (if any) along the extent of the removed infrastructure.
- Assessment of potential soil vapour risks to future site users may be required if soil or groundwater conditions indicate potential for vapour intrusion.
- A SEMP will likely have to be implemented to provide a framework for ongoing maintenance and management of Regatta Point during future development and use if contamination is identified. The SEMP may be required to include:
    - Management and mitigation measures for any soil contamination encountered.
    - Management and handling measures for contaminated groundwater. In the event that significant subsurface structures are included in future development (e.g. basement construction) management measures for contaminated shallow groundwater potentially displaced will be required.
    - Management and mitigation measures for any soil vapour risks encountered.

  The SEMP is likely to require review and endorsement by the Contaminated Land Auditor and be included as part of the Site Suitability Statement.
- Additional documentation is likely to be required for development and/or remediation works:
    - A CEMP will likely have to be prepared to support developments to manage any potential risks to workers, the public and the environment during construction works if contamination is identified.

  A WHSP should be implemented for any intrusive works. This WHSP should provide guidance with respect to the minimum PPE requirements and handling measures, with reference to the SEMP, where workers are likely to come into contact with potentially contaminated materials, if present. Specific Safe Work Method Statement (SWMS) for each task to be performed should also be included in the WHSP.

7.3.9 Royal Engineers Building

The Royal Engineers Building (and surrounding grounds) are located outside of the previously defined Audit Areas and no field assessment has been completed to date.

Under the Precinct Plan, and with the Royal Engineers Building constituting a Place of Cultural Significance on the *Sullivans Cove Planning Scheme 1997*, no intrusive works or changes to this area are proposed as part of development of Macquarie Point. An assessment of the Royal Engineers Building and surrounding grounds is planned for mid-2024 to assess if contamination which may require remediation or mitigation is present.

Based on the available history of the Royal Engineers Building, where no contaminating uses have been identified, no potential additional controls, beyond adoption and maintenance of the SEMP, have been identified for this area at this time.

7.4 Other Key Investigations or Assessments

7.4.1 Assessment of Potential Off-Site Ecological Impacts

The site-specific RC discussed in **Section 7.1** have been developed to be protective of human health exposure scenarios and did not consider potential ecological receptors.

The *Assessment of Potential Off-Site Ecological Impacts* (AECOM, 2020b) was prepared to evaluate the potential risk to identified off-Site aquatic ecological receptors from Site-related groundwater impacts. The receptors primarily include the nearby marine ecosystems of the River Derwent and Sullivans Cove, which contain the inferred points of discharge of Site groundwater.

This assessment considered multiple lines of evidence to assess potential risk posed to off-Site aquatic ecological receptors. Based on the outcomes of the weight-of evidence assessment, it is considered unlikely that the Chemicals of Potential Ecological Concern (CoPEC) concentrations in groundwater beneath the Site are presenting a potentially unacceptable risk to off-Site aquatic ecological receptors at the inferred points of discharge on the basis that:

- The assessed adjacent aquatic habitats are artificial, of low ecological value and considered to be 'highly disturbed' environments.
- Concentrations of CoPEC were below adopted screening levels near Sullivans Cove and the River Derwent, were likely to attenuate further prior to discharge into these areas or were associated with background conditions.
- Hydrocarbon fingerprinting of an LNAPL sample collected from within Plume B suggests that the LNAPL is dominantly composed of weathered diesel and lube oil. No new sources of LNAPL were identified. The plume is likely to be relatively stable, and no significant TRH-signature is evident downgradient near the receiving environment at Sullivans Cove.
- A mixing zone indicating estuarine/saline water interaction noted near Sullivans Cove is likely to result in the reduction of groundwater concentrations of key CoPEC prior to the point of discharge into the receiving environments.
- The Hobart Rivulet concrete walls are understood to be below the groundwater level beneath the Site and may act as a barrier to groundwater flow in the direction of the point of discharge to River Derwent.
- Groundwater is inferred to predominately discharge through cracks and protrusions in the seawalls. No obvious groundwater seepage through the concrete seawall was noted near Sullivans Cove or the River Derwent during low tide inspections as part of this assessment.

In summary, based on the weight of evidence approach, which considered concentrations of CoPEC, composition and stability of LNAPL impacts, and interaction between groundwater and seawater, including the effects of subsurface infrastructure and seawalls, it is considered that groundwater emanating from the Site boundary is unlikely to pose an unacceptable risk to off-Site aquatic ecological receptors at Sullivans Cove and the River Derwent.

Notwithstanding the outcomes of the *Assessment of Potential Off-Site Ecological Impacts* investigation, NAPL remains in the Site subsurface at select locations which require remediation to the extent practicable to mitigate potential future risks and to satisfy the requirements of the Site Environmental Audit.

Whilst an LNAPL remediation program has been implemented at the Site and was assessed as having reached CUTEP (**Section 6.3.1**), DNAPL impacts associated with the former Gasworks remain *in situ* in the Gateway and, while do not currently appear to have a complete pathway to potential ecological receptors, could represent a risk if mobilised or disturbed by future development of the Gateway. Remediation of DNAPL impacts is currently being conducted as discussed in **Sections 6.3.2** and **7.3.7**.

It is noted that the *Assessment of Potential Off-Site Ecological Impacts* was conducted under current Site groundwater conditions and may require reassessment if the proposed development significantly alters groundwater flow pathways.

7.4.2 Acid Sulfate Soil Assessment Preliminary Assessment

The Site is mapped as having a low probability of PASS, as indicated on LISTmap's Coastal Acid Sulfate Soils (0 – 20m AHD) layer, and, in accordance with the *Tasmanian Acid Sulfate Soil Management Guidelines* (the Guidelines) (DPIPWE, 2009), will require an assessment of ASS / PASS for development where disturbance of deeper soil (especially soil beneath the water table) will be undertaken.

As the proposed future development of the Site may include excavation or disturbance of deeper soils in order to install basements, footings, or other structures, an initial investigation has been commenced in April 20204 in order to:

- Assess the likelihood of ASS or PASS being encountered during future development of the Site.
- Provide guidance for management or mitigation methodologies which may be required during future development if ASS or PASS is present, or for any further investigation which may be warranted to allow safe implementation of the proposed development of the Site with regards to ASS/PASS.

For the initial investigation, 20 soil bores have been advanced on the Site and had soil samples collected every 0.5 m above underlying dolerite bedrock. All samples have been analysed with a pH field screen recording field pH (pH_f) and pH following oxidation with hydrogen peroxide (pH_{fox}). Targeted samples, based on field screen results and soil bore observations and characteristics, have been further analysed for Chromium Reducible Sulfur (CRS) and Suspension Peroxide Combination Acidification (SPOCAS) analytical suites.

The results of sample analysis have not yet been fully reported or analysed; however preliminary review has identified locations where PASS may be present in some estuarine material below the water table. When issued, the results of this assessment will contain further detail and any recommendations or requirements for future works. However, it is considered likely that development and implementation of an Acid Sulfate Soil Management Plan will be a requirement for future work at the Site, which should document at a minimum:

- The identified Site areas and geological layers which may contain PASS.
- A methodology and framework to inform identification and management of PASS during future works, including minimisation of disturbance, soil handling and storage techniques, and neutralisation (if required) to be applied.
- Reporting and disposal requirements for an excavated or disturbed PASS.

7.5 Final Data Review and Overall Site Suitability Statement

It is planned that, once assessment, remediation, and determination of any future management requirements has been completed for all Site areas, a final review and assessment of Site data will be undertaken in order to:

- Confirm that the data and assumptions inherent to assessment of each individual area are accurate and reflect the Site conditions and proposed future Site uses.
- Assess if any impacts requiring remediation or management remain and determine if any further remediation work is required or management conditions should be adopted in order to prevent any unacceptable level of risk to future Site users, or adjacent sites and ecological systems.

Additional activities may be required prior to or following this review, such as:

- Update of any aged data (for example, groundwater conditions) if a significant period has passed since previous assessments.
- Review and consideration of previous assessment data on any changes in future Site uses. For example, future Site uses under the Precinct Plan may differ than assessment assumptions or may have potential to introduce changes to Site conditions such as groundwater flow and behaviour.
- Further remediation of any identified impacts, if required.

Following this review and completion of any identified additional works, the overall Site data will be submitted to the Auditor for issue of an overall Site Suitability Statement, if they are satisfied that the Site is suitable for the proposed future use and management controls.

7.6 Future Management of Residual Contamination

As part of seeking issue of Site Suitability Statements for each considered area, and for the Site as a whole, if significant additional Site environmental data is uncovered, or Site conditions or uses significantly change, the SEMP (described in **Section 7.2**) should be updated and document known contamination, risks, and management or handling requirements to prevent generation of unacceptable risks.

The SEMP contains review requirements and should be maintained and applied for future work or management of the Site. Any changes to the SEMP which deviate from the Site Suitability Statements will require documented review, update and acceptance by a Site Auditor.

8.0 Development Considerations

8.1 Auditor Site Suitability Statements and Conditions

Development will need to consider the Site Suitability Statements that have been issued for portions of the Site by the Environmental Auditor, which are summarised in **Section 7.3**.

The following planning controls are included in the SEMP (AECOM, 2021a), based on current Site Suitability Statements, and should be considered if development of the Site proceeds under the former Masterplan. These controls may be altered or replaced when development of the Site in accordance with the Precinct Plan proceeds.

- Development of an area will not proceed without an area-specific Contaminated Land Audit Report issued by an Environmental Auditor approved under Section 37 of the *Macquarie Point Development Act 2012*. Modifications in Site uses or development (i.e. planning for residential uses in an open space area) will require approval by a Contaminated Land Auditor.
- The Site surface will be covered with either hardstand and/or an engineered break layer, as specified in Section 4.6 of the SEMP, which shall be implemented to provide a framework for ongoing maintenance and management of the Site during future use.
- Prior to commencement of building-related works within the Goods Shed, or any other structures within the Goods Shed and Yard area, a suitably qualified occupational hygienist should be consulted to confirm the nature and extent of ACM in the work area (if any), and to provide advice regarding the removal and management of ACM.
- The existing hardstand and flooring of the Goods Shed (including the slab, raised platform areas, crawl spaces and hard coverings etc.) remains *in situ*. In the event that the existing hardstand is partly or wholly removed, and/or changes to the configuration and/or penetrations are made, where the hardstand was placed directly above soils (e.g. slab on-grade), hardstand is to be reinstated to at least the minimum specification noted in Section 4.6 of the SEMP.
- No ground floor residential uses will be included in developments in the Promenade and Underground Carpark, and Precinct North areas. Residential uses may be allowed on the first floor and above.
- The design of the Underground Carpark in the Promenade and Underground Carpark area should consist of the following:
    - A single level carpark excavated to a depth of 2.5 to 3.5 m bgl. The base of the carpark should be located approximately 1.5 m above groundwater.
    - The carpark roof should be located between 0.5 to 1 m above the current surface area, with an open ventilation space present surrounding the structure.
    - Any conduits or services which run beside or beneath the carpark at a depth of >2 m bgl should be installed in protective shrouds or in trenches/corridors of clean fill and no contact with soil beneath the carpark (i.e. for maintenance works) is expected as part of future carpark usage.
    - The Underground Carpark should be ventilated in accordance with ventilated in accordance with Building Code of Australia (BCA) requirements to deal with exhaust fumes.

  Final carpark design will be determined by a Site developer. Any significant changes to the proposed design should be reviewed by a qualified environmental practitioner and approved by a Contaminated Land Auditor and will require update of the SEMP.
- The potential exists for methane migration into buildings or structures in the Promenade and Underground Carpark and Precinct North areas during development. *Soil Vapour and Indoor Air Investigations 2019* (AECOM, 2021h) assessed the risk from soil methane as Characteristic Situation 3 – Moderate Risk (CS3), as defined by *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (EPA NSW, 2020). Based on this rating, and the proposed future development of the area (Arts/Institutional) a minimum gas protection guidance value of 3 should be incorporated into the future development. The potential for methane infiltration

of confined spaces in these areas of the Site (such as pits, trenches or conduits) should be considered when planning and managing works.

Where development does not align with the Site Suitability Statements, further environmental assessment and remediation may be required as outlined in the Site Remediation Framework in **Section 6.1**.

8.1.1 Proposed Future Development Plans (the Precinct Plan)

As detailed in **Section 7.3**, Site Suitability Statements have been issued for the Goods Shed, Audit Area 4 West, Lot E and Underground Carpark, and the Precinct North. Remediation programs have been completed in the Precinct South and have been submitted to the Environmental Auditor for assessment, and remediation of identified impacts is currently underway within the Gateway.

Further assessment and/ or remediation of Audit Area 4 East, the Regatta Grounds and the Royal Engineers Building is required and may be required in the Precinct South and the Gateway pending Auditor appraisal of results of remediation completed to date.

Table 11 below provides a summary of the Audit Areas that have Site Suitability Statements, their applicable land uses, and the proposed future development areas and applicable land uses which align with the RC discussed in **Section 7.1**.

Suitability for each area for the proposed future uses has not been reviewed by the Environmental Auditor and would require assessment of existing Site data and approval for any change in future use prior to development. This assessment does not allow for potential subsurface development (such as further excavation of the Site or development of basements or underground carparking) except where noted in existing Site Suitability Statements and the SEMP.

Overall review of historic data and remediation of the Site and identification of any further remediation and/or management requirements for submission to the Environmental Auditor is planned as part of the Site remediation strategy as discussed in **Section 7.5**.

Table 11 Future Development Areas and Site Suitability under the Precinct Plan

Proposed Future Development Area	Future Land Use	Audit Area	Site Suitability					
			Residential (medium and high density)	Retail	Commercial	Recreational/ public open space	Transport	Other less sensitive uses
Aboriginal culturally informed zone	Open space and commercial	The Escarpment (Audit Area 4 West)	✓	✓	✓	✓	✓	✓
		The Promenade and Underground Carpark (Lot E)	✓	✓	✓	✓	✓	✓
		The Gateway	Audit not yet complete					

Proposed Future Development Area	Future Land Use	Audit Area	Site Suitability					
			Residential (medium and high density)	Retail	Commercial	Recreational/ public open space	Transport	Other less sensitive uses
Multipurpose stadium and associated concourse zone	Open space and commercial	The Escarpment (Audit Area 4 West)	✓	✓	✓	✓	✓	✓
		The Promenade and Underground Carpark (Lot E)	✓	✓	✓	✓	✓	✓
		The Precinct North (Lot B)	✓[1]	✓	✓	✓	✓	✓
		The Precinct South	Audit not yet complete					
		The Goods Shed and Audit Area 1	×	✓	✓	✓	✓	✓
		The Gateway	Audit not yet complete					
Royal Engineers building and land	Open space and commercial	Royal Engineers Building	Not yet assessed					
Complementary integrated mixed use zone, including restraints, cafes, hotels, medical facilities and commercial office space	Open space and commercial	The Precinct North (Lot B)	✓[1]	✓	✓	✓	✓	✓
		The Precinct South	Audit not yet complete					
		The Goods Shed and Audit Area 1	×	✓	✓	✓	✓	✓
		The Gateway	Audit not yet complete					
Antarctic facilities zone including commercial spaces and connections with the complementary integrated mixed use zone	Commercial and underground car parking[2]	Audit Area 4 East	Audit not yet complete					
		The Precinct North (Lot B)	✓[1]	✓	✓	✓	✓	✓
		Audit Area 4 West	✓	✓	✓	✓	✓	✓

Proposed Future Development Area	Future Land Use	Audit Area	Site Suitability					
			Residential (medium and high density)	Retail	Commercial	Recreational/ public open space	Transport	Other less sensitive uses
Residential development and public foreshore zone accommodating a variety of tenures and housing opportunities, along with a new public promenade and food and beverage offerings	Medium to high density residential and commercial	Regatta Point	Not currently part of the Macquarie Point Site and has not been subject to intrusive environmental investigation. Initial intrusive investigations are planned to occur in 2024 and will provide initial information about any further assessment, or management and remediation, requirements for this area.					
Transport Area	Open Space	Audit Area 4 East	Audit not yet complete					
Vegetated Area	Open Space	Audit Area 4 West	✓	✓	✓	✓	✓	✓
		Audit Area 4 East	Audit not yet complete					

Notes: 1. High density residential is acceptable, except on the ground floor; 2. Underground carparking has been previously excluded from development of these areas and requires reassessment; ✓ The land parcel is suitable for the land use scenario, subject to the conditions of the Site Suitability Statement; × The land parcel is not suitable for the land use scenario; A green shaded cell indicates that the land use scenario aligns with the development under the Precinct Plan;

8.2 Environmental Management Considerations

8.2.1 Contaminated Soil Management

Where development activities intersect soil at the Site, consideration needs to be given to the potential contamination status of the soil and what impact the development may have on the residual contamination (e.g. LNAPL plumes).

Any soil that is excavated as part of the development of the Site will need to be managed in accordance with SEMP applicable to the area of the Site. The SEMP is a living document which is updated any work occurs or additional assessment is completed which changes the condition or knowledge of Site soil conditions.

In situ solidification of gasworks impacted soil is currently being undertaken in the Gateway. If removal of solidified material is required for future development, it should be considered as potentially contaminated unless assessed and identified as having no unacceptable risks by a suitably qualified environmental practitioner.

Any soil to be removed or reused on the Site requires assessment and classification in accordance with *Information Bulletin No. 105 Classification and Management of Contaminated Soil for Disposal* (EPA, 2018) and *Clean fill Type 1 and type 2 – Declaration of pollutant levels* (EPA, 2020).

8.2.1.1 Remnant Pipelines or Infrastructure

If any unknown remnant pipelines or infrastructure from previous Site uses are uncovered during future work, they should be assessed to determine if they are a potential source of contamination or unacceptable risk to Site users, neighbours, or receiving ecological systems, and if so, should be removed and disposed off-Site in accordance with a remediation plan prepared by a suitably qualified environmental practitioner, which includes validation of removal to assess if any residual risks associated with the removal remain.

8.2.1.2 Asbestos Containing Material

If encountered, ACM should be assessed and, if possible, removed from the Site by a suitably licenced professional. The area of assessment should be validated as free of ACM, or appropriate ACM management procedures be documented and implemented if ACM remains on-Site.

8.2.1.3 Acid Sulfate Soils

As discussed in **Section 4.3.2**, there is a 'Low' probability of occurrence (6-7% chance of occurrence) of PASS being present on the Site. A preliminary assessment of the presence or absence of actual or potential acid sulfate soil on the Site is currently being conducted in April and May 2024, and as noted in **Section 7.4.2**, preliminary results indicate that PASS is likely to be present in natural soils beneath the water table. Full assessment and recommendations for future management requirements will be provided once this investigation is complete, however based on these early indications:

- Should excavation or disturbance of soil beneath the water table which may potentially oxidise PASS and generate ASS occur during development or remediation of the Site, consideration should be given to ASS and PASS in accordance with the Tasmanian Acid Sulfate Soil Management Guidelines (DPIPWE, 2009), including development of an ASS Management Plan.
- Where possible, disturbance of ASS and PASS should be avoided. If > 100 m^3 of ASS or PASS is excavated or >500 m^3 of fill is imported and placed at a depth >0.5 m, consideration needs to be given to the assessment and management of ASS ad PASS.

8.2.2 Contaminated Groundwater Management

Groundwater from beneath the Site should not be extracted for any purpose other than environmental monitoring, assessment or remediation.

Groundwater which ponds in open excavations or infiltrates into subsurface infrastructure (i.e., service trenches or conduits) which needs to be removed for logistical considerations should be removed by a licensed waste contractor, or alternatively treated and disposed to sewer under a Site-specific Trade Waste Agreement (subject to regulatory approval).

If Site development has the potential to alter groundwater flow and behaviour, potential risks such as the disturbance or mobilisation of identified contaminated groundwater or NAPL should be assessed, and appropriate mitigations or management approaches applied.

8.2.3 Soil Vapour

Assessment of potential vapour intrusion risks associated with the LNAPL plumes undertaken in *Soil Vapour and Indoor Air Investigations 2019* (AECOM, 2021h) surmised that soil vapour impacts associated with the LNAPL plumes do not present an unacceptable risk to the planned future uses of the Site.

Soil vapour investigations identified methane exists in potentially hazardous concentrations in the subsurface within the Precinct North and the Promenade and Underground Carpark Area. The risk from soil methane in the area assessed has been calculated as CS3 – Moderate Risk, as defined by *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (EPA NSW, 2020), and appropriate mitigation measures should be included in future building design in this area or when conducting works in potentially enclosed spaces, such as pits, trenches or conduits, in these areas.

The potential exists for harmful soil vapour concentrations derived from historical gasworks operations to be present in the Gateway area. Assessment of soil vapour in this area is planned for later in 2024,

but until assessed and quantified, appropriate mitigation measures should be identified and employed for subsurface work or excavation and trenching in this area.

8.3 Safety Considerations

It is recognised that as part of current and proposed future uses of the Site, it may be necessary to undertake intrusive works. Such activities increase the exposure to potentially impacted materials and therefore protective measures are to be adopted prior to work commencing.

Any works conducted on the Site should include reference to the SEMP and be undertaken in accordance with a WHSP. This WHSP should provide guidance with respect to the minimum PPE requirements where workers are likely to come into contact with potentially contaminated materials. Specific SWMS for each task to be performed should also be included in the WHSP.

Any company/contractor engaged to conduct subsurface works and/or earthworks on the Site must prepare a Site-specific WHSP covering their workers and planned activities. The SEMP should be

The following is an overview of WHS considerations for any works that may be undertaken, at a minimum, at the Site:

- Identification of WHS roles and responsibilities
- Evaluation of the Site hazards and the risks associated with these hazards
- Risk assessment methods and the risk control measures
- Details on work practices and restrictions, assessment of anticipated protection levels (including PPE), controls on access to the Site and decontamination
- Methodology for handing and management of soil and groundwater in accordance with the SEMP, or any other available information on contamination in the area of work.
- Detail regarding appropriate ventilation of the work area
- First aid and emergency procedures
- The notification of accidents and other matters
- Environmental monitoring protocols.

Appropriate WHS measures should be established by the contractors for personnel involved in subsurface works at the Site. The levels of protection and the procedures specified in this section are related to contamination issues only and do not represent a WHSP for the Site.

The ultimate responsibility and authority for the health and safety of the individual rests with the individual themselves and their colleagues. Each worker is responsible for exercising utmost care and good judgement in protecting his or her own health and safety and that of fellow workers. It is the responsibility of Site owners and those working on Site to bring any observed potentially unsafe condition or situations to the attention of any worker or contractor. Should workers find themselves in a potentially hazardous situation, they should immediately discontinue the hazardous procedure and take effective corrective or preventative action.

All incidents and/or near misses pertaining to works carried out on Site should be reported immediately to the owner or occupier of the area of the Site in which they occur.

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AECOM Australia Pty Limited (AECOM) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of the Macquarie Point Development Corporation (the Corporation) and only those third parties who have been authorised in writing by AECOM to rely on this Report.

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It is prepared in accordance with the scope of work and for the purpose outlined in the proposal *AFL Stadium Development – Proposal for Site Remediation Strategy Update* dated 24 November 2024.

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Any estimates of potential costs which have been provided are presented as estimates only as at the date of the Report. Any cost estimates that have been provided may therefore vary from actual costs at the time of expenditure.

Figures

Figures

PROJECT ID 60321835
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LAST MODIFIED PK 15 JAN 2024

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N

DATUM GDA 1994, PROJECTION MGA ZONE 55

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metres

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LEGEND

- Regatta Grounds Boundary
- Macquarie Point Site Boundary

SITE LOCATION

Macquarie Point Development Corporation

Site Remediation Strategy, 2024

Macquarie Point, Hobart, TAS

Figure

F1

Map Document: (L:\Legacy\Projects\603X\60321835\4. Tech work area\4.99 GIS\02_Maps\2024\01\SRS_24\F1_Site_Location.mxd)

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DATUM GDA 1994, PROJECTION MGA ZONE 55

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Legend

- Regatta Point Site Boundary
- Proposed Future Building Footprint
- Assessment Area
- Site Boundary

Proposed Landuse

- Aboriginal Culturally Informed Zone
- Residential Development and Public Foreshore Zone
- Paved area and extension to the Aboriginal Culturally Informed Zone
- Multipurpose Stadium and Associated Concourse Zone
- Complementary Integrated Mixed Use Zone
- Royal Engineers Building and Land
- Antarctic Facilities Zone
- Transport Corridor
- Vegetated Area

DRAFT PRECINCT PLAN DEVELOPMENT LAYOUT

Macquarie Point Development Corporation

Site Remediation Strategy Update 2024

Macquarie Point, Hobart, TAS

Figure
F2

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Legend

- Regatta Point Site Boundary
- Assessment Area
- Former Audit Areas
- Site Boundary

Proposed Land Use (Former Masterplan)

- Art and Institutional Area
- Open Space Area
- Mixed Use Area
- Access Link
- Transport/Vehicle Areas
- Residential Area

SITE LAYOUT

Macquarie Point Development Corporation

Site Remediation Strategy Update 2024

Macquarie Point, Hobart, TAS

Figure
F3

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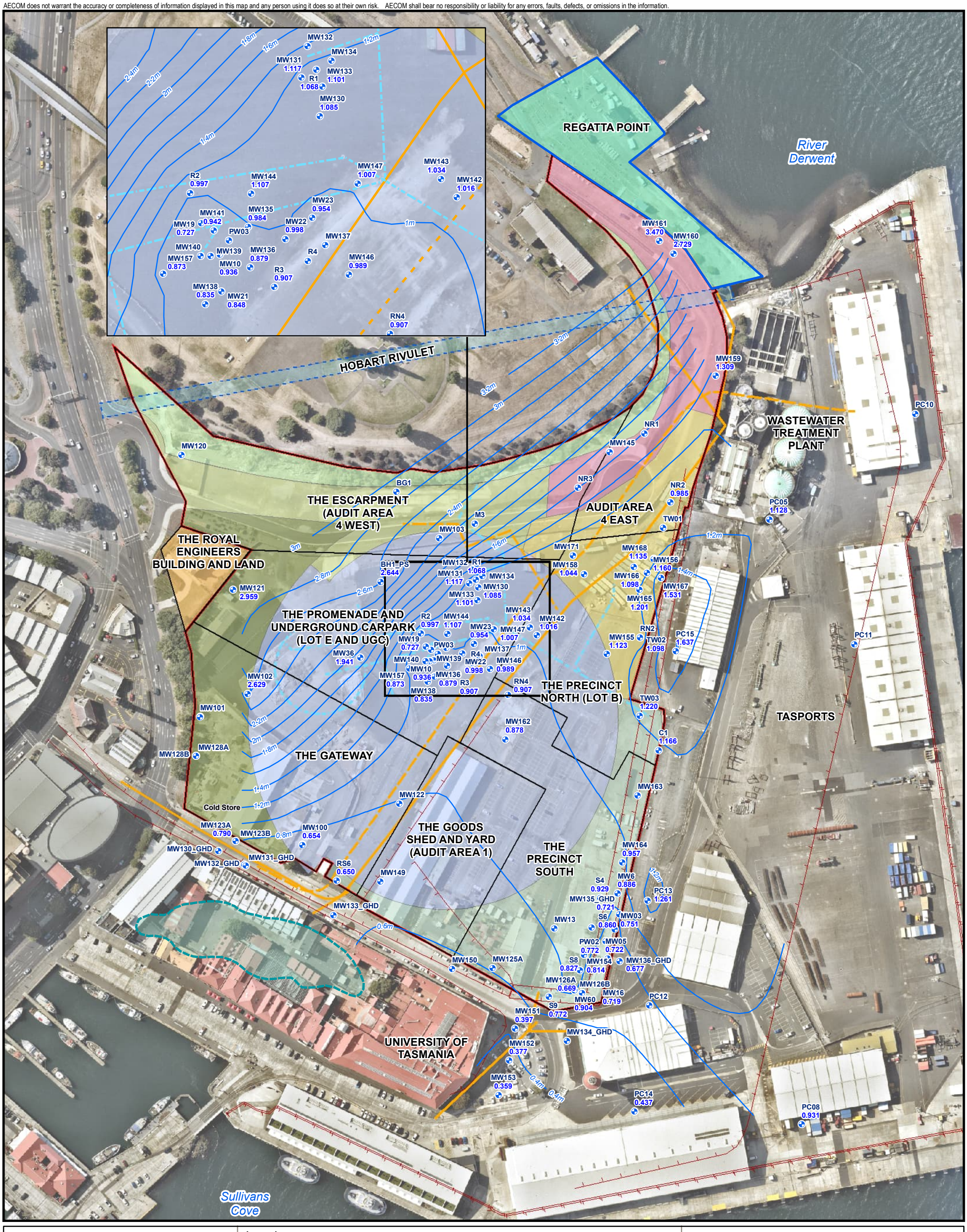

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Legend

- Groundwater Monitoring Well Locations
- 0.20m Contours (mAHD)
- Sea Wall
- Stormwater Infrastructure
- Sewer pipeline - Historic
- Sewer Pipeline - Existing
- Hobart Rivulet Diversion
- Hunter Island
- Assessment Area
- Site Boundary

Proposed Landuse

- Aboriginal Culturally Informed Zone
- Residential Development and Public Foreshore Zone
- Paved area and extension to the Aboriginal Culturally Informed Zone
- Multipurpose Stadium and Associated Concourse Zone
- Complementary Integrated Mixed Use Zone
- Royal Engineers Building and Land
- Antarctic Facilities Zone
- Transport Corridor
- Vegetated Area
- Residential Area

0.614 Groundwater Elevation (mAHD)

INFERRED SHALLOW GROUNDWATER LEVEL CONTOURS NOVEMBER 2019

Macquarie Point Development Corporation

Site Remediation Strategy Update 2024

Macquarie Point, Hobart, TAS

Figure **F4**

Map Document: (L:\Legacy\Projects\603X\60321835\4. Tech work area\4.99 GIS\02_Maps\2024\06\SRS_Update_24\F4_Inferred_Groundwater_Flow_Direction.mxd)

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REGATTA POINT
HOBART RIVULET DIVERSION
AUDIT AREA 4 EAST
NORTHERN VEHICULAR ACCESS
THE ESCARPMENT (AUDIT AREA 4 WEST)
THE ROYAL ENGINEERS BUILDING AND LAND
LNAPL Plume A1
THE PROMENADE AND UNDERGROUND CARPARK (LOT E AND UGC)
Former LNAPL Plume A3
THE PRECINCT NORTH (LOT B)
LNAPL Plume A2
Tar Plume D
Tar Plume C
THE GATEWAY
Tar Plume A
LONGHOUSE
Tar Plume B
1
2
3
4
5
6
THE GOODS SHED AND YARD (AUDIT AREA 1)
GOODS SHED
THE PRECINCT SOUTH
FORMER HOBART RIVULET
RED SHED
SEAROAD SHED SLAB
LNAPL Plume B

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Legend

- Assessment Area
- Site Boundary
- Sea Wall
- HV Conduit and Direct Bury
- LV Conduit and Direct Bury
- City of Hobart Services
- Stormwater pipeline
- Sewer (Main Hobart Pipeline)
- Former Sewer pipeline
- Pipeline (Unknown)
- Tar pipeline
- Naval oil pipeline
- Water pipeline
- Diesel Pipeline (Remaining)
- Oil Line (Remaining)
- Fuel Line (Remaining)
- Telecommunication Cables
- Lead impacted soil on Site boundary
- Petroleum impacted soil on Site boundary
- Potential Buried ACM
- Previous UST Location
- Inferred Extent of LNAPL Plume
- Historical Inferred Extent of LNAPL Plume
- Inferred Tar Extent

KNOWN SUBSURFACE FEATURES AND AREAS OF NOTABLE IMPACTS

Macquarie Point Development Corporation

Site Remediation Strategy Update 2024

Macquarie Point, Hobart, TAS

Figure
F5

Map Document: (L:\Legacy\Projects\603X\603218351\4. Tech work area\4.99 GIS\02_Maps\2024\06\SRS_Update_24\F5_Known_Subsurface_Features_Areas_Notable_Impacts.mxd)

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