Moorebank Precinct West - Early Works Per & Poly-Fluoroalkyl Substances (PFAS) Management Plan

Report No	MPW PFASMP-01
Revision	G
Date	27/02/2018

Moorebank Precinct West – Early Works

Per & Poly-Fluoroalkyl Substances (PFAS) Management Plan

Prepared for

QUBE Property Management Services Pty Ltd on behalf of Sydney Intermodal Terminal Alliance (SIMTA)

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Quality Information

Document Title	Moorebank Precinct West Early Works PFAS Management Plan
Report no.	MPW-PFASMP-01
Date	27/02/2018
Prepared by	Kellie Guenther
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Document Control

Version	Date	Description of Revision	Prepared By	Reviewed By	Approved By
A	17/02/2017	Draft issued for comment	PP	NB	NS
B	17/05/2017	Updated to address comments by Department of Environment and Energy and to incorporate Food Standards Australia New Zealand (FSANZ) guidance released in April 2017	PP	NB	NS
C	21/06/2017	Updated to address comments by Department of Environment and Energy on Revision B and to incorporate NSW Office of Environment and Heritage (OEH) Science, (Draft) PFAS Screening Criteria	PP	NB	NS
D	06/12/2017	Updated to address comments by Department of Environment and Energy on Revision C and to incorporate Risk Assessment Screening Criteria	KG	NB	NS
E	22/12/2017	Updated to address comments by Department of Environment and Energy on Revision D	KG	PS	NS
F	03/01/2018	Updated to address comments by Department of Environment and Energy on Revision E	KG	NB	NS
G	27/02/2018	Updated to address comments by Department of Environment and Energy on Revision F	KG	NB	NS

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Glossary/Abbreviations

Term	Meaning
AEC	Areas of Environmental Concern
AFFF	Aqueous Film Forming Foam
AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environmental Conservation Council
AS/NZS	Australian Standards/New Zealand Standards
C&D	Construction and Demolition
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CLM	Contaminated Land Management Regulation 2013
CoA	Conditions of Approval
DA	Development Approval
DBFTA	Dust Bowl Fire Training Area
DCP	Development Control Plan
Development	Moorebank Precinct West
DGI	Data Gap Investigation
DNSDC	Defence National Storage and Distribution Centre
DoD	The Department of Defence
Early Works	Land Preparation Works – Demolition and Remediation
EEC	Ecologically Endangered Community
EIS	Environmental Impact Statement
EHC	Environmentally Hazardous Chemicals Regulation 2008
EP&A Act	Environmental Planning and Assessment Act
EPA	New South Wales Environmental Protection Authority
EPBC	Environmental Protection and Biodiversity Act
EPL	Environmental Protection License
ER	Environmental Representative
ESL	Ecological Screening Level
FFTA	Former Fire Training Area
FSANZ	Food Standards Australia New Zealand
GAC	Granular Activated Carbon
GSW	General Solid Waste
HSL	Health Screening Level
LGA	Local Government Area
MCoA	Minister's Conditions of Approval
MIC	Moorebank Intermodal Company
MNES	Matters of National Environmental Significance
MPW	Moorebank Precinct West
OEMP	Operations Environmental Management Plan
NEPMs	National Environmental Protection Measures
NSW	New South Wales
OEMP	Operational Environmental Management Plan

PEA	Preliminary Environmental Assessment
PFAS	Per & Poly-Fluoroalkyl Substances
PFASMP	Moorebank Precinct West Early Works Per & Poly-Fluoroalkyl Substances Management Plan
PFC	Perfluorinated Chemicals
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctane Sulfonic Acid
PFOS	Perfluorooctanoic Acid
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
RSW	Restricted Solid Waste
SCC	Specific Containment Concentrations
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SIMTA	Sydney Intermodal Terminal Alliance
Site	Moorebank Precinct West
SME	School of Military Engineering
SSD	State Significant Development
TCLP	Toxicity Characteristics Leaching Procedure
TDI	Tolerable Daily Intake
WQOs	Water Quality Objectives

1 Introduction

1.1 Purpose

1.1.1 The purpose of the Moorebank Precinct West (MPW) Early Works Per & Poly-fluoroalkyl Management Plan (PFASMP) is to outline how PFAS impacted soil, surface water and groundwater will be managed during the MPW Early Works construction activities should they be encountered.

1.1.2 This plan is intended to satisfy the requirements of Condition 8 of the approval notice EPBC 2011/6086 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1.3 This plan is intended to be a sub-plan of the Liberty Industrial MPW Early Works Construction Environmental Management Plan (CEMP) (Liberty 2016[1]) and should be used in conjunction with the Remediation Action Plan (RAP) (Golder 2016[2]) (**Appendix A**) as a part of the overall environmental management framework for the MPW Early Works Project.

1.2 Background

1.2.1 The Moorebank Precinct is situated within the City of Liverpool Local Government Area (LGA) and is located approximately 2.5km from the Liverpool City Centre and approximately 27km south west of the Sydney Central Business District (CBD). The Moorebank Precinct has been divided into two sub-precincts, Moorebank Precinct East and Moorebank Precinct West (the Site).

1.2.2 The development of the Site involves the construction of intermodal facilities which will be linked to Port Botany, the interstate road networks and the interstate freight rail network.

1.2.3 The first construction package is Land Preparation Works Demolition and Remediation which includes the demolition of existing buildings and remediation of identified contamination.

1.2.4 The site is bounded by the M5 Motorway to the north, the Georges River and Southern Sydney Freight Line to the west, the East Hills Railway line to the south and Moorebank Precinct East to the east. It is generally described as land contained in Lot 1 DP 117707 and Lot 100 DP1049508

1.2.5 The Site was previously used by the School of Military Engineering primarily for training activities, some of which included firefighting training and the use of Aqueous Film Forming Foam (AFFF) containing PFAS.

[1] *Moorebank Intermodal Terminal LPWDR Construction Environmental Management Plan*, Liberty Industrial Pty Ltd, 13 December 2016 (Liberty 2016).

[2] *Moorebank Intermodal Company Property West Land Preparation Works Stage 1 and Stage 2 – Remediation Action Plan*, Golder Associates, August 2016 (Golder 2016).

1.2.6 The PFAS group of chemicals, also known as perfluorinated chemicals (PFCs), are man-made fully fluorinated organic compounds with surfactant and emulsification properties. They are used for the manufacture of fluoropolymers which in turn are used for production of products such as fire-fighting foams, coating additives (such as in Teflon and Gore-Tex), cleaning products and numerous other commercial applications. PFAS are associated with AFFF that have been used since 1950s. The PFAS compounds include perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorohexane sulfonate (PFHxS) and fluorotelomer 6:2FTS and 8:2FTS. Fluorotelomers may break down to PFOA under certain conditions in the Environment (WA DER 2016).

1.2.7 In accordance with the Environmental Planning and Assessment Act (NSW 1979), the Planning Assessment Commission of NSW granted development consent to the Moorebank Intermodal Company for the Concept Proposal and Early Works (Stage 1). The development was approved as a State Significant Development under application number SSD 5066.

1.2.8 Early Works (Stage 1) is defined as: removal of six underground storage tanks and an interceptor pit described in Section 1.2.12 below.

1.2.9 SSD 5066; Condition B3 of the Early Works (Stage 1) development consent requires "the subject site is to be remediated in accordance with a) The approved Remedial Action Plan (sic); b) State Environmental Planning Policy No. 55 Remediation of Land; and c) The guidelines in force under the Contaminated Land Management Act. The RAP must be endorsed by a NSW EPA Certified Site Auditor under the NSW Site Auditor Scheme.

1.2.10 Condition D20 of SSD 5066 requires that prior to the commencement of Early Works "the Applicant shall prepare and implement a Construction Environmental Management Plan (CEMP)". This PFAS Management Plan is a sub-plan of the CEMP (Liberty 2016).

1.2.11 The EPBC 2011/6086 conditions of approval No. 3 requires "the person taking that action must ensure that early works are undertaken in accordance with SSD 5066 and comply with the measures described in Condition 8 wherever perfluoroalkyl substances (PFAS) contamination is identified".

1.2.12 The current scope of the early works contract, where PFAS is identified as a part of the validation criteria, includes the remediation of the following areas only **Figure 1** and RAP Section 7, Table 5, Golder 2016, **Appendix A**:

- UST – 0367/S_UST_008 (Figure 004- J)
- UST – Waste Oil_3767S_UST_003 (Figure 004 -D)
- UST – Waste Oil_UST_009 (Figure 004 -D)
- UST – 03767S_UST_006 (Figure 004- E)
- Interceptor Pit SWSS0285 (Figure 004-B)
- UST – Waste Oil_UST_005 (Figure 004 -F)
- UST – Waste Oil_03767_UST_010 (Figure 004- A)

Figure 1: Location of identify USTs and Interceptor Pits

1.2.13 The known impacts for the remediation areas listed above comprise soil impacts only.

1.2.14 The contaminants of concern for the Early Works Remediation Areas (EWRA) include, but are not limited to, Total Recoverable Hydrocarbons (TRH), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes (BTEX), heavy metals, asbestos, volatile organic compounds (VOCs), Semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols and PFAS.

1.2.15 The EWRAs areas are shown on **Figure 1**.

Furthermore, as provided in Section 4.4 of the RAP (Golder 2016), PFAS has only been identified in groundwater within the two source areas, Former Dust Bowl Fire Training Area (Dust Bowl) and Former Fire Fighting Training Area (FFTA). These impacts require assessment and management but are separate to the current scope of Early Works. These areas are shown on **Figure 2**.

Figure 2: Location of Source Areas -Dust Bowl and FFTA

1.2.16 It is considered unlikely the EWRAs will encounter groundwater. The scope of the Early Works is restricted by SSD 5066 Development Consent Condition B2 which requires "the approved works (including any excavation required for remediation) must not occur below 5 metres Australian Height Datum (AHD)". The surveyed groundwater level is approx. 3.5 m AHD and the construction works area for the nominated EWRA is at an existing ground level of approx. 17 m AHD. This means that the Early Works will not come into contact with the groundwater where the potential for PFAS contamination to exist has been identified.

1.2.17 A Risk Assessment (EP Risk 2017a[3]) (**Appendix B**) was undertaken to establish appropriate investigation/remediation target levels for the management of identified PFAS impacts in soil, surface water and groundwater associated with the Dust Bowl and FFTA. As PFAS has been identified as a potential contaminant of concern within the EWRAs screening levels developed in EP Risk (2017) will be incorporated into this plan.

1.3 Objectives

1.3.1 The objective of this PFASMP is to outline the management of any PFAS impacted soil, sediment, surface water and groundwater identified during the MPW Early Works in order to minimise the risk to human health and the environment.

1.4 Scope of Works

1.4.1 This PFASMP covers the management of PFAS impacted soil, sediment, surface water and groundwater during the MPW Early Works construction project phase only, which comprises:

- Remediation of the EWRAs as specified in **Section 1.2.12** above.

1.4.2 This PFASMP does not constitute a long term environmental management plan for the Site.

2 Relevant Environmental Legislation and Guidelines

2.1 Overview

2.1.1 Key environmental legislation, standards and guidance / technical notes related to the management of PFAS contamination comprise:

2.2 International

- Stockholm Convention.

2.3 Australian Federal Legislation

- National Environment Protection Council (NEPC) Act 1994.
- Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.

2.4 NSW State Legislation

- Protection of the Environment Operations (POEO) Act 1997.
- Contaminated Land Management (CLM) Act 1997.
- Contaminated Land Management Amendment Act 2008.
- Environmental Planning and Assessment (EP&A) Act 1979.
- Environmental Hazardous Chemicals (EHC) Act 1985.

2.5 National Guidelines

- Commonwealth Environmental Management Guidance (CEMG) on Perfluoro octane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA), October 2016 (Draft).
- National Environment Protection Council (NEPC), National Environmental Protection Measure (NEPM) (Assessment of Site Contamination) 1999 (April 2013), (NEPC 2013).
- Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), National Water Quality Management Strategy Australian and New Zealand guidelines for fresh and marine water quality, 2000 (ANZECC 2000).
- National Health and Medical Research Council (NHMRC) Guidelines for Managing Risk in Recreational Waters, 2008 (GMRRW 2008).
- NHMRC and Natural Resource Management Ministerial Council (NRMMC), National Water Quality Management Strategy Australian Drinking Water Guidelines, 2013 (NRMMC 2013).
- Heads of EPAs Australia and New Zealand (HEPA), PFAS National Environmental Management Plan, January 2018 (HEPA 2018).

2.6 NSW Guidelines

- NSW Environment Protection Authority (EPA) State Environmental Planning Policy 55 – Remediation of Land (SEPP55), 1998.
- Department of Environment and Conservation (DEC) New South Wales (NSW), Guidelines for the Assessment and Management of Groundwater Contamination, 2007 (DEC 2007).
- NSW Environmental Protection Authority (EPA) Protection of the Environment Operations (Waste) Regulation 2014.

[3] *Literature Review, Criteria for Assessment of PFAS and Risk Assessment Moorebank Intermodal Terminal Development,* EP Risk Pty Ltd, EP0488.001.v3, September 2017 (EP Risk 2017a)

- NSW EPA Waste Classification Guidelines 2014.
- NSW EPA Addendum to the Waste Classification Guidelines (2014) – Part 1: Classifying Waste.
- NSW EPA Designing Sampling Programs for Sites Potentially Contaminated by PFAS, Guidance Document, 2016.
- NSW Office of Environment and Heritage (OEH) Science, (Draft) PFAS Screening Criteria, May 2017 (OEH 2017) (not publicly available).

2.7 Other Guidelines

- Western Australia Department of Environmental Regulations (WA DER). Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) - Contaminated Sites Guidelines, Final Version (February 2016) (WA DER 2016).

2.8 Other Documentation

- Golder Associates; Moorebank Intermodal Company Property West Land Preparation Works Stage 1 and Stage 2 –Remediation Action Plan (the RAP) Revision 0 9-Aug-2016 (**Appendix A**).
- EP Risk; Literature Review, Criteria for Assessment of PFAS and Risk Assessment Moorebank Intermodal Terminal Development, Version 3, September 2017 (EP Risk 2017a) (**Appendix B**).
- Liberty Industrial; Moorebank Intermodal Terminal LPWDR Stockpile Management (Materials Tracking) Plan, Revision E, December 2017 (**Appendix C**).
- Golder Associates; Moorebank Intermodal Asbestos in Soils Management Plan Revision 1, 16/08/2016.
- Construction SME Unexploded Ordnance Management Plan Revision 0 29-Aug 2016.

3 Minister's Conditions of Approval (MCoA)

3.1.1 The Minister of Planning granted consent to the development application for the Project subject to a set of conditions which are required to;

- Prevent, minimise, and/or offset adverse environmental; impacts including economic and social impacts;
- Set standards and performance measures for acceptable environmental performance;
- Require regular monitoring and reporting; and
- Provide for the ongoing environmental management of the development.

3.1.2 Approval for development of the Site has been granted conditional to a set of requirements to ensure environmental best practice is employed.

3.1.3 The SSD CoA that relate to environmental impacts are addressed by the Liberty Industrial CEMP and sub-plans. The relevant CoA conditions to the management of PFAS impacted soil, sediment, surface water and groundwater are shown in Table 1.

Table 1 - CoA relevant to the PFASMP

MCoA No.	Condition's Requirements	Section
B14	All liquid and/or non-liquid waste generated on the Site shall be assessed and classified in accordance with *EPA Waste Classification Guidelines 2014*	Section 9.3
B15	All waste materials removed from the Site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials.	Section 9.3

4 EPBC Approval

4.1.1 Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), environment assessments are undertaken to enable environment and heritage protection and biodiversity conservation.

4.1.2 It was determined that the Project required formal assessment and it was referred for assessment, with the following two controlling provisions being identified:

- Listed threatened species and communities (*sections 18 & 18A – EPBC Act*).
- Commonwealth action (*section 28 – EPBC Act).*

4.1.3 EPBC approval was granted subject to the list of conditions listed in the approval notice EPBC 2011/6086. The conditions relevant to this PFASMP are shown in Table 2.

Table 2 - EPBC conditions of approval

CoA No.	Condition's Requirements	Document Ref.
8	Sections of the CEMP and Operational Environmental Management Plan (OEMP) relating to contamination and soils must be prepared by a suitably qualified expert and must:	
8 (d) (i)	In relation to management of PFAS: i. be consistent with: ▽ National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) ▽ Australian and New Zealand Guidelines for Fresh and Marine Water Quality (under the National Water Quality Management Strategy) including the draft default guideline values for perfluorooctanoic acid (PFOS) and perfluorooctane sulfonic acid (PFOA) in freshwater as applied by the state government ▽ relevant Commonwealth environmental management guidance on PFOS and PFOA	▽ Section 2 ▽ Section 2 ▽ Section 2
8 (d) (ii)	Detail implementation and operational procedures, appropriate to the risk posed by any contamination, including: ▽ roles and responsibilities ▽ management of potential PFAS impacted sites as yet un-investigated ▽ management of areas of known PFAS contamination, including strategies to reduce runoff, dewatering and migration of contamination across and off the proposed site ▽ a contingency action plan for unexpected PFAS contaminant discoveries	▽ Section 5 ▽ Section 6 ▽ Section 7 ▽ Section 9
8 (d) (iii)	Detail soil, groundwater and surface water PFAS contamination monitoring requirements and testing and disposal procedures appropriate to the risk posed by any contamination.	▽ Section 8
8 (d) (iv)	Include requirements for site validation reports appropriate to the risk posed by any contamination.	▽ Section 8
8 (d) (v)	include requirements for RAPs appropriate to the risk posed by any contamination	▽ Remediation Action Plan
8 (d) (vi)	Detail review procedures appropriate to the risk posed by any contamination	▽ Section 11
8 (d) (vii)	Impose the following performance measures for managing earthworks and the potential for effects to occur due to disturbance of PFAS impacted soils during construction: ▽ impacted sediment to be discharged outside the Site of the action to be minimised ▽ impacted waste material, including excavated soil, to be released through dewatering to be handled appropriately to the risk posed by the contamination and disposed of in an environmentally sound manner such that potential for the PFAS content to enter the environment is minimised ▽ impacted waste material, including excavated soil, with a PFOS or PFOA content above 50 milligrams per kilogram (mg/kg) to be stored or disposed of in an environmentally sound manner, such that PFAS content does not enter the environment ▽ all soil remaining at the site of the action to be suitable for purpose.	▽ Section 7
8 (e)	Be approved by the minister	Note

5 Roles & Responsibilities

5.1.1 The roles and responsibilities of all key stakeholders are identified in Table 3.

Table 3 - Roles and Responsibilities

Role	*Company*	*Responsibility*
Principal	SIMTA	The Principal shall ensure all works are carried out in a compliance with all relevant legislation, standards and guidelines.
Superintendent	Tactical	▽ Reviewing and approving the Contractor's proposed construction methodology or designs and specifications for any Contractor's options / alternatives. ▽ Ensuring that the Contractor constructs all Works in accordance with the designs and drawings to which consents have been given under the Contract and by the relevant authorities. ▽ Monitoring site safety, environmental performance and quality assurance and control activities of the Contractor, ▽ Monitoring the progress of the construction works and supervise all demolition and remediation activities, including the Contractor's audit activities.
Remediation Representative	CARAS	▽ Review of the Contractor's systems, processes and documentation to ensure the Site Remediation Works are completed in accordance with project documentation and all relevant State and Federal legislative requirements and Australian Standards ▽ Providing remediation and sustainability advice to the Superintendent on the design, construction and operation of the project ▽ Regular auditing of the Contractor's systems and processes relating to Site Remediation Works, including compliance inspections ▽ Liaison with Authorities, relevant stakeholders, the Principal, Superintendent and other Consultants
Accredited Site Auditor	Enviroview	▽ Approval of stage specific RAPs. ▽ Ensure that measures employed as part of the Remediation Works are capable of achieving the desired outcomes of the RAP. ▽ Upon competition of the Remediation, delivery of a Site Audit Statement to certify that the RAP was successful and development of the site for its intended use is able to continue. ▽ Liaise with the Principle, Contracts Administrators, Remediation Contractors, Environmental Consultants and the EPA where required.
Environmental Representative	HBS	The Environment Representative shall as Per MCoA D1: ▽ Be the principal point of advice in relation to the environmental performance of the Early Works; ▽ Monitor the implementation of environmental management plans and monitoring programs required under this approval and advise the Applicant upon the achievement of these plans/programs; ▽ Have responsibility for considering, and advising the Applicant on, matters specified in the conditions of this approval, and other licenses and approvals related to the environmental performance and impacts of the Early Works; ▽ Ensure that environmental auditing is undertaken in accordance with the Applicant's Environmental Management System(s); ▽ Be given the authority to approve/reject minor amendment to the Construction Environment Management Plan. What constitutes a "minor" amendment shall be clearly explained in the Construction Environment Management Plan (Section 1.5); ▽ Be given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts; and

		▽ Be consulted in responding to the community concerning the environmental performance of the Early Works where the resolution of points of conflict between the Applicant and the community is required.
Environmental Consultant	JBS&G	▽ Provision of on-site technical advice and assistance to the Contractor as required. ▽ Validation of: - completed management measures via additional soil and groundwater assessment in affected areas; - excavations; - stockpile classifications. ▽ Continual testing and investigation of areas suspected of contamination or previously inaccessible. ▽ Upon completion of remediation works, preparation of Remediation Validation Report ▽ Where required liaise with Site Auditors, Remediation Contractors, EPA etc.
Principal Contractor	Liberty Industrial	▽ Compliance with the implementation of all site management plans and WHS measures relevant to their activities, including this one. ▽ Implementation and compliance with the Materials Tracking System ▽ Achieving the remediation requirements in accordance with all statutory documentation regarding PFAS contamination and soil and water quality. ▽ Full cooperation with all relevant site staff, consultants, sub-contractors and other contractors working on the Development. ▽ Record keeping of all transport and disposal documentation related to the removal of waste. ▽ Organise the purchase, provision and maintenance of spill kits, and ensure they are easily accessible. ▽ Ensure appropriate training is provided in spill prevention, management and clean up. ▽ Ensure that this PFASMP is made available to all staff and contractors involved with PFAS remediation and control activities. ▽ Ensure that all relevant personnel are made aware of all the WHS procedures and measures to control the human impact of PFAS. ▽ Manage the disposal and tracking of waste generated through PFAS remediation and control.

6 Contamination Status

6.1 Overview

6.1.1 Conceptual Site Models for the Site are presented within Golder (2016) and EP Risk (2017a and 2017b).

6.1.2 Various phases of site investigation and risk assessment have previously been undertaken across the Site to assess the extent of PFAS contamination. PFAS impacts were generally not **identified within soils (Golder 2015 to 2016). However, PFAS was reported within** groundwater. Subsequently, a Data Gap Investigation (DGI) was undertaken by EP Risk (2017b[4]), targeting the two known source areas and delineating the previous Golder on-site delineation works. PFAS concentrations in groundwater were reported above the newly published and adopted groundwater investigation levels[5] onsite. The significant groundwater impacts were generally localised to the two known source areas (Dust Bowl and FFTA), which are shown in **Figure 2**. As noted above, these impacts require assessment and management but are separate to the current scope of Early Works.

6.1.3 In conjunction with the DGI works, a literature review and updated risk assessment has been undertaken by EP Risk (2017a). The findings of the risk assessment and the most recently published relevant investigation levels has been incorporated into this PFASMP, which are detailed in **Section 9** (**Table 5**) below.

6.1.4 Where PFAS impacts are encountered during the Early Works they will be managed in accordance with the control measures defined in this document.

[4] *Per-& Polyfluoroalkyl Substances (PFAS) Data Gap Investigation Moorebank Intermodal Terminal Development*, EP Risk Management Pty Ltd, 20 November 2017 (EP Risk 2017b)
[5] Converted enHealth Interim Values for Protection of Public Health, based on FSANZ developed TDIs

7 Sampling Analysis Plan

7.1.1 CARAS has adopted the Data Quality Objectives ('DQOs') planning process as recommended in the National Environment Protection Council ('NEPC') 2013, National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013) ('NEPM 2013') and required within the NSW Department of Environment and Conservation 2006, Guidelines for the NSW Site Auditors Scheme (2nd edition) ('DEC 2016').

7.2 State the Problem

7.2.1 The potential for PFAS impacted soils has been identified within the EWRAs.

7.3 Identify the Decision

7.3.1 Is PFAS impacted soil present within the EWRAs?

7.3.2 Does the presence of PFAS within the EWRAs present a human health and/or ecological risk?

7.3.3 Is there any evidence of, or potential for, migration of contaminants off-site?

7.3.4 Is a site management strategy required?

7.4 Identify Inputs into the Decision

7.4.1 Environmental data as collected by sampling and analysis and site observations made during this investigation.

7.4.2 Assessment criteria to be achieved on the site as based on the intended land use and project objectives, as defined by the assessment criteria nominated in **Section 9.**

7.4.3 Confirmation the data generated by sampling and analysis are of an acceptable quality to allow reliable comparison to assessment criteria as undertaken by assessment of quality assurance and quality control (QA/QC) as per Appendix B of the RAP.

7.5 Define the Boundaries of the Study Area

7.5.1 The study area comprises the EWRAs as identified on **Figure 1**.

7.6 Develop a Decision Rule

7.6.1 Laboratory analytical data will be assessed against the site-specific criteria nominated in **Section 9.** Where PFOS and PFOA are detected in soil samples reported concentrations will be compared to the range of investigation levels in Table 5 and lines of evidence will be presented as to the most suitable investigation criteria to use.

7.6.2 The decision rules adopted to answer the decisions identified in **Section 7.3** are summarised below:

Decision Rules Matrix

Decision required to be made	Decision Rule
Is PFAS impacted soil present within the EWRAs?	If analytical results report PFAS concentrations above the LORs the decision is Yes. Results below the LOR, the decision is No
Does the presence of PFAS within the EWRAs present a human health and/or ecological risk?	The nature and extent of soil impacts will be assessed, and soil analytical data will be compared against site specific criteria in **Section 9**. Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils: Either: the reported concentrations are all below the site criteria; Or: the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and the standard deviation of the results must be less than 50% of the site criteria. And: the 95% upper confidence limit (UCL) of the average concentration for each analyte must be below the adopted site criterion. If the statistical criteria stated above are satisfied, and an assessment of risk indicates no unacceptable risks, the decision is No. Otherwise, the decision is Yes.
Is there any evidence of, or potential for, migration of contami nants off-site?	Are contaminants present within natural soils at concentrations exceeding **Section 9** criteria? If yes, the answer to the decision is Yes. Otherwise, the answer to the decision is No. And If groundwater analytical results exceed the **Section 9** criteria and the downgradient groundwater impacted, the decision is yes. Otherwise, the decision is No.
Is a site management strategy required?	Is the answer to any of the above decisions Yes? If yes, a site management strategy will be required to be developed. If no, a site management strategy is not required.

7.7 Specify Acceptable Limits of Decision Errors

7.7.1 To assess the usability of the data prior to making decisions, the data will be assessed against predetermined Data Quality Indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy. The acceptable limit on decision error is 95% compliance with DQIs.

7.7.2 The pre-determined Data Quality Indicators (DQIs) established for the project are precision, accuracy, representativeness, comparability and completeness (PARCC parameters), and are discussed in *Guidelines for the NSW Site Auditor Scheme (2nd Edition)* NSW EPA (2006). Quality Assurance and Quality Control (QA/QC) is specified in Appendix B of the RAP (Golder 2016).

7.8 Optimise the Design for Obtaining Data (Methodology)

7.8.1 The proposed sampling methodology is discussed within Section 7 and 8 of the RAP (**Appendix A**).

7.8.2 Approximately 25% of soil validation samples within the EWRAs will be analysed for the PFAS Suite[6] (**Appendix D**).

7.8.3 Materials excavated from the EWRAs will be managed in accordance with Section 7.2 of the RAP (**Appendix A**).

[6] ALS 28 parameter suite LOR 0.0002 mg/kg to 0.001 mg/kg.

8 Controls and Mitigation Measures

8.1.1 As noted in previous sections no known PFAS soil impacts have been identified within the Early Works areas. Therefore, should PFAS be identified through the stockpile management and/or validation procedure the following controls and mitigation measures will be triggered.

8.1.2 Early works are not anticipated to intersect groundwater within the site. However, it has been included and discussed below for completeness.

Table 4 - Controls and Mitigation Measures

Activity	Potential Risks	Control Measure	Responsibility	Monitoring & Reporting	Performance measure
Utility services and stormwater identification, protection, diversion and disconnection	*PFAS/ Suspected PFAS impacted soil encountered. Where impacted soil encountered potential for stormwater ingress.*	▽ *Unexpected PFAS finds procedure (Section 10) is implemented.* ▽ *Isolation of work area* ▽ *No unauthorised movement of materials*	*Remediation Representative/ Environmental Consultant*	▽ *Site inspections* ▽ *Construction Compliance Audits* ▽ *Laboratory Testing* ▽ *Validation Report*	*No discharge of PFAS impacted soils and/or stormwater is permitted above the adopted site investigation levels nominated in Section 9.*
Heritage Salvage Works	*PFAS/ Suspected PFAS impacted soil encountered. Where impacted soil encountered potential for stormwater ingress.*	▽ *Unexpected PFAS finds procedure (Section 10) is implemented.* ▽ *Isolation of work area* ▽ *No unauthorised movement of materials*	*Remediation Representative/ Environmental Consultant*	▽ *Site inspections* ▽ *Construction Compliance Audits* ▽ *Laboratory Testing* ▽ *Validation Report*	*No discharge of PFAS impacted soils and/or stormwater is permitted above the adopted site investigation levels nominated in Section 9.*
Demolition of existing infrastructure & buildings	*PFAS/ Suspected PFAS impacted soil encountered. Where impacted soil encountered potential for stormwater ingress.*	▽ *Unexpected PFAS finds procedure (Section 10) is implemented.* ▽ *Isolation of work area* ▽ *No unauthorised movement of materials*	*Remediation Representative/ Environmental Consultant*	▽ *Site inspections* ▽ *Construction Compliance Audits* ▽ *Laboratory Testing* ▽ *Validation Report*	*No discharge of PFAS impacted soils and/or stormwater is permitted above the adopted site investigation levels nominated in Section 9.*
Remediation of identified EWRAs	*Worker exposed to PFAS during excavation works*	▽ *Project inductions to identify areas with high risk of PFAS contamination.* ▽ *JHA to identify risk of PFAS and appropriate*	*Remediation Representative/ Environmental*	▽ *Site inspections* ▽ *Construction Compliance Audits*	*No worker is permitted to enter an identified or suspected PFAS Area*

Activity	Potential Risks	Control Measure	Responsibility	Monitoring & Reporting	Performance measure
		control measures ▽ *Excavation Permit to control the excavations in high risk remediation of identified contamination areas.* ▽ *PPE used in high risk areas including:* ▽ *Disposable overall suits including boots* ▽ *Disposable waterproof nitrite gloves in addition to standard glove requirements* ▽ *All other standard PPE required for works on Site* ▽ *Signage placed in ablution blocks to ensure all workers wash hands and face prior to eating, regardless if gloves are worn* ▽ *If worker's skin comes into contact with PFAS impacted water, ensure skin is immediately washed with clean water and wet clothing is removed immediately after work is complete* ▽ *Dewatering of groundwater impacted with PFAS should be avoided*	*Consultant*	▽ *Laboratory Testing* ▽ *Validation Report*	*unless they are wearing the nominated PPE.*
	PFAS impacted sediment is discharged outside the Site	▽ *To reduce PFAS impacted sediment, stormwater controls should be designed to limit infiltration of run-off into areas where PFAS impacted soils are located.* ▽ *Sediment ponds used to store stormwater to allow sediment to settle prior to discharge* ▽ *Stormwater tested prior to being discharged or used.* ▽ *Stormwater reused for dust suppression will not be sourced from known PFAS impacted areas.*	*Remediation Representative/ Environmental Consultant*	▽ *Site inspections* ▽ *Construction Compliance Audits* ▽ *Laboratory Testing* ▽ *Validation Report*	*No discharge of PFAS impacted soils and/or stormwater is permitted above the adopted site investigation levels nominated in Section 9.*
	PFAS impacted stormwater is discharged outside the site	▽ *To reduce PFAS impacted stormwater, sediment and stormwater controls should be designed to limit infiltration of run-off into areas where PFAS impacted soils are located.* ▽ *Stormwater tested prior to being discharged or used.* ▽ *Stormwater reused for dust suppression will not be sourced from known PFAS impacted areas*	*Remediation Representative/ Environmental Consultant*	▽ *Site inspections* ▽ *Construction Compliance Audits* ▽ *Laboratory Testing – super trace suite (LOR 0.0003-0.001 µg/L).* ▽ *Validation Report*	*No discharge of PFAS impacted stormwater is permitted above the adopted site investigation levels nominated in Section 9.*

Activity	Potential Risks	Control Measure	Responsibility	Monitoring & Reporting	Performance measure
	PFAS impacted groundwater is encountered within the EWRAs	▼ *Unexpected PFAS finds procedure (Section 10) is implemented.* ▼ *Area will be incorporated in to the PFAS RAP (EP Risk 2017c).* ▼ *Dewatering of groundwater impacted with PFAS should be avoided* ▼ *Testing of groundwater for PFAS in and around proposed dewatering areas should be undertaken prior to dewatering* ▼ *A Dewatering Management Plan should be prepared which details appropriate control measure to treat groundwater impacted with PFAS which is generated from dewatering* ▼ *The Dewatering Management Plan should also detail management of hydraulic gradients in and around the dewatering zone so as not to promote migration of PFAS impacted groundwater to un-impacted areas of the Site or off-site* ▼ *To reduce leaching into groundwater, sediment and stormwater controls should be designed to limit infiltration of run-off into areas where PFAS impacted soils are located*	*Remediation Representative/ Environmental Consultant*	▼ *Site inspections* ▼ *Construction Compliance Audits* ▼ *Laboratory Testing* ▼ *Validation Report*	*No discharge of PFAS impacted groundwater is permitted above the adopted site investigation levels nominated in Section 9*
	PFAS impacted waste not stored/stockpiled in an environmentally sound manner	*Where PFAS impacted soils need to be temporarily stored onsite the following has been included in the Stockpile Management Plan (Liberty 2017):* ▼ *The stockpiles of PFAS impacted material should be kept separate from all other stockpiled material.*	*Remediation Representative/ Environmental Consultant*	▼ *Site inspections* ▼ *Construction Compliance Audits* ▼ *Laboratory Testing* ▼ *Validation Report*	*Stockpiles managed in accordance with the Stockpile Management (Material Tracking Plan (Liberty 2017).* *Storage is undertaken in such a way that contamination does not migrate into the surrounding soil or water in accordance with HEPA (2018: 21-22).*

Activity	Potential Risks	Control Measure	Responsibility	Monitoring & Reporting	Performance measure
		▼ *The area will be located and constructed to adequately protect the contents from the ingress of stormwater, weather conditions and unlawful entry.* ▼ *Have an impermeable floor or base with no drainage outlets.* ▼ *Have appropriate environmental controls to prevent offsite contamination and where practicable be bunded in accordance with Australian Standard AS1940.* ▼ *The storage area will be sign posted noting the PFAS impacted soils are stored here.* ▼ *The storage area will be inspected weekly to ensure proper containment and management has been maintained. Where improvements are required these will be reported to the Principal Contractor and conducted within 24 hours.* ▼ *Any leachate must be captured, analysed for PFASs, and if necessary treated, removed, and destroyed in accordance with HEPA 2018.*			

Activity	Potential Risks	Control Measure	Responsibility	Monitoring & Reporting	Performance measure
	PFAS impacted waste not disposed off-site in an environmentally sound manner	▼ *Any PFAS Impacted waste must be classified in accordance with this Plan.* ▼ *Impacted waste must be transported to appropriately licensed waste facility.* ▼ *Impacted waste is transported in trucks with appropriate environmental controls such as tarp covers.* ▼ *Waste tracked as per the Liberty Industrial Waste Tracking Management Plan.* ▼ *Environmental controls such as road sweeping should be implemented.* ▼ *Any waste material with a concentration of PFOS or PFOA above 50 mg/kg must be treated in such a way that there is zero environmental release of PFOS and PFOA, such as through destruction. Assurance must be received from the treatment or waste facility that this outcome can be achieved.*	*Remediation Representative/ Environmental Consultant*	▼ *Waste classification testing* ▼ *Waste classification letter* ▼ *Waste disposal dockets*	*PFAS impacted waste will be disposed of or treated offsite in a licenced treatment or waste facility in compliance with the NSW Waste Guidelines (or other relevant state guidelines if transported interstate).*
	PFAS impacted material above acceptable site-specific criteria remains on site	▼ *All soil excavated from previously identified remediation areas suspected of containing PFAS is to be removed to the Contamination Assessment Treatment Area (CATA) for testing.* ▼ *Based on test results the soil will be stored and managed in accordance with the PFAS Materials Tracking Plan (Liberty 2017) and the Remedial Action Plan (RAP) (EP Risk 2017c).*	*Remediation Representative/ Environmental Consultant*	▼ *Site inspections* ▼ *Construction Compliance Audits* ▼ *Laboratory Testing* ▼ *Validation Report*	*PFAS impacted material that remains on site is below adopted site acceptance criteria. See* ***Section*** *Error! Reference source not found.**.***

9 Adopted Investigation Levels

9.1.1 The soil trigger values for further investigation have been adopted from the *PFAS National Environment Management Plan* (HEPA 2018) and are presented in **Table 5** below.

Table 5 - Adopted Site-Specific Investigation Levels for the Site and Georges River

Criteria	PFOS/PFHxS and PFOS Grouped Chemicals[7]	PFOA and PFOA Grouped Chemicals
Soil onsite		
HSL C (open space, recreation)[8]	1 mg/kg	10 mg/kg
HSL D (industrial/commercial)[9]	20 mg/kg	50 mg/kg
ESL (open space)[10]	1 mg/kg	10 mg/kg
ESL (industrial/commercial)[11]	0.14 mg/kg	-
Surface water and groundwater onsite and offsite		
Drinking Water (potable)	0.07 µg/L	0.56 µg/L
Recreational uses (non-potable)	0.7 µg/L	5.6 µg/L
Georges River – Human Health through fish consumption		
$HSL_{freshwater,\ fish\ consumption}$ (bw=body weight)	0.02 $\mu g/kg_{bw}/d$	0.16 $\mu g/kg_{bw}/d$
Georges River - Ecological (freshwater) offsite		
High conservation value systems (99% species protection) [12]	0.00023 µg/L	19 µg/L
Slightly to moderately disturbed systems (95% species protection)	0.13 µg/L	220 µg/L

[7] For the purposes of risk assessment and to be in line with the previous Golder work, these CoPC were combined under PFOS and PFOS grouped chemicals and PFOA and PFOA grouped chemicals due to their chemical characteristics, degradation in the environment and for the purpose of risk assessment screening.

[8] Based on 20% of FSANZ TDI, i.e. up to 80% of exposure is assumed to come from other pathways.
National Environment Protection (Assessment of Site Contamination) Measure Health Investigation Level C assumptions for public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools (except where soil used for agriculture studies) and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate. HEPA (2018: 14)

[9] Based on 20% of FSANZ TDI, i.e. up to 80% of exposure is assumed to come from other pathways.
National Environment Protection (Assessment of Site Contamination) Measure Health Investigation Level D assumptions including 8 hrs spent indoors and 1 hr spent outdoors at a site such as a shop, office, factory or industrial site. Note 4: the industrial / commercial level for PFOA has been set as 50 mg/kg in anticipation of the Stockholm Convention low content limit of 50 mg/kg. HEPA (2018: 14)

[10] As an interim, the human health screening value for public open space is to be used HEPA (2018: 15)

[11] 2017 Canadian Federal Environmental Quality Guidelines for Residential and Parkland (soil ingestion by a secondary consumer) and Commercial and Industrial – Coarse Soil (concentration in soil that is expected to protect against potential impacts on freshwater life from PFOS originating in soil that may enter the groundwater and subsequently discharge to a surface water body).

[12] Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft default guideline values.
Note 1: The 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement. Note 2: The draft guidelines do not account for effects which result from the biomagnification of toxicants in air-breathing animals or in animals which prey on aquatic organisms. Note 3: The WQG advise that the 99% level of protection be used for slightly to moderately disturbed systems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. HEPA (2018: 16)

9.2 Onsite Reuse

9.2.1 Re-use of soil containing PFOS, PFHxS, and PFOA above the investigation levels in **Table 5** of will need a specific risk assessment regarding its intended use. Materials above the levels in **Table 5** are classified as Class 4, as set out in the Stockpile Management (Materials Tracking) Plan (Liberty 2016:10). Re-use must not lead to an unacceptable risk to the environment and / or human health, or an increase in the level of risk at or near the location in which re-used materials are used. Dilution of PFAS- contamination is not an acceptable waste management strategy for creating material suitable for reuse. The re-use of PFAS-contaminated material above 50 mg/kg is not permitted. PFAS-contaminated material above 50 mg/kg is to be destroyed by high temperature incineration.

9.2.2 The following factors should be considered when assessing the potential for reuse of PFAS contaminated materials:

- potential for pre-existing 'background' PFAS impacts at the destination site and potential to add to the overall mass of PFAS in the receiving area;
- if the receiving environment already contains PFAS, whether the addition of more PFAS to that system increases the potential for harm;
- current and likely future land uses at the destination site;
- hydrology and hydrogeology at the destination site, including: erosion, runoff, infiltration rates, nature of any unconfined and confined aquifer systems, the potential for these to be impacted, and the actual and potential beneficial uses of groundwater;
- proximity of the destination site to pathways such as open drains, storm water systems, water bodies, including groundwater, and to sensitive environmental receptors, including groundwater dependent ecosystems and sensitive plants and animals; and
- potential for the receiving environmental conditions to accelerate the mobilisation of PFAS in the contaminated material or in existing PFAS at that site.

9.2.3 The following reuses are likely to include exposure pathways to potentially sensitive receptors and would therefore normally be considered unacceptable uses for PFAS contaminated material based on risks to the environment and / or human health. The environmental regulator may consider these uses on a case by case basis based on an appropriate site-specific risk assessment and with consideration of applicable legislative requirements. Additional management and institutional controls, including monitoring, are likely to be required to ensure protection of the environment and / or human health. Contact with the environmental regulator must be made before any proposal for the following uses is made:

- fill, burial, or reuse of PFAS-contaminated material less than 2.0 metres above the seasonal maximum groundwater level;
- fill, burial, or reuse within 200 metres of a surface water body or wetland area;
- fill, burial, or reuse of soil or other solid waste, and water in (or in the vicinity of and able to be transported to) areas which can be identified with any of the nine matters of national environmental significance protected under the EPBC Act, and areas of environmental significance as identified in specific jurisdictions;

- fill, burial, or reuse in locations potentially affected by reasonably foreseeable future rises in groundwater or sea level, or near stormwater drains;
- fill, burial, or reuse on agricultural land;
- fill, burial, or reuse in residential developments;
- fill, burial, or reuse on public open space / parkland / recreational land; and
- inclusion in compost, fertilisers, or soil conditioners.

10 Waste Classification, Disposal and/or Management

10.1.1 Where PFAS impacted soils are encountered within the EWRAs these will be treated in accordance with Condition 8. d) vii). All wastes will be classified and managed in accordance with the NSW EPA *Waste Classification Guidelines* (2014) and *Addendum to the Waste Classification Guidelines (2014) – Part 1 Classifying Waste.*

10.1.2 If material is to be disposed off-site, a waste classification must be undertaken in accordance with NSW EPA (2014), as amended, by an appropriately experienced Environmental Consultant.

Table 6 - Adopted Investigation TCLP and SCC values for classifying waste by chemical assessment

Contaminant[3]	Maximum values for leachable concentration and specific contaminant concentration when used together			
	General solid waste[4]		Restricted solid waste	
	Leachable concentration	Specific contaminant concentration	Leachable concentration	Specific contaminant concentration
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)
PFOS + PFHxS	0.05	1.8	0.2	7.2
PFOA	0.50	18.0	2.0	50*

* Waste material with concentrations equal to or greater than 50 mg/kg criteria will be considered Hazardous Waste in accordance with the Stockholm Convention.
[3]PFOS and PFHxS are to be summed for comparison against the TCLP and SCC values.
[4]Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible).

10.1.3 All waste must be disposed to an appropriately NSW EPA licenced landfill facility allowed to accept the waste.

10.1.4 For PFOS and PFOA, the SSC1 threshold (General Solid Waste) is 1.8 mg/kg and 18 mg/kg respectively. In accordance with Condition 8(d)(vii), waste material with concentrations equal to or greater than 50 mg/kg criteria will be considered Hazardous Waste in accordance with the Stockholm Convention.

10.1.5 For PFOS and PFOA, any wastes reported above 7.2 mg/kg and 50 mg/kg respectively, will be considered Hazardous Waste in accordance with the NSW EPA waste framework and the Stockholm Convention. These wastes will be stored in accordance with the Stockpile Management Plan (Liberty 2017) (**Appendix C**). Should hazardous waste containing PFAS be encountered during the current Early Works materials will be managed in accordance with the PFAS RAP (EP Risk 2017c[13]).

10.2 Validation Reporting

10.2.1 Early Works Validation reporting will be conducted in accordance Section 12 of the RAP (Golder 2016).

11 Unexpected PFAS Finds Procedure

11.1.1 Unexpected finds should be managed in accordance with **Section 7** of this plan, Section 10.4.2.1 of the RAP (Golder 2016). If unexpected finds of PFAS contamination are suspected, the procedure in **Figure 3** below is to be followed.

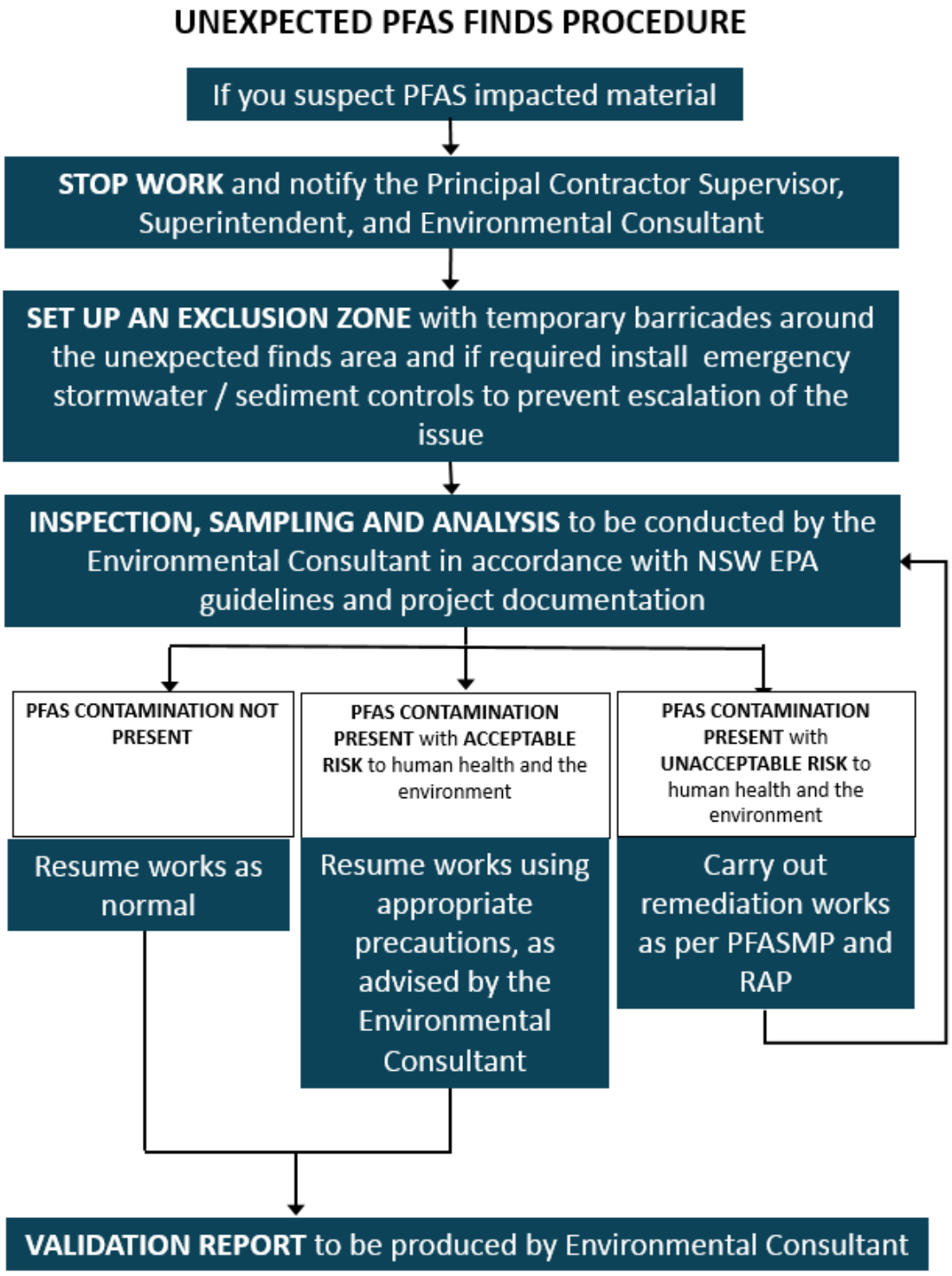
[13] *Per-and Poly-fluoroalkyl Substances Remediation Action Plan Moorebank Intermodal Terminal Development*, EP Risk Management Pty Ltd, 3 November 2017 (EP Risk 2017c).

Figure 3 - Unexpected Finds Protocol

All excavations should be continually monitored for signs of PFAS impacted material.

Signs of PFAS may include;

- Drums, containers or cylinders with no labels or labels containing words 'AFF'
- Fire extinguishers



11.1.2 The extent of PFAS contamination shall be assessed as per Section 7 and 8 of the RAP (Golder 2016) and **Section 7**.

11.1.3 If no PFAS contamination is detected, works can resume as normal.

11.1.4 If PFAS contamination is detected which falls below the adopted investigation levels, this presents an *acceptable risk* and works can resume using appropriate precautions, as directed by the Environmental Consultant.

11.1.5 If PFAS contamination is detected above the investigation levels in Table 5, a risk based approach will be implemented and if an unacceptable risk to human health and/ or the environment is identified remediation works may be required, as per the remediation strategy and control measures outlined in the RAPs (Golder 2016 and EP Risk 2017c).

11.1.6 Once works in the unexpected finds area is complete, the Environmental Consultant should issue a Validation Report, as per the RAP, confirming the PFAS contamination risk has been mitigated.

12 Document Control/Review

12.1.1 Due to the status of PFAS as a contaminant of emerging concern, regulations and accepted procedures for management and disposal are constantly being updated. As such the recommendations and requirements set out in this PFASMP will be subject to change.

12.1.2 In order to incorporate the most up to date information regarding PFAS management, this PFASMP shall be reviewed and updated every six months and/or whenever there are pertinent developments in governing framework.

13 References

Documents
ANZECC Water Quality Guidelines 2000
Contaminated Land Management Regulation 2013
Determination Report, State Significant Development: Moorebank Intermodal Terminal Concept Plan
Development Consent – Concept Proposal, Early Works Stage 1 – Application SSD 5066
Draft *Commonwealth Environmental Management Guidance on PFOS and PFOA* (CEMG)
Environmentally Hazardous Chemicals Regulation 2008
EP Risk, EP0448 – Literature Review, Criteria for Assessment of PFAS and Risk Assessment: Moorebank Intermodal Terminal Development, September 2017.
Food Standards Australia New Zealand (FSANZ) guidance released in April 2017
Indicative Secretary's Environmental Assessment Requirements (SEARs) for SSD Mining Developments, 2015
Liberty Industrial Early Works – Asbestos Removal Control Plan, v.B 21 September 2016
Liberty Industrial Early Works – Construction Air Quality Management Plan, v.E 5 January 2017
Liberty Industrial Early Works – Construction (Demolition) Management Plan, v.1 24 October 2016
Liberty Industrial Early Works – Construction Environmental Management Plan, v.I 13 December 2016
Liberty Industrial Early Works – Construction Flora and Fauna Management Plan, v.4 12 January 2017
Liberty Industrial Early Works – Construction Heritage Management Plan, v.01 4 August 2016
Liberty Industrial Early Works – Construction Security Management Plan, v.0 17 October 2016
Liberty Industrial Early Works – Construction Soil and Water Management Plan, v.H 18 January 2017
Liberty Industrial Early Works – Construction Traffic and Access Management Plan, v.2 15 November 2016
Liberty Industrial Early Works – De Construction SME: Unexploded Ordnance Management Plan, v.0 29 August 2016
Liberty Industrial Early Works – Hazardous Materials Management Plan, v.0 7 October 2016
Liberty Industrial Early Works – Incident Management Plan, v.0 26 September 2016
Liberty Industrial Early Works – Materials Tracking Plan, v.0 24 November 2016
Liberty Industrial Early Works – Noise & Vibration Management Plan, v.F 24 January 2017
Liberty Industrial Early Works – Project Management Plan, v.0 17 October 2016
Liberty Industrial Early Works – Quality Management Plan, v.1 24 October 2016
Liberty Industrial Early Works – Risk Management Plan, v.0 17 October 2016
Liberty Industrial Early Works – Safety Interface Management Statement, v.A 28 August 2016
Liberty Industrial Early Works – Site Remediation Plan, v.0 24 November 2016
Liberty Industrial Early Works – Stakeholder and Community Liaison Plan, v.3 21 December 2016
Liberty Industrial Early Works – Work Health and Safety Management Plan, v.D 7 December 2016
Managing Urban Stormwater – Soils and Construction Vols 1 and 2, 4th Edition (Landcom 2004)
Golder 2016 - Moorebank Intermodal Company Property West, Land Preparation Works Stage 1 and Stage 2 – *Remediation Action Plan*
Moorebank Intermodal Terminal Project Concept – EPBC Approval 2011/6086
Moorebank Intermodal Terminal Project- Project Concept Environmental Impact Statement
National Environment Protection (Assessment of Site Contamination) Measure 1999
NSW EPA Update 2017, and Look Ahead
NSW Office of Environment and Heritage (OEH) Science, (Draft) PFAS Screening Criteria, May 2017
Phase 1 Environmental Site Assessment – Rail Corridor Land for SIMTA Moorebank Intermodal Terminal
POEO (General) Regulation 2009
SIMTA Moorebank Intermodal Facility Concept Plan Environmental Assessment

State Environmental Planning Policy No. 55 – Remediation of Land

Waste Classification Guidelines- *Part 1: Classifying Waste*

Waste Classification Guidelines- *Part 2: Immobilising Waste*