STATEMENT OF ENVIRONMENTAL EFFECTS

August 2017

Report

Tank 101 Demolition Works

AECOM

CALTEX

Statement of Environmental Effects

Client: Caltex Refineries (NSW) Pty Ltd

ABN: 19000108725

Prepared by

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August 2017

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Statement of Validity

Submission of Statement of Environmental Effects

Prepared as Modification to Development Consent SSD 5544 under S.96 (1A) of the *Environmental Planning and Assessment Act 1979*.

Statement of Environmental Effects prepared by:

Role	**Project Director**	**Project Manager**	**Lead SEE Author**
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Address:	AECOM Services Pty Ltd Level 21 420 George Street Sydney NSW 2000		

In respect of

Applicant and Land Details

Applicant	Caltex Refineries (NSW) Pty Ltd 2 Solander Street, Kurnell, NSW, 2231
Subject Site	Caltex is seeking approval for the Tank 101 demolition works as a modification to development consent SSD 5544 under S.96 (1A) of the *Environmental Planning and Assessment Act 1979.*
Project Summary	The Tank 101 demolition works would include the following activities within the Tank 101 demolition works area presented on Figure 1-2: • disconnection of the tank from the existing pipework; • demolition and dismantling of Tank 101 and associated infrastructure; • associated civil works with the works outlined above; • intermediate storage of the demolished material at the former Caltex Lubricant Oil Refinery (CLOR) prior to disposal or recycling; and • returning the works areas to ground level. The Tank 101 demolition works would be completed within the boundary of the Site (as defined by the EIS for SSD 5544).

Lot and DP	Lot 56/ DP 908; Lot D/ DP 361103; Part Lot 123/ DP 8135; Lot 62/ DP 908; Lot G/ DP 361103; Part Lot 125/ DP 8135; Part Lot 12/ DP 7632 ; Lot K/ DP 362655; Lot 77/ DP 9564; Lot 190/ DP 7632; Lot 570/ DP 752064; Lot 81/ DP 9564; Lot 44/ DP 8135; Lot 1/ DP 1044690; Part Lot 2/ DP 215818; Lot 46/ DP 8135; Lot 283 / DP 752064; Lot B/ DP 338897; Lot 78/ DP 8135; Lot 57/ DP 908; Part Lot F/ DP 361103; Part Lot 122/ DP 8135; Part Lot 11/ DP 7632; Lot J/ DP 362655; Part Lot 124/ DP 8135; Lot 189/ DP 7632; Lot H/ DP 362655; Lot 48/ DP 9564; Lot 43/ DP 8135; Lot 24/DP 776328; Lot 78/ DP 9564 ; Lot 45/ DP 8135; Lot 25 / DP 776328; Part Lot 1/ DP 215818; Part Lot 77/ DP 8135; Lot 1 / DP 132055; Lot 1/ DP 215819; Lot 79/ DP 8135.

Statement of Environmental Effects

A Statement of Environmental Effects (SEE) is attached. The SEE assesses the environmental impacts of the modification to the Project.

Declaration

I certify that I have prepared the contents of the SEE in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* and *Environmental Planning and Assessment Regulation 2000* and that, to the best of my knowledge, the information contained in this report is not false or misleading.

Signature: _____ **Date:** August 2017

Name: JAMIE MCMAHON

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LIMITATIONS

AECOM Services Pty Ltd (AECOM) has prepared this Statement of Environmental Effects (SEE) in accordance with the usual care and thoroughness and based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this SEE.

This SEE has been produced in accordance with the stipulations in the *Environmental Planning and Assessment Act 1979* and the *Environmental Planning and Assessment Regulation 2000*.

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This SEE was prepared between June 2017 and August 2017 and is based on the conditions encountered and information reviewed at the time of preparation. AECOM disclaims responsibility for any changes that may have occurred after this time.

This SEE should be read in full. No responsibility is accepted for use of any part of this SEE in any other context or for any other purpose.

NOTES ON TEXT

As a determination of the modification to SSD 5544 has not yet been made, the future consolidated tense is used throughout this Assessment when describing the modification, alternatives and assessing impacts. “Would” is, therefore, used throughout the text in preference to “will”.

If all approvals are given for the modification to proceed, all “would” references should be interpreted as “will”, subject to final conditions of consent.

ABBREVIATIONS

Acronym	Definition
AS/NZS	Australian / New Zealand Standard
ABN	Australian Business Number
ACM	Asbestos Containing Material
ACS	Asbestos Contaminated Soil
ACT	Australian Capital Territory
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AMC	Australian Museum Consulting
AMP	Asbestos Management Plan
ANZECC	Australia and New Zealand Environment and Conservation Council
AORA Act	Australian Oil Refining Agreements Act
API	American Petroleum Institute
AQMP	Air Quality Management Plan
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
BWMP	Biodiversity and Weed Management Plan
CAMBA	China-Australia Migratory Bird Agreement
CBD	Central Business District
CCTV	Closed-Circuit Television
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CLOR	Caltex Lubricating Oil Refinery
CMP	Contamination Management Plan
CMZ	Contamination Management Zone
CO	Carbon Monoxide
COPC	Contaminants of Potential Concern
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSRF	Caltex Soil Remediation Facility
dB	decibel
DECC	NSW Department of Environment and Climate Change
DEMP	Demolition Environmental Management Plan
DMP	Demolition Management Plan
DNVMP	Demolition Noise and Vibration Management Plan
DoE	Department of Environment
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries

Acronym	Definition
DWRMP	Demolition Waste and Resource Management Plan
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
ENM	Excavated Natural Material
EP&A Act	NSW Environmental Planning and Assessment Act
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPL	Environment Protection Licence
EPI	Environmental Planning Instruments
ERA	Environmental Risk Assessment
ESA	Environmental Site Assessment
ESD	Ecologically Sustainable Development
GDE	Groundwater Dependent Ecosystems
GWMP	Groundwater Management Plan
Ha	Hectares
HIA	Heritage Impact Assessment
HMS	Heritage Management Strategy
ICNG	Interim Construction Noise Guideline
ISEPP	State Environmental Planning Policy (Infrastructure)
ISO	International Organisation for Standardisation
JAMBA	Japan-Australia Migratory Bird Agreement
km²	kilometres squared
Leq	Equivalent noise level
LDAR	Leak Detection and Repair
LEP	Local Environment Plan
LGA	Local Government Area
LNAPL	Light Non-Aqueous Phase Liquid
LPG	Liquefied Petroleum Gas
m	metres
m³	metres cubed
m/s	metres per second
mbgl	metres below ground level
MHF	Major Hazard Facility
min	minutes
MNES	Matter of National Environmental Significance

Acronym	Definition
MOD	Modification
NAPL	Non-Aqueous Phase Liquid
NEPM	National Environment Protection Measure
NHL	National Heritage List
NO_x	Oxides of Nitrogen
NOW	NSW Office of Water
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OEH	Office of Environment and Heritage
OEMP	Operational Environmental Management Plan
OWSS	Oily Water Sewer System
PAC	Planning Assessment Commission
PAD	Potential Archaeological Deposit
PASS	Potential Acid Sulfate Soils
PHA	Preliminary Hazard Analysis
PID	Photo-Ionisation Detector
POEO Act	Protection of the Environment Operations Act
PPE	Personal Protective Equipment
PROC	Process
PRP	Pollution Reduction Program
PULP	Premium Unleaded Petrol
RNP	Road Noise Policy
secs/veh	seconds per vehicle
SCC	Specific Contaminant Concentrations
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SMP	Stormwater Management Plan
SO_2	Sulphur Dioxide
SPULP	Super Premium Unleaded Petrol
SSC	Sutherland Shire Council
SSD	State Significant Development
SSLEP	Sutherland Shire Local Environment Plan
STD	Standard
SWM	Safe Work Method
SWMP	Soil and Water Management Plan
t	tonne

Acronym	Definition
TCLP	Toxicity Characteristics Leaching Procedure
TMP	Traffic Management Plan
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
TSC Act	Threatened Species Conservation Act
ULP	Unleaded Petrol
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compounds
WHS	Work Health and Safety
WMS	Waste Management System
WRMP	Waste and Resource Management Plan
WWTP	Wastewater Treatment Plant

Executive Summary

ES 1.1 Introduction

Caltex Refineries (NSW) Pty Ltd (hereafter referred to as Caltex) currently operates the Kurnell Terminal ('the Site') on the southern side of Botany Bay in Kurnell NSW. Between 1956 and 2014 the Site was used as both an oil refinery and a fuel terminal. In July 2012 Caltex announced that it would progress with converting the refinery to a finished product terminal ('the Project'). In 2014 refining ceased and now the main purpose of the Site is as a fuel import terminal.

The objective of the overall conversion Project is "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*".

The Project is divided into two phases:

1. converting infrastructure to allow the Site to operate as a terminal and shutdown the refinery (the conversion works); and
2. demolition and removal of redundant infrastructure (the demolition works).

The conversion of the Site from a refinery to a fuel import terminal was consented under SSD 5544 in 2014. Two subsequent modifications of this consent have been submitted for demolition works (SSD 5544 MOD1 – approved in mid-2015) and asbestos contaminated soils management works (SSD 5544 MOD2 – lodged late 2016 and currently still under consideration by the NSW Department of Planning and Environment).

Following internal reviews and discussions with various stakeholders Caltex has decided to demolish Tank 101 located in the far north-eastern corner of the Site. The existing modification consent for the demolition works (SSD 5544 MOD1) included the demolition, dismantling, or removal of redundant tanks as well as associated minor civil works and waste management activities. However, Tank 101 was not one of the tanks approved to be demolished as part of this modification.

Caltex is seeking approval for the removal of Tank 101 (the Tank 101 demolition works) as a modification to development consent SSD 5544 under S.96(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The end result of these works would be substantially the same development as the approved Project under SSD 5544.

This Statement of Environmental Effects (SEE) has been prepared to support the application for the Tank 101 works. This SEE considers a range of environmental, safety, legal, social and economic impacts related to the tank 101 demolition works. Potential impacts are identified and where necessary mitigated or offset to ensure that they are minimised for the local environment and Kurnell community.

ES 1.2 Modification Need and Alternatives

The Tank 101 demolition works share the objective of the Project in that the purpose of the works is to ensure that Caltex's operations within Australia remain viable whilst ensuring that the company can provide a safe, reliable and sustainable supply of petroleum fuels to NSW and the ACT.

Tank 101 has recently been removed from service in response to community requests, discussions with regulators and because the remaining tankage at the Site can sufficiently service the NSW and ACT market. Two potential options for managing the disused tank were identified:

- maintain the redundant tank in situ; and
- demolish and remove the tank.

A multi-criteria analysis was undertaken and determined that the demolition and removal of Tank 101 is the best option for Caltex to ensure that it meets the objective of the Project. The demolition of Tank 101 would eliminate ongoing maintenance costs, contribute to the commercial viability of the terminal and respond to regulator and community discussions regarding the tank.

ES 1.3 Site Location and Existing Environment

The Caltex Kurnell Terminal is located on the Kurnell Peninsula within Sutherland Shire Local Government Area (LGA), approximately 15 km south of Sydney's Central Business District (CBD). The Kurnell Peninsula is serviced by Captain Cook Drive, a single lane road that connects the area with the wider road network.

The Site is legally described under 38 Lot and deposited plan (DP) numbers, which are listed in **Section 2.1**of this SEE.

The Tank 101 demolition works would be completed wholly within the boundary of the Site **(Figure 1-2)**.

ES 1.4 Project and Demolition Works Description

Approved Project

Caltex received development consent for the refinery to terminal conversion works in January 2014 (SSD 5544). By the end of 2016 all of the works approved under this initial development consent for the Project were completed.

The demolition works (SSD 5544 MOD1) were consented in August 2015 and broadly involve the demolition, dismantling or removal of redundant refining infrastructure including tanks, pipeways, buildings and services, as well as associated civil and waste management works.

The ACS management works (SSD 5544 MOD2) involve the classification, removal, and emplacement of asbestos contaminated soils within a containment cell within the Site. This includes the verification, closure and ongoing management of the cell. This modification application is currently being assessed by the DPE.

Tank 101 Demolition Works

The Tank 101 demolition works would broadly involve the following activities:

- disconnection of the tank from the existing pipework;
- demolition and dismantling of Tank 101 and associated infrastructure;
- associated civil works;
- intermediate storage of the demolished material at the former Caltex Lubricant Oil Refinery (CLOR) prior to disposal or recycling; and
- returning the works areas to ground level.

The works would be completed over a four week period in Q4 2017 and would be undertaken during daytime hours only. The works would be managed as part of the demolition activities and as such would be undertaken in accordance with the existing Demolition Environmental Management Plan (DEMP) and associated sub-plans where applicable.

ES 1.5 Legislation and Planning Policy

A modification through section 96(1A) of the EP&A Act requires that aspects of the Tank 101 demolition works that may have environmental, social or economic impacts that differ from those previously assessed within the Environmental Impact Statement (EIS) for SSD 5544, are required to undergo assessment in line with Section 79C of the EP&A Act.

Under Section 79C, Part 4 of the EP&A Act, the Tank 101 demolition works must be evaluated against a range of considerations including environmental planning instruments, NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), the likely environmental, social and economic impacts of that development, the suitability of the Site, and the public interest. In order to comply with the requirements for assessing this type of modification, a SEE must be prepared and submitted alongside the Modification Application.

A complete account of relevant Commonwealth, State and local government legislation and policy is provided in **Chapter 5.0 Legislation, Planning Policy and Approvals**.

ES 1.6 Consultation

The objective of consultation to date, with statutory agencies, Sutherland Shire Council and the wider community, has been to provide information to, and understand the concerns of, the various stakeholders. Consultation has continued throughout the preparation of this SEE and will continue during exhibition, and following approval of the modification.

Chapter 6.0 Consultation presents a list of the key comments raised during the consultation process and identifies where issues have been addressed in this SEE.

ES 1.7 Environmental Scoping Assessment

In order to assess the environmental impact of the Project, a number of key environmental issues have been identified through a scoping process. A qualitative risk assessment was then undertaken to determine the key issues and prioritise the scope of work for each environmental aspect. This risk assessment considered issues raised by relevant stakeholders, as well as in main EIS and subsequent modification applications.

The risk assessment was undertaken in accordance with the guidelines outlined in AS/NZS 4360:2004 and AS/NZS ISO 31000:2009. This assessment, combined with the key issues raised during the consultation process, guided the detailed assessments undertaken for the SEE.

ES 1.8 Soil, Water and Contamination

Ground disturbances associated with the removal of Tank 101 would extend to a maximum of 1 mbgl. This ground disturbance would be minimal and would mostly entail the removal of small pipeline/infrastructure within the tank bund.

Potential impacts to stormwater associated with the Tank 101 demolition works include those arising from demolition and ground disturbance works (i.e. potential impacts to stormwater run-off quality), as well as potential changes to the operation of stormwater catchments in the short and longer term (i.e. catchment hydraulics).

Potential soil and groundwater impacts from the Tank 101 demolition works include:

- demolition workers encountering contaminated soil, asbestos and potential acid sulfate soils (PASS) during excavation activities;
- excavation works and stockpiling of soils generating dust and/or odours that affect on-site and off-site receptors;
- stockpiles, excavated areas and newly disturbed areas subject to erosion and sediment control issues;
- disturbance of soils through excavation and backfilling increasing contaminant migration to underlying groundwater;
- contaminants from stockpiles potentially contaminating ground and surface water;
- spills and leaks from demolition equipment potentially contaminating soil and groundwater; and
- vehicles dispersing contaminated materials across the Site and off-site.

The potential soil, groundwater and contamination impacts arising from the Tank 101 demolition works would be largely consistent with those identified and managed within the DEMP for the Project. The DEMP includes a Soil and Water Management Plan (SWMP), Contamination Management Plan, Acid Sulfate Soils (ASS) Management Plan, and Asbestos Management Plan (AMP) which include management measures for managing contamination and erosion and protecting soils and groundwater.

Caltex would maintain the existing risk reduction measures in place across the Site. Caltex's existing permit system would continue to operate for all Tank 101 works that may require excavation or otherwise interact with contaminated material.

ES 1.9 Noise and Vibration

The demolition noise assessment determined that the Tank 101 demolition works have the potential to generate exceedances of the established construction noise criteria at Receiver R2 during the daytime and evening period and at Receiver R3 during the evening. Cumulative noise exceedances were noted at Receivers R2 and R3 during the day and evening and at R7 during the evening.

To reduce these exceedances, Caltex has committed to complete the Tank 101 demolition works within daytime hours between Monday and Saturday, excluding public holidays. Caltex would also, as far as practicable, manage the potentially coinciding demolition works undertaken in the vicinity of Tank 101 such that cumulative noise is minimised. It is noted that the Tank 101 demolition would be undertaken over a relatively short period of up to four weeks.

Potential noise impacts would be largely the same as those identified and managed within the DEMP for the approved demolition works (SSD 5544 MOD1). Noise during the Tank 101 demolition works would be managed in accordance with the existing DEMP and with the measures specified in **Chapter 14.0 Revised Management and Mitigation Measures**.

ES 1.10 Air Quality and Odour

Air emissions associated with the demolition of Tank 101 are likely to be generated by a variety of on-site activities including vehicle movements and movement, stockpiling and processing of waste and other materials. The primary emissions identified for such works are dust particulates, Volatile Organic Compounds (VOCs) and odour.

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures** and would largely be consistent with the approved demolition works (SSD 5544 MOD1). These measures would be consistent with those documented within the existing DEMP and Air Quality Management Plan (AQMP) included as a sub-plan within the DEMP.

ES 1.11 Heritage

A Statement of Heritage Impact (SOHI) was undertaken as part of this SEE to assess the likely impacts of the demolition works on Aboriginal and Historic (or Non-Aboriginal) heritage values. The SOHI built on the work that had been completed for the Heritage Management Strategy (HMS) for the Site and was undertaken in accordance with the relevant state and federal legislation, policies and guidelines. No Aboriginal archaeological assessment was undertaken as part of the SOHI, and instead relied on previous studies undertaken as part of the approved Project (SSD 5544).

Aboriginal Heritage Impacts

The Site has been subject to extensive disturbance from the industrial development and as such, it is unlikely that Aboriginal deposits, artefacts or burials are present below the ground surface.

Historic Heritage Impacts

The impacts of the Tank 101 demolition works were assessed against each of the heritage criteria outlined in the *Kurnell Refinery Heritage Management Strategy* (Australian Museum Consulting, 2014b) (HMS) prepared for the conversion works (SSD 5544

The SOHI concluded that the removal of Tank 101, in isolation, would be deemed a minor negative impact on the heritage value of the Site. However given the substantial changes to the heritage nature of the Site associated with the previously approved conversion works the cumulative change to the Site's heritage value is deemed to be major negative. This is a function of the reduction of the number of retained tanks to seven and the general reduction of the physical integrity of the original tank farm layout.

Conservation measures outlined in the HMS require the retention of at least six original tanks as part of the approved demolitions works, and at least three pre-1955 tanks. There are four pre-1955 tanks located on the northeast boundary of the Eastern Tank Farm, Tanks 101, 102, 103 and 104. The planned retention and reuse of Tanks 102, 103 and 104 would ensure that this conservation measure is still met whilst retaining a total of seven tanks in the Eastern Tank Farm area.

Mitigation measures relevant to the removal of Tank 101, including archival photographic and other documentary recordings, have been completed prior to the commencement of the current approved demolition works.

There would be no impacts to other heritage items within the vicinity of the Site. In addition, the Tank 101 demolition works would result in long term positive impacts on the National and State listed Kamay Botany Bay National Park and Kurnell Peninsula Headland through the reduction in vertical scale and prominence of the Site in significant views of the headland.

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**, and would largely be consistent with the Project approved modification for the demolition works (SSD 5544 MOD1). Caltex would ensure that the strategies as outlined in the HMS are fulfilled and that long term conservation of the remaining significant buildings, including the three tanks along the northern boundary of the eastern Tank Farm are maintained.

ES 1.12 Other Issues

Hazards and Risks

The Tank 101 demolition works are consistent with the tank removal works that were assessed by the Hazards in Demolition (HAZDEM) assessment in the demolition works SEE. As such the hazards that could occur as a result of these works are the same to those presented for the demolition works.

The HAZDEM found that the general health and safety hazards included those associated with working from heights and subsidence and collapse during excavation. It identified five hazards which have potential to initiate a process safety incident which could lead to environmental pollution or safety concerns involving Caltex personnel and/or the demolition contractors. These hazards relate to the potential to damage plant, equipment, pipes and tanks during demolition activities or the potential to introduce ignition sources into classified areas.

The risks associated with the demolition related hazards would be minimised through the implementation of a hierarchy of controls in accordance with the legislative requirements. The management of activities associated with the demolition work would ensure that the probability of an incident occurring is minimised and that, should an incident occur, its consequences would be managed.

The HAZDEM concluded that the levels of risks to the biophysical environment and to the safety of the public, staff and contractors are reduced to So Far As Is Reasonably Practicable (SFAIRP) levels. As part of the process of analysing the hazards identified for the demolition works a number of risk reduction measures were identified as summarised in **Chapter 14.0 Revised Management and Mitigation Measures**.

Waste Management

It is intended that up to 90% the waste generated from the Tank 101 demolition works would be recycled and if possible, re-used on-site. Some wastes generated from the Tank 101 demolition works such as general solid wastes, stormwater, oily water and sewerage would continue to be managed in accordance with the existing certified environmental management system (EMS) for the Site and Caltex's Waste Management System (WMS) 2012.

During the Tank 101 demolition works, primary waste generated would include steel and alloys, other mixed demolition waste, concrete, uncontaminated soil and contaminated soil. Other waste streams that would be generated in relatively minor quantities include packaging waste, asphalt waste, food waste from demolition workers, and liquid waste including wastewater from dewatered groundwater (if required).

Measures to ensure appropriate waste management during the Tank 101 demolition works would be consistent with those documented within the existing DEMP. The DEMP includes a Demolition Waste and Resource Management Plan (DWRMP) which includes management measures for waste. No impacts to waste management are expected as a result of the Tank 101 demolition works provided that the measures contained within the DEMP and its sub plans are implemented.

Ecology

The Tank 101 demolition works were assessed to result in minor to negligible impacts on the ecological values within the Site due to the following factors:

- the Tank 101 demolition works would be undertaken in a highly modified and disturbed landscape within the tank bund, devoid of native vegetation or fauna habitat;
- the Tank 101 demolition works would not involve the removal or modification of any remnant native vegetation; and
- there is low likelihood of threatened biota and/or Threatened Ecological Communities being present within the Tank 101 demolition works area due to the lack of vegetation and/or foraging habitat.

Impacts would be mitigated through the implementation of the management and mitigation measures contained within the DEMP for the Project. The DEMP and its sub-plans contain a suite of measures to manage potential impacts related to erosion, stormwater, groundwater, noxious weeds and ecology.

Traffic, Transport and Access

The demolition of Tank 101 would be undertaken by demolition contractors who are currently completing the other demolition works at the Site. As a result, no additional staff would be required on Site, which means that an increase in construction worker traffic as a result of these works is not anticipated.

The heavy vehicle movements, should they be required, for the Tank 101 demolition works can be accommodated within the maximum heavy vehicle movements for the approved demolition works. It is therefore considered unlikely that these works would have an adverse impact on the local road network.

In general, impacts upon the capacity and operations of the existing road network would be negligible. Despite this, works would be undertaken in accordance with the measures outlined in the existing Traffic Management Plan (TMP) developed for the approved demolition works.

ES 1.13 Cumulative Impacts

The assessments within this SEE have concluded that the Tank 101 demolition works are unlikely to result in significant adverse cumulative impacts on the surrounding community or environmental receptors. The majority of the potential impacts related to the Tank 101 demolition works would be avoided or mitigated through the implementation of the measures outlined in **Chapter 14.0 Revised Management and Mitigation Measures**.

ES 1.15 Evaluation and Justification

The Tank 101 demolition is consistent with and contributes directly to the objectives of the overall conversion Project "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*".

This SEE provides a comprehensive assessment of the Tank 101 demolition works and includes investigations regarding all relevant environmental issues. Potential impacts have been assessed and strategies to avoid, minimise and mitigate those impacts are provided.

The Tank 101 demolition works have, to the extent feasible, been designed to address the key issues of concern. Caltex has also considered impacts on the surrounding environment and community of Kurnell. Caltex believes it can undertake the Tank 101 demolition works in a manner which would safeguard local environment and public amenity of the area.

This SEE has concluded that the Tank 101 demolition works should proceed because they would:

- Result in no long term adverse impacts to the environment or local community;
- Ensure the primary objectives of the Project continue to be achieved; and
- Satisfy the principles of Ecologically Sustainable Development as described in the EP&A Regulation.

On the basis of the findings detailed within this Statement of Environmental Effects, the Tank 101 demolition works are considered to be justified.

1.0 Introduction

1.1 Overview

Caltex Refineries (NSW) Pty Ltd (hereafter referred to as Caltex) currently operates the Kurnell Terminal (the 'Site') on the southern side of Botany Bay, in Kurnell, NSW (refer to **Figure 1-1**). Between 1956 and 2014 the Site was used as both an oil refinery and a fuel terminal. In July 2012, Caltex announced that it would progress with converting the refinery to a finished product terminal (the 'Project'). In 2014 refining ceased and now the main purpose of the Site is as a fuel import terminal, although other ancillary and related operations also occur.

The process to convert the refinery to a terminal has involved a number of related activities including numerous upgrades and changes to operational infrastructure, as well as the removal and demolition of redundant infrastructure. This process is ongoing. The objective of the Project was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*". This includes providing a safe working environment at the terminal and also ensuring that the operation is not burdened by unnecessary costs.

The Project has been divided into two phases:

1. converting infrastructure to allow the Site to operate as a terminal and shutdown the refinery (the conversion works); and
2. demolition and removal of redundant infrastructure (the demolition works).

Caltex has received development consent to complete the conversion (SSD 5544) and demolition works (SSD 5544 MOD1). A second modification to this consent, the 'ACS management works' (SSD 5544 MOD2) was lodged in late 2016 and is currently being assessed by the Department of Planning and Environment (DPE).

Following internal reviews and discussions with various stakeholders Caltex has decided to demolish Tank 101, located in the far north-eastern corner of the Site. The modification consent for the demolition works included the demolition, dismantling or removal of redundant tanks as well as associated minor civil works and waste management activities. Tank 101 was not one of the tanks approved to be demolished as part of SSD 5544 MOD1.

The decision to demolish Tank 101 is based on three main factors:

1. The tank is coming to the end of its operational life and would require investment to maintain the asset;
2. The terminal has enough storage to meet current market requirements without needing to use this tank; and
3. The tank is located approximately 69 metres from the closest residential property and, given its proximity to Kurnell, the community and regulators have requested that Caltex consider its removal.

Caltex is seeking approval for the removal of Tank 101 (the Tank 101 demolition works) as a modification to development consent SSD 5544 under section 96(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This modification is sought as the works are a continuation of the conversion project, are likely to be the same scale as previously consented and would only result in minimal environmental impacts. The end result of these works would be substantially the same development as the approved Project under SSD 5544 (as modified).

This Statement of Environmental Effects (SEE) has been prepared to support the application for the Tank 101 demolition works. In line with the requirements of section 96 of the EP&A Act, this SEE provides the information required by clause 115 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). This SEE considers a range of relevant environmental, safety, legal, social and economic impacts related to the Tank 101 demolition works. Potential impacts are identified and where necessary avoided, mitigated or offset to provide an improved outcome for the local environment and Kurnell community.

KEY

- The Site
- Caltex Land Ownership
- Towra Point Aquatic Reserve
- National Park
- Towra Point Nature Reserve

0 100 200 400 m

AECOM

SCALE 1:15,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE **FIGURE 1-1** - THE SITE

PROJECT TANK 101 DEMOLITION WORKS

CLIENT CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G001	01	60546439
CHECK	DATE			

KEY

The Site

Tank 101 Demolition Works Area

0 50 100 200 m

AECOM

SCALE	1:8,000
SIZE	A3
SHEET	01 of 01
COORDINATE SYSTEM	GDA 1994 MGA Zone 56

TITLE

FIGURE 1-2 - TANK 101 DEMOLITION WORKS AREA

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT

CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G002	01	60546439
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1.2 Proponent and Team

The proponent for the works is Caltex Refineries (NSW) Pty Ltd, 2 Solander Street Kurnell, NSW 2231. The proponent contact is Craig Collard, Demolition Manager.

The SEE has been prepared by AECOM Services Pty Ltd ABN 46 000 691 690, Level 21, 420 George Street Sydney, 2000, Tel: (02) 8934 0000. The environmental planning and assessment coordinator is William Miles, CEnvP IA and Associate Director - Environment.

1.3 Project Need and Alternatives

1.3.1 Background

From 1956 to 2014 the Site operated as an oil refinery and terminal facility. The development consent to convert the Site to a fuel import terminal was granted in January 2014 (Application Number SSD 5544). Since 2014 when the conversion works commenced and refining at the Site ceased, the Site is now only managing finished petroleum products and is referred to as the Kurnell Terminal.

As part of SSD 5544, a number of previous Development Applications (DAs) for the Site were surrendered. As such SSD 5544 is the dominant consent for the Site. In 2015 a modification to this consent (SSD 5544 MOD1) was granted to consent the proposed 'demolition works' at the Site. At the end of 2016, Caltex lodged a second modification related to the management of asbestos contaminated soils (ACS) from the Site. The modification application (SSD 5544 MOD2) for ACS management works is currently being assessed.

These various works all related to the objective of the Project to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell.

1.3.2 Need and Objectives of the Project

As noted within the Environmental Impact Statement (EIS) for SSD 5544, "*Caltex initiated a review of its refining operations in May 2011".* In summary, this review concluded that *"the Caltex Kurnell and Lytton refineries in their current configuration are relatively small and are disadvantaged compared to the modern, larger scale and more efficient refineries in the Asian region. This disadvantage is exacerbated by the impact of the ongoing strength of the Australian dollar, lower Caltex refining margins and increasing costs on the 'as is' refining business. As a result of the refining review, Caltex is proposing to close the Kurnell Refinery and convert the Site to a petroleum fuels import (finished product) terminal*".

However, whilst it was concluded that the refinery business is no longer viable at Kurnell, the EIS also stated that the Site is at the hub of Caltex's supply chain for NSW and ACT and therefore needed to be retained as a finished product terminal to receive and distribute refined petroleum product.

This needs case for the Project (SSD 5544) supported its objective which was:

"*To ensure that Caltex's operations within Australia remain viable whilst ensuring that the company can provide a safe, reliable and sustainable supply of petroleum fuels to NSW and the ACT.*"

1.3.3 Need and Objectives of the Tank 101 Works

The modification consent for the demolition works included the demolition, dismantling or removal or redundant tanks. Tank 101 was not one of the tanks approved to be demolished as part of this modification. At the time the future requirement for Tank 101 was unclear and therefore it was retained.

Tank 101 is currently approved for gasoline use under the consent for SSD 5544. Recently this tank has been removed from service in response to community requests, discussions with regulators and because the remaining tankage at the Site is sufficient to service the NSW and ACT market. Given this context, Caltex has decided to remove Tank 101 permanently.

The alternative would be to maintain the disused tank in situ. Maintaining the tank would require ongoing maintenance which would have an associated cost. Maintaining a tank which serves no purpose and which both Caltex and the community would like to remove would not be in line with the objective of the Project as it would affect the viability of the terminal.

Caltex have therefore decided to demolish Tank 101. The demolition of Tank 101 would eliminate ongoing maintenance costs, contribute to the commercial viability of the terminal and respond to regulator and community discussions regarding the tank.

1.4 Section 96 (1A) Modification

The demolition of Tank 101 is considered a minor change to the activities consented under SSD 5544 in that the demolition of Tank 101 is consistent with the 'demolition works' consent under SSD 5544 MOD1, given that this activity involves the removal of tanks that are no longer required at the Site. Based on this connection with the previously consented activities, the removal of Tank 101 is considered to be 'substantially the same development' as the development consented under SSD 5544 (as modified).

Modifications to development consents are provided for by section 96 of the EP&A Act. Section 96(1A) relates to modifications involving minimal environmental impact. To progress the Tank 101 demolition works in accordance within section 96(1A), the proposed works must be substantially the same development as approved under SSD 5544 and would be likely to result in minimal environmental impact.

The Tank 101 demolition works are directly linked to the approved Project SSD 5544 and SSD 5544 MOD1 as they involve the demolition of a redundant tank at the Site. The modification consent for the demolition works (SSD 5544 MOD1) included the demolition, dismantling or removal of redundant tanks as well as associated minor civil works and waste management activities.

As discussed above, the removal of the tank supports the objective of the Project to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell. The Tank 101 demolition works are part of the same process as the conversion and demolition works, they share a similar needs case, project objective and purpose.

Caltex are seeking to modify the development consent for SSD 5544 to ensure that the Project objective for this consent can be successfully achieved and the Project continued. Following completion of the Tank 101 demolition works the end result for the Site would be substantially the same development as approved under SSD 5544.

As demonstrated within this SEE, Caltex expects that the Tank 101 demolition works are likely to result in impacts which are of 'minimal environmental impact' (i.e. impacts that are expected to be within the same scale as those that have been previously approved and would result in "very small' or "negligible" overall environmental impacts[1]). The management and mitigation measures that were approved for the demolition works (SSD 5544 MOD1) would continue to apply to the demolition of Tank 101. Whilst the demolition of the tank would result in a minimal temporary noise impact, its removal would have a long term beneficial impact from a social and hazards and risk perspective. As such it can be concluded that the works to removal Tank 101 are likely to result in "very small' or "negligible" overall environmental impacts.

Therefore a modification to SSD 5544 is being sought under section 96(1A) of the EP&A Act.

1.5 Section 96 (1A) Modification Process

1.5.1 The Scope of this SEE

This Statement of Environmental Effects (SEE) has been prepared to support the modification application for the tank 101 demolition works. In line with the requirements of section 96(1A) of the EP&A Act, this SEE provides the information required by clause 115 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

Further requirements for consideration within the SEE were identified through the consultation process summarised in **Chapter 6.0 Consultation**.

The key issues identified during the consultation process were investigated by Caltex through targeted assessments by specialists in their fields in line with relevant guidelines and assessment

[1] King, Markwick, Taylor & Ors v Bathurst Regional Council [2006] NSWLEC 2005

requirements. These assessments are summarised in **Chapters 8.0** to **13.0** of this SEE. Where necessary the conclusions in these chapters are supported by appendices.

The outcomes of these assessments have been used to formulate the proposed revised management and mitigation measures (refer to **14.0 Revised Management and Mitigation Measures**) and to justify why the Tank 101 demolition works are needed (refer to **Chapter 16.0 Evaluation and Justification**).

1.5.2 Preparation and Exhibition

The objectives of this SEE are to:

- comply with the requirements of the EP&A Act and EP&A Regulation
- address the requirements of key stakeholders as identified during the consultation process
- provide the Minister and the Minister's delegates at the NSW Planning Assessment Commission (PAC) with sufficient information to assess the potential environmental impacts, confirm the mitigation measures required and understand the benefits of the Tank 101 demolition works, and
- inform stakeholders and the community about the proposed works. A full account of this process up to lodgement of the modification application is included in **Chapter 6.0 Consultation**.

Clause 115 of the EP&A Regulation contains provisions which indicate the specific information that must be included within the SEE. The relevant clauses in Section 115 and where these have been addressed in the SEE are shown below in **Table 1-1**.

Table 1-1 Clause 115 Requirements

Clause	Requirement	SEE Location
1(a)	The name and address of the applicant.	**Section 1.2**
1(b)	A description of the development to be carried out under the consent (as previously modified).	**Chapter 3**
1(c)	The address, and formal particulars of title, of the land on which the development is to be carried out.	**Section 1.2** **Section 2.1.2**
1(d)	A description of the proposed modification to the development consent.	**Chapter 4**
1(e)	A statement that indicates either: • that the modification is merely intended to correct a minor error, misdescription or miscalculation, or • that the modification is intended to have some other effect, as specified in the statement,	**Section 1.1** **Section 1.4** **Chapter 5** **Chapter 16**
1(f)	A description of the expected impacts of the modification.	**Chapters 8-12**
1(g)	An undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved.	**Section 1.1** **Section 1.4** **Chapter 5** **Chapter 15**
1(h)	If the applicant is not the owner of the land, a statement signed by the owner of the land to the effect that the owner consents to the making of the application (except where the application for the consent the subject of the modification was made, or could have been made, without the consent of the owner).	Applicant (Caltex) is owner of land.
1(i)	A statement as to whether the application is being made to the Court (under section 96) or to the consent authority (under section 96AA), and, if the consent authority so requires, must be in the form approved by that authority.	**Section 1.4** **Section 5.3.1**

Clause	Requirement	SEE Location
2	The notification requirements of clause 49 apply in respect of an application if the consent of the owner of the land would not be required were the application an application for development consent rather than an application for the modification of such consent	Not applicable
3	Additional requirements if an application for the modification of a development consent under section 96 (2) or 96AA (1) of the Act, if it relates to residential flat development.	Not applicable
4	Additional requirements if an application referred to in subclause (3) is also accompanied by a BASIX certificate.	Not applicable
5	The consent authority may refer the proposed modification to the relevant design review panel but not if the application is for modification of a development consent for State significant development.	The Project is classified as State Significant Development
6	Additional requirements if an application for the modification of a development consent under section 96 (1A) or (2) of the Act, if it relates to development for which the development application was required to be accompanied by a BASIX certificate or BASIX certificate.	Not applicable
7	Additional requirements relating to the appropriate BASIX certificate.	Not applicable
8	An application for modification of a development consent under section 96 (1), (1A) or (2) or 96AA (1) of the Act relating to land owned by a Local Aboriginal Land Council may be made only with the consent of the New South Wales Aboriginal Land Council.	Land is not owned by Local Aboriginal Land Council
9	The application must be accompanied by the relevant fee prescribed under Part 15.	Noted
10	A development consent may not be modified by the Land and Environment Court under section 96 of the Act if an application for modification of the consent has been made to the consent authority under section 96AA of the Act and has not been withdrawn.	Not applicable

1.5.3 Assessment and Determination

Following lodgement, DP&E will make the following documents publically available:

- the section 96 application for modification to development consent SSD 5544, including any accompanying documents or information and any amendments made to the development application
- any assessment report prepared by DP&E.

DP&E will prepare an Assessment Report for the Tank 101 demolition works that will take into account comments from relevant Government authorities as well as other stakeholders. The Assessment Report will be provided to the Minister, or their delegate, who will determine whether to recommend section 96 approval. The Minister may delegate this determination to the PAC.

If granted, the approval may include a number of recommended conditions of consent to which the proponent would need to adhere during the undertaking of the Tank 101 demolition works.

1.6 Terms and Definitions

Table 1-2 provides a summary of the terms used throughout this SEE.

Table 1-2 Summary of Key Terms and Definitions

Terminology used in this SEE	Definition
the Project	The conversion of the Caltex Refinery in Kurnell for future use as a viable and sustainable terminal to receive and distribute refined petroleum product.
the conversion works	The previously approved works to convert the Kurnell Refinery to a finished product terminal. These works were approved as SSD 5544 (the Project is summarised in **Chapter 3.0 Approved Project and ACS Management Description**).
the demolition works	These previously approved works for the demolition, dismantling or removal of refinery process units, redundant tanks, redundant pipelines, redundant services and redundant buildings as well as associated minor civil works and waste management activities. These works were approved as SSD 5544 MOD1 (the Project is summarised in **Chapter 3.0 Approved Project and ACS Management Description**).
the ACS management works	These works involve the management of the asbestos contaminated soils (ACS) at the Site by placing them in a purpose built containment cell. These works are being assessed as SSD 5544 MOD2 (the Project is summarised in **Chapter 3.0 Approved Project and ACS Management Description**).
the Tank 101 demolition works	These works involve the demolition and removal of Tank 101. These works are the purpose of this modification application.
the Site	The Caltex Terminal on the Kurnell Peninsula, land owned and occupied by Caltex Australia Petroleum Pty Ltd. This is the area bordered by a solid black line on **Figure 1-1.**
Caltex's land ownership	This is the land owned by Caltex on the Kurnell Peninsula. It includes the Site and two other areas adjacent to the Site. This is the area bordered by a dotted black line on **Figure 1-1**.
conversion works area	The part of the Site where the conversion works took place (refer to **Figure 3-1**).
demolition works area	The area within which the demolition works are taking take place (refer to **Figure 3-1**).
the study area	The area in which environmental studies have been undertaken to assist in determining the impacts of the tank 101 works. The parameters of a study area will vary depending on the environmental study being completed.
the proponent	Caltex Refineries (NSW) Pty Ltd (Caltex)

1.7 Document Structure

Table 1-3 provides a summary of the document structure of this SEE.

Table 1-3 Document Structure

Executive Summary	This summarises the key issues and findings detailed in the other parts of the SEE.
Introduction	**Chapter 1** provides an outline of the approved Project (SSD 5544 and SSD 5544 MOD1) the ACS management works (SSD 5544 MOD2), the proposed Tank 101 demolition works, the need for the works, briefly outlines the environmental impact assessment process and introduces the various terms used throughout the SEE.
Project Location and Existing Environment	**Chapter 2** provides a description of the location of the Lots and the Site and describes the existing environment.
Approved Project and ACS Management works	**Chapter 3** provides a description of the approved Project and ACS management works.
Proposed Modification	**Chapter 4** provides a detailed description of the proposed modification including a program of activities and how they interact with the approved Project.
Legislation, Planning Policy and Approvals	**Chapter 5** includes the relevant controlling Commonwealth and State legislation and State and local policies. It identifies the licences and approvals required to enable the proposed modification to proceed.
Consultation	**Chapter 6** summarises the issues raised during consultation with the relevant stakeholders. The issues raised during the consultation process are addressed in the subsequent specialist chapters of the SEE.
Environmental Scoping Assessment	**Chapter 7** provides an assessment of the potential environmental impacts of the proposed modification and identifies the key issues for further assessment.
Environmental Assessment	**Chapters 8 - 13** provide an assessment of the potential impacts of the proposed modification, including potential cumulative impacts, and the identification of appropriate mitigation measures to safeguard the environment.
Revised Management and Mitigation Measures	**Chapter 14** details the relevant environmental management and mitigation measures to safeguard against or minimise potential impacts from the proposed modification.
Revised Conditions of Consent	**Chapter 15** outlines the existing conditions of consent for the conversion and demolition works that may need to be altered.
Justification	**Chapter 16** addresses the principles of Ecologically Sustainable Development (ESD) and the objects of the EP&A Act as well as providing a justification for the proposed modification.
Appendices	**Appendices A – B** contain technical appendices for the Noise and Vibration Assessment and Heritage Assessment.

2.0 Project Location and Existing Environment

2.1 The Site

2.1.1 Refinery and Terminal Operations

The Kurnell Terminal (the 'Site') is located on the Kurnell Peninsula within the Sutherland Shire Local Government Area (LGA), approximately 15 km south of Sydney's Central Business District. The Site is approximately 187 ha in size and consists of a number of lots and deposited plans. Between 1956 and 2014 the Site was used as both an oil refinery and a fuel terminal.

Kurnell Refinery was the largest oil refinery in NSW and the second largest of the seven oil refineries in Australia, based on crude oil processing capacity. It operated from 1956 to 2014. As consented by SSD 5544, refinery operations ceased in Q4 of 2014. A description of the approved conversion works (SSD 5544), demolition works (SSD 5544 MOD1) and the proposed ACS management works (SSD 5544 MOD2) are provided in **Chapter 3.0 Approved Project and ACS Management Description**.

Caltex now only import finished products (gasoline, jet fuel and diesel) through the two fixed berths at the existing wharf and the additional sub berth located in Botany Bay. These products are stored in existing and converted tanks.

2.1.2 Site History

Caltex requested permission to establish a major oil refinery in NSW in 1951. Permission was granted by Cumberland County Council in June 1952 and the facility was commissioned in 1956. Since commissioning, the Site has been subject to various development applications (DAs).

The Site (refer to **Figure 1-1**) is legally described under the following lot and deposited plan (DP) numbers:

- Lot 56/ DP 908
- Lot 62/ DP 908
- Part Lot 12/ DP 7632
- Lot 190/ DP 7632
- Lot 44/ DP 8135
- Lot 46/ DP 8135
- Lot 78/ DP 8135
- Part Lot 122/ DP 8135
- Part Lot 124/ DP 8135
- Lot 48/ DP 9564
- Lot 78/ DP 9564
- Part Lot 1/ DP 215818
- Lot 1/ DP 215819
- Lot D/ DP 361103
- Lot G/ DP 361103
- Lot K/ DP 362655
- Lot 570/ DP 752064
- Lot 1/ DP 1044690
- Lot 283 / DP 752064
- Lot 57/ DP 908
- Part Lot 11/ DP 7632
- Lot 189/ DP 7632
- Lot 43/ DP 8135
- Lot 45/ DP 8135
- Part Lot 77/ DP 8135
- Lot 79/ DP 8135
- Part Lot 123/ DP 8135
- Part Lot 125/ DP 8135
- Lot 77/ DP 9564
- Lot 81/ DP 9564
- Part Lot 2/ DP 215818
- Lot B/ DP 338897
- Part Lot F/ DP 361103
- Lot J/ DP 362655
- Lot H/ DP 362655
- Lot 24/DP 776328
- Lot 25 / DP 776328
- Lot 1 / DP 132055

Caltex also has a number of other landholdings close to the Site.

2.1.3 Existing Site Environment

The majority of the Site is zoned as Zone IN3 Heavy Industrial under the *Sutherland Shire Local Environment Plan 2015.*

The Site was highly disturbed during the construction and operation of the refinery. As such there are few areas of ecological significance within the Site boundary.

The Site is listed as an 'archaeological site' under the under the *Sutherland Shire Local Environment Plan 2015* as the 'Australia Oil Refinery'. A summary of the history of the Site is included as part of the heritage assessment contained in **Chapter 11.0 Heritage**.

The terminal operates under an Environment Protection Licence (EPL No 837) which outlines requirements with regards to noise, air quality, water quality, ground investigations and monitoring and reporting.

2.2 The Surrounding Area

2.2.1 Surrounding Land Uses

Land uses surrounding the Site are as follows:

- to the east and south of the Site is the southern portion of the Kamay Botany Bay National Park;
- to the north-west of the Site, is the village of Kurnell and Marton Park;
- to the west of the Site is Quibray Bay; and
- land to the south west has the following land use zonings:
    - General Industrial;
    - Light Industrial;
    - Special Industrial; and
    - Special development.

2.2.2 Residential Areas

The village of Kurnell was proclaimed in 1933 and began to flourish following the construction of the Kurnell Refinery as many of the workers employed to construct the facility took up residence. Many of the workers who were employed to construct the refinery elected to stay in the area following the project's completion.

The Site is immediately to the south of the Kurnell Village and the Kurnell Village lies immediately to the south of Botany Bay. In the 2011 census Kurnell was recorded to have a population of 2,213[2].

2.2.3 The Existing Road Network

The Kurnell Peninsula is serviced by Captain Cook Drive. Captain Cook Drive has one lane in each direction for the majority of its length and is the only access route to and from the peninsula. This is discussed further in **Section 12.4.**

2.2.4 Existing Environment Surrounding the Site

The general Site context in relation to Botany Bay and the wider area of Kurnell is shown in **Figure 1-1**.

The Site is located at the eastern end of Kurnell Peninsula. The Site is bounded by the Kamay Botany Bay National Park to the south and east, Captain Cook Drive to the north west and St Joseph Banks Drive to the south west. The northern Site boundary is bordered by Solander Street, a small southern section of Cook Street, undeveloped land, light industry and residences adjoining the eastern side of Cook Street, and undeveloped land on the southern side of Reserve Road. Additional residences are located on the north side of Reserve Road. The Kurnell residential area is generally located to the

[2] http://www.censusdata.abs.gov.au – accessed 19 June 2017

immediate north and north west of the Site. Residential areas in Cronulla are located approximately 5 km to the south west.

Marton Park, comprising a developed recreational park and an undeveloped wetland area, is located on the northern side of Solander Street. Kurnell Substation is located on the western side of Captain Cook Drive opposite the Site. Kurnell Desalination Plant is located opposite the terminal on the western side of Sir Joseph Banks Drive. The former Continental Carbon Australia facility is located approximately 800 metres due south of the southern Site boundary, and is surrounded by the National Park.

In addition to the Kamay Botany Bay National Park and Marton Park, there are a number of other reserves within proximity of the Site. Captain Cook's Landing Place Park is located approximately 500 metres to the north of the Site, while Bonna Point Reserve is located approximately 1.4 kilometres to the north west of the Site. Towra Point Nature Reserve (on Towra Point Peninsula) is a Ramsar Site located to the west of the site, on the other die of Quibray and Weeney Bays. Some of the Towra Point Nature Reserve extends as a vegetated fringe around the edge of Quibray Bay to an area close to the Site, north of Captain Cook Drive. Quibray Bay also includes Towra Point Aquatic Reserve which, whilst not part of Towra Point Nature Reserve and the Ramsar Site, forms part of the wider ecosystem associated with it. To the north of Kurnell is Botany Bay, a large bay with a diverse number of habitats and existing uses, and where the Georges and Cooks Rivers meet before joining the Pacific Ocean.

3.0 Approved Project and ACS Management Description

3.1 Introduction

This Chapter provides an overview of the key components of the approved Project (SSD 5544) (the conversion works) and approved Project modification for the demolition works (SSD 5544 MOD1). This Chapter also provides an overview of the ACS management works which are currently being assessed by the DP&E(SSD 5544 MOD2).

A full project description is available in the Kurnell Refinery Conversion EIS (URS, 2013), the Kurnell Refinery Demolition SEE (URS, 2014) and the ACS Management Project SEE (AECOM, 2016).

3.2 The Project

3.2.1 Conversion Works (SSD 5544)

The conversion works involved the conversion of tanks and installation of pumps and associated pipelines to allow for the cessation of refining at the Site and to allow for the expansion of terminal operations. These works occurred within the approved Project Area (referred to as the conversion works area) as presented in **Figure 3-1**.

Caltex received development consent for the conversion works in January 2014 (SSD 5544). Cessation of refinery operations occurred in Q4 of 2014. By the end of 2016 all of the works approved under this initial development consent for the Project were completed. The Kurnell Terminal uses part of the Site in a manner similar to the refinery, i.e. for the storage and distribution of petroleum products. The operation of the terminal continue to be managed in line with the EPL for the Site.

Under SSD 5544, the Kurnell Terminal has a nominal maximum storage capacity of 925 megalitres (ML) of refined product and by products.

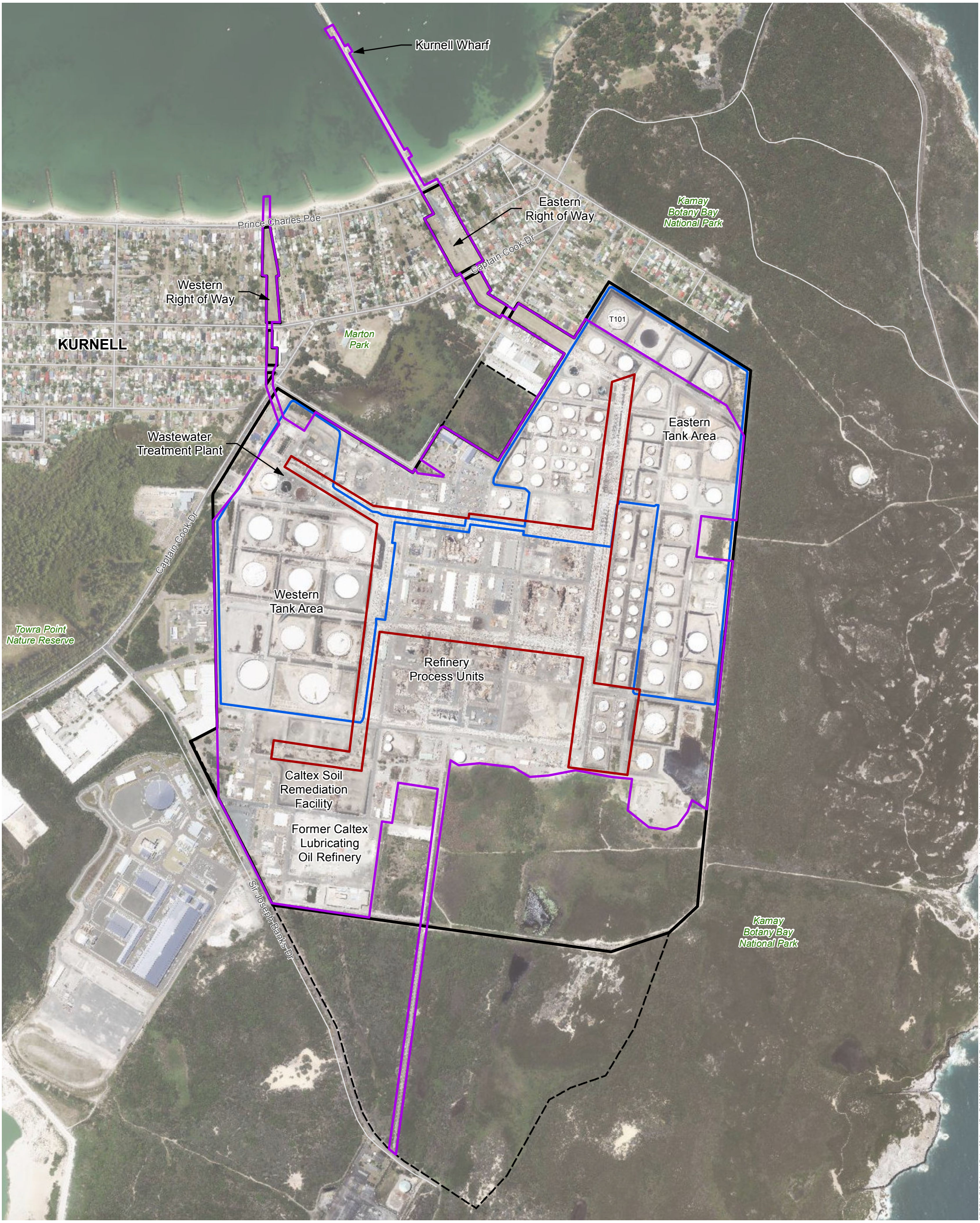
The Kurnell terminal has consent to manage the following products:

- Gasoline – Unleaded Petrol (ULP), Premium Unleaded Petrol (PULP) and Super Premium Unleaded Petrol (SPULP);
- Diesel; and
- Jet Fuel.

The terminal also has consent to manage the following by-products:

- Slop[3]; and
- Wastewater.

[3] Slop or slop oil is a petrochemical industry term for recovered petroleum hydrocarbons in a refinery or terminal, which requires further processing to make it suitable for sale and use. It is a product which Caltex would either reprocess at a separate facility or sell to a customer.



KEY

- The Site
- Caltex Land Ownership
- ACS management works
- Conversion Works Area
- Demolition Works Area

N

0 50 100 200 m

AECOM

SCALE 1:9,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 3-1 - CONVERSION AND DEMOLITION WORKS

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G003	01	60546439
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3.2.2 Demolition Works (SSD 5544 MOD1)

The demolition works involve the following activities:

- demolition, dismantling or removal of:
  - refinery process units and associated infrastructure;
  - redundant tanks and associated infrastructure;
  - redundant pipeways and above and underground pipelines; and
  - redundant buildings and services.
- associated civil works with the works outlined above;
- waste management activities including concrete crushing; and
- returning the works areas to ground level.

These works occurred within the approved demolition works area as presented in **Figure 3-1**.

Caltex received development consent for the demolition works in August 2015 and this consent is valid for 3 years. The demolition works are ongoing and due to be complete in early 2018. The majority of the refinery process units have now been removed and number of tanks demolished.

This consent also included measures to manage the excavation, testing, storage and disposal of various soils at the Site, included hydrocarbon contaminated soils and ACSs, during the demolition works.

Management and mitigation measures and the conditions of consent for the demolition works were agreed with various regulators and documented within the Demolition Environmental Management Plan (DEMP). The DEMP was agreed with a number of stakeholders and was approved by the DPE.

3.2.3 ACS management works (SSD 5544 MOD2)

Caltex submitted a second modification application at the end of 2016 for the Kurnell Asbestos Contamination Soil (ACS) Management Project. The Site has certain areas, most notably the pipeways, which contain ACS. The ACS management works propose to remove the ACSs and place them in a containment cell, in order to remove the hygiene risk and the WHS Regulation Exemption from the pipeways.

The ACS management works involve the following activities:

- Construction:
  - Additional soil sampling within the pipeways to confirm the waste classification of the soil prior to placement in the containment cell;
  - Construction of the containment cell base and leachate collection system in the proposed cell location;
  - Installation of ground water monitoring wells down gradient of the proposed cell location;
  - Excavation and transportation of ACSs directly to the containment cell location for emplacement;
  - Filling and compaction of the ACSs into the containment cell;
  - Verifying the removal of ACS from the pipeways; and
  - Closure of the containment cell.
- Operation:
  - Managing and monitoring the closed containment cell.

The modification application (SSD 5544 MOD2) for this project is currently being assessed by DP&E.

3.2.4 Program

The conversion works program, the demolition works program and the ACS management works program is provided in **Table 3-1**.

Table 3-1 Proposed Conversion, Demolition and ACS management works Schedule

Task	Indicative Date
Conversion works	
Detailed Engineering & Design Start	Mid 2012
Engineering & Design Completed	Second half 2013
Tank Conversions Start	Q1 2014
Installation of Piping, Pumps and Associated Infrastructure	Q1 2014
Construction on Piping Completed	Q2 2014
Kurnell Refinery Shutdown	Q4 2014
Kurnell Refinery Decommissioning Process Units	First half 2015
Kurnell Refinery Decommissioning Tanks and lines	2015 – Mid 2016
Continued Tank Conversions	End 2014 – end 2016
CONVERSION TO TERMINAL COMPLETED	December 2016
Demolition works	
Demolition of Refinery Process Units	Mid 2015 – Mid 2017
Demolition of Tanks	Mid 2016 – End 2017
Pipeline Removal	Start 2016 – End 2017
Demolition of Buildings	Mid 2016 – End 2017
Concrete Crushing	End 2017
ACS management works	
Containment Cell Construction	Late 2017 – Q2 2018*
Excavation of ACS from Pipeways and Filling of Containment Cell	Late 2017 – Q3 2018*
Closure of Containment Cell	Q4 2018 – Q2 2019*

*Dependent on timing of consent.

3.3 Continued Works

Continued maintenance and upgrade works are likely to occur over the coming years in order to maintain the viability of the terminal into the future. These upgrade works would be subject of future development applications and/or approvals.

4.0 Proposed Modification

4.1 Introduction

This Chapter provides an overview of the works to demolish Tank 101. It includes a description of the works and a program for when the works would be undertaken. The tank 101 demolition works are in addition to the works described in **Chapter 3.0 Approved Project and ACS Management Description**.

4.2 Tank 101 Demolition Works

Tank 101 is located on the north eastern corner of the Site (refer to **Figure 4-1**). The demolition of this tank would be undertaken using the same approach used for the demolition of the other tanks under the approved demolition works (SSD 5544 MOD1). The tank has already been cleaned and is currently empty awaiting demolition. The tank is predominantly made of metal.

The works to remove the tank include the following activities:

- disconnection of the tank from the existing pipework;
- demolition and dismantling of Tank 101 and associated infrastructure;
- associated civil works with the works outlined above;
- intermediate storage of the demolished material at the former Caltex Lubricant Oil Refinery (CLOR) prior to disposal or recycling; and
- returning the works areas to ground level.

The works are planned to be completed over a four week period in Q4 2017 as part of the wider program of the approved demolition works.

These works may require excavation extending down to 1 meter below ground level. The bund associated with the demolished tank would remain intact. Bund drainage would not be affected by the works. The bund would still drain to the Site's oily water sewer.

The following equipment and plant would be required to demolish Tank 101:

- Large Shearer
- Oxycutter
- Mobile 130T Crane
- Vacuum Truck or Trucks
- Concrete Crusher
- Excavator
- Jackhammer

The majority of the work to demolish the tank itself would be completed by an excavator and shear. **Figure 4-2, Figure 4-3** and **Figure 4-4** below show an excavator and shear demolishing a tank. No additional equipment or plant would need to be bought to Site to complete these works.

No additional staff would be required on Site. The demolition of Tank 101 would be completed by the contractors who are currently completing the other demolition works.

The demolition of Tank 101 would be undertaken within the boundary of the Site. The presence of the relevant equipment and personnel at the Site means that an increase in traffic as a result of these works is not anticipated. Traffic impacts are discussed further in **Section 12.4.**

KEY

- The Site
- Caltex Land Ownership
- Tank 101 Demolition Works Area

N

0 5 10 20 30 m

AECOM

SCALE	1:1,000
SIZE	A3
SHEET	01 of 01
COORDINATE SYSTEM	GDA 1994 MGA Zone 56

TITLE

FIGURE 4-1 - DEMOLITION OF TANK 101

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT

CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17			
CHECK	DATE	G004	01	60546439

AECOM GIS Printed:Date: 09-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G004_01_A3PDDP_FeatureCloseups_170706.mxd

The Tank 101 demolition works would be completed in line with the Conditions of Consent for SSD 5544 and SSD 5544 MOD1, in particular Conditions C18, C19 and C20. In summary:

- Construction to be undertaken between 7.00 am and 10.00 pm seven days a week (Condition C18);
- High noise generating construction and demolition works would be confined to less sensitive times of the day, and shall not be undertaken on Sundays or public holidays or outside the hours of 7.00 am to 6.00 pm Monday to Saturday (Condition C19); and
- Construction outside those hours would only be undertaken in certain circumstances as defined in Condition C20.

Given the proximity of Tank 101 to residential areas of Kurnell, Caltex has committed to completing these works during daytime hours in line with Condition 19.

Potential noise impacts related to the Tank 101 demolition works are discussed further in **Chapter 9.0 Noise and Vibration** and **Appendix A Demolition Noise Assessment**.

Figure 4-2 Excavator/Shear Part 1

Figure 4-3 Excavator/Shear Part 2

Figure 4-4 Excavator/Shear Part 3

4.3 Environmental Management

The Tank 101 demolition works would be undertaken in accordance with the existing Demolition Environmental Management Plan (DEMP) and associated sub-plans where applicable.

4.4 Operation

The operation of the Kurnell Terminal would remain as described in the Kurnell Refinery Conversion EIS (URS, 2013) and would be consistent with the development consent for SSD 5544. The demolition of Tank 101 would not affect the operation of the terminal.

5.0 Legislation, Planning Policy and Approvals

5.1 Introduction

This Chapter reviews the key Commonwealth and State legislation as well as the State, regional and local planning policies that apply to the Tank 101 demolition works in order to determine the approvals that would be required to allow the works to proceed.

The key approval required is consent under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). In addition to consent under the EP&A Act, a number of other approvals may be required.

5.2 Commonwealth Legislation

5.2.1 Environmental Protection and Biodiversity Conservation Act 1999

Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) states that an action which has, will have or is likely to have a significant impact on a matter of national environmental significance may not be undertaken without prior approval of the Commonwealth Minister for Environment and Energy, as provided for under the provisions of Part 9 of the EPBC Act. The Act identifies the following as matters of national environmental significance for which Ministerial approval is required:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance (including Ramsar Wetlands);
- listed threatened species and ecological communities;
- listed migratory species protected under international agreements (e.g. CAMBA and JAMBA);
- protection of the environment from nuclear actions; and
- Commonwealth marine areas.

The EPBC Act also protects the environment within which any action is proposed to be undertaken, or where an action will affect Commonwealth land.

The Tank 101 demolition works would not involve a nuclear action, would not have a significant effect upon the health and viability of any migratory species listed under provisions of the Act, would not affect any World Heritage property, and would not affect any Commonwealth land or its environment.

Kurnell Terminal is located approximately 150 m from the Towra Point Nature Reserve, a listed Ramsar Wetland of international significance. The Kurnell Peninsula Headland is included in the National Heritage List (NHL listing No. 105812) established under the EPBC Act. The NHL was established to protect places that have outstanding value to the nation. Approval from the Minister is required under the EPBC Act for controlled actions which are deemed will have a significant impact on items and places listed under the NHL and on Ramsar Wetlands.

The Tank 101 demolition works would not impact the Towra Point Nature Reserve or any threatened species and communities. As such the Tank 101 demolition works do not require referral to the Commonwealth Department of Environment (DoE) for approval under the EPBC Act.

5.2.2 Australian Heritage Council Act 2003

The Australian Heritage Council Act 2003 establishes the Australian Heritage Council as an independent advisory body regarding National/Commonwealth heritage places and mandates the Council to maintain the Register of the National Estate (RNE) to promote the assessment and conservation of heritage items.

No items listed under the RNE are located on or adjacent to the Site (refer to **Chapter 11 Heritage** and **Appendix B Statement of Heritage Impact**).

5.3 NSW State Legislation

5.3.1 Environmental Planning and Assessment Act 1979

The Tank 101 demolition works constitutes 'development' as defined by the EP&A Act and therefore require consent under Part 4 of the same Act. The Tank 101 demolition works are directly linked to the approved Projects SSD 5544 and SSD 5544 MOD1 as they are additional works relating to the conversion and demolition process at the Site to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell. The demolition of Tank 101 is considered a very small change to the activities consented under SSD 5544 in that the demolition of Tank 101 is consistent with the 'demolition works' consent under SSD 5544 MOD1 as this activity involves the removal of tanks that are no longer required at the Site.

The Tank 101 demolition works shares the same needs case, project objective and the same purpose as the Project, and is consistent with previously consented activities. Therefore the removal of Tank 101 is considered to be 'substantially the same development' as the development consented under SSD 5544.

Given this connection, Caltex are seeking to modify the development consent for SSD 5544 to include the demolition and removal of Tank 101. Following completion of the works the end result for the Site would be substantially the same development as approved under SSD 5544.

As demonstrated within this SEE, Caltex expects that the Tank 101 demolition works are likely to result in impacts which are of 'minimal environmental impact' (i.e. impacts that are expected to be within the same scale as those that have been previously approved and would result in "very small' or "negligible" overall environmental impacts[4]). The potential impacts associated with the demolition of Tank 101 would be of same scale as those that have been previously approved. The management and mitigation measures that were approved for the demolition works (SSD 5544 MOD1) would still apply. Whilst the demolition of the tank would result in a minimal temporary noise impact, its removal would have a long term beneficial impact from a social and hazards and risk perspective. As such it can be concluded that the works to removal Tank 101 are likely to result in "very small' or "negligible" overall environmental impacts. Therefore a modification to SSD 5544 is being sought under S.96 (1A) of the EP&A Act.

A modification through Section 96 (1A) of the EP&A Act requires that aspects of the Tank 101 demolition works that may have environmental, social or economic impacts that differ from those previously assessed for SSD 5544, are required to undergo assessment in line with Section 79C of the EP&A Act.

Under Section 79C, Part 4 of the EP&A Act, the Tank 101 demolition works must be evaluated against a range of considerations including environmental planning instruments, NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), the likely environmental, social and economic impacts of that development, the suitability of the Site, and the public interest.

In order to comply with the requirements for assessing this type of modification, a SEE (this document) must be prepared and submitted alongside the Modification Application (MA).

As this application is modifying a State Significant Development, the consent authority remains the Minister of Planning.

5.3.2 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) operate under the jurisdiction of the EP&A Act and set out planning policies for various geographies and project types within NSW. The relevant SEPPs for the Tank 101 demolition works, and their requirements, are outlined below.

5.3.2.1 State Environmental Planning Policy 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) outlines the approach used in NSW for planning and assessing the risks and hazards associated with industrial development proposals. Through the policy, the permissibility of an industrial proposal is

[4] King, Markwick, Taylor & Ors v Bathurst Regional Council [2006] NSWLEC 2005

linked to its safety and pollution control performance. SEPP 33 applies to proposals that fall under the policy's definition of *'potentially hazardous industry'* or '*potentially offensive industry'*.

As part of the assessment of the demolition works (SSD 5544 MOD1) a Hazards in Demolition (HAZDEM) assessment was completed. This assessment identified the impacts of demolition works on the existing simultaneous terminal operations and whether these potential risks change the conclusions of the Preliminary Hazards Analysis for the approved Project. The HAZDEM assessment concluded that the demolition works (in addition to the approved Project and simultaneously with the approved Project) would not contravene the NSW land-use safety criteria (as detailed within the Hazardous Industry Planning Advisory Papers) and would therefore be acceptable under the provisions of SEPP 33.

The Tank 101 demolition works are consistent with the tank removal works that were assessed by the HAZDEM. As such these works would be acceptable under the provisions of SEPP 33. The controls identified in the HAZDEM would be implemented for the Tank 101 demolition works.

5.3.2.2 State Environmental Planning Policy No. 14 – Coastal Wetlands

The Tank 101 demolition works would not directly affect any *State Environmental Planning Policy No 14 – Coastal Wetlands* (SEPP 14) wetlands as this SEPP does not apply to wetlands within the Sydney Metropolitan Region.

5.3.2.3 State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 55 - Remediation of Land (SEPP 55) provides a state wide planning approach to the remediation of contaminated land. SEPP 55 aims to promote the remediation of contaminated land with the objective of reducing the risk of harm to human health or other aspects of the environment. Section 7 of the SEPP specifies that:

'A consent authority must not consent to the carrying out of any development on land unless:

(a) it has considered whether the land is contaminated, and

(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and

(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.'

Contamination issues are discussed within **Chapter 9 Soil, Water and Contamination**. If contamination is encountered during the Tank 101 demolition works, it would be managed in line with the measures detailed within the approved DEMP.

Overall remediation of existing contamination on the Site would be assessed as part of a separate approval process. This would be developed in consultation with the NSW Environment Protection Agency (EPA), the Sutherland Shire Council (SSC) and other relevant parties.

As no change of use is proposed as part of the Tank 101 demolition works, the land would continue to be suitable for its continued consented use as a liquid fuel depot and therefore the provisions of SEPP 55 do not prevent consent being granted for the works.

5.3.3 Other NSW State Legislation

5.3.3.1 Australian Oil Refining Agreements Act 1954

The Australian Oil Refining Agreements Act 1954 (AORA Act) was introduced to facilitate the construction and operation of the Kurnell Refinery. The Act also allows for Caltex to maintain its asset at the Site.

5.3.3.2 Protection of the Environment Operations Act 1997

Section 48 of the *Protection of the Environment Operations Act* 1997 (PoEO Act) provides for the issue of an Environment Protection Licence (EPL) for scheduled activities related to pollution and waste disposal caused by development or operation of developments. Activities requiring an EPL are listed in Schedule 1 of the Act.

Activities relating to chemical storage are listed in clause 9 of Schedule 1 of the PoEO Act. These include Petroleum Products Storage with a capacity to store more than 200 tonnes (liquefied gases) or 2,000 tonnes (chemicals in any other form). Caltex has an existing EPL (No. 837) that licenses a number of activities for the Site, including Petroleum Products Storage. Condition B13 of the conditions of consent for SSD 5544 specifically noted the requirement to amend the EPL as the refinery transitions to a terminal operation. The EPL for the Site is frequently amended, in consultation with the EPA, to ensure that the activities at the Site are appropriately managed.

The Tank 101 demolition works would not alone be defined as a Scheduled Activity under the PoEO Act and no licenced emission source specific to these works has been identified.

5.3.3.3 Work Health and Safety Act 2011

The *Work Health and Safety Act 2011* (WH&S Act) and its supporting *Work Health and Safety Regulation 2011* (WH&S Regulation) defines major hazard facilities (MHFs), regulates their operation and includes measures to prevent accidents occurring at MHFs.

The Site is classified as a MHF. Any works to or modifications of a MHF need to be discussed with SafeWork NSW as the administrators of the WH&S Act. Caltex undertakes regular consultation with SafeWork NSW and will continue to do so moving forward. However as the Tank 101 demolition works would not modify the MHF, consent and approval of SafeWork NSW is not required.

5.3.3.4 Water Management Act 2000

The *Water Management Act 2000* (WM Act) governs the issue of water access licences and approvals for those water sources (rivers, lakes, estuaries and groundwater) in New South Wales where water sharing plans have commenced. The Site is located within the area covered by the commenced Water Sharing plan entitled the 'Greater Metropolitan Region Groundwater Sources' 2011.

The WM Act creates:

- mechanisms for protecting and restoring water sources and their dependent ecosystems;
- improved access rights to water; and
- partnership arrangements between the community and the Government for water management.

The WM Act defines an aquifer interference activity as that which involves any of the following:

- the penetration of an aquifer;
- the interference with water in an aquifer;
- the obstruction of the flow of water in an aquifer;
- the taking of water from an aquifer in the course of carrying out mining or any other prescribed activity; and
- the disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.

The NSW Aquifer Interference Policy applies to any project or activity involving any of the above where a water licence is required whether water is taken for consumptive use or whether it is taken incidentally by the aquifer interference activity. The Policy recognises that even where there is no take of water, aquifer interference activities can still affect the functioning of aquifers which can impact water users and dependent ecosystems.

Across the Site, groundwater is likely to be encountered in excavations deeper than 1.4 metres below ground level (mbgl).Ground disturbances associated with the Tank 101 demolition works would extend to a maximum of 1 mblg. Therefore groundwater would not be encountered as part of the Tank 101 demolition works and an Aquifer Interference Licence is not required.

This is further discussed in **Chapter 9 Soil, Water and Contamination**.

5.3.3.5 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides legal status for biota of conservation significance in NSW. The Act aims to 'conserve biological diversity and promote ecologically sustainable development'.

The Tank 101 demolition works would result in no impacts to the values protected by the TSC Act (refer to **Chapter 12 Other Issues**).

5.3.3.6 Noxious Weeds Act 1993

The *Noxious Weeds Act 1993* provides for the identification and control of noxious weeds, including the duties of public and private landholders on this regard. The Act stipulates that an occupier of land must take steps to control noxious weeds on their land.

The Tank 101 demolition works are unlikely to affect the presence of noxious weeds or their management at the Site (refer to **Chapter 12 Other Issues**). Management of noxious weeds on the Site would continue to be subject to Caltex's existing Weed Management Plan.

5.3.3.7 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides for the conservation of environmental heritage defined as places, buildings, works, relics, moveable objects, and precincts, of State or local heritage significance that are at least 50 years old. The Act provides for the listing of heritage structures on the State Heritage Register and Orders can be made under the Act to protect relics from removal or alteration. This Act applies to non-Aboriginal relics only. Aboriginal relics are protected under the *National Parks and Wildlife Act 1974* (see below).

An assessment of the potential impacts of the Tank 101 demolition works on heritage items in the area is provided in **Appendix B Statement of Heritage Impact** and summarised in **Chapter 11 Heritage.** That assessment concluded that the heritage significance of the Site would not be significantly impacted by the works.

5.3.3.8 National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974* (NP&W Act) the NSW National Parks and Wildlife Service (NPWS) (part of the Office of Environment and Heritage (OEH)) is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas, state conservation areas and regional parks.

The relevant provisions of this Act and relevant State-protected sites of ecological value have been considered within **Chapter 12 Other Issues**. This assessment concluded that the Tank 101 demolition works would not have an impact on any species, population or community protected under this Act.

5.4 Local Planning Policies and Instruments

Land use within the Site and the wider Kurnell Peninsula, as discussed in **Section 2.1**, is controlled *Sutherland Shire Local Environment Plan 2015* (SSLEP 2015).

The SSLEP 2015 indicates that the Site is zoned as Heavy Industrial (IN3). As the Tank 101 demolition works are for the purpose of a liquid fuel depot, they are permissible under the SSLEP 2015.

The SSLEP 2015 aims to promote an appropriate balance of development and management of the environment that will be ecologically sustainable, socially equitable and economically viable. As discussed in **Chapter 16 Evaluation and Justification.** the Tank 101 demolition works are consistent with the principles or Ecologically Sustainable Development (ESD).

5.5 Strategic Planning Framework

5.5.1 Land Use Safety Study (Kurnell Peninsula) 2007

The Land Use Safety Study (Kurnell Peninsula) 2007 assesses the current risks from Caltex Terminal operations to existing and future residential land uses and provides recommendations for risk reduction and development control.

The Land Use Safety Study identifies three main sources of risk from the Site:

- fires from large crude oil and refined petroleum product storage tanks and associated transfer pipelines;
- fires, explosions or toxic gas releases from processing areas; and
- fires and explosions from large liquefied petroleum gas (LPG) storage.

The HAZDEM completed for the demolition works considered the findings of the Land Use Safety Study. As discussed above, the Tank 101 demolition works are consistent with the tank removal works that were assessed by the HAZDEM. The controls identified in the HAZDEM would be implemented for the Tank 101 demolition works (refer to **Section 12.1**).

6.0 Consultation

This chapter documents the consultation effort for the Tank 101 demolition works.

6.1 Methodology

Consultation between the Caltex Terminal Management and various stakeholders is an ongoing process. Caltex maintains an open dialogue between the personnel responsible for the Site and those residents with whom it shares the Kurnell Peninsula. Regular community meetings, announcements and feedback sessions with the residents are part of the ongoing consultation process. Consultation on the Tank 101 demolition works has included liaison with government agencies, including DP&E and NSW EPA.

6.2 Objectives of Consultation

The main objectives of the consultation are to:

- identify the relevant stakeholders and advise them of the Tank 101 demolition works;
- identify the key issues and sensitivities related to the Tank 101 demolition works;
- ensure ongoing communication is implemented with regards to the Tank 101 demolition works and approvals process; and
- ensure that relevant government agencies are engaged in the planning and approvals process.

6.3 Stakeholder Identification

Given the nature and location of the Tank 101 demolition works, the stakeholders relevant to these works are similar to those identified as part of Caltex's ongoing community and stakeholder liaison strategy.

For this modification the key stakeholders were identified as DP&E, NSW EPA and the community.

6.4 Government Agency Identification

The consultation undertaken with government stakeholders is outlined in **Table 6-1**. The initial consultation with DP&E and NSW EPA discussed a number of potential modifications and therefore comments regarding the Tank 101 demolition works were limited.

Table 6-1 Government Stakeholder Consultation

Department	Consultation Method	Response Provided
NSW Department of Planning and Environment (DPE)	Meeting 9 March Letter issued to DP&E05 August 2017	Meeting outcomes associated with the Tank 101 demolition works included a recommendation to consult with neighbouring properties in proximity to the works; and email response to letter confirming modification approach
Sutherland Shire Council	Letter issued to Sutherland Shire Council 05 August 2017	No response received
NSW Environment Protection Authority (NSW EPA)	Letter issued to NSW EPA 05 August 2017	No response received

6.5 Public Consultation

Caltex maintain on-going dialogue with the local community regarding its operations on the Kurnell Peninsula. Quarterly meetings are held for the Kurnell community. This consultation is advertised and well-attended by a core group from the local community. In addition to the quarterly Kurnell Community Meeting, Caltex also engages with the local Kurnell community through:

- Kurnell Progress Residents Association (monthly) Meeting; and
- printed reports in Kurnell Village News (bi-monthly).

Since the announcement of the Project in July 2012, the quarterly briefings have discussed the works that were planned to occur at the Site (including demolition). These briefings have discussed both the progress and upcoming elements of the conversion works and the demolition works.

The removal of Tank 101 has been discussed with the community for a number of years. Over the past 18 months the community has asked a number of times whether Caltex had plans to remove the tank. At the quarterly community meeting on the 28 March 2017, Caltex confirmed that following an internal review that the tank was no longer required and that they would demolish it. No other questions regarding the removal of the tank have been asked by the community. It is understood that the community are supportive of the demolition of Tank 101.

6.6 During the Tank 101 demolition works

During the demolition activities for Tank 101 Caltex would continue to consult with the community via the established channels outlined above. In addition to these regular community meetings Caltex would further consult with relevant local residences and businesses via letterbox drops outlining the Tank 101 demolition works and the relevant detail.

During the works Caltex would welcome direct feedback and concerns via the following methods:

- 24 Hour Community Concern Hotline; and
- email contacts featured on their website.

Comments and concerns received would be managed under the established governance process whereby they would be logged, tracked and responded to promptly

7.0 Environmental Scoping Assessment

7.1 Environmental Scoping for Modification Application

This SEE documents a number of environmental assessments. These environmental assessments identify additional environmental impacts resulting from the Tank 101 demolition works and identify appropriate measures to manage or mitigate these impacts.

The identification of potential impacts, and confirmation of appropriate assessment methodologies, is determined through a scoping process. The scoping process for this SEE was based on:

- a review of available information and documents relating to the existing environment;
- site visits and appraisals;
- consultation with stakeholders (refer to **Chapter 6 Consultation**);
- a review of relevant legislation and planning policy (refer to **Chapter 5 Legislation, Planning Policy and Approvals**); identifying the sensitivities of the local environment (refer to **Chapter 2 Project Location and Existing Environment**);
- understanding the characteristics of the modification and how they relate to the approved Project and the assessments which have been completed previously, in particular the demolition works (refer to **Chapter 4 Proposed Modification**); and
- an identification of other projects or actions that may cumulatively add to any perceived impact from the Tank 101 demolition works.

7.2 Summary of Potential Issues Identified

Following the scoping process the following environmental aspects were considered relevant to the modification:

- Hazards & Risks;
- Soil, Water and Contamination;
- Air Quality;
- Noise and Vibration;
- Heritage; and
- Waste Management.

Ecology and Transport and Access were considered unlikely to be impacted by the Tank 101 demolition works. This was because:

- For Ecology, the Tank 101 demolition works would take place on a part of the Site devoid of any vegetation and of no value for fauna; and
- For Transport and Access, the Tank 101 demolition works would be completed by the contractors already completing the demolition works, using equipment already at the Site and would be completed within the program approved for the wider demolition works.

Therefore these aspects were discounted and are not discussed further.

7.3 Prioritisation of Potential Issues

A risk assessment was undertaken to determine the key issues and prioritise the scope of work for each environmental aspect. This risk assessment considered the issues mentioned in:

- consultation with relevant stakeholders;
- the EIS for the conversion works (URS, 2013);
- the SEE for the demolition works (URS, 2014); and

- the SEE for the ACS management works (AECOM, 2016).

The risk assessment was undertaken in accordance with the guidelines outlined in AS/NZS 4360:2004 and AS/NZS ISO 31000:2009.

Table 7-1 outlines the key environmental aspects in relation to the Tank 101 demolition works.

Table 7-1 Prioritisation of Environmental Issues

High Priority Issues	Medium Priority Issues	Low Priority Issues
• Noise (**Chapter 9**) • Heritage (**Chapter 11)**	• Air quality (**Chapter 10**) • Soil, Water and Contamination (**Chapter 8**)	• Hazards and risk (**Section 12.1**) • Waste Management (**Section 12.2**)

7.4 Format of the Assessment Chapters

A common format has been adopted for reporting each of the assessment chapters of the SEE. This is outlined below.

Introduction

This section provides an overview of the environmental aspect under consideration. It also provides cross-reference to other technical assessments or relevant appendices that have been used to inform the assessment chapter.

Method of Assessment

This section summarises the methodology for:

- determining the existing environment relevant to the particular environmental aspect;
- conducting an assessment of the potential impacts of the modification in relation to the particular environmental aspect;
- determining whether these impacts are significant; and
- providing a suite of mitigation measures that will minimise and manage these impacts.

For each environmental assessment there is an explanation of the approach to identifying impacts and assessing whether a potential impact is likely to be considered significant. Assessments can either be quantitative (relying on criteria, standards and thresholds) or qualitative (using certain scientific material, but ultimately making decisions based on professional judgement).

Existing Environment

The section describes the key components, characteristics and the status of the existing environment relevant to the environmental aspect. It also considers changes to the existing environment over the period of time that the Tank 101 demolition works are to take place.

As the Tank 101 demolition works are a modification to an approved Project, the existing environment takes into consideration the influence the conversion works and demolition works (i.e. the approved Project) would have on the existing environment. This needs careful consideration as there is an overlap between the approved demolition works in 2017.

Also, the key receptors for each assessment will be identified and described in this section.

Impact Assessment

This section identifies potential impacts of the Tank 101 demolition works on the sensitive receptors for the particular environmental aspect and evaluates the significance of the impact in accordance with the criteria detailed in the Method of Assessment.

Impacts may be referred to either prior to (potential impact) or following mitigation (residual impact). In the ‘Impact Assessment’ section all impacts are potential impacts.

Impacts can be considered:

- direct or indirect;
- adverse or beneficial; and
- significant, non-significant (negligible) or neutral.

Where existing criteria, guidance, environmental standards or assessment methodologies exist, the significance of an impact will be based on that information. Where possible and/or necessary quantitative judgements about the significance of an impact will be made using this information. Where no explicit guidance or information exists, qualitative judgements on the significance of an impact will be made. Where qualitative judgements are required, some or all of the following impact characteristics will be considered to understand its potential magnitude:

- extent – the area potentially affected by the impact;
- magnitude – the size or amount of the impact;
- duration – how long the impact is likely to last;
- frequency – whether the impact is continuous, brief or intermittent;
- timing – if the impact occurs at a particularly sensitive time; and
- permanence – whether the impact is permanent or temporary.

The judgement as to whether an impact is significant will depend on the importance or sensitivity of the receptor (e.g. as defined by legislation, policy, standards or guidance) and the magnitude of the impact affecting it (as decided by quantitative or qualitative means). For the purposes of the 'Impact Assessment' section of each technical chapter all impacts are considered 'alone' and not cumulatively.

Mitigation

This section describes the management and mitigation measures that have been identified to avoid, reduce or compensate for the effects of significant impacts on the environment.

The mitigation hierarchy has been used to help identify management and mitigation measures for each of the technical assessments. Wherever possible, impacts have been firstly avoided where possible, then either reduced at source or at receptor where avoidance cannot be achieved, and finally either compensated or offset where avoidance or reduction is not possible or would not achieve practicable or acceptable levels of mitigation.

If management and mitigation measures are to be implemented through particular environmental management plans, then these will also be discussed.

Once all of the mitigation measures are identified and described, this section will also consider any residual impacts that would remain following the application of the management and mitigation measures.

Summary

At the end of each assessment chapter a summary is provided. This summary will note residual impacts and other relevant permits or licences that are required. It will also provide a table summarising the management and mitigation measures for just the Tank 101 demolition works. These may include unaltered or amended measures from SSD 5544, SSD 5544 MOD1 or new measures.

The management and mitigation tables from all of the technical assessments are collated into a single table (**Table 14-1**) within **Chapter 14 Revised Management and Mitigation Measures**. **Table 14-1** includes an updated, consolidated schedule of mitigation and management measures, and differentiates between the measures established for the approved Project and those proposed for the Tank 101 demolition works.

8.0 Soil, Water and Contamination

8.1 Introduction

This chapter presents a description of the soil, water and contamination status of the areas which would be disturbed during the Tank 101 demolition works. This description is based on a desktop review of existing information.

The potential impacts of the Tank 101 demolition works are identified and assessed. Mitigation measures are provided with a view to avoiding or minimising the potential impacts of the Tank 101 demolition works in relation to soils, water and contamination.

8.2 Method of Assessment

This assessment has been conducted as a desktop investigation. This involved the review of existing information relevant to the Site including previous investigations, historic site information, records of contamination and detail of past contamination management activities.

The information presented in this chapter is primarily drawn from a review of the following reports:

- Kurnell Refinery Conversion Environmental Impact Statement (URS, 2013a);
- Kurnell Refinery Demolition Statement of Environmental Effects (URS, 2014);
- Kurnell Refinery ACS Management Project Statement of Environmental Effects (AECOM, 2016a);
- Soil and Groundwater Contamination Assessment, Classification and Risk Ranking Report (Coffey, 2007);
- Contaminated Site Risk Reduction Program Annual Review Progress Report Caltex Refineries (NSW) Pty Ltd, NSW (Caltex, 2012);
- Soil and Water Contamination Data Review – Caltex Refinery, Kurnell (Caltex, 2013a);
- Contamination Data Gap Assessment – Caltex Refinery, Kurnell (Caltex, 2013b);
- Caltex Contaminated Site Risk Reduction Program Annual Review Progress Report (Caltex, 2013c);
- Caltex Australia Petroleum 2014 Caltex Refinery Kurnell Preliminary Investigation Order 20131001 April (Caltex, 2014b); and
- Contamination Data Gap Investigation Plan – Caltex Refinery, Kurnell (Caltex, 2014a).

8.3 Existing Environment

8.3.1 The Local Catchment

The Site is located on the Kurnell Peninsula. The land area of this peninsula, as well as the surrounding marine and estuarine waters, constitute the receiving environment for surface water discharges from the Site. The main water bodies in proximity to the Site include the Tasman Sea, Botany Bay, Quibray Bay, Weeney Bay, and the Marton Park Wetland area.

The Site is located within the Botany Bay catchment, which extends across a land area of 1,165 km^2. The catchment is part of the Greater Sydney Region of Local Land Services NSW.

The Botany Bay Catchment has four main sub-catchments, based on the major river which drain to it. These are the:

- Georges River catchment;
- Cooks River catchment;
- Woronora catchment; and

- Botany Bay (direct discharge) catchment.

The Site is located in the catchment area that drains directly to Botany Bay. A substantial part of the catchment is highly developed with almost 40% of its area being used for urban, industrial or commercial purposes.

8.3.2 Regional Topography and Geology

The Kurnell Peninsula, is an elevated plateau of Hawkesbury Sandstone which is approximately 18 kilometres in length (URS, 2004). The elevation on and around the Site is generally in the region of 5 metres Australian Height Datum (AHD). Land to the east of the Site in Kamay Botany Bay National Park rises to approximately 30 metres AHD (Port Hacking 9129-4N Topographic Map, Third Edition, Land and Property Information NSW, 2001). The depth to bedrock beneath the Site varies from 2 metres to 20 metres. Bedrock surface elevation rises toward the east and south of the Site, with sandstone outcrops mapped at the northeast and southeast boundaries (URS, 2006).

According to published geological information (Sydney 1:100,000 geological service sheet), the Site is underlain by Quaternary (Pleistocene) wind-blown medium to fine-grained, well-sorted marine quartz sand (URS, 2004, 2010). The sandstone is described as medium to coarse-grained, composed predominantly of quartz with minor lithic fragments, feldspar, mica and clay pellets. The Site lies on the aeolian Kurnell landscape unit, composed of gently undulating to rolling coastal dunefield and relict dunes (NSW Soil Conservation Service Soil Landscape Series, Wollongong-Port Hacking, URS, 2011).

8.3.3 Acid Sulfate Soils

A review of the Atlas of Australian Acid Sulfate Soils Mapping (CSIRO, 2008) indicated that the Tank 101 demolition works area is on ground classified as having a 'Low Probability' of containing Potential Acid Sulfate Soils (PASS).

Despite this, acid sulfate soils have been recorded and classified by Sutherland Shire Council in the Tank 101 demolition works area. These maps show the Tank 101 demolition works area extends across land classified as Class 4 with respect to PASS. Sutherland Shire Council has provided the following definition of Class 4 areas:

> *In a Class 4 area, acid sulphate soils are likely to be found beyond 2 metres below the natural ground surface. Any works that extend beyond 2 metres below the natural ground surface, or works which are likely to lower the water table beyond 2 metres below the natural ground surface, will trigger the requirement for assessment and may require management (Sutherland Shire Council, 2010).*

The Tank 101 demolition works would not require excavation beyond 1 metre below ground level (mbgl), therefore acid sulfate soils are unlikely to be encountered.

8.3.4 Hydrogeology

A *Voluntary Investigation Final Report* by Coffey (2003) indicated that groundwater at the Site is contained within an unconfined aquifer in Quaternary sands, generally 2 to 2.5 mbgl. Although the groundwater is generally found at this depth, groundwater monitoring (Coffey 2011, Caltex 2013a) indicates that there is variable depth to groundwater across the Site, ranging from approximately 1 mbgl in the north-western area of the Site, to 15 mbgl in the south eastern area of the Site. The groundwater flow is generally to the northwest (refer to **Figure 8-1**) and influenced by the strike and dip of the underlying sandstone bedrock (Coffey 2007). Within the Site there is an east-west groundwater divide located south of the pipeways and north of the Caltex Soil Remediation Facility (CSRF) (Caltex, 2013b). To the north of the divide the groundwater flows in a north-westerly direction to Botany Bay at a gradient of 0.003 to 0.005. South of the divide the groundwater is thought to flow south west at gradient of 0.006 towards a stormwater drain, and then flow north west into Botany Bay via Quibray Bay (refer to **Figure 8-1**).

The Tank 101 demolition works area is located north of the divide and therefore would only potentially affect groundwater flowing in a north-westerly direction.

The *Soil and Groundwater Contamination Assessment, Classification and Risk Ranking Report* by Coffey (2007) reports that groundwater in the north of the Site is thought to discharge to the Marton

Park Wetland. The receiving waters for groundwater migrating from the Site is Botany Bay to the north and Quibray Bay to the west. The ecosystem within Quibray Bay is considered sensitive and different parts of it comprise either Towra Point Nature Reserve or Towra Point Aquatic Reserve.

A quarterly groundwater monitoring program is implemented at the Site as a protection system to identify the potential for migration of hydrocarbon contaminated groundwater before it leaves the Site. The monitoring program includes monitoring wells in the central part of the Site and various boundary monitoring wells along the northern and western boundaries of the Site (including several adjacent to Tank 101) corresponding to the down gradient direction of groundwater flow (Coffey, 2003) (refer to **Figure 8-1**). There are also a number of private groundwater bores in Kurnell that are generally used for watering gardens. Monitoring of groundwater bores in the Kurnell residential area is conducted by Caltex every seven years.

8.3.5 Stormwater and Oily Water Management

Stormwater generated on the Site is collected in the Site's stormwater system, treated where necessary (via API oil/water separators) and discharged off-site to two receiving water bodies, Quibray Bay and Botany Bay. The stormwater system only collects runoff from areas of the Site that have been designated low risk with respect to interaction with petroleum products, such as roadways and building roofs.

The Site has a separate oily water sewer system (OWSS) to handle water that is or may be impacted by petroleum products, including a proportion of stormwater runoff collected from areas where there is or may be interaction with petroleum products such as tanks and bunds. This water is treated at the Waste Water Treatment Plant (WWTP) prior to being discharged to the Tasman Sea. Under the current EPL conditions, all wastewater must be treated using the biotreator in the WWTP or the oil-water separators/induced air floatation system prior to discharge into the Tasman Sea at Yena Gap, located east of the Site.

There are seven main catchment areas on the Site. Tank 101 is within Catchment A which is located on the eastern and northern area of the Site. Catchment A is one of the main catchments with the potential for interaction between petroleum products and stormwater, primarily along the pipeways.

Due to incidents of localised flooding on-site which resulted in oily water being discharged from the Site on three separate occasions in June 2010, March 2011 and April 2012, Caltex prepared a Stormwater Management Plan (SMP) which was submitted to the EPA on 5 October 2012. Implementation of the SMP is ongoing. Caltex continues to work with the EPA to implement the ongoing stormwater improvement strategy to prevent localised flooding.

8.3.6 Groundwater Dependant Ecosystems

The online Groundwater Dependent Ecosystems Atlas was consulted to determine the proximity of the Tank 101 demolition works to affect potential Groundwater Dependent Ecosystems (GDEs). As shown in **Figure 8-2,** a GDE that was noted as 'identified within a previous study' is located within proximity to Caltex owned land. This GDE is the Marton Park Wetland (shown in **Figure 8-2**), a freshwater wetland which includes woodland communities. Further information about this GDE is presented in **Section 12.3**.

Much of the Site is bunded and surface runoff from potentially contaminated areas, including the Tank 101 demolition works area, is treated onsite at the WWTP before discharging to the Tasman Sea.

Threats to the groundwater quality include the large number of houses in the area, the area not being sewered for a long time (historical threat), and potential infiltration from industrial sites (including the Site) (Molino Stewart Pty Ltd, 2009).

8.3.7 Flood Risk

The Site lies at south eastern portion of the Kurnell township catchment. According to the *Kurnell Township Flood Study Final Report* (WMAwater, 2009), prepared on behalf of Sutherland Shire Council, Kurnell is susceptible to flooding from both rainfall and tidal inundation. Its localised depression and low lying topography can make it vulnerable to extensive flooding (WMAwater, 2009). This report however does not extend across the Site.

The Kurnell Township Flood Study Final Report (WMA water, 2009) concluded that Captain Cook Drive, near the western boundary of the Site will be overtopped during the 1% year (also known as a 1 in 100 year) Annual Exceedance Probability (AEP) flood. Similarly provisional hydraulic hazard mapping of the Kurnell Township indicated that most of the areas which were classified as 'High Risk' from flooding are wetlands (including part of the Quibray Bay wetlands and Marton Park wetlands) are located near the western and northern boundaries of the Site.

While the impacts of flood events on the Site were not directly assessed in the WMA water study (2009) the Site is generally elevated above the surrounding low lying areas on the western and northern boundaries (where Tank 101 is located), and the on-site bunding around petroleum products storage areas effectively increases the flood height that would need to be present for any interaction between petroleum products and flood waters to occur.

8.3.8 Contamination

Various investigations have been conducted to determine key contaminants of potential concern (COPC) based on the historical land use and reported activities carried out across the Site (Coffey, 2007, Coffey, 2011, Caltex 2013a, AECOM, 2013, AECOM, 2016a and AECOM, 2016c). Due to its size, the Site was divided into 22 Contamination Management Zones (CMZs) to assist with classifying and managing the types of contaminants that may be found within different areas (refer to **Figure 8-3**).

The proposed works associated with the Tank 101 demolition works, are located within Zone F. **Table 8-1** presents a summary of COPC within Zone F that have the potential to be affected by the Tank 101 demolition works (refer to **Figure 8-3**). As demonstrated in **Table 8-1**, Caltex have a number of processes and monitoring programs in place on the Site to manage existing COPC. The information provided in **Table 8-1** has been sourced from Coffey 2007, Caltex 2012, Caltex 2013a and AECOM 2013.

KEY

- The Site
- Caltex Land Ownership
- Tank 101 Demolition Works Area
- Interpreted groundwater level contours (mAOR)
- Interpreted groundwater flow direction
- Approximate location of bedrock ridge (Groundwater divide)
- Permanent Monitoring Well
- ASC Preliminary works Monitoring Bore

N

0 50 100 200 m

AECOM

SCALE 1:9,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 8-1 - COFFEY (2007) GROUNDWATER FLOW DIRECTION AND MONITORING WELLS

PROJECT TANK 101 DEMOLITION WORKS

CLIENT CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G005	01	60546439
CHECK	DATE			

AECOM GIS Printed:Date: 09-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G005_01_A3P_Groundwater_Flow_170706.mxd

KEY

- The Site
- Caltex Land Ownership
- Tank 101 Demolition Works Area

GDE, Reliant on subsurface groundwater (vegetation)

- Identified in previous study: fieldwork
- High potential for groundwater interaction
- Moderate potential for groundwater interaction
- Low potential for groundwater interaction

N

0 200 400 600 m

AECOM

SCALE 1:18,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 8-2 - GROUNDWATER DEPENDANT ECOSYSTEM

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT

CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G006	01	60546439
CHECK	DATE			

AECOM GIS Printed:Date: 09-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G006_01_A3P_Groundwater_Ecosystem_170706.mxd

Kurnell Wharf
Zone N
Zone M
Eastern Right of Way
Prince Charles Pde
Captain Cook Dr
Kamay Botany Bay National Park
Western Right of Way
Zone V
KURNELL
Marton Park
T101
Zone F
Zone C
Wastewater Treatment Plant
Zone T
Zone E
Zone I
Zone L
Zone J
Zone I
Zone S
Zone H
Zone D
Zone B
Towra Point Nature Reserve
Zone G
Zone H
Zone R
Zone Q
Zone Q
Zone O
Zone A
Zone P
Sir Joseph Banks Dr
Zone K
Zone U
Zone U
Kamay Botany Bay National Park

KEY

The Site
Caltex Land Ownership
Tank 101 Demolition Works Area

Contamination Management Zone

Zone A	Zone G	Zone M	Zone S
Zone B	Zone H	Zone N	Zone T
Zone C	Zone I	Zone O	Zone U
Zone D	Zone J	Zone P	Zone V
Zone E	Zone K	Zone Q	
Zone F	Zone L	Zone R	

N
0 50 100 200 m

AECOM

SCALE 1:9,000
SIZE A3
SHEET 01 of 01
COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE
FIGURE 8-3 - COFFEY (2007)
CONTAMINATION MANAGEMENT ZONES

PROJECT
TANK 101 DEMOLITION WORKS

CLIENT
CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G007 01		60546439
CHECK	DATE			

AECOM GIS Printed:Date: 09-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G007_01_A3P_Coffey_Contamination_Zones_170706.mxd

Table 8-1 Contaminants of potential concern at Zone F

CMZ	Monitoring / Characterisation	Contaminants of Potential Concern	Groundwater Considerations	Soil Considerations
Zone F (Gasoline tanks)	Quarterly groundwater monitoring includes four boundary monitoring wells and three inbound wells. Refer to **Figure 8-1**for the monitoring well locations. Zone F has been the subject of a voluntary investigation program requiring sampling of the on-site groundwater monitoring wells and on-site and off-site soil sampling.	TPH, PAHs, BTEX, Pb (inorganic and TEL).	Historical monitoring has shown elevated concentrations of TPH and BTEX in groundwater on-site and at the boundary. Remediation measures operating in Zone F (e.g. bioventing system, LNAPL recovery) have contributed to the significant reduction in groundwater contaminant concentrations over the past two years.	Elevated concentrations of TPH, BTEX, naphthalene and lead have been measured in soil beneath Zone F. LNAPL has also been detected in monitoring wells along Road B (Caltex 2012). Soil samples analysed in 2013 found chromium reducible sulphur exceeding trigger levels indicative of the presence of potential acid sulfate soils (ASS), although these were reported in only two samples, with remaining samples indicating the majority of soil had a low likelihood of ASS formation.

8.3.9 Remediation and Validation

Condition E1.1 of EPL 837, requires Caltex to undertake several investigations to address the data gaps identified in the “Contaminated Data Gap Investigation Plan, dated 15 April 2014. The final submission to the EPA under this program is due on the 26 December 2017. In addition Caltex will also prepare a Remediation Action Plan (RAP) for the Site for the commencement of remedial works in 2018.

In accordance with condition M2 of EPL 837, Caltex will continue to conduct quarterly groundwater monitoring. Groundwater monitoring results are reported to the EPA under condition R1, in the Site’s Annual Return.

The Tank 101 demolition works would not result in the removal of any monitoring wells and would not affect the ongoing remediation program at the Site.

As reported by Caltex (2013c), elevated concentrations of TPH, BTEX, naphthalene and lead have been measured in soil and groundwater beneath the road in Zone F. Petroleum hydrocarbon product (referred to as LNAPL) has also been detected in monitoring wells in this area. Historical records for Zone F indicate that the contamination is most likely to have been sourced from historical leaks/spills from storage tanks and product transfer pipes.

The main goals for CMZ Zone F are to:

- remediate LNAPL in Zone F to the extent practicable;
- reduce potential for contaminant exposure to on-site workers; and
- reduce the potential for off-site migration and exposure of off-site receptors (people and aquatic environments) to impacted groundwater, which is monitored through quarterly groundwater monitoring.

As reported in the Caltex (2013c) *Contaminated Site Risk Reduction Program Annual Review Progress Report*, active remediation works have been undertaken for a number of years in this CMZ.

8.4 Impact Assessment

8.4.1 Demolition impacts

Ground disturbance associated with the removal of Tank 101 would extend to a maximum of 1 mbgl. This ground disturbance would be minimal and would mostly entail the removal of small pipelines and other minor infrastructure elements within the tank bund.

Any excavated soil would be managed in the following ways:

- during excavation visual and olfactory indicators of impact would be monitored;
- soils considered to be contaminated would be stored at the former CLOR site in the south west of the Site. These soils would be appropriately stockpiled, bunded and managed for the short term; and
- where no contamination issues are identified, excavated material would be used as backfill to bring the excavated area back to grade as soon as practicable. If required, certified Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or appropriately remediated soils would be used to provide additional backfill material.

Once the soil has been classified, if appropriate, it would be managed on-site in accordance with the Site's existing EPL. Where contaminated soil cannot be appropriately managed on-site, it may be taken off-site for disposal at an appropriately licenced facility.

According to available Acid Sulfate Soil Mapping (refer to **Section 8.3.3**), the probability of encountering acid sulfate soils across the majority of the Tank 101 demolition works area (PASS Class Area 4) is considered to be low (as excavations would only be to 1 mbgl). However, historical assessments (Caltex, 2013) identified potential acid sulfate soils in this area (Zone F). Measures to manage acid sulfate soils have therefore been provided in **Section 8.5** and are consistent with the measures in the DEMP.

8.4.1.1 Surface water, wastewater and flooding

Potential stormwater impacts associated with the Tank 101 demolition works include those arising from demolition and ground disturbance works (i.e. potential impacts to stormwater run-off quality), as well as potential changes to the operation of stormwater catchments in the short and longer term (i.e. catchment hydraulics).

Tank 101 is located within the Catchment A area of the site, which already has controls in place to remove suspended solids from stormwater via sedimentation and to remove oil via gravity separation. These controls would remain in place during the duration of the demolition works. Given that the Tank 101 demolition works are proposed to occur following the emptying and cleaning of Tank 101, it is expected that only minor to negligible hydrocarbon residues would likely be present prior to the demolition works occurring.

In addition, Tank 101 is located within an existing bund which would remain intact and in situ. Bund drainage would not be affected by the works and the bund would continue to drain stormwater to the Site's OWSS. Therefore no impacts to stormwater quality are anticipated as a result of the Tank 101 demolition works. Despite this, controls would be implemented to control sediment run off during excavation works as per **Section 8.5**.

The risk profile of the Site with respect to the ability to accommodate high rainfall events and/or broader flooding events would not change from that which currently exists during and following the Tank 101 demolition works. The existing bund would be left intact, even after tank within it is removed. While some redundant infrastructure would be removed, the existing ground level would stay essentially the same and as such there would be no noticeable change in the flooding risk profile.

Water supply would be required during the Tank 101 demolition works for a range of uses including:

- dust suppression;

- general cleaning; and
- general workforce amenities.

This water would be potable water supplied through the existing Sydney Water connection. Water demand during the Tank 101 demolition works is likely to be minimal.

The Tank 101 demolition works would utilise the existing domestic wastewater infrastructure at the Site, and domestic wastewater would continue to be pumped to the Sydney Water sewerage system for treatment at the Cronulla Treatment Plant.

The WWTP would continue to operate under the Site's existing EPL during the Tank 101 demolition works. The treated wastewater effluent generated during and after the Tank 101 demolition works, would continue to be discharged to Yena Gap in accordance with the current EPL.

8.4.1.2 Contamination and groundwater

Potential soil and groundwater impacts from the demolition of Tank 101 works may include:

- demolition workers encountering contaminated soil, asbestos and PASS during excavation activities and mobilising or dispersing it across the Site and local environment;
- excavation works and stockpiling of soils generating dust and/or odours that affect on-site and off-site receptors;
- stockpiles, excavated areas and newly disturbed areas subject to erosion and sediment control issues;
- disturbance of soils through excavation and backfilling increasing contaminant migration to underlying groundwater;
- contaminants from stockpiles potentially contaminating ground and surface water;
- spills and leaks from demolition equipment potentially contaminating soil and groundwater; and
- vehicles dispersing contaminated materials across the Site and off-site.

As discussed in **Section 8.3.8**, the soils in Zone F (where Tank 101 is located) have levels of contamination that require management, including elevated concentrations of TPH, BTEX, naphthalene and lead in the soil and LNAPL in the monitoring wells in the CMZ. Contaminated soils would be stored at the former CLOR site in the south west area of the Site. These soils would be appropriately stockpiled, bunded and managed until they can be properly disposed of at a licenced waste management facility.

Groundwater is not expected to be encountered during ground disturbance works as it is generally observed to be 2 to 2.5 mbgl across the majority of the Site.

In the event that groundwater or surface water accumulates in an excavation and dewatering is required (e.g. following a rainfall event), then the accumulated water would be collected and disposed of in the Site's WWTP (unless it is tested and is of suitable quality to be directed to stormwater). Management measures for dewatering and disposing of wastewater are included in the existing DEMP and would be applied to these works.

8.4.2 Post-Demolition Impacts

Ongoing investigations and monitoring in relation to groundwater and contamination would continue in accordance with the existing environmental management system for the Site and in line with the EPL.

The existing stormwater management system at the Site would remain intact once the Tank 101 demolition works are complete. In addition, the Site's stormwater receiving environments would not change.

The quality of stormwater arising from the Site following the Tank 101 demolition works would be of a similar character as is currently the case. Potentially contaminated water would be directed to the oily water management system and managed in accordance with the EPL as the Tank 101 bund would remain connected to the oily water management system. Stormwater would be managed with existing systems.

The change in volume and quality of stormwater discharged from the Site, arising from the Tank 101 demolition works is not expected to be significant. The Site stormwater system would continue to be reviewed and improved in line with the requirements of the existing SMP.

8.5 Mitigation

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**, and would largely be consistent with the Project approved modification for the demolition works (SSD 5544 MOD1).

Measures to manage potential impacts to stormwater runoff quality during the Tank 101 demolition works be consistent, as relevant, with those currently documented within DEMP. The existing DEMP includes the following sub-plans:

- Contamination Management Plan;
- Soils and Water Management Plan (SWMP);
- Acid Sulfate Soils (ASS) Management Plan; and
- Asbestos Management Plan (AMP).

Caltex would maintain their existing risk reduction measures in place across the Site. Caltex requires all contractors and employees to obtain a work permit for all work in areas where potential soil and groundwater contamination exists (such as within tank bunds or for any works that can potentially expose groundwater). The work permit includes a hazard analysis, outlines controls (such as monitoring) and required personal protective equipment (PPE). Worker exposure is also reduced by restricting access to areas requiring work permits to only authorised personnel. In addition, during ground disturbance, Excavation Permits are required. This permit needs to consider the potential for impacts to utilities, explosive atmospheres, ground stability, and exposure to contamination.

9.0 Noise and Vibration

9.1 Introduction

The following chapter assess the potential noise and vibration impacts generated by the Tank 101 demolition works. A Demolition Noise Assessment was undertaken by acoustic consultants Wilkinson and Murray Pty Ltd (WM) (2017) and is provided in **Appendix A Demolition Noise Assessment**. The results of the assessment have been summarised in this chapter.

9.2 Method of Assessment

9.2.1 Overview

The Tank 101 demolition works noise assessment has been carried out using the following methodology:

- identification of nearby noise sensitive receivers potentially affected by the Tank 101 demolition works in comparison to the previous noise assessment undertaken for the Project;
- prediction of construction noise levels at the sensitive receivers using acoustic noise modelling software “CadnaA”. The noise modelling considered the following factors:
  - the noise contributions from the approved demolition works (SSD 5544 MOD1), the Sustainable Soil Regeneration Facility (SSRF) operation, and ACS management works which could potentially contribute to cumulative noise level impacts with the Tank 101 demolition works;
  - Tank 101 demolition works equipment sound level emissions and location;
  - sensitive receiver locations/ground topography;
  - noise attenuation due to geometric spreading;
  - ground absorption; and
  - atmospheric absorption.
- comparison and assessment of predicted cumulative construction noise levels against the approved noise limits specified in the development consent for SSD 5544; and
- identification of noise mitigation, monitoring and management measures, where required.

Vibration effects are not expected due to the setback distances afforded to receivers and the work methods to be used. Therefore, vibration effects were not assessed. In addition, the operation of the Site following the demolition of Tank 101 would be consistent with its existing operation (no noise generation). As such, an operational noise assessment is not required.

Tank 101 is located within a 2.5 m high tank bund, which would provide effective acoustic shielding for the works undertaken at ground level. However, for the purpose of providing a conservative assessment, the shielding effects from the bund have been disregarded. The levels predicted by this assessment assume a worst-case scenario where noise sources are assumed to be in an elevated position (above the height of the bund). For much of the time materially lower levels of off-site noise may be expected.

Concrete crushing that would be undertaken at the CLOR has already been considered in the cumulative assessment for the Tank 101 demolition works as part of the ongoing activities of the approved demolition works. This has not been considered again as part of this assessment.

9.2.2 Noise criteria

The noise assessment considered the approved construction noise limits identified in the development consent for Application SSD 5544. These noise limits were deemed appropriate as they were established using the typical minimum background levels and are consistent with the *Interim Construction Noise Guideline* (ICNG). The noise limits are listed below in **Table 9-1**. Condition C16 of the consent (SSD 5544 MOD1) requires that construction noise does not exceed these criteria.

Table 9-1 Construction Noise Limits in SSD 5544

Location	Day, $L_{Aeq,15min}$	Evening, $L_{Aeq,15min}$
R2 – 30D Cook Street	46	40
At any other residence or other noise sensitive receivers	50	45

The noise criteria for the assessment of traffic noise are provided in NSW Government's *NSW Road Noise Policy* (RNP). However, the demolition of Tank 101 would be completed by the contractors who are currently completing the other demolition works. Therefore no incremental traffic movements would be generated, beyond the volumes previously assessed for the approved demolition works. Additional off-site noise impacts generated by truck movements are therefore not expected and have not been assessed further.

9.3 Existing Environment

The existing physical environment on the Site is outlined in Chapter **2.0 Project Location and Existing Environment**. The acoustic environment on the Kurnell Peninsula is characterised mainly by industrial sources, however other potential noise contributors include marine activities in Botany Bay and aircraft noise from the Sydney (Kingsford Smith) Airport. Other noise sources include local traffic, ocean waves and local fauna.

Potentially affected noise sensitive receptors for the Tank 101 demolition works are consistent with those identified for the approved Project. These industrial and residential premises and have been identified below in **Table 9-2** and are shown on **Figure 9-1**.

Table 9-2 Identified Potentially Noise Affected Sensitive Receivers

Receiver ID	Location	Type	Description
R1	44-64 Cook Street	Industrial Premises	Industrial premises adjacent to the Site to the west and sharing a common boundary
R2	30D Cook Street	Residential	Residential property adjacent to the Site to the west and sharing a common boundary
R3	Reserve Road	Residential	Residential properties north of the Site
R4	Prince Charles Parade	Residential	Residential properties close to the eastern right of way
R5	Corner of Captain Cook Drive and Silver Beach Road	Residential	Residential properties north of the Site
R6	Tasman Street	Residential	Residential property west of the Site
R7	35 Cook Street	Residential	Residential property north of the Site
R8	End of Chisholm Road	Industrial Premises	Industrial premises adjacent to the Site to the west and sharing a common boundary
R9	Sir Joseph Banks Drive	Industrial Premises	Industrial premises on the other side of Sir Joseph Banks Drive to the west of the Site

KEY

- The Site
- Tank 101 Demolition Works Area
- Location of Noise Receivers

AECOM

0 50 100 200 m

SCALE 1:8,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 9-1 - LOCATION OF NOISE RECEIVERS

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	09-Aug-17	G009	01	60546439
CHECK	DATE			

9.4 Impact Assessment

9.4.1 Overview

As outline in **4.0 Proposed Modification**, Tank 101 demolition works are anticipated to occur over a four week period within the wider program agreed for the approved demolition works. The proposed demolition hours are discussed in **Section 4.2**.

Table 9-3 presents the Tank 101 demolition works and associated equipment information that has been considered in the noise modelling presented in **Section 9.4.2**.

Table 9-3 Tank 101 Demolition Information and Equipment

Proposed Works	Construction Equipment	Equipment Quantities	Sound Power Level per Plant Item (dBA)	Activity Sound Power Level (dBA)
Demolition of Tank 101	Large Shearer	1	105	109
	Oxy-acetylene cutter	1	101	
	Mobile Crane	1	104	
	Vacuum Truck	1	93	
	Concrete Saw	1	105	
	Excavator	1	105	
	Jackhammer	1	110	

Note: It is unlikely that the mobile plant items identified would all concurrently operate at full capacity. The calculated total sound power level includes a -5dB correction to account for the operational on-time of the identified plant items.

9.4.2 Tank 101 Demolition noise

The results of the construction noise modelling are presented in **Table 9-4**. These results show the worst-case noise levels predicted for the Tank 101 demolition works, in combination with noise contributions from the demolition works (SSD 5544 MOD1), ACS management works and the SSRF operation.

Table 9-4 Predicted Noise Levels – Tank 101 Demolition Works ($LA_{eq,15min}$)

#	Sensitive Receivers	Predicted $LA_{eq,15min}$ Noise Level					Day Criteria 07:00-18:00h $L_{Aeq,15min}$ (dBA)	Eve Criteria 18:00-22:00h $L_{Aeq,15min}$ (dBA)	Complies with Criteria (Yes / No)	
		Tank 101	ACS	Refinery Demolition	SSRF Operation	Cumulative			Day	Eve
R1	Cook Street (Industrial Premises)	47	38	51	26	53	75	75	Yes	Yes
R2	30D Cook Street (Residential Premises)	**53**	40	**50**	25	**55**	46	40	**No**	**No**
R3	Reserve Road (Residential Premises)	**50**	35	**50**	23	**53**	50	45	Yes	**No**
R4	Prince Charles Parade (Residential Premises)	35	28	40	24	42	50	45	Yes	Yes
R5	Corner of Captain Cook Drive and Silver Beach Rd (Residential Premises)	34	32	42	30	43	50	45	Yes	Yes
R6	Tasman Street (Residential Premises)	26	29	44	27	44	50	45	Yes	Yes
R7	Cook Street (Residential Premises)	44	33	45	28	**48**	50	45	Yes	**No**
R8	End of Chisholm Road (Industrial Premises)	23	34	45	41	47	75	75	Yes	Yes
R9	Sir Joseph Banks Drive (Industrial Premises)	19	37	47	44	49	75	75	Yes	Yes

Note: Operational noise levels from the Kurnell Terminal are predicted to have no material influence on the off-site levels shown in this table.

The Tank 101 demolition works have the potential to generate exceedances of the established construction noise criteria at Receiver R2 by approximately 7 dBA (daytime) and 13 dBA (evening) and at Receiver R3 by approximately 5 dBA (evening).

If the Tank 101 demolition works coincide with the approved demolition works, cumulative noise levels may be expected to exceed criteria at R2 by up to approximately 9 dBA (day) and 15 dBA (evening). At R3 cumulative exceedances of up to 3 dBA (day) and 8 dBA (evening) may be expected. Additionally, at R7 cumulative noise levels of up to 3 dBA above criteria are predicted (evening).

To reduce these exceedances, Caltex has committed to complete the Tank 101 demolition works within daytime hours (7.00 am to 6.00 pm Monday to Saturday as per Condition C19 for SSD 5544) and, as far as practicable, manage the potentially coinciding demolition works undertaken in the vicinity of Tank 101 such that cumulative noise is minimised.

Notwithstanding this, it is noted that the Tank 101 demolition would be undertaken over a limited duration of up to 4 weeks and as such, any impacts would be of a relatively short duration. Whilst the works are predicted to at times exceed the construction/demolition noise management levels at the closest residential receivers, the predicted noise levels do not exceed the highly noise affected 75 dBA noise criterion from the ICNG.

Additionally, it should be noted that this assessment is conservative as the shielding effect of the tank bund has been disregarded. On this basis, the predicted cumulative noise increases are considered minimal in nature, particularly following the application of reasonable and feasible mitigation measures.

Further mitigation measures are outlined in **Section 9.5**.

9.5 Mitigation

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**, and would largely be consistent, as relevant, with the approved modification for the demolition works (SSD 5544 MOD1).

The DEMP for the approved demolition works includes a Noise and Vibration Management Plan. This includes a number of noise management measures. These measures include specified working hours and noise criteria limits.

In order to minimise impacts, the Tank 101 demolition works would be coordinated with other nearby demolition works to reduce the magnitude of potential cumulative impacts.

10.0 Air Quality and Odour

10.1 Introduction

This chapter presents the air quality assessment undertaken to outline the potential air quality impacts associated with the Tank 101 demolition works, and identifies suitable mechanisms to manage these impacts.

10.2 Method of Assessment

The consideration of air quality within this SEE has incorporated a qualitative methodology for assessment of potential air quality impacts. The methodology included:

- a review of Tank 101 demolition works activities and air emission potential; and
- nomination of suitable mitigation measures and monitoring requirements for the scale and type of activity to ensure air quality is appropriately managed.

10.3 Existing Environment

10.3.1 Climate and Meteorology

The Site is located on the Kurnell Peninsula. Terrain across the Kurnell Peninsula is generally low-lying with the exception of the eastern-most portion of the headland where a ridge runs on a north/south alignment. The eastern boundary of the Site is bound by this ridge where elevations reach approximately 40 m above sea level. Winds at the Site are typical for coastal areas in the Sydney region, however some higher than average wind speeds may be present due to the exposed nature of the Peninsula. Some sheltering of easterly winds has potential to be present due to the ridge to the east of the Site. **Figure 10-1** shows the wind rose for the Site from 2008. Winds are shown to be well distributed in all directions, with the slight accentuation of north easterly sea breezes, south-south westerly and north-westerly winds, as common to the coastal areas of Sydney. A large proportion of high wind speed conditions is also evident. Refer to Appendix G of the Kurnell Refinery Conversion Project EIS Air Quality Impact Assessment (URS, 2013) for more detail.

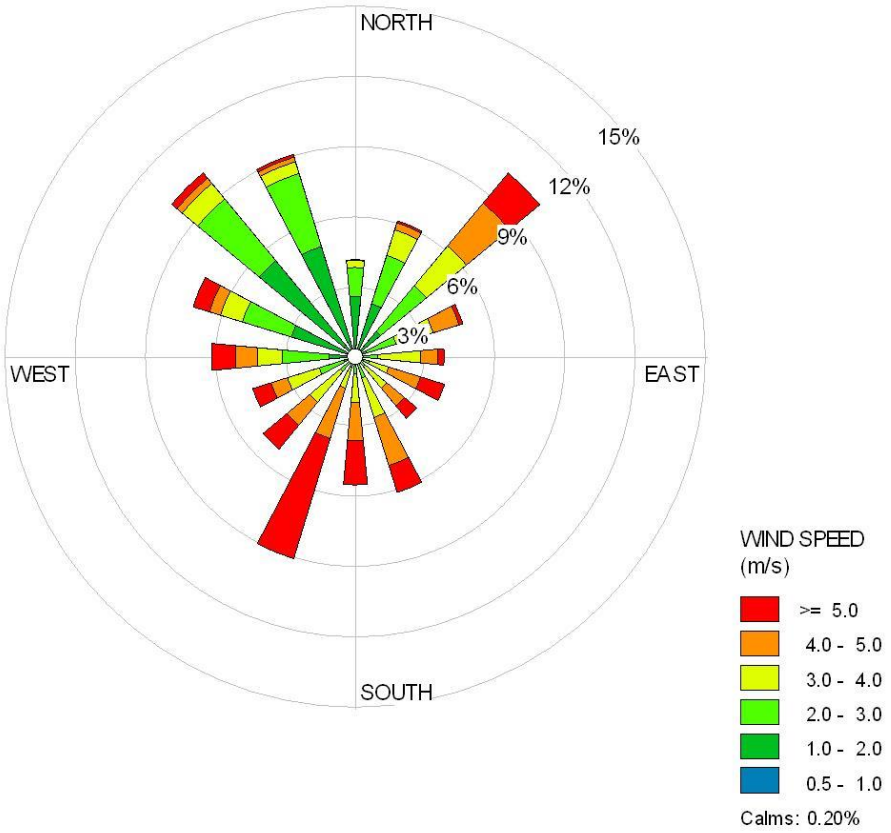

Figure 10-1 Wind rose for 2008

10.3.2 Existing Air Quality

Given the coastal location and isolation from main roads, local air quality on the Kurnell Peninsula, up until 2014, was primarily influenced by emissions from existing refinery operations within the Site. Such emissions included combustion products (e.g. oxides of nitrogen [NO_x], sulphur dioxide [SO_2], carbon monoxide [CO]) and Volatile Organic Compounds (VOCs) arising from both fugitive process emissions, and combustion processes.

With the transition of the Site from refinery to terminal operations in 2014, air emissions from the Site have reduced significantly. The shutdown of the refinery has been estimated to result in total VOCs emissions halving in quantity. In addition, emissions of NO_x, CO, SO_2, particulate matter and hydrogen sulphide have all significantly reduced with cessation of refining at the Site. This reduction is illustrated in **Table 10-2** below from the EIS for SSD 5544. Refer to Appendix G of the Kurnell Refinery Conversion Project EIS Air Quality Impact Assessment (URS, 2013) for more detail.

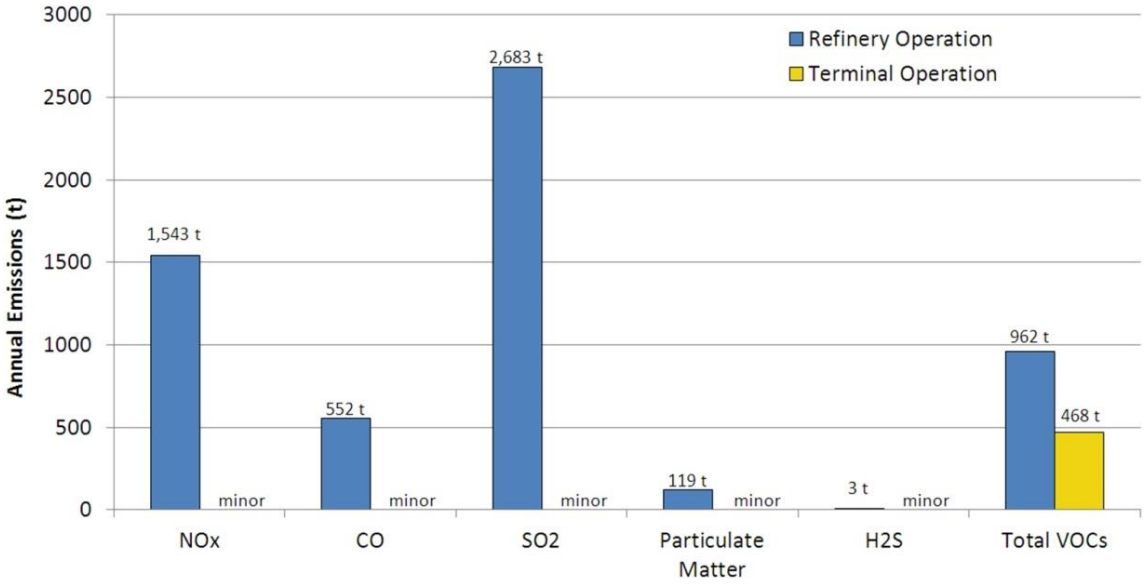

Figure 10-2 Change in Emissions Profile with Conversion of the Site

10.3.3 Sensitive Receivers

Sensitive receivers for the Tank 101 demolition works have been identified and shown as receivers R1 through to R9 in **Figure 9-1**. The nearest sensitive receivers to the Tank 101 demolition works area are located on Cook Street and Reserve Road. These include industrial receiver R1 and residential receivers R2, and R7 which border the Site on the Eastern Right of Way and residential receiver R3 which is east of Tank 101.

Material stockpiling and recycling would also be undertaken at the former CLOR site. The closest receptor to the CLOR area is the Desalination Plant, which is located to the west of the Site.

The proximity of the nearest sensitive receivers to the Tank 101 demolition works area is shown in **Table 10-1**.

Table 10-1 Proximity of Tank 101 demolition modification works to nearest sensitive receivers

Nearest Receivers	Approximate distance from Tank 101 demolition works area
Receiver R1 – 44-64 Cook Street (Industrial Premises). Industrial premises adjacent to the Site to the west and sharing a common boundary.	145 metres
Receiver R2 – 30D Cook Street (Residential). Residential property adjacent to the Site to the west and sharing a common boundary.	30 metres
Receiver R3 – Reserve Road (Residential). Residential properties north of the Site.	90 metres
Receiver R7 – 35 Cook Street (Residential). Residential property north of the Site.	230 metres

10.4 Impact Assessment

10.4.1 Potential emissions to air

The Tank 101 demolition works would involve the demolition and dismantling of Tank 101 and associated infrastructure., This would include associated civil works and would return the area to ground level.

Tanks 101 demolition activities that may generate air emissions (dust) include soil excavation associated with the removal of pipeline infrastructure from within the bunded area. Air emissions may also be generated by the handling of materials generated during the Tank 101 demolition works, which would be re-processed for use on-site e.g. concrete.

It is anticipated that only a small amount of soil would be stockpiled prior to reuse or being transported to the CLOR site. This is discussed further in **Chapter 8.0 Soil, Water and Contamination**.

Table 10-2 presents the key activities and air emissions which may be generated by the Tank 101 demolition works and those associated with concrete re-cycling which would be undertaken at the CLOR site.

Table 10-2 Summary of Key Activities and Air Emissions

Activity	Air Emission	Key air quality considerations
Works within the main area of the Site		
Vehicle movements	Dust from roads and VOCs from exhaust	The potential for dust, VOCs and odour emissions from exposed surfaces affecting residential and commercial receptors in Kurnell. This is based on the activities to be undertaken and the known and potential contamination within this area presented (refer to **Table 8-1** in Chapter **8.0 Soil, Water and Contamination**)
Removal of concrete and cutting / grinding works	Dust emissions from the handling/removal of concrete	
Emplacement of Material	Fumes and fine particulate emissions from cutting/grinding	
Removal of underground piping and infrastructure	Dust during placement	
Removal of contaminated soil	Dust emissions from the handling/removal of concrete/infrastructure	
Handling and transfer of soil	Dust during handling and stockpiling	
Back filling excavated areas	Dust during backfilling	
Stockpiling of material	VOC and odour emissions and windblown dust	
Concrete re-cycling (including stockpiling of material) at the CLOR		
Handling of stockpiled material	Windblown dust	The potential for dust impacts on commercial receptors (Desalination Plant)
Processing of Material	Dust emissions	
Vehicle movements	Dust from roads and VOCs from exhaust	

10.4.1.1 Excavation works

Ground disturbance associated with the demolition of Tank 101 would extend to a maximum of 1 mbgl. This ground disturbance would be primarily associated with the removal of small underground pipework within the bunded tank area. The tank bund itself would remain intact.

There is the potential for dust, VOCs and odour emissions from exposed surfaces to be generated by the works. This would result in adverse air quality impacts on local residential and commercial receptors during demolition works. The existing hardstand within the bund area would however be retained, reducing the overall degree of ground engagement. Potential impacts would be managed through the implementation of the management and mitigation measures outlined in **Section 10.5**.

10.4.1.2 Other activities

Concrete crushing would be undertaken within the former CLOR site. It is anticipated that only a minor amount of concrete would be generated by the Tank 101 demolition and require crushing. This crushed concrete would be used on the Site, as it serves a suitable base for providing ground compaction in areas where excavation has taken place.

The process of crushing concrete at the former CLOR site could potentially result in dust impacts on commercial receptors to the south west of the Site. Emissions associated with the process would be managed through the implementation of the management and mitigation measures outlined in **Section 10.5**.

As identified in **Table 10-2**, dust may be generated by vehicle movements on unsealed roads. However movements would be primarily restricted to existing sealed refinery roads, minimising dust generation.

Table 10-2 also noted that adverse air emissions may be generated from plant and equipment used for the Tank 101 demolition works. These impacts would be effectively mitigated thought the implementation of measures proposed in **Section 10.5**.

10.5 Mitigation

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**, and would largely be consistent with the Project approved modification for the demolition works (SSD 5544 MOD1).

Measures to ensure impacts to air quality during the Tank 101 demolition works are appropriately managed would be consistent, as relevant, with those documented within the existing DEMP. An Air Quality Management Plan (AQMP) is included as a sub-plan within the DEMP.

10.5.1 Excavation works

The primary air emissions that would potentially affect sensitive receivers during the Tank 101 demolition works would result from the excavation of contaminated soil/concrete and the subsequent release of odorous VOCs. The EPL requires that no offensive odours occur beyond the Site boundary.

Given the minimal excavation required, impacts would be managed via the implementation of existing measures that have been developed for the approved demolition works at the Site (such as odour and VOC monitoring and storage of contaminated soils away from receptors).

10.5.2 Other activities

A number of additional dust suppression measures were implemented for the conversion works. These measures included monitoring for dust as excavations took place and covering soil on the back of trucks. These measures would also be employed to avoid dust impacts from the demolition works.

Excavation and stockpile management would be undertaken in line with the measures identified in the Soil and Water Management Plan in the DEMP. These measures would help avoid and mitigate impacts associated with dust and particulate matter.

All demolition plant would be maintained and operated in line with the manufacturer's specifications in order to minimise the emission of air pollutants and offensive odours. Plant and construction vehicles would be turned off when not in use.

The crushing of concrete, asphalt and aggregates with be undertaken using a jaw crusher located in the former CLOR site. During crushing, a number of dust suppression measures would be implemented including regular watering of stockpiles and use of dust curtains. In addition real-time monitoring of particulate matter (TSP and/or PM_{10}) at the boundary would be undertaken during the start-up of the concrete crushing operation to ensure particulate matter is adequately controlled, as per SSD 5544 MOD1.

11.0 Heritage

11.1 Introduction

A Statement of Heritage Impact (SOHI) was undertaken to address the historic heritage impacts that may result from the Tank 101 demolition works. This chapter provides a summary of the findings of the SOHI and includes relevant information from the previous HIA for the Conversion Works EIS (AMC, 2013), approved demolition works (AMC, 2014) and the subsequent *Kurnell Refinery Heritage Management Strategy* (HMS) (AMC, 2014). The SOHI for the Tank 101 demolition works is provided in full in **Appendix B Statement of Heritage Impact**. No Aboriginal archaeological assessment has been undertaken as part of this SOHI.

11.2 Method of Assessment

The key objectives of this chapter and **Appendix B Statement of Heritage Impact** are to:

- identify the significance of Tank 101 as part of the Eastern Tank farm area and as part of the overall Site;
- identify all known and potential impacts the removal of Tank 101 would have on the heritage significance of the Site as determined by the HMS;
- assess the impacts from the removal of the tank against the HMS; and
- provide recommendations for mitigation of heritage.

The Aboriginal heritage assessment and SOHI have relied on previous studies undertaken as part of the approved Project (SSD 5544) (the conversion works) and approved demolition works (SSD 5544 MOD1). These studies include:

- a Heritage Impact Assessment (HIA) undertaken by AMC in 2013 for the conversion works EIS (SSD 5544);
- a HMS undertaken by AMC in 2014 to manage potential impacts to heritage of the conversion and demolition works, following approval of the project in January 2014;
- a Heritage Impact Assessments (HIA) undertaken by Australian Museum Consulting (AMC) in 2014 for the approved demolition works SEE (SSD 5544 MOD1), approved in August 2015; and
- the Heritage Assessment for the Permanent Soil Regeneration Facility completed in July 2015 and contained within the EIS for this project (July 2015).

For the purposes of SOHI, the study area comprises Tank 101 itself and the land within its immediate bunded area (refer to **Figure 4-1**).

11.2.1 Assessment of significance

An assessment of significance is undertaken to explain why a particular item is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in The *Australia ICOMOS Charter for Places of Cultural Significance 2013* (the Australian ICOMOS Burra Charter, 2013) as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" (Article 1.2). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is significant to us now may change as similar items are located, more historical research is undertaken and community attitudes change.

The process of linking this assessment with an item's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance*, part of the NSW Heritage Manual (NSW Heritage Office and Department of Urban Affairs & Planning, 1996). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level, at a State level or at a National or Commonwealth level.

The magnitude and severity criterion used to assess potential heritage impacts resulting from the Tank 101 demolition works is provided in **Table 11-1**.

Table 11-1 Impact type definitions

Impact Type	Definition
Major negative impacts	Substantially affects fabric or values of state significance
Moderate negative impacts	Irreversible loss of fabric or values of local significance; minor impacts on State significance
Minor negative impacts	Reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values
Negligible or no impacts	Does not affect heritage values either negatively or positively
Minor positive impacts	Enhances access to, understanding or conservation of fabric or values of local significance
Major positive impacts	Enhances access to, understanding or conservation of fabric or values of state significance

11.2.2 Previous Heritage Studies and Management

Following the granting of development consent SSD 5544, a HMS was prepared for the Site in response to the Consent Condition C31. The HMS included:

- a review of the heritage significance of the Australian Oil Refinery site and a revised summary statement of significance; and
- a strategy to minimise or mitigate the loss of the refinery's heritage value during the Project and to manage the Site's heritage during present and future works.

The HMS confirmed the Site's heritage significance and presented a number of recommendations for managing the future works at the Site. The re-assessment of significance and development of management strategies was undertaken in consultation with the Heritage Division of OEH, as delegate for the Heritage Council of NSW. The HMS has since been discussed with SSC and approved by the Heritage Council of NSW.

11.3 Existing Environment

11.3.1 Aboriginal Heritage

The identified Aboriginal sites in the vicinity of the Site are shown on **Figure 11-1**. One potential Aboriginal site has been previously identified in the immediate vicinity of the Site, a Potential Archaeological Deposit which extends 100 metres into the Site between Solander Street and Road 14 (Kurnell Pipeline PAD; not registered on AHIMS). This area and the whole site has been subject to extensive disturbance from the industrial development, including roads, installation of pipelines, tanks and a stormwater basin, and ongoing maintenance of subsurface infrastructure, as well as exotic plantings. As such, it is unlikely that midden deposits, subsurface artefact occurrences or burials are present below the ground surface. Equally the HIA for SSD 5544 determined that, due to the disturbed nature of the Site, it was highly unlikely that any Aboriginal Heritage items remained on the Site.

Kurnell Wharf
Prince Charles Pde
Captain Cook Dr
Kamay Botany Bay National Park
T101
KURNELL
Marton Park
Marton Park Wetland
Captain Cook Dr
Towra Point Nature Reserve
Sir Joseph Banks Dr
Kamay Botany Bay National Park

KEY

- The Site
- Tank 101 Demolition Works Area
- Towra Point Aquatic Reserve
- National Park
- Towra Point Nature Reserve

Heritage Site Types

- Artefact Scatter
- Burial
- Burial/s, Midden
- Midden
- Open Camp Site
- PAD
- Rock Engraving

Noxious Weeds

- Chrysanthemoides monilifera subsp. rotunda
- Lantana camara
- Ludwidgia peruviana
- Ricinus communis

N

0 50100 200 m

AECOM

SCALE 1:10,000
SIZE A3
SHEET 01 of 01
COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE
FIGURE 11-1 - ABORIGINAL HERITAGE SITES AND ECOLOGY

PROJECT
TANK 101 DEMOLITION WORKS

CLIENT
CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	16-Aug-17			
CHECK	DATE	G010 01		60546439

AECOM GIS Printed Date: 16-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G010_01_A3P_Heritage_170816.mxd

11.3.2 Historic Heritage

The Kurnell Peninsula was formally settled by Europeans in 1815. The peninsula was used for farming, timber in the 1800s and for sand extraction in the early 1900s.

In the 1950s Caltex commenced construction of the Kurnell Refinery. This involved draining swamps, clearing scrub and installing roads , water supplies and sewerage facilities. This activity led to further development of the peninsula and village of Kurnell.

There are a number of known historic heritage items and places within general proximity of the Tank 101 demolition works area (as listed in **Table 11-2**) however there are only four identified historic heritage items or places in the immediate vicinity (refer to **Figure 11-2**):

- the Tank 101 demolition works area falls within the heritage curtilage of the locally significant 'Australian Oil Refinery' (as listed on Part 2 of Schedule 5 of the SSLEP 2015);
- the locally significant 'Silver Beach and roadway' is located adjacent to the Site;
- the locally significant four wheel drive track (Captain Cook Drive) would need to be traversed to access the Tank 101 demolition works area, however there is no physical evidence of the track within the boundary of the Site today; and
- the nationally significant Kurnell Peninsula Headland adjoins the eastern boundary of the Site.

In **Table 14-1** the following acronyms have been used to describe each stage:

- CHL – Commonwealth Heritage List;
- NHL – National Heritage List;
- SHR – NSW State Heritage Register;
- S170 - OEH Section 170 Heritage and Conservation Register; and
- SSLEP – *Sutherland Shire Local Environment Plan 2015.*

Table 11-2 Heritage items in the vicinity of the Site

Item	Primary address	CHL	NHL	SHR	S170	SSLEP
Kurnell Peninsula Headland	Cape Solander Dr, Kurnell, NSW, Australia		✓			
Kamay Botany Bay*	Captain Cook Dr, Kurnell, NSW, Australia		✓			
Cape Baily Lighthouse	Sir Joseph Banks Dr, Kurnell NSW, Australia	✓				
Kamay Botany Bay National Park (North and South) and Towra Point National Reserve	Cape Solander Drive, Kurnell, NSW 2231			✓		
Alpha Farm Site and Kurnell Accommodation House (Complex)	Botany Bay National Park, Sutherland				✓	
Banks Memorial	Botany Bay National Park, Sutherland				✓	
Captain Cook's Landing Place Monuments (Complex)	Botany Bay National Park, Sutherland				✓	
Commemorative Tree Plantings (Complex)	Botany Bay National Park, Sutherland				✓	
Cook's Landing Rock memorial	Botany Bay National Park, Sutherland				✓	

Item	Primary address	CHL	NHL	SHR	S170	SSLEP
Cook's Monument	Botany Bay National Park, Sutherland				✓	
Cook's Well	Botany Bay National Park, Sutherland				✓	
Discovery Centre	Botany Bay National Park, Sutherland				✓	
Forby Sutherland Monument	Botany Bay National Park, Sutherland				✓	
Foreshore Pines near Flagstaff	Botany Bay National Park, Sutherland				✓	
Foreshore seawall course stone	Botany Bay National Park, Sutherland				✓	
Freshwater Steam Plaque	Botany Bay National Park, Sutherland				✓	
Inscription Point Plaque	Botany Bay National Park, Sutherland				✓	
Isaac Smith Memorial	Botany Bay National Park, Sutherland				✓	
Kurnell Peninsula Meeting Place Precinct (Complex)	Botany Bay National Park, Sutherland				✓	
Landing Place Memorial	Botany Bay National Park, Sutherland				✓	
Main Flagstaff	Botany Bay National Park, Sutherland				✓	
Prince's Tree Memorial	Botany Bay National Park, Sutherland				✓	
Queen Elizabeth II Tree	Botany Bay National Park, Sutherland				✓	
Solander Memorial	Botany Bay National Park, Sutherland				✓	
Trust Wharf Abutment	Botany Bay National Park, Sutherland				✓	
Four wheel drive track	Captain Cook Drive, Kurnell					✓
Australian Oil Refinery	Sir Joseph Banks Drive, Kurnell					✓
Silver Beach and roadway	Prince Charles Parade, Kurnell					✓

*A listing for the Kamay Botany Bay has been nominated for inclusion in the NHL, if included this listing would include all the values currently listed within the Kurnell Peninsula Headland listing within a broader boundary and would recognise additional associative heritage values, thereby superseding the former listing.

LA PEROUSE

Botany National Park

Kurnell Wharf

Captain Cooks Landing Place Park

Silver Beach

Prince Charles Pde

Captain Cook Dr

KURNELL

Marton Park

Marton Park Wetland

Kamay Botany Bay National Park

Towra Point Nature Reserve

Captain Cook Dr

Sir Joseph Banks Dr

Kamay Botany Bay National Park

Cape Bally Lighthouse (Commonwealth Heritage List))

KEY

- The Site
- Tank 101 Demolition Works Area
- Eastern Tank Area
- Four wheel drive track
- Towra Point Aquatic Reserve
- Protected Area
- Towra Point Nature Reserve

N

0 200 400 800 m

AECOM

SCALE 1:20,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 11-2 - RECORDED HISTORIC HERITAGE ITEMS

PROJECT TANK 101 DEMOLITION WORKS

CLIENT CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	23-Aug-17	G014 01		60546439
CHECK	DATE			

AECOM GIS Printed:Date: 23-Aug-17 \\ausyd1fp001\Projects\60546439\4. Tech work area\4.3 GIS\02_Maps\G014_01_A3P_RecordedHistoricHeritage_170818.mxd

11.4 Impact Assessment

11.4.1.1 Aboriginal Heritage

Considering all works involved in the Tank 101 demolition works would be contained within previously disturbed areas within the Site boundary, no impacts to Aboriginal heritage values are anticipated.

11.4.2 Historic Heritage

11.4.2.1 Australian Oil Refinery

The heritage curtilage of the Australian Oil Refinery is defined as the property owned and/or managed by Caltex on the Kurnell Peninsula. It includes the following elements:

- the above ground and subsurface components of the refinery plant and associated infrastructure, including industrial, administrative and amenities buildings across the Site; and
- the Kurnell Wharf and pipeline easements between the wharf and the main refinery site.

The curtilage excludes areas of natural bushland in the southern part of the Site and part of the Continental Carbon Pipeline route.

The Tank 101 demolition works have been assessed against the HMS (Australian Museum Consulting, 2014b). Of relevance to the Eastern Tank farm area (within which the Tank 101 demolition works area falls) are the management strategies 1, 6, 10, 13 and 17. These strategies were created to provide for ongoing care and management of the Caltex Kurnell Refinery site as an operational industrial heritage site. Strategies 9 and 17 relate to the recording of the refinery as a whole, and are not specific to the Tank 101 demolition works. The relevant strategies are outlined below.

- *Strategy 1* looks at the continued conservation of the heritage significance of the refinery through its ongoing use. The aim is to conserve a representative sample of significant refinery infrastructure in use as part of the proposed fuel impact terminal. The strategy also includes consideration for retaining significant fabric in use wherever possible.
- *Strategy 6* places consideration options for “mothballing” highly significant buildings or infrastructure that cannot be immediately reused as part of the import terminal, but could conceivably be used to fulfil future planning needs.
- *Strategy 9* relates to undertaking audio-visual recording of the refinery plan while it is still in operation. This is to record and preserve the history and technology of the plant in operation and to interview former and existing operators to explain the processes before and now.
- *Strategy 10* commits to undertaking an archival photographic recording of the refinery while the Site is still in operation, during refurbishment of tanks, and during demolition or dismantling activities. An archival quality photographic recording should be prepared in accordance with guidelines for *Photographic Recording of Heritage Items Using Film or Digital Capture*.
- *Strategy 17* recommends that communication of the history and significance of the Kurnell Refinery is understood by Caltex staff and the broader community. This is to include displays of memorabilia and historic photos, signage and interpretation panels.

The impacts of the Tank 101 demolition works have been assessed against each of the heritage criteria within the HMS.

The removal of Tank 101 is deemed necessary to minimise operational risks to the operational workforce and to minimise the cost of ongoing maintenance. Maintaining a tank which serves no purpose and which both Caltex and the community would like to remove would not be in line with the objective of the Project as it would affect the viability of the terminal.

The removal of Tank 101 would contribute to impacts identified as part of the previously approved demolition works. That is, the removal of the tank would affect the remaining heritage fabric, historical and technical significance associated with the former Kurnell Refinery. Removing Tank 101 would further reduce the number of retained tanks to seven and contribute to the reduction of the physical integrity of the original tank farm layout.

The removal of Tank 101 itself is seen as a minor negative impact as mitigation measures implemented and completed by Caltex for the previously approved demolition works have retrieved some values of the significance of the tank.

Conservation measures outlined in the HMS require the retention of at least six original tanks as part of the approved demolitions works, and at least three pre-1955 tanks. There are four pre-1955 tanks located on the northeast boundary of the Eastern Tank Farm, Tanks 101, 102, 103 and 104. The planned retention and reuse of Tanks 102, 103 and 104 would ensure that this conservation measure is still met, and ensure seven tanks would still be retained in the Eastern Tank Farm area overall.

Other mitigation measures, including archival photographic and other documentary recordings, have been completed prior to the commencement of the current approved demolition works. This included an archival photographic recording within the Eastern Tank Farm area where Tank 101 is situated.

The proposed demolition of Tank 101 would not adversely affect the significance of the Australian Oil Refinery heritage item, listed as an archaeological site on Schedule 5 the SSLEP. This would be achieved through the implementation of mitigation measures outlined in the previous demolition works HIA as well as measures outlined in the HMS.

11.4.3 Other heritage items

A HIA was previously prepared to address the approved demolition works, which included an assessment of impacts upon nearby national, state and locally significant historical heritage items, as well as upon to the heritage significance identified in the HMS.

The HIA determined that the approved demolition works would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National Park and Kurnell Peninsula Headland, specifically:

> *"…reducing the vertical scale and prominence of the site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*" (Australian Museum Business Services, 2013).

The Tank 101 demolition works would not result in any direct or indirect impacts on the Silver Beach and roadway due to the separation between this item and Tank 101.

The Four Wheel Drive Track originally connected Kurnell Village with Cronulla to the southwest, and was largely overlaid in 1953-56 by the construction of Captain Cook Drive, which in turn facilitated construction of the Kurnell Refinery. Much of the alignment of Captain Cook Drive reflects that of the original track. However, a short section of Captain Cook Drive along the western boundary of the Site by-passes the original route of the track where it intersected the refinery property. Construction of the refinery in the 1950s effectively erased this section of the track from the landscape. Considering that there is no physical evidence of the former Four Wheel Drive Track still existing within the Site boundary today, and that the Tank 101 demolition works are limited to the footprint of the Site, the modifications would not impact on the fabric or the historic significance of this local heritage item.

There would be no impacts on the 21 items listed on the OEH Section 170 Heritage and Conservation Register that are within Kamay Botany Bay National Park, These items are located over 500 metres away from the Tank 101 demolition works area and are not visible from the refinery.

11.4.4 Archaeological remains

There would be no impacts to known or potential historical archaeological relics within the Tank 101 demolition works area.

The site formation associated with clearing of the land and the creation of the hardstand area within the Tank 101 demolition works area has caused heavy disturbance to, and immediately around, the location of Tank 101. This is likely to have resulted in the removal of any potential historical archaeological relics or deposits present within the demolitions works area. This is also supported by the archaeological assessment in the HMS that states there is unlikely to be any subsurface archaeology extant on the site which pre-dates the history of the refinery.

11.5 Mitigation

The management and mitigation measures relating to Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**, and would largely be consistent with the Project approved modification for the demolition works (SSD 5544 MOD1).

A HMS has been prepared for the Site for the ongoing management and conservation of the Site during and after its conversion to a finished fuel terminal. A separate HIA was undertaken to assess the impact of the approved demolition works on the heritage significance associated with the Kurnell Refinery as identified in the HMS. With regard to the Eastern Tank Farm Area, 64 tanks were to be demolished, leaving eight tanks, including Tank 101. The HIA recommended the loss of these tanks could be mitigated by:

- Preserving a representative sample of significant refinery infrastructure in use as part of the fuel import terminal, including examples of original tanks, workshops, administrative and amenities buildings. These remnant buildings and structures were originally constructed to support the operation of the refinery. Ongoing use of these items in terminal operations is consistent with the identified heritage values of the site and would contribute to the conservation of these heritage values into the future.
- Preserving a representative sample of significant original/early modernist buildings in use across the site. Consideration should be given to preparing detailed conservation management plans for highly significant buildings.
- Creating a permanent archival collection of records and moveable heritage items that documents the engineering history, social history, and unique character of the site. A permanent and accessible archive would be a basic resource for people wishing to understand or interpret the heritage significance of the site to present and future generations.
- Communicating the history and significance of the refinery to Caltex staff and the broader community.

The above mitigation measures have been completed and implemented, or are in the process of being completed. It is understood the archival recording of the refinery, including the Eastern Tank Farm Area where Tank 101 is situated, has been completed. Additionally the audio-visual documentary and the archival report of plans, documents and drawings was completed while the refinery was still in operation.

Retaining and converting Tanks 102, 103 and 104 along the northeast boundary of the Eastern Tank Farm Area for continued use would ensure the conservation recommendations in the HIA report are maintained by ensuring three of the four pre-1955 tanks located along the northern boundary of the Eastern Tank Farm are retained.

To prevent further erosion of the heritage value of the Site it is recommended that the strategies outlined in the HMS are fulfilled. This includes long term preservation of the remaining significant buildings, including the three tanks along the northern boundary of the Eastern Tank Farm.

12.0 Other Issues

12.1 Hazards and Risks

12.1.1 Introduction

As part of the assessment of the demolition works (SSD 5544 MOD1) a Hazards in Demolition (HAZDEM) assessment was undertaken. This chapter provides a brief summary of the HAZDEM assessment and discusses the controls identified that would be implemented for the Tank 101 demolition works.

12.1.2 Existing Environment

Caltex has a commitment to meet the intent and specific requirements of the WH&S Act and the NSW *Work Health and Safety Regulation 2011* (WH&S Regulations). Caltex has numerous policies, procedures and controls to create and maintain a safe workplace at the Site. This includes an established incident reporting and response process. These are regularly reviewed and modified as necessary in order to maintain compliance with the WH&S Act and WH&S Regulations. The Tank 101 demolition works would comply with these policies, procedures and controls.

The Tank 101 demolition works would also comply with other current and relevant safety codes and statutory requirements with respect to safe working conditions. In particular, this would include standards and requirements relating to the handling and management of hazardous/flammable/contaminated materials. Personnel required to work with these substances would be trained in their safe use and handling and would be provided with all the relevant safety equipment.

Emergency procedures have been developed for the Site. The Site has a manager with overall responsibility for safety, who is supported by experienced personnel trained in the operation and support of the plant and associated facilities.

The Tank 101 demolition works would be undertaken under the supervision of Site Safety Manager and in accordance with the existing DEMP and associated sub-plans, where applicable.

Personnel involved with the Tank 101 demolition works would be provided with appropriate personal protective equipment (PPE) suitable for use with the specific hazardous substances.

Personnel who are first-aid trained are listed on company noticeboards across the Site and would be communicated as necessary in relevant safety meetings, including daily toolbox talks.

12.1.3 Impact Assessment

The HAZDEM included within the SEE for the approved demolition works comprehensively identified possible causes of potential incidents scenarios and their consequences to public safety and the biophysical environment. Each risk was then given a level of risk from 1 to 10 using the Chevron Integrated Risk Prioritization Matrix. Recommendations were provided for risks given a priority ranking between 1 and 5, as well as for events or conditions with low likelihood and high consequence that may require further risk evaluation. Further details on the methodology used to identify and assess potential risks are provided in the SEE for SSD 5544 MOD1 (URS, 2014).

The Tank 101 demolition works are consistent with the tank removal works that were assessed in the HAZDEM. As such the hazards that could occur as a result of these works have already been assessed and discussed and these works would also be acceptable under the provisions of SEPP 33.

Table 12-1 below provides a summary of the hazards identified for the approved demolition works and their relevance to the Tank 101 demolition works. Some of the hazards listed in **Table 12-1** are not applicable to the Tank 101 demolition works due to minor differences in scope.

Table 12-1 Summary of Identified Demolition Hazards

Hazard		Relevant to Tank 101 works
Process Safety Related Hazards		
Scenario 1:	Damage to adjacent plant or equipment due to uncontrolled and/or unplanned falling of structure, object or crane collapse	Y
Scenario 2:	Damage to live pipework during removal or inadvertent cutting into live pipe or pipeline	Y
Scenario 3:	Failure to isolate process equipment	N/A
Scenario 4:	Damage to underground cables and/or oily water sewer	Y
Scenario 5:	Introduction of ignition sources in area classified as Hazardous Area	Y
General Health and Safety Related Hazards		
Scenario 6:	Crushing or impact injuries	Y
Scenario 7:	Fall from heights	Y
Scenario 8:	Working over water with a potential for drowning	N/A
Scenario 9:	Worker trapped (at end of wharf, at height etc.)	Y
Scenario 10:	Subsidence and collapse/fall into excavation	Y
Scenario 11:	Public and traffic hazardous interaction on public roads or footpath	NA
Scenario 12:	Loss of material in transit leading to traffic incident and potential injury	Y
Scenario 13:	Exposure to airborne hazardous material, or skin contact with such material (heavy metals, asbestos etc.)	Y
Scenario 14:	Damage to overhead power lines	Y
Scenario 15:	Injury during diving operations	N/A
Loss of Amenity to Workforce and Community		
Scenario 16:	Discomfort from odour associated with removal and disposal of cooling water pipelines (smell – no health hazard)	N/A
Scenario 17:	Offensive odour and community complaints from mercaptan	N/A
Scenario 18:	Noise generation (no health risk to community)	Y
Other Risk to the Biophysical Environment		
Scenario 19:	Incorrect classification of waste leading to contamination of trucks and potential delivery to wrong landfill location	Y
Scenario 20:	Re-contamination of opened pipework	N/A

As noted above these hazards were subject to a risk assessment which allocated risk priority rankings. A comparison of the scenarios provided for the previous demolition works against those for the operating terminal are summarised as follows:

- no scenarios with risk levels one to five were identified for the operating terminal or for the demolition works;
- two scenarios were identified as risk level six for the demolition works. These two scenarios are also ranked as risk level six for the terminal during operation; and
- the remaining scenarios were ranked with risk levels seven or eight, for both the demolition works and the operating terminal.

A further assessment was then completed looking at the potential impact of Scenarios 1, 2, 3 and 5 on the risk profile of the terminal.

The HAZDEM concluded that:

"*The hazard and risk assessment of demolition works has found that the levels of risks to the biophysical environment and to the safety of the public, staff and contractors are reduced to So Far As Is Reasonable Practicable (SFAIRP) levels as long as:*

- *Caltex continue to implement established processes for managing the Site;*
- *the demolition contractors undertaking the demolition works complete the works in general accordance with Demolition Code of Practice (2013) and relevant Australian Standards; and*
- *the measures listed in Section 8.7 are implemented." (URS, 2014).*

The measures listed in Section 8.7 of the Kurnell Refinery Demolition SEE are summarised in **Chapter 14.0 Revised Management and Mitigation Measures**

In addition, considering Tank 101 is currently approved for gasoline use under the consent for SSD 5544, the removal of this tank would be a beneficial outcome for the risk profile of the Site.

12.1.4 Mitigation

Whilst no risks are considered likely to occur, a number of risk reduction measures would be implemented to help ensure that appropriate controls are in place during the Tank 101 demolition works.

A Demolition Environmental Management Plan (DEMP) was prepared for the approved demolition works in accordance with the recommendations listed within Section 8.7 of the Kurnell Refinery Demolition SEE. The Tank 101 demolition works would be managed in accordance with, as relevant, the controls outlined in the existing DEMP, which are summarised in **Chapter 14.0 Revised Management and Mitigation Measures** (B1-B25). Caltex would also continue to manage the Site in accordance with existing requirements as a major hazard facility.

12.2 Waste Management

12.2.1 Introduction

This section provides an assessment of the waste management issues relating to the Tank 101 demolition works. This chapter identifies, quantifies and classifies the various waste streams generated from the Tank 101 demolition works and proposes relevant management strategies for effective storage, reuse/recovery, treatment and/or disposal in accordance with applicable standards and regulatory requirements.

12.2.2 Method of Assessment

The waste management assessment involved an analysis of the proposed Tank 101 demolition works to identify potential or likely waste streams and volumes arising from the works. The assessment has been completed using information provided by Caltex and the requirements of legislation and policy outlined in **Chapter 5.0 Legislation, Planning Policy and Approvals**.

12.2.3 Existing Environment

12.2.3.1 Existing Waste Management Measures

Wastes generated from Caltex's existing operations in Kurnell are generally recycled where possible or sent to landfill for appropriate treatment and disposal. These activities are undertaken in accordance with the existing certified environmental management system (EMS) for the Site, as well as Caltex's Waste Management System (WMS) (2012). The WMS outlines the current waste management processes currently in place at the Site.

As stated previously, it is intended that the waste generated from the Tank 101 demolition works would be recycled and, if possible, re-used on-site. Some wastes generated from the Tank 101 demolition works such as general solid wastes, stormwater, oily water and sewerage would continue to be managed in accordance with the existing EMS and WMS and associated procedures, in particular:

- PROC 5.06.11.001 Kurnell Waste Management;
- PROC 5.06.11.002 Use of Sludge Lagoons;
- PROC 5.06.11.003 Management of Used and Empty Drums;
- STD 5.06.11.001 Management of Waste Skip Bins in the Kurnell Refinery;
- STD 2.05.03.018 Hazard Control of Equipment & Material Leaving Site; and
- STD 2.05.03.019 Recyclable Materials Handling.

The Site also has conditions on its existing EPL (EPL 837) for the management of waste:

- *O5.1 The licensee must ensure that any liquid and/or non-liquid waste generated and/or stored at the premises is assessed and classified in accordance with the EPA Waste Classification Guidelines as in force from time to time.*
- *O5.2 The licensee must ensure that waste identified for recycling is stored separately from other waste.*

Where relevant, the management of waste from Tank 101 demolition works would be undertaken so as to also comply with the conditions of the EPL.

The key on-site waste management facilities utilised for management of waste generated from existing operations include:

- Empty Drum Storage Area: This area is used for the storage of empty drums prior to sending them for recycling.
- Waste Water Treatment Plant (WWTP): Water treatment at this facility involves three stages of treatment from physical to chemical and biological. The unit allows on-site treatment of all effluent, spent caustic waste, second and third flush water from the Polymerisation Plant reactors and a large range of aqueous liquid wastes.
- Landfarm: This is used to degrade the hydrocarbon content of oily sludge, tank bottoms or highly contaminated sand/soil used to clean up spills. Access to the Landfarm is controlled through the use of a Waste Disposal Permit. No material is to be placed on the Landfarm or hard stand adjacent to it without the authorisation of an approved Waste Disposal Permit.
- Slop Troughs: The Site operates a melting trough for the recovery of clean oils for reprocessing.
- Metal Recycling Area: This is used to store only uncontaminated metal pieces, which are suitable for on-site reuse, or off-site recycling.

12.2.4 Impact Assessment

12.2.4.1 Environmental Values and Potential Impacts

Waste has the potential to affect ecological functions, air quality, water quality, visual amenity, social values and human health. However, if re-use options are available and utilised, waste can be considered a resource.

The environmental values that have the potential to be affected by waste during the Tank 101 demolition works are:

- life, health and wellbeing of people;
- diversity of ecological processes and associated ecosystems;
- land use capability, having regard to economic considerations; and
- the management of finite natural resources.

The effective management of waste would protect these values through the duration of the Tank 101 demolition works.

If not managed responsibly, waste generated by the Tank 101 demolition works has the potential to cause the following impacts:

- land and water (surface and groundwater) contamination as a result of spills or inappropriate storage, handling, transportation and disposal of solid and liquid wastes;
- increased population of vermin and spread of disease from inappropriate storage and handling of wastes;
- visual amenity impacts caused by poorly executed demolition activities and inappropriate storage of waste;
- air quality impacts such as dust and odour generated from the inadequate storage, handling, transportation and disposal of solid wastes;
- social impacts to neighbouring residents as a result of air quality and visual amenity impacts; and
- inefficient and careless use of resources.

Management strategies developed for each waste stream have been designed to be consistent with the waste management hierarchy, meet relevant legislation and policy, and to achieve the environmental objectives of the Tank 101 demolition works. These strategies have been developed with view to minimising impacts with respect to the above factors.

12.2.4.2 Waste Generation

During the Tank 101 demolition works the key activity expected to generate waste is the demolition of the actual tank itself. During the works the tank would be progressively cut-up to allow for transport by truck. The target is to recycle 90% of the generated material streams from the demolition works and, where possible, reuse this material elsewhere within the Caltex Site.

The estimated classification, and primary source of major waste streams generated during the Tank 101 demolition works are summarised in **Table 12-2**.

Table 12-2 Estimated quantity, classification and source of primary waste streams

Waste Type	Classification*	Primary Source
Steel and alloys	General Solid (Non-Putrescible)	Demolition of the body of Tank 101
Other mixed demolition waste	General Solid (Non-Putrescible)	Demolition of redundant pipelines
Concrete	General Solid (Non-Putrescible)	Demolition of Tank 101
Uncontaminated Soil	General Solid (Non-Putrescible)	Removal of underground pipelines
Contaminated soil	To be determined	Removal of underground pipelines

Note: Waste classification would be confirmed prior to disposal in accordance with the *Waste Classification Guidelines (EPA, 2014)*

Other waste streams that would be generated in relatively minor quantities include:

- General Solid Waste (Non-putrescible) including packaging waste, and asphalt waste;
- General Solid Waste (Putrescible) food waste from demolition workers; and
- liquid waste including wastewater from dewatered groundwater if required (contaminated and uncontaminated) from demolition activities (refer to **Chapter 8.0 Soil, Water and Contamination**).

Measures to ensure appropriate waste management during the Tank 101 demolition works would be consistent, as relevant, with those documented within the existing DEMP. The DEMP includes a Demolition Waste and Resource Management Plan (DWRMP) which includes management measures for waste.

12.2.5 Mitigation

Measures to ensure appropriate waste management during the Tank 101 demolition works would be consistent, as relevant, with those documented within the existing DEMP. The DEMP includes a Demolition Waste and Resource Management Plan (DWRMP) which includes management measures for waste.

12.3 Ecology

12.3.1 Introduction

This section provides an overview of the ecological considerations for the Tank 101 demolition works.

12.3.2 Method of Assessment

The Site has been investigated for ecological values as part of the SSD 5544 and SSD 5544 MOD1 Applications (Biosis 2012 and 2014). These studies have been utilised for this assessment.

These assessments involved desktop reviews of a number of ecological databases and relevant literature. The results of the literature and database reviews were used to assess the likelihood of threatened biota occurring within the local area. Site investigations were then undertaken, with further consideration given to species considered to have a medium or high likelihood of occurrence.

12.3.3 Existing Environment

The original vegetation of the Site and the Kurnell Peninsula generally has been extensively cleared. Remnant patches of vegetation only remain in some areas including:

- Marton Park Woodland and Wetlands (a Groundwater Dependent Ecosystem which includes fringing Swamp Oak Floodplain Forest);
- Towra Point Nature Reserve (Ramsar wetland);
- Towra Point Aquatic Reserve; and
- Kamay Botany Bay National Park.

Whilst the broader Site includes some areas of greater ecological value (Biosis 2014), the area around Tank 101 has been kept clear of vegetation. As such the ecological value of the site, including fauna habitat value, is considered to be very small.

12.3.4 Impact Assessment

The demolition of Tank 101 would be wholly confined to the area outlined in **Figure 4-1**, with the exception of transport of waste materials to other locations within and outside the Site. Access to other areas with the Site would be via existing established roads.

The potential ecological impacts from Tank 101 demolition works are as follows:

- potential discharge of stormwater run-off, sediment laden water, contaminated water and oily water off-site and into the groundwater system affecting nearby waterways, natural areas and GDEs; and
- potential for the spread of new or existing noxious weed infestations.

The Tank 101 demolition works would be expected to result in minor to negligible impacts on the ecological values within and adjacent to the Site due to the following factors:

- the Tank 101 demolition works would be undertaken in a highly modified and disturbed landscape within the tank bund, which is substantially devoid of native vegetation or fauna habitat;
- off-site sedimentation and contamination would be limited by the management measures proposed, as well as the ongoing presence of the 2.5 metre bund around the Site;
- the Tank 101 demolition works would not involve the removal or modification of any remnant native vegetation; and
- there is low likelihood of threatened biota and/or Threatened Ecological Communities being present within the Tank 101 demolition works area due to the lack of vegetation and/or foraging habitat.

12.3.5 Mitigation

Impacts would be mitigated through the implementation of the relevant management and mitigation measures contained within the existing DEMP for the Project. The DEMP and its sub-plans contain a suite of measures to manage potential impacts related to erosion, stormwater, groundwater, noxious weeds and ecological values generally.

12.4 Traffic, Transport and Access

12.4.1 Introduction

This section provides an overview of the traffic, transport and access considerations for the Tank 101 demolition works.

12.4.2 Method of Assessment

The scope of this assessment is to provide a qualitative assessment of the potential traffic impacts that could arise from the Tank 101 demolition works.

Potential impacts have been qualitatively discussed in the context of the existing environment and other approved activities that have taken place and are taking place at the Site. This assessment has relied on previous assessments undertaken for the approved demolition works (SSD 5544 MOD1) and ACS management works.

12.4.3 Existing Environment

12.4.3.1 Local Road Network

Kurnell is located on the southern shore of Botany Bay and is accessed via Captain Cook Drive, the major access road connecting the Kurnell peninsula to the wider Sydney road network. This road connects Taren Point Road to the west (and further to the Princes Highway via The Boulevard) with Prince Charles Parade to the east. Captain Cook Drive has three lanes in each direction west of Gannons Road with a median strip separating each carriageway, reducing to two lanes in each direction and divided carriageways between Gannons Road and Woolooware Road. It further decreases to an undivided carriageway with one lane in each direction east of Woolooware Road to Kurnell.

The road networks serving the Site include:

- **Captain Cook Drive** west of Gannons Road is classified as a State Road. To the east of Gannons Road, Captain Cook Drive is classified as a Regional Road. Within the vicinity of the Site, the carriageway is divided and comprises one traffic lane in each direction. A section of Captain Cook Drive between Woolooware Road and Elouera Road has been upgraded to two traffic lanes in each direction.
- **Taren Point Road** is classified as a State Road and follows a north-south alignment. Within the suburb of Taren Point, Taren Point Road is aligned parallel to and east of the Princess Highway and provides an alternate route. Generally, the carriageway is divided and comprises three traffic lanes in each direction with auxiliary turning lanes.
- **Solander Street** is classified as a Regional Road and provides vehicular access to the Site. It connects the Site's main car park with Captain Cook Drive. The carriageway comprises one traffic lane in each direction. Unrestricted parallel parking is permitted on both sides of the street.

12.4.3.2 Public Transport

The Site is serviced by the Route Number 987 bus service that is operated by Veolia. The service connects Kurnell to Cronulla train station. There are bus stops located within close proximity to the Captain Cook Drive and Solander Street intersection.

Regular train services are provided between Cronulla Railway Station and Bondi Junction via Hurstville and the Sydney CBD. In addition a number of bus routes servicing the greater Sutherland Shire area utilise the bus interchange located adjacent to Cronulla train station.

On-road bike lanes are provided along the length of Captain Cook Drive between Elouera Road and Torres Street. Near the Kurnell township, the bike lanes are shared with parallel parking.

12.4.3.3 Site Access

The main entrance into the Site is via Solander Street exiting from Captain Cook Drive, Vehicle access into the Site is also available from Sir Josephs Banks Drive.

The intersection of Captain Cook Drive / Solander Street has sight distances well in excess of the minimum requirement of 97 metres and are therefore compliant. It also has adequate signage with an unobstructed "give way" sign provided on the Solander Street approach. Lane markings are visible on all approaches. A recent swept path assessment indicated that two truck and dog vehicles can turn right (into) and left (out of) onto Solander Street at the same time (GTA, 2015).

Given the nature of Solander Street (i.e. its width, demarcation etc.) it is considered appropriate for use by heavy vehicles. Further, Captain Cook Drive and Solander Street are approved B-double (26 m) routes[5].

In summary, based on this information, the Captain Cook Drive / Solander Street intersection is considered appropriate from a safety and design perspective for use as access to the Site.

[5] Roads and Maritime website - http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/index.html

12.4.4 Impact Assessment

The Site has been progressively converted from an active refinery to a storage and distribution facility (terminal). As a result of this change the number of employees on-site has reduced significantly. In turn, traffic generation from the Site has also significantly reduced in recent years (refer to the EIS for SSD 5544).

The demolition of Tank 101 would be undertaken by demolition contractors who are currently completing the other demolition works at the Site. As a result, no additional staff would be required on Site, which means that an increase in construction worker traffic as a result of these works is not anticipated.

The heavy vehicle movements for the Tank 101 demolition works, should they be required, can be accommodated within the maximum heavy vehicle movements for the approved demolition works. It is therefore considered unlikely that these works would have any additional adverse impact on the local road network.

The Tank 101 demolition works would not result in any impacts on access, as the main vehicle entrance to the Site would be consistent with the approved demolition works.

Considering the Tank 101 demolition works would be confined to the Site, and would utilise existing staff on the Site, further impacts on existing bus routes, train services, or cycle and pedestrian networks are also unlikely.

In general, impacts to traffic, transport and access would not be greater than those already identified and approved as part of the demolition works consent for the broader Caltex Site.

12.4.5 Mitigation

Measures to manage traffic, transport and access impacts during the Tank 101 demolition works are identified in **Chapter 14.0 Revised Management and Mitigation Measures**. These are largely consistent with the approved modification for the demolition works (SSD 5544 MOD1). Works would be undertaken, as relevant, in accordance with the measures outlined in the existing Traffic Management Plan (TMP) developed for the approved demolition works.

13.0 Cumulative Impacts

13.1 Introduction

Certain technical assessments have considered not only the impacts of the Tank 101 demolition works alone, but also the potential cumulative effects of the Tank 101 demolition works and the other ongoing works at the Site. Where necessary a Cumulative Effects Assessment (CEA) was included in the technical chapters of this SEE. This chapter summarises the findings of those cumulative assessments.

13.2 Method of Assessment

13.2.1 Introduction

CEA is a receptor based assessment, whereby in order to have a cumulative effect, two projects or impacts need to affect the same receptor. Therefore, if a project or activity is not affecting a receptor or group of receptors 'alone' then it cannot have a cumulative effect with another project or activity. The only exception to this rule is if one of the potential cumulative projects weakens a management or mitigation measure to the point where a residual impact generated by works becomes significant again. As such, CEA focuses on the residual impacts from a project (i.e. those impacts that remain post mitigation).

There is no provision in Part 4 of the EP&A Act explicitly requiring a consideration of cumulative effects when determining a development application. However, when determining a development application, the consent authority is required, under section 79C(1)(b) of the EP&A Act, to take into account the '*likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality*'.

Case law also exists where the consideration of cumulative impact assessment has been successfully contested under the EP&A Act.

13.2.2 Approach

The first stage of the CEA is to understand the adverse residual impacts of the project or activity. The second stage is to identify other development nearby that may affect the same receptors. Other relevant projects that may generate a cumulative impact have been identified using the following assessment parameters:

- **spatial parameter** – The spatial parameter depends on the characteristics of the environmental impact and the likely area over which a residual impact would occur. For example, an air quality impact would potentially affect a wider physical area than a noise impact and would therefore affect different human or environmental receptors in different ways
- **temporal parameter** – The temporal parameter relates to how far into the future, or the past, the assessment considers cumulative proposals or activities. Projects that are in the planning stage (e.g. are currently on exhibition) or are being constructed are considered. Projects that are operational have already been considered as they form part of the existing environmental baseline for each environmental aspect assessed in this SEE (refer to **Chapters 8.0** to **12.0**). Projects that are not yet on exhibition have been discounted as their assessments do not contain enough detail on residual effects or final design to allow a robust cumulative impact assessment to take place.

There is no guidance on undertaking interactive or cumulative impact/effect assessments in NSW or Australia. Therefore, this assessment has made reference to the European Commission (EC) Guidelines for the *Assessment of Indirect and Cumulative Impacts as well as Impact Interactions 1999* and the Canadian Environmental Assessment Agency *Cumulative Effects Assessment Practitioner's Guide 1999*.

13.3 Cumulative Impact Assessment

As discussed, for a cumulative effect to occur, impacts from two or more distinct projects need to affect the same receptor. As outlined above, the Tank 101 demolition works have the potential to result in a number of environmental impacts. For all of these aspects, there are expected to be no significant residual impacts as a result of the Tank 101 demolition works on any sensitive receptors.

It is noted that the noise assessment (refer to **Chapter 9.0 Noise and Vibration** and **Appendix B Statement of Heritage Impact**) assessed cumulative impacts resulting from the Tank 101 demolition works coinciding with the approved demolition works (SSD 554 MOD1), ACS management works, and SSRF operation. The assessment concluded that if the Tank 101 demolition works coincide with the approved demolition works, noise limits may be exceeded at tree residential receptors. Despite this, the predicted noise levels are not anticipated to exceed the highly noise affected criterion as set out in the ICNG (75 dBA). In addition, the Tank 101 demolition works would be undertaken over a four week period and as such, any impacts would be relatively short in duration.

Notwithstanding this, mitigation measures were identified to manage the noise impacts of the Tank 101 demolition works, including undertaking the demolition works within daytime hours (7.00 am to 6.00 pm Monday to Saturday as per Condition C19 for SSD 5544), and Caltex would also, as far as practicable, manage other potentially coinciding demolition works being undertaken in proximity to the Tank 101 works area in order to reduce the incidence of multiple noisy works being undertaken simultaneously.

Provided the management and mitigation measures are implemented, as relevant, (refer to **Chapter 14.0 Revised Management and Mitigation Measures**) and remain effective, it is considered unlikely that the proposed activity would result in significant adverse cumulative effects on any nearby sensitive receptors (e.g. local residents, ecological values, heritage values, local roads etc.).

14.0 Revised Management and Mitigation Measures

The preceding chapters of this SEE describe the potential impacts of the Tank 101 demolition works and identify a suite of measures and controls for managing risk to avoid, mitigate or offset potential impacts. This chapter provides a summary of all proposed management and mitigation measures outlined in these sections. These measures are expected to provide a basis for conditions of consent to be issued to Caltex, should the Tank 101 demolition works be approved.

Broadly, mitigation and management measures relevant to the demolition would be implemented and monitored through the existing Demolition Environmental Plan (DEMP).

Post-demolition management and mitigation measures would be implemented in accordance with in the existing Operational Environmental Management Plan (OEMP) for the Site.

14.1 Draft Mitigation and Management Measures

The adoption of the mitigation and management measures discussed in **Chapters 8-13** is an important component of the Project and reinforces Caltex's commitment to controlling its potential impact on the environment and community. These measures would be complemented by an ongoing process of community and regulatory engagement, before, during and following the Tank 101 demolition works.

Table 14-1 below contains a consolidated set of mitigation and management measures for the whole Project (i.e. the conversion works, the approved demolition works, ACS management works and the Tank 101 demolition works), and confirms the stage at which each measure would be implemented. Any updates to the measures, or measures that relate only to the Tank 101 demolition works have been shown in bold.

If required, these measures may be modified as a result of subsequent discussions with NSW Department of Planning and Environment (DP&E) and other stakeholders.

In **Table 14-1** the following acronyms have been used to describe each stage:

- CD – Conversion Design;
- Conv – Conversion;
- Op – Operation;
- DD – Demolition Design;
- Dem – Demolition; and
- Con – Construction.

Where management plans were identified as being required for the approved demolition works (SSD 5544 MOD1), they would be implemented and updated, as relevant, to the Tank 101 demolition works (refer to **Section 14.2**). As such, the measures requiring the development of plans for the approved demolition works have not been identified as being relevant in the table.

Table 14-1 Consolidated Management Mitigation Measures

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
General										
A1	Caltex would carry out the proposed works in accordance with the EIS, the SEE**s** and the approval conditions.	✓	✓	✓	✓	✓	✓	✓	✓	✓
A2	Caltex would implement reasonable and practicable measures to avoid, or minimise impacts to the environment that may arise as a result of the Project.	✓	✓	✓	✓	✓	✓	✓	✓	✓
A3	Caltex would ensure that the Project contractor prepares and implements a Construction Environmental Management Plan (CEMP) for the conversion works and a Demolition Environmental Management Plan (DEMP) for the demolition works (inclusive of the ACS Modification works **and Tank 101 demolition works**) to manage any Project impacts. This would be reviewed and approved by a Caltex Environmental Management Representative (EMR). Elements of these plans may be shared as required.		✓			✓	✓			✓
A4	Caltex would appoint an EMR to monitor the implementation of all required environmental mitigation and management measures. The EMR would ensure that all measures were being effectively applied during the proposed works and that the work would be carried out in accordance with the CEMP, the DEMP and all environmental approvals and legislative conditions.		✓			✓	✓			✓
A5	Caltex and the various works' contractor personnel would undergo training in accordance with the CEMP, the DEMP and currently implemented environmental and safety measures agreed as part of the Project approval.		✓			✓	✓			✓
A6	Caltex would provide Sutherland Shire Council the opportunity to review and comment on the CEMP prior to the commencement of conversion works.		✓							

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
A7	Prior to the demolition works commencing for a particular structure or group of structures, Caltex would develop a specific demolition management plan (DMP) for each structure or group of structures to be demolished. The DMPs would be made available to the appropriate regulators prior to being implemented if requested. The DMPs for the two concrete stacks (power plant and common stacks) and for the tall complex structures (two catalytic cracker units (plants 4 and 34)) would be provided to the EPA for comment ahead of the demolition works for these structures taking place.					✓				✓
A8	Caltex would provide a draft of the DEMP and SWMP to NSW DPI for review and comment prior to finalising.				✓				✓	
A9	Caltex would provide NSW Health with a copy of the DEMP and Asbestos Management Plan (AMP) for review and comment prior to finalising.				✓				✓	
A10	Caltex would provide NSW OEH with a copy of the Biodiversity and Weed Management Plan (BWMP) for review and comment prior to finalising.				✓					
A11	Following the ACS Modification works, Caltex will update the Asbestos Management Plan for the Site and Asbestos Register.							✓		
A12	A Containment Cell Long Term Environmental Management Plan (CCLTEMP) would be prepared in consultation with the EPA prior to the closure of the containment cell. The CCLTEMP would detail the ongoing environmental management of containment cell, including maintenance of the capping and drainage, groundwater monitoring (including groundwater quality and levels), and land use restrictions that will apply to the containment cell. The CCLTEMP would be attached to the positive covenant for the land where the containment cell is located, if required.							✓		

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
A13	From development consent of SSD 5544 MOD2 until the quarterly community meeting after the containment cell is closed, Caltex will provide an update on the progress of the ACS Modification works, including issues faced or complaints received, at each of the quarterly community meetings.						✓	✓		
A14	ACS from the pipeways classified as hazardous waste under the NSW EPA Waste Classification Guidelines would have a minimum cover of at least 500 mm plus the surface cap.						✓			
A15	Within one month after it has been validated that all ACS from the pipeways has been removed, the containment cell would be capped and permanently sealed as per the containment cell design.						✓			
A16	Caltex would prepare an ACS Modification Works Completion Report following the completion and closure of the containment cell. The report would include a summary of the waste classification and environmental monitoring data conducted in accordance with the Environmental Management Plans (and associated Sub Plans). Monitoring data should include but not necessarily be limited to: i. Waste Characterisation and Tracking ii. Air Quality monitoring (including dust and asbestos) iii. Groundwater Monitoring.						✓			
Hazards and Risk										
B1	A program of routine testing, inspection and maintenance would be developed for each new piece of equipment or function of instrumentation to be added to the preventative maintenance program already established for existing plant and equipment.		✓	✓						

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
B2	The recommendations of the Fire Safety Study would be implemented for the design and operation of the terminal.	✓	✓							
B3	The Process Hazard Analysis Recommendations would be implemented for the design and operation of the terminal.	✓	✓							
B4	The spill response plan for the Site would be updated for the proposed terminal.		✓							
B5	Caltex would review hardware protection in place and proposed to ensure the risk of filling low flash point material into tanks designed for high flash point usage is minimised. Particular attention to human factors issues at manifolds.	✓	✓							
B6	Caltex would determine need for additional means of communication, e.g. for lone worker on the proposed terminal.		✓							
B7	Caltex would review the procedures used for potentially hazardous manual operation to ensure they are appropriate and sufficient for any increased frequency of use.		✓							
B8	The bullet pointed measures listed in Section 8.7 of the SEE would be implemented to ensure that the conclusions of Appendix C Hazards and Risks Assessment of the SEE remain valid.				✓	✓			✓	✓
B9	Personnel required to work with hazardous/flammable/contaminated materials would be trained in safe use and handling and would be provided with all relevant safety equipment.						✓			
B10	Procedures are currently in place to manage incidents and injuries at the Site. This includes an established incident reporting and response process. These processes would be implemented for the ACS Modification works.						✓	✓		
Soils, Groundwater and Contamination										

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
C1	A Soils and Erosion Management Plan would be developed as part of the Construction Environmental Management Plan (CEMP) to manage the excavation, testing, stockpiling, reuse and rehabilitation of soils. This plan would outline: • the areas where soil disturbance is likely; • soil testing procedures; • soil handling procedures; • locations where soil would be stockpiled on-site for either removal, treatment or reuse; • procedures to reduce erosion and the spread of dust; • restricting traffic to defined roads or tracks where necessary; and • the rehabilitation of bare soil following completion of the construction works.		✓							
C2	All materials would be stockpiled in accordance with 'The Blue Book' *Managing Urban Stormwater - Soils and Construction Volume 1 and 2* (Landcom, 2004). Principal controls would include the following: • silt fences would be installed around stockpiles to reduce erosion and protect vegetation or Site infrastructure as necessary; • silt and sediment traps would be installed across stormwater drains in proximity to excavation areas; • stockpiles would be restricted to cleared areas and not impact any vegetation; • stockpiles would be placed on impermeable sheeting; • stockpiles would be covered and wetted down in order to reduce dust creation; • stockpiles would not be located in close proximity to any stormwater drainage systems; • Caltex would not stockpile in areas that are prone to flooding as identified in Figure 4-10 of Appendix D of the SEE; and		✓			✓	✓			✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	• Stockpile locations and erosion and sediment control requirements associated with the Project would be reviewed by a suitably qualified person to ensure that the recommended measures achieve the environmental outcomes for the Site.									
C3	The Soils and Erosion Management Plan would also outline the inspection program for any erosion control structures and bunded areas.		✓							
C4	Excavated soils would be tested for both contaminants and odour using standard practices (e.g. soil vapour and soil sampling etc.)		✓							
C5	Clean materials would be separated from contaminated materials for reuse as backfill where required.		✓							
C6	A Contamination Management Plan would form part of the CEMP for the Project. This plan would outline measures for testing, classifying, handling, storing and managing contaminated soils and contaminated groundwater.		✓							
C7	Suspected contaminated materials would be assessed and classified in accordance with EPL requirements and NSW (2009) *Waste Classification Guidelines: Part 1: Classifying Waste*, batched, further tested (where required) and disposed by a licenced contractor.		✓							
C8	Disposal of any contaminated soils or groundwater would be in accordance with EPL requirements and NSW DECCW's *Waste Classification Guidelines* and the Contamination Management Plan (CMP) for the Project. Contaminated materials would be sent to appropriately licensed facilities in accordance with the *Contaminated Land Management Act 1997*.		✓							
C9	If Acid Sulfate Soils (ASS) are encountered during construction or the ACS Modification works, an ASS Management Plan would be prepared in accordance with the ASS Manual (ASS Management Advisory Committee 1998).		✓			✓	✓			✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
C10	A Groundwater Management Plan (GWMP) would be developed and included within the CEMP. This plan would outline the measures that would be used to manage the testing, dewatering, storage, movement and treatment of any groundwater intercepted during the construction phase. Measures would include: • the use of appropriate drip trays and interception techniques for any construction specific liquids stored on the Site; • bunding of any fuel or chemical storage area at the construction Site; • regular inspection of construction equipment to ensure any leaks are minimised and rectified; • management of vehicles leaving the Site to reduce soil on roads, production of dust and the introduction of contamination to the groundwater and/or stormwater system; • appropriate and timely disposal of any contaminated soil, water or waste generated during construction; • regular inspection of erosion control structures and bunded areas; and • regular inspection and testing of containment areas, drainage lines and process pipe work.		✓							
C11	Any runoff that may accumulate in excavations would be periodically tested for elevated levels of contamination. Water that is found to have elevated levels of contaminants would be collected and sent to the on-site Wastewater Treatment Plant in accordance with the established refinery wastewater management procedures.		✓							
C12	Runoff entering any excavations would be limited by using bunds or similar structures as required.		✓			✓				✓
C13	Construction/demolition workers would be instructed in appropriate health and safety and handling protocols for minimising human contact with contaminated soils and groundwater.		✓			✓	✓			✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
C14	During the cleaning of the crude and finished fuel tanks, measures would be implemented in line with Caltex's existing Turnaround and Inspection process to contain and collect any potentially contaminating material for appropriate disposal to the on-site wastewater treatment plant, landfarm or appropriate off-site disposal facilities. This process would be detailed within the CEMP.		✓							
C15	Permits would be required to work in the areas where potential soil and groundwater contamination exists. The work permit includes requirements such as monitoring and PPE. No unauthorised entry into these areas is permitted, without a permit.		✓			✓	✓			✓
C16	Appropriate inspection, assessment, maintenance and repair programmes that would be implemented as part of the operation of the Project. These safeguards would be incorporated into the updated management plans for the proposed terminal. The Project would be appropriately licenced under the *Protection of the Environment Operations Act 1997* and would be managed in accordance with EPL requirements.		✓	✓				✓		
C17	A Contamination Management Plan would be developed to outline measures for monitoring, handling, storing and managing contaminated soils and contaminated groundwater. It would include the following: • During excavation visual and olfactory indicators of impact would be monitored. Where there is potential for volatile organic contaminants (based on known ground conditions) or where hydrocarbons are seen or smelt during excavations, soils would be inspected for hydrocarbon impacts using a PID and/or testing. Excavated soils would not be used for backfill if they are impacted at levels exceeding commercial/industrial as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013*.					✓	✓			✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	• All excavations would be sampled for asbestos. Asbestos assessment would be undertaken in accordance with Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013.* • Asbestos impacted soil not found in the pipeways would be disposed of at the ACS containment cell or removed from the Site as soon as practicable if excavated. If these soils need to be temporarily stockpiled they would be stored at a defined location at the former CLOR site, covered and labelled as asbestos waste. Asbestos impacted soil would be classified in accordance with NSW EPA guidelines for transport and disposal at either the ACS containment cell or a licensed landfill (and in accordance with the Site waste management system and the Demolition Waste and Resource Management Plan (DWRMP) for the demolition works. The excavation, transport and disposal of asbestos impacted soil would be undertaken by a licenced contractor and comply with NSW WorkCover requirements. • Hydrocarbon impacted soil would not be temporarily stockpiled adjacent to the excavation. If these soils need to be temporarily stockpiled they would be stored at a defined location at the former CLOR site. • Excavated soils would be separated into stockpiles according to odours, staining and other environmental indicators. Soils that are potentially contaminated (following visual and olfactory inspection and or use of monitoring equipment) would be placed on impermeable sheeting into uniquely identified stockpiles and appropriately bunded and managed. The bunds would be impermeable and of sufficient capacity to ensure that runoff from these stockpiles is contained prior to being sent to the WWTP. • Where no contamination issues are identified, excavated material would be used as backfill to bring the excavated area back to grade as soon as practicable. If required, certified VENM, ENM or appropriated remediated									

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	material would be used to provide additional backfill material. • If excavated material cannot be re-used or managed on-site then it would be removed off-site as waste to an appropriately licensed facility. • Further, excavated material; would be classified in accordance with EPL condition O5.1 which requires "any liquid and/or non-liquid waste generated and/or stored [at the Site] is assessed and classified in accordance with the NSW (2009) *Waste Classification Guidelines: Part 1: Classifying Waste*, batched and further tested (where required, for example Toxicity Characteristics Leaching Procedure (TCLP) testing)". • The method of disposal or reuse would be in line with the materials' classification in accordance with specifications set out in a DWRMP. • Where soils are reused on Site (i.e. are not considered to be impacted at levels exceeding commercial/industrial as defined by *Schedule B1 Guidelines, Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013)* a record would be kept (in the Waste Management Database) of where these soils are reused, the volumes reused; the type and levels of contaminants present in the soils and the soil classification.									
C18	The Soil and Water Management Plan would outline management measures for any soils that are excavated or stored on-site during the demolition works and ACS Modification works and water management requirements. It would identify: • the areas where soil disturbance is likely; • how excavations would be staged so that the length of time that excavations are left open and temporary stockpiles are required is minimised; • locations where soil would be stockpiled on-site for either removal, treatment or reuse; • that if additional backfill material is required, only certified VENM, ENM or					✓	✓			✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	appropriated remediated material would be used; • procedures to reduce erosion and the spread of dust; • restricting traffic to defined roads or tracks where necessary; • measures to protect excavations from increased stormwater runoff (e.g. by using bunds or similar structures where required); • measures to manage the storage of demolition and ACS Modification works specific liquids at the Site and the appropriate bunding or containment of demolition related fuel or chemical storage areas; • demolition and ACS Modification works equipment is maintained and operated in a proper and efficient condition to reduce the likelihood of spills or leaks; • measures to manage vehicles leaving the Site to reduce soil on roads, production of dust and the introduction of contamination to the groundwater and/or stormwater system; • measures for the dewatering, storage, movement and treatment of groundwater encountered in excavations. Dewatered groundwater would be collected and sent to the on-site Wastewater Treatment Plant in accordance with the established Site wastewater management procedures, unless it is tested and is of suitable quality to be directed to stormwater; • procedures for dewatering, including the need to liaise with NOW to ensure the necessary water licences are obtained, if required; and • how the rehabilitation of bare soil would be managed across the Site once areas are returned to grade.									

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
C19	The Soil and Water Management Plan would also: • be developed in accordance with *'The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004); • outline the inspection program for erosion control structures and bunded areas; • continue the existing groundwater monitoring program; and • include a plan for corrective action should an unexpected increase in COPC be observed in the groundwater monitoring					✓	✓			✓
C20	An Asbestos Management Plan would be developed in accordance with the relevant guidelines. Caltex would utilise existing registers, procedures and plans in place for the Site for the preparation of an Asbestos Management Plan.					✓	✓			
C21	Additional sampling would be undertaken to ensure that the area of soil disturbance is restricted as far as practicable to asbestos impacted areas only.						✓			
C22	ACS in the pipeways would be wetted down prior to excavation, loading and transport.						✓			
C23	ACS classified as general or restricted under the Waste Classification Guidelines would be transported directly to the containment cell. Excavation works would be staged to allow placement of ACS directly into the containment cell to minimise the need to stockpile ACS.						✓			
C24	Where hazardous ACS cannot be appropriately managed on-site, it would be taken off-site for treatment and disposal at an appropriately licensed facility.						✓			
C25	All vehicle tyres would be cleaned before exiting the containment cell works area a temporary truck wash system.						✓			

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
C26	During the works, the containment cell area would remain bunded to prevent water flowing out of the respective areas except via the OWSS and WWTP.						✓	✓		
C27	During the works, stormwater within the containment cell works area would be directed to the OWSS and treated at the WWTP.						✓			
C28	Stormwater from within excavated areas of the pipeways would be sent to the WWTP unless it is tested and is of suitable quality to be directed to stormwater, as per normal operation of the pipeways.						✓			
C29	Two groundwater monitoring bores would be installed at the north and west of the containment cell. Quarterly monitoring would be undertaken during construction, filling and closure of the cell.						✓	✓		
C30	A marker layer would be installed during the final capping of the containment cell to identify the presence of asbestos as a safeguard for potential future use.						✓			
C31	Following excavation of ACS, an independent licenced asbestos inspector would be employed to verify that the friable asbestos has been removed from the pipeways and that the Exemption Order under Section 419 of the Work, Health and Safety Regulation 2011 is no longer required.						✓			
C32	The OEMP for the Site would be updated to include the following measures: • Quarterly groundwater monitoring for two years for the two installed monitoring wells. Following this time, annual groundwater monitoring would be undertaken to provide ongoing demonstration that the containment cell liner is operating effectively. Monitoring of these bores would occur in accordance with the existing groundwater monitoring program for the Site. • Regular inspections of the containment cell to monitor the effectiveness of the erosion and sediment control measures incorporated into the design of the containment cell, in line with the Site's existing Inspection Checklist and following heavy rain events.							✓		

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
Human Health and Ecological Risk										
D1	Construction/demolition personnel would be made aware of the potential presence of Non Aqueous Phase Liquids (NAPL) and would be shown how to identify its presence. The CEMP/DEMP would include management measures to appropriately deal with any NAPL found on Site.		✓		✓		✓		✓	✓
D2	Construction/demolition staff would be inducted and provided with training prior to working with potentially contaminated soil as part of the Project, to prevent unnecessary disturbance (e.g. dust generation, asbestos fibre liberation, contaminant mobility and volatilisation).		✓		✓		✓		✓	✓
D3	The location of potentially contaminated areas would be noted in the CEMP/DEMP and provided to construction/demolition personnel involved in soil excavation and handling. The CEMP/DEMP would also identify the type of contamination found in each area. Where necessary, safety training and appropriate PPE would be provided.		✓	✓	✓	✓	✓		✓	✓
D4	Caltex would continue to monitor groundwater quality in areas that are known to contain impacts to ensure that significant mobilisation of COPC from groundwater to surface water is not occurring.		✓	✓	✓	✓			✓	✓
Waste Management										
E1	The Project would be integrated into existing resource efficiency, waste management and handling, emergency response and preparedness plans for the existing Site.	✓	✓	✓	✓	✓	✓	✓	✓	✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
E2	Construction and Operation Waste and Resource Management Plans (WRMP) and Demolition Waste and Resource Management Plans (DWRMP) would be compiled prior to the each phase commencing. The DWRMP would be updated to include reference to management of waste generated by the ACS Modification works prior to construction works commencing.	✓			✓		✓		✓	
E3	The WRMPs and DWRMP would: • identify requirements consistent with the waste and resource hierarchy; • ensure resourcing efficiency is delivered through the design and responsible construction, demolition and operational practices; • ensure procurement of pre-fabricated materials to eliminate off-cuts on-site, and the re-use of materials where possible; • provide consistent clear direction on waste and resource handling, storage, stockpiling, use and reuse management measures (consistent with current management practices relating to Caltex's Kurnell Waste Management System); • provide separate waste containers/skips to ensure waste material segregation and maximise the opportunities for re-use and recycling; • identify disposal and management routes consistent with current management practices as adapted for the Project; • set out clear requirements for meeting legislative and regulatory requirements; • ensure safe storage and disposal of waste ensuring least amount of harm to surrounding environment; • define requirements to support Caltex's sustainable procurement objectives through effective, design, construction, operation and procurement; and • set out processes for disposal, including on-site transfer, management and the necessary associated approvals.	✓	✓	✓	✓	✓	✓		✓	✓

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
E4	The WRMP and DWRMP would incorporate the requirements of the waste and resource hierarchy and cleaner production initiatives.	✓	✓	✓	✓	✓	✓		✓	✓
E5	The WRMP and DWRMP would include a process for auditing, monitoring and reporting, which would include regular inspections off-site activities and the waste management area(s). The WRMP and DWRMP would be subject to regular auditing and a system would be used to record and report the types, volumes and management measures for all waste and resource arising from/used for the works.	✓	✓	✓	✓	✓	✓		✓	✓
E6	Project-generated waste would be segregated at the source and stored in accordance with current Site practices. Site management practices would potentially need adapting to consider additional storage requirements. Regardless, all waste would be stored in suitable containers and designated waste management areas.		✓	✓		✓	✓			✓
E7	Caltex's existing procedures for the disposal of sewage, greywater, hazardous materials, general waste and recyclable materials would be adopted for the Project (and modified if required). This would include using licensed contractors to remove and transport waste from the Site.						✓	✓	✓	

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
E8	A Waste Register would be prepared, used and maintained by the Demolition Contractor to track all wastes generated from demolition works. The Demolition Contractor would retain waste receipts to indicate evidence of waste disposal. The database would also be used to track all materials reused at the premises including its reuse location, type of waste and classification. A Waste Register would be prepared, used and maintained by the Contractor to track all wastes generated from the ACS Modification works and used to record and report the types, volumes and management measures for all waste and resources arising from/used for the works. This would be subject to regular auditing.				✓	✓	✓		✓	✓
E9	Stockpiled wastes would be: • appropriately segregated to avoid mixing and contamination; • clearly labelled; • contained in bunded areas and if necessary on an appropriate lining; • less than 5m in height; and • located >40m away from any sensitive receivers, heritage, ecological areas and watercourses.				✓	✓	✓		✓	✓
E10	Materials to be re-used would be analysed to ensure material is not contaminated and re-use is appropriate.				✓	✓	✓		✓	✓
E11	An Asbestos Management Plan would be prepared and implemented in accordance with relevant legislative and other requirements. This plan would outline proposed methods of managing asbestos waste by the contractor. The Asbestos Management Plan would be updated to include the ACS Modification works.				✓	✓	✓			

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
E12	The Site's existing Asbestos Waste Register would be amended as appropriate, implemented and maintained to track asbestos wastes generated during the works.				✓	✓	✓	✓	✓	✓
E13	If stored on-site, asbestos wastes would be located away from operational areas and properly sealed and contained to minimise human exposure and clearly labelled. Signage and barriers/fencing would be installed to ensure all employees, contractors and visitors would keep away from the area at all times.					✓	✓			✓
E14	The removal and disposal of asbestos wastes would be undertaken by a licenced asbestos contractor.					✓	✓			✓
E15	A Decontamination Area would be provided on-site for all authorised personnel handling asbestos.				✓	✓	✓			
E16	Wastes (both liquid and non-liquid) generated from the works would be assessed, classified and managed. Wastes would be disposed of at an appropriately licenced facility.					✓	✓			✓
E17	Recyclable wastes would be stored in suitable containers and designated waste management areas, to be transferred by a licensed waste contractor to an appropriate recycling facility where possible.						✓			
E18	Treated soils from the CSRF would be used where possible for the containment cell construction works in accordance with the conditions of the Caltex treated soil exemption 2016.						✓			
E19	New waste streams would be addressed as they arise and assessed to determine the most suitable management measures to use when handling, storing, transporting and disposing of the waste.						✓			

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
E20	Unidentifiable waste streams would be analysed and sent for testing in an accredited laboratory to assess the risks associated with handling and disposal of the waste.						✓			
E21	Additional sampling will be undertaken in the pipeways to further delineate the areas classified as asbestos contaminated in order to minimise the volume of soil classified as Special Waste and disposed of in the containment cell.						✓			
E22	Caltex would complete inspections following periods of extended heavy rainfall to confirm that pumps within the containment cell sumps are directing leachate to the Site's WWTP.						✓	✓		
Surface Water, Wastewater and Flooding										
F1	The Construction Environmental Management Plan (CEMP) for the Project would include a Soil and Erosion Management Plan. This plan would include the following measures: • All materials would be stockpiled in accordance with '*The Blue Book' Managing Urban Stormwater – Soils and Construction Volume 1 and 2* (Landcom, 2004); • Silt fences would be installed around stockpiles to reduce erosion and the movement of suspended solids as necessary; • Soil stockpiles and any polluted materials would be stored in designated areas which are not in close proximity to any stormwater drainage systems; • Erosion control structures, bunded areas, containment areas, drainage lines and interception measures would be subject to regular inspection; • Clean materials would be separated from contaminated materials; and • Soil erosion and sedimentation devices would remain in place until the disturbed ground surface is restored. These devices would also capture any gross pollutants.		✓							

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F2	A Soils and Water Management Plan would be developed as a sub plan to the DEMP. Measures to be included in the plan and implemented during the demolition works to protect stormwater quality would include: • Stormwater or groundwater ponded in excavations would be sent to the WWTP, unless it is tested and is of suitable quality to be directed to stormwater; • Stormwater that is captured in the bunds around the contaminated soil stockpiles would be collected and sent to the WWTP; • Silt fencing and/or alternate sediment control measures would be installed around soil stockpiles and disturbed areas or areas where dust suppression is being undertaken; • Regular inspection would be undertaken of soil stockpiles/excavation areas, including following rainfall events; • Regular inspection of excavation areas *and* containment cell area, including following rainfall events; • Regular inspections would be undertaken of stormwater drains down hydraulic gradient of disturbed areas; • Stormwater management measures incorporated into the design of the containment cell would be regularly inspected during operation in line with the Site's existing Inspection Checklist and following heavy rain events; • If stormwater quality is impacted during the demolition works and ACS Modification works in areas that have been disturbed, water would be diverted to the intermediate sewer system; and • During the demolition works and ACS Modification works, following notable but prolonged rainfall events (over three days) or following heavy rainfall events over a shorter timescale, water sampling would be completed at the stormwater retention basin to ensure that the quality of the water is of an appropriate standard to be discharged from the Site. Water that is not of an appropriate quality would be either treated in situ or directed to the WWTP.					✓	✓			

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F3	Caltex would continue to implement the measures within the Stormwater Management Plan (SMP) for the Site. This plan has been produced in response to Environment Protection Licence No. 837, PRP U24.1: Stormwater Catchment and Management Plan. The SMP has committed Caltex to implementing a Stormwater Management Strategy and completing a number of stormwater management measures in a staged manner. Measures include: • Ongoing maintenance of the existing stormwater system; • Implementation of a number of projects to improve the infrastructure, reduce the potential for the refinery to flood, and prevent contaminated stormwater leaving the refinery premises; • Working with the NSW Office of Environment and Heritage (OEH), NSW EPA and Sutherland Shire Council to divert to flow of stormwater from the National Park away from the Site's stormwater system to the Sutherland Shire Council's stormwater infrastructure; • Carrying out stormwater flow monitoring; and • Updating the Site's stormwater system performance model to account for the changes to the stormwater system infrastructure that can then be used as a tool to assess future modifications, as necessary. This work would be completed in consultation with NSW EPA.	✓	✓	✓	✓	✓	✓	✓	✓	✓
F4	Discharges from the Wastewater Treatment Plant would be within existing EPL limits during demolition, construction and operation. Any required change to this Oily Water Management System would be discussed and agreed with NSW EPA.	✓	✓			✓	✓	✓		✓
F5	The measures and processes currently in place at the Site to prevent any loss of contaminant would be maintained throughout the demolition, construction and operation phases of the Project. All bunds on tanks which are retained in service would meet the capacity requirements of *Australian Standard AS1940* during the operation of the Project.	✓	✓			✓	✓	✓		✓

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F6	Improvements to monitoring would be initiated to ensure that if a loss of containment into a bund occurs it is detected early and contingency actions can be taken promptly. The measures for tanks containing low flash materials include: • explosive vapour detectors within the bunds; • triple infrared scanners on tank roofs; and • CCTV in conjunction with infrared cameras as a confirmation for alarms. All tanks on-site would be subject to: • an automated high level shut off system; and • continuance of a comprehensive inspection/repair program.			✓						
F7	Caltex undertakes a flood study, commencing in March 2018 that assesses potential flood risks from the Site to the Kurnell township, with a particular emphasis on the impacts from surface water entering the Site from land to the east and south of the Site and whether current diversion methods are appropriate. The flood study would consider the Sutherland Shire Council's *Draft Sea Level Rise Policy* (May 2016), or a latest revision. Caltex to remain in consultation with Sutherland Shire Council throughout the flooding investigation works to identify a mutually acceptable solution to potential flood risks along the north eastern boundary of the Site. The timing and form of consultation is to be mutually agreed by both parties (Caltex and Sutherland Shire Council) and outlined within a written document to be produced by Caltex prior to March 2018. It shall include regular reporting updates and milestone meetings, for example, at the Scope of Works, concept design, at the issuing of the draft report to discuss results and recommendations as a result of the study.			✓		✓		✓		✓

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F8	The following measures would be employed during and following the demolition of the refinery process units and associated infrastructure: • Appropriate bunding and controls would be put in place to prevent stormwater runoff from the demolition works area entering the stormwater system. • Following the completion of the demolition works and removal of redundant infrastructure, the former refinery process area would be regraded. The regrading would aim to ensure that water does not pool in this area. • As part of the regrading works, the surface material in this area would meet the commercial/industrial criteria as defined by Schedule B1 Guidelines, *Investigation Levels for Soil and Groundwater, National Environment Protection Measure (Assessment of Site Contamination) Amendment Measure 2013*. A crushed aggregate made from clean concrete and asphalt from the demolition works would also be spread across the surface to help reduce soil erosion. • Stormwater runoff collected in the stormwater system would be subject to the controls within this system (such as the oily water separators) prior to being discharged.					✓				✓
F9	Excavation of the pipeways would be staged, effectively minimising the area of disturbance at one time. The ACS Modification works would be undertaken in a manner to minimise the potential for soil erosion and sedimentation.						✓			
F10	Local weather patterns would be monitored to ensure that workers completing the ACS Modification works at the Site were aware of predicted heavy rainfalls so that work could be stopped in the pipeways prior to them containing surface water flows.						✓			

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F11	The OEMP for the Site would be updated to include the following measures: • the new stormwater management infrastructure for the containment cell would be regularly maintained to ensure that stormwater flows are properly conveyed to the wider catchment; and • the leachate collection system including the tank would be regularly inspected to ensure that it is operating effectively and that no leaks have occurred.							✓		
Noise and Vibration										
G1	The CEMP/DEMP for the Project would include a Noise and Vibration Management Plan (NVMP). The NVMP would outline: • The locations of noise sensitive receptors; • Construction noise monitoring procedures; and • Construction equipment maintenance to ensure good working order.		✓			✓				
G2	Low-noise plant and equipment would be selected, where practicable, in order to minimise potential for noise and vibration. All equipment would be regularly checked to ensure that the mufflers and other noise reduction equipment are working correctly.		✓			✓	✓			✓
G3	Community consultation with local residents would be undertaken to assist in the alleviation of community concerns. Prior to the proposed demolition works commencing within the Eastern and Western Right of Ways, at Silver Beach, on the Wharf or prior to particularly loud demolition works occurring on the main terminal site, potentially affected residents within Kurnell would be notified in advance. Should complaints be received, the complaints register would continue to be maintained and managed in line with the existing feedback process at the Site.		✓	✓		✓	✓			✓

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G4	Any noise complaint(s) would be investigated immediately. Reasonable and feasible measures would to be implemented to reduce noise impacts.		✓	✓		✓	✓	✓		✓
G5	Construction/demolition equipment would be located to reduce noise emission to sensitive receptors, where practicable.		✓			✓	✓			✓
G6	The majority of the conversion works for the Project would typically be completed between 7.00am to 10.00pm seven days a week. Some works consistent with Caltex's existing day-to-day operational and maintenance procedures would occur over a 24 hour period as regulated by the Environmental Protection Licence (No. 837) (EPL) for the Site.		✓			✓	✓			
G7	Construction/Demolition staff and contractors would undergo training in environmental noise issues including: • minimising the use of horn signals and maintaining a low volume. Alternative methods of communication should be considered; • avoiding any unnecessary noise when carrying out manual operations and when operating plant; and • switching off any equipment not in use for extended periods during construction work. • ensuring works occur within approved hours.		✓			✓	✓			✓
G8	Should any unexpected construction activities occur which could potentially generate significant noise not described in this report, monitoring would be undertaken to ensure construction noise emission levels do not exceed EPL limits.		✓				✓			
G9	Pipeline removal works would be confined to 7.00 am to 6.00 pm Monday to Saturday as per Condition C19 (for SSD 5544).					✓	✓			
G10	Demolition works near 30D Cook Street (i.e. within 500m) would be confined to 7.00am to 6.00 pm Monday to Saturday as per Condition C19.					✓				✓

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G11	Demolition noise monitoring would be undertaken when necessary to ensure compliance with demolition noise criteria.					✓	✓			✓
G12	Caltex would ensure that the noise generated by the demolition works does not exceed the criteria defined in Table 2 (from Condition of Consent C16 of SSD 5544) unless the reasonable and feasible noise mitigation strategies outlined within the DNVMP have been implemented. Reasonable and feasible noise mitigation strategies would include appropriate respite periods during particularly noisy or prolonged activities.					✓				✓
G13	The DNVMP would describe where demolition noise limits from Table 2 (from Condition of Consent C16 of SSD 5544) are likely to be exceeded and what reasonable and feasible noise mitigation would be employed to minimise noise.					✓				✓
G14	To help ensure that the structures on Site that are to be retained with high or medium heritage significance are protected from potential vibration impacts, the DNVMP would also • Utilise Appendix H Heritage Impact Assessment to identify the medium to high heritage significance buildings to be retained; • Identify where works to demolish redundant structures are occurring within 20 m of a medium to high significance heritage building and the requirement to undertake vibration monitoring and management for these buildings to protect their integrity; and • Outline general monitoring and management measures to monitor vibration and manage buildings.				✓				✓	
G15	**The Tank 101 demolition works would be coordinated with other nearby demolition works to reduce the potential for cumulative impacts.**									✓

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Air Quality and Odour										
H1	Dust emissions from the construction phase of the Project and during the demolition works would be monitored by construction/demolition staff. Visual inspections would be completed by demolition staff during the works. Demolition staff would also complete dust deposition monitoring during the demolition works (as per AS/NZS 3580) in appropriate locations on the Site boundary and in Kurnell. Staff would also monitor dust (PM_{10}) levels using the on site real time ambient air quality monitoring station. When required, during activities likely to cause high dust levels or adverse weather conditions etc., a designated worker would continuously monitor downwind emissions to the community or local residents, using the methods described above, and call a halt to activities if sensitive receptors are likely to be affected by airborne particulate matter. Should significant impacts be likely, appropriate measures would be taken to mitigate adverse air quality impacts.		✓			✓	✓			✓
H2	Within the refinery, vehicles would only travel on designated roads where possible and would be limited to a maximum speed of 10 km/hr in offroad areas, and 25 km/hr elsewhere.		✓			✓	✓			✓
H3	Where there is the potential for dust or odour generation from trucks carrying spoil, loads would be covered and all tailgates would be securely fastened. Vehicles would not be loaded higher than the sides and tailboard.		✓			✓	✓			✓
H4	Construction and potentially dust generating demolition activities would be limited during high wind events if sensitive receivers are likely to be significantly impacted.		✓			✓	✓			✓
H5	All plant would be maintained and operated in line with the manufacturer's specifications in order to minimise the emission of air pollutants and offensive odours. Plant and construction vehicles would be turned off when not in use.		✓			✓	✓			✓

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H6	Stockpiled material would be assessed for the potential for causing odorous or particulate emissions. If air pollutants and offensive odours are likely, controls would be put into place to manage adverse impacts.		✓			✓				✓
H7	All concrete cutting and coring would to be undertaken using “wet tools”.		✓			✓				✓
H8	An odour reduction program would be implemented in accordance with the existing EPL.		✓	✓						
H9	The guidepoles on the EFRTs in gasoline service would be fitted with sleeves.		✓	✓						
H10	Caltex’s Leak Detection and Repair (LDAR) Program would continue in accordance with the Environment Protection Licence.		✓	✓						
H11	All reasonable and feasible measures would be implemented to minimise dust and odour emissions during the demolition works					✓	✓			✓
H12	VOC and Odour Monitoring would be undertaken by demolition workers or ACS Modification workers (i.e. visual and olfactory monitoring) and monitoring equipment during excavation activities where potential hydrocarbon contamination is present. Contractors would notify the Caltex Environment Specialist of any significant odours identified during demolition.					✓	✓			✓
H13	Soils or concrete with significant hydrocarbon staining or obvious hydrocarbon odours would be transported to the former CLOR area and stored appropriately. Stockpiles of contaminated soil stored on-site would be managed to prevent odorous VOC emissions and windblown particulate emissions.					✓				✓
H14	Excavation would be staged to manage potential VOC and odour emissions. Where practical, excavations would not commence prior to 8am nor after 4pm as weather conditions at these times are generally conducive to adverse odour air quality situations from fugitive emissions.					✓	✓			✓

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H15	In unfavourable weather conditions (e.g. dry and windy conditions) or where dust sources are present near sensitive receivers, water sprays would be used to dampen down soils prior to excavation, handling and/or loading/unloading materials. All exposed surfaces (from recent excavations) and stockpiles (of excavated material) would also be watered, sprayed or covered where required, to minimise nuisance dust and odours.					✓	✓			✓
H16	During adverse meteorological conditions and extraordinary events, such as events where elevated background dust is present, additional mitigation measures would be considered to prevent and minimise air quality impacts from demolition works. These measures would include, but not be limited to implementing the following during high wind events (e.g. > 8m/s hourly average): • Reducing working surface area • Commencing excavation during favourable wind conditions • Increase wetting agents for exposed surfaces • Increase covering of exposed surface areas.					✓	✓			✓
H17	Surface disturbance would be minimised. Exposed ground would be rehabilitated as soon as practicable.					✓	✓			✓
H18	Real-time dust monitoring would be undertaking during the operation of the concrete crusher. Details of this monitoring (and associated response actions) would be incorporated into the AQMP for the demolition works.					✓				✓
H19	During crushing, a number of dust suppression measures would be implemented. These could include regular watering of stockpiles, dust curtains and other measures as appropriate.					✓				✓

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H20	Where biological matter is present within cooling water inlet pipework, the pipework would be removed be as soon as possible. This would help to minimise the potential for odour issues associated with the degradation and then exposure of the biological matter.					✓				✓
H21	Where visible dust emissions are observed appropriate management actions would be implemented to prevent impact.					✓				✓
H22	In the event of an odour complaint, an evaluation would be undertaken to confirm if the demolition works are the source of the odours. If the demolition works are confirmed as a potential ongoing odour source additional mitigation measures would be implemented which could include the use of water sprays to suppress odours and, if necessary, the use of odour suppressants. Off-site olfactory observations and VOC monitoring using equipment would also be undertaken if necessary. In the event of ongoing odour issues, excavation activities would be stopped and if necessary the excavation covered or backfilled.					✓	✓			✓
H23	In line with Caltex's existing procedure, following a complaint and its subsequent investigation, feedback regarding the source and nature of the complaint would be provided to the affected community members.					✓	✓			✓
H24	Dust deposition monitoring would be undertaken during the demolition works (as per AS/NZS 3580). This would include monitoring points in appropriate locations on the Site boundary and in Kurnell.					✓				✓
H25	The on-site real time ambient air quality monitoring station would continue to operate throughout the demolition works. This station continuously monitors for PM_{10}, wind direction and speed, temperature and humidity and rainfall.					✓	✓			✓
H26	A summary of the air quality monitoring data for the demolition works would be provided to the community during Caltex's quarterly community meeting.					✓	✓			✓

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H27	The DEMP would include a subplan: the Containment Cell Management Plan. With regards to air quality, this subplan would include: • A brief overview of the containment cell operations relevant to potential air emission sources. • Identification of mitigation measures for each respective emission source including those measures outlined in the DEMP for the Site (where relevant to operations within the containment cell area). • Details of proposed monitoring and recordkeeping procedures. During the production of this plan the NSW EPA *Guidelines for Environmental Management On-Site Remediation*, would be reviewed and if necessary relevant measures incorporated.						✓			
H28	The Containment Cell Management Plan would be prepared and include the following mitigation measures: • A Soil Acceptance Criteria which identifies: - Only soil contaminated with airborne asbestos* (referred to in the ACS Modification works as ACS) from the Site (as defined by Figure 1-2 in the SEE) would be accepted into the containment cell. - Soils entering the containment cell from the Site but outside of the pipeways must be classified in accordance with the NSW EPA Waste Classification Guidelines 2014, as either special general solid waste or special restricted solid waste. - All soils, regardless of their classification under the NSW EPA Waste Classification Guidelines 2014 from the pipeways on the Site (as shown on Figure 1.2 of the SEE) would be disposed of in the containment cell. - The total volume of ACS would be limited by the design specifications final landform. • Prior to the commencement of filling activities dust and aerosol monitoring stations would be placed at a minimum of six locations around the working						✓			

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	area with the objective of monitoring prevalent upwind and downwind locations. • Soil moisture content will be managed to ensure that it is greater than 15% in order to minimise potential particulate matter and asbestos [fibre] emissions to the maximum extent practicable by wetting of soils during filling of cell to minimise the generation of dust. • Directed water sprays will be used when required throughout ACS handling operations. • A biodegradable cover would be sprayed over ACS in the containment cell to minimise the generation of dust. The cover would be applied following the placement of ACS within the containment cell, and at the end of each day. • Limiting potentially dust generating activities during high wind events (i.e. >8m/s hourly average or in severe wind gust conditions) • Stockpiles will be maintained in a moist condition when not covered, and be covered if not in use or left overnight. • Completed areas of the works area will be revegetated with native grasses as soon as is practicable. *Note - Airborne asbestos means any fibres of asbestos small enough to be made airborne (Safe Work Australia, April 2016, Code of Practice: How to Safely Remove Asbestos)									

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H29	The DEMP and relevant sub plans (e.g. Asbestos Management Plan and Containment Cell Management Plan) would be revised to include the following measures: • a defined exclusion zone around the work area within which only staff who have been appropriately inducted in relation to the site procedures are permitted entry • wetting of soils during excavation and disturbance works to minimise the generation of dust • an Asbestos Removal Control Plan which identifies appropriate procedures for personal protective equipment; staff induction and decontamination of equipment • preparation of an asbestos monitoring and management plan to account for the activities that may liberate asbestos into the atmosphere. Dust and aerosol monitoring would occur in areas of the Site where asbestos in soil has been identified or is suspected to occur (including the pipeways) together with monitoring and analysis methods, exposure and control criteria and contingencies that will be implemented in the event specific exposure control criteria are exceeded.						✓			
Transport and Access										
I1	Local Authorities and Kurnell residents would be informed of any Project related work which would affect the road network.		✓			✓	✓			✓
I2	A Traffic Management Plan would be developed for the construction/demolition phase. The Traffic Management Plan would comply with all relevant Regulations and By-Laws and in particular address safe access and egress to the public road network. The Transport Management Plan would include: • hours of permitted vehicle activity; • designated routes for construction and demolition traffic and defined access		✓			✓	✓			

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	points to the Site and demolition works area; • duration of works; • permitted demolition vehicle types; • designated areas within the Site and demolition works area for truck turning movements, parking, loading and unloading to allow heavy vehicles to enter and leave the Site and demolition works area in a forward direction; • sequence for implementing traffic management measures should these be required; and • procedures and/or principles for construction and demolition vehicle speed limits and the safe operation of construction and demolition vehicles; and • coordination of off-site heavy vehicle movements from the demolition works and ACS Modification works to ensure that heavy vehicle movements do not exceed 60 movements per day.									
I3	Works to remove pipelines from under the road reserves in Kurnell would not take place before a road opening application has been approved by Sutherland Shire Council and on the days the following events are taking place: • Australia Day (January); • The Festival of Kites (May); • The Boree Regatta (October). and • Water events for the Australian Scout Jamboree (first two weeks of January 2016).				✓	✓				
I4	Traffic related to the ACS Modification works would be managed under the Traffic Management Plan that forms a sub-plan to the DEMP						✓			

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Heritage										
J1	A Heritage Management Strategy would be prepared for the Australian Oil Refinery prior to shut-down of the refinery plant, to provide Caltex with a basic framework for the ongoing management of the Site's heritage during present and future works. The Strategy would include a review of the heritage significance of the overall Site. The review would clarify the extent and relative heritage value of the place by identifying key elements of industrial and built heritage as well as social values of the refinery, and the relative contribution of these elements to the overall significance of the Site. Recommendations would also address the future assessment and management of memorabilia and other significant items of moveable heritage maintained on-site.	✓								
J2	If any further heritage items were discovered throughout the Project, work would cease until an assessment is carried out by a qualified heritage professional.	✓	✓			✓	✓			✓
J3	An archival photographic record of the existing fabric and operations of the Kurnell Refinery would be prepared while the plant is still operational, and during the decommissioning process. The recording would be undertaken in accordance with the Heritage Council guidelines on *Photographic Recording of Heritage Items Using Film and Digital Capture* (2006). The archival recording would be maintained for the appreciation of present and future generations. To this end, the recording would be lodged with the Sutherland Shire Library and NSW State Library.	✓	✓							
J4	The Heritage Management Strategy (HMS) and the management strategies within it would continue to be implemented.				✓	✓			✓	✓
J5	Opportunities to adaptively reuse redundant buildings identified in the HMS as having high or moderate heritage significance would continue to be reviewed prior to final demolition works.				✓	✓				

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J6	The sculptural panels by Bert Flugelman would be retained and preserved.				✓	✓				
J7	Sandstone blocks from the informal sandstone wall along Silver Beach would be set aside in a secure location prior to works, and reinstated in the same location following removal of the cooling water outlet pipeline.				✓	✓				
J8	Appropriate mitigation measures would be implemented to reduce the likely damage to the interpretive footpath in front of the driveway entrance to the Kurnell Wharf. Measures would include: • Making a record of the current state of the pavement. • Removing the affected pavement in sections and storing these sections in a secure location. • Reinstating the pavement in the same location following the removal of pipelines; • If this is not practicable, a similar pavement treatment and a matching or compatible interpretative design would be reinstated.				✓	✓				
J9	If historical archaeological relics are unexpectedly found during the demolition works, works in the area of the relics would cease and the Heritage Council of NSW would be notified.					✓	✓			✓
J10	A Stop Works procedure would be implemented should any Aboriginal Heritage items be found. Works would cease at the vicinity of the item and OEH would be notified as soon as possible					✓	✓			✓
J11	If any human remains are disturbed, all work in the vicinity of the remains would stop immediately and the remains would not be further disturbed or moved. Works would cease at the vicinity of the item and OEH and NSW Police would be notified as soon as possible.					✓	✓			✓
J12	Prior to works commencing, all personnel and contractors involved in ground disturbance works would be briefed on the procedures to follow if human remains				✓	✓	✓		✓	✓

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	or unexpected heritage items are found.									
J13	As part of the DEMP, a Heritage Management Section will be developed. This will incorporate previous Management and Mitigation Measures that are not already included in the HMS.				✓	✓	✓			
Ecology										
K1	A Biodiversity and Weed Management Plan (BWMP) would be prepared in order to limit and control the spread of noxious weeds within the Site/demolition works area. It would include the following: • wash down procedures to reduce the spread of weeds via vehicles and machinery; • measures to target potential new weed outbreaks including soil stockpiles and any other disturbed areas; • outline monitoring programs for noxious and problematic weeds on site and in the surrounding areas; • measures for strict stockpiling control to help eradicate all noxious weeds as per NSW DPI specifications for Sutherland Shire LGA; • include a list of 'frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO for the control of noxious weeds; and ensure that only amphibian friendly herbicides are used; • wash down protocols for construction/demolition vehicles and machinery to prevent the spread of root-rot fungus (*Phytophthora cinnamomi*) and noxious weeds; • all personnel undertaking routine management activities of any noxious weeds should be appropriated trained and all contractors should hold the necessary permits and licenses. Noxious weed information sheets would be provided to demolition contractors to help identification of relevant noxious weeds.	✓	✓	✓	✓	✓				

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
K2	A BWMP would be prepared in order to limit potential impacts to existing vegetation outside of the area of proposed works, but within the Site. It would include the following: • existing vegetation on Site would be clearly marked on all Site plans and construction diagrams, with clear indications of no-go zones within all vegetated areas; • existing vegetation would be clearly signposted and fenced off prior to the commencement of construction activities, and should remain fenced off until the completion of works (as per the Vegetation Exclusion Zones shown on Figure 17-1); and • absolutely all works would be limited to the defined construction/demolition footprint.	✓	✓	✓	✓	✓				
K3	To minimise the potential for impacts to native fauna species, the BWMP would be developed and include following measures: • if any frogs are found within the Project Area, works would cease until frogs have been relocated to areas outside the area of impact; • if any threatened frogs e.g. Green and Golden Bell Frog or Wallum Froglet are identified within the Site, works would cease and active searching should be undertaken by a qualified zoologist experienced in the identification and management of the Green and Golden Bell Frog and Wallum Froglet; • all trenches would be inspected prior to works each morning. Any frogs that become trapped within trenches would be assessed by a suitably qualified ecologist or veterinarian and then released into the nearest suitable habitat if uninjured; • identification sheets would be provided to all construction workers on Site for the two threatened frog species predicted to occur within the Site; • wash down protocols to prevent the spread of Amphibian Chytrid Disease	✓	✓	✓						

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	(chytridiomycosis) would be implemented at relevant work areas. Protocols would be consistent with OEH guidelines (DECC, 2008b); • 'frog-friendly' and 'wetland friendly' herbicides such as Roundup Biactive or Weedmaster DUO would be used for the control of noxious weeds; and • if fauna are found to be utilising the Site, or a nest, den or roost is found, work in the immediate area is to stop and the animals are to be allowed to move off freely, or relocated by an authorised person to an area outside the construction footprint.									
K4	To minimise the potential impacts to native fauna during the demolition works the following measures would be included in the BWMP: • demolition workers would be provided with identification sheets relating to the threatened fauna species predicted to occur within the Site. • Stop work procedures would be implemented during the works on the chance encounter of any dispersing threatened frogs or the identification of nesting Pied Oystercatcher, Little Tern, Osprey or White-bellied Sea-eagle to avoid death or injury to frogs dispersing across the study area, or disturbance to nesting threatened birds. • Trenches/holes would be back-filled daily or covered overnight. Where this is not possible, other measures would be considered to prevent and/or mitigate fauna entrapment. Trenches/holes would be inspected prior to works each morning. Injured frogs that become trapped within trenches would be assessed by a veterinarian or ecologist. Uninjured frogs would be captured and released into the nearest suitable habitat to the south of the study area. • If threatened frogs, Green and Golden Bell Frog or Wallum Froglet are identified during demolition works, active searching would be undertaken by a qualified zoologist experienced in the identification and management of the Green and Golden Bell Frog and Wallum Froglet. • When open trenching/digging/excavating, Caltex would ensure that				✓	✓				

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
	exclusion fencing is erected prior to works commencing each morning. Exclusion fencing shall be maintained during all seasons of the year, given the active season for the Green and Golden Bell Frog extends from September to April and the Wallum Froglet peak activity period occurs during the colder months. • If practicable, works at Silver Beach to remove the cooling water outlet should be completed outside of the known nesting periods for Pied Oystercatcher (August to January) and Little Tern (Spring/Summer). If nesting shorebirds are encountered in the Silver Beach foreshore area in the vicinity of works (within 20 m), works at Silver Beach would cease, a qualified zoologist would be consulted and appropriate actions would be implemented, prior to works recommencing. • If practical, works to remove tall structures on-site should be completed outside of the known nesting periods the threatened bird species (July to September for Osprey and June to January for White-bellied Sea-eagle). If not practical then tall structures would be inspected for active nests prior to commencing the demolition works.									

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
K5	The following recommendations, would be contained in the Cooling Water Outlet Management Plan for managing the potential marine ecology impact and implemented during demolition works: • silt curtains would be installed seaward of the demolition works area but not directly above existing seagrass communities; • all plant and equipment used in the water column would be appropriately prepared, checked and cleaned to avoid potential release of contaminants; • plant and equipment used in the water column would be inspected to ensure fragments of the invasive algae Caulerpa taxifolia are not present; • spill kits would be used to contain and clean up any spills from demolition plant and equipment. Spill kits would be located within 20 m of demolition plant and equipment; and • demolition works at Silver Beach (particularly those located in the water column) would be timed such that they do not coincide with high-tide conditions or during significant wave action.				✓	✓				
K6	Following the removal of the continental carbon pipeline and other infrastructure Caltex would develop a strategy to manage the redundant right of way (CCROW). The strategy would include measures to: • remove fencing, reprofile and allow natural regeneration the southern part of the CCROW (beyond the southern boundary of the Site) to promote consistent and connected vegetative communities across the southern part of Caltex's ownership; • remove and keep out noxious and invasive weeds, especially during the regeneration phase; and • reprofiling of the CCROW could include creating gaps in the raised easement to allow for hydrological exchange and habitat regeneration.					✓				

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
K7	Caltex would undertake the following prior to excavation along the Continental Carbon Right of Way: • pre-clearing inspections; and • implementing frog exclusion measures to ensure dispersing frogs are not captured and trapped in trenches during pipeline removal (e.g. exclusion fencing).					✓				
Coastal Processes										
L1	A Cooling Water Outlet Management Plan would be developed as part of the Demolition Environment Management Plan (DEMP). Rehabilitation works at Silver Beach would be in accordance with this Cooling Water Outlet Management Plan. The following measures would be included:				✓	✓				
L2	A detailed survey of the likely extent of the disturbed area at Silver Beach would be undertaken prior to commencing demolition works to ensure that the pre-existing topography is re-established following the works.					✓				
L3	The affected sand dunes (including the back-beach and sub-aerial beach) would be re-instated using the stockpiled overburden sand and if necessary, additional sand. Additional sand used for reinstating sand dunes would be of similar particle size and composition as the overburden sand.					✓				
L4	The affected sand dunes would be restored to match the previously surveyed topography. A smooth profile from the back-beach area to the dune would be re-established to ensure the aerodynamics are as consistent as possible with the undisturbed areas adjacent to the disturbed area. If necessary, liquid sprays or geotextiles would be used to help stabilise the beach and protect against erosion.					✓				

Item	Management and Mitigation Measure	Conversion (SSD 5544)			Demolition (SSD 5544 MOD1)		ACS Works (SSD 5544 MOD2)		Tank 101 demolition works (MOD3)	
		CD	Conv	Op	DD	Dem	Con	Op	DD	Dem
L5	The affected sand dunes would be re-vegetated using indigenous, native flora. The existing vegetation is limited to grasses, with no woody vegetation. The area would be re-planted with similar grass species in a manner that ensures minimal loss of wind-blown sand from the dune while the area is re-vegetating. All re-vegetated areas would: • contain signage to highlight these areas as rehabilitation zones that prohibit public and vehicular access; • be temporarily fenced, and • be maintained and monitored until vegetation is established using approved dune rehabilitation methods.							✓		
L6	Material of a similar sediment size and colour characteristics would be used as back fill material for the trench below the low tide mark. To account for later settling and consolidations, some overfilling would be undertaken to account for later consolidation (approximately 10 % would be recommended).							✓		

14.2 Environmental Management

14.2.1 Overview

Current operations at the Site comply with relevant legislative and regulatory requirements including EPL no. 837. This EPL is regularly updated to ensure the management of the Site meets certain environmental requirements. As the operations on the Site change the EPL will continue to be updated to ensure that it remains relevant to the activities being undertaken.

In order to maintain compliance with relevant legislative and regulatory requirements, Caltex implements an Environmental Management System (EMS). The EMS consists of a suite of internal policy documents and plans. The EMS is overseen by a dedicated member of the Caltex Environment Team. This EMS would continue to apply to all Tank 101 demolition works.

This SEE has outlined a suite of measures that would assist in avoiding, mitigating or managing the anticipated impacts associated with the Tank 101 demolition works. These measures would be incorporated into the modified conditions of consent for the Project. During the Tank 101 demolition works all relevant measures would be implemented through the DEMP, associated existing sub-plans or other means.

The DEMP would be updated to cover additional measures identified within **Chapters 8.0** to **14.0** of this SEE as required.

The DEMP and all associated sub-plans would help ensure that:

- all work complies with all relevant environmental legislation, regulations and standards;
- environmental factors are taken into account for each activity;
- maintenance of environmental compliance and performance is achieved through ongoing environmental monitoring and reporting; and
- regular audits are performed to confirm compliance with environmental policies and standards.

Any operational measures included in this SEE would be incorporated into the existing OEMP for the Site and operating procedures currently in place at the Site.

14.2.2 The DEMP

The DEMP outlines the procedures that would be implemented to address and manage environmental impacts associated with Tank 101 demolition works for the Project. The DEMP would be updated by Caltex prior to commencement of Tank 101 demolition works.

The primary purpose of the DEMP is to provide a reference document outlining the relevant safeguards and mitigation measures that are in line with the conditions of consent, and ensure that these are implemented and maintained. The DEMP would outline the key steps to be taken by personnel and contractors to manage the environmental hazards and risks associated with the Tank 101 demolition works and to effectively minimise the potential for environmental harm. The DEMP would be subject to ongoing review throughout the Tank 101 demolition works period.

The DEMP shall include the following:

- a description of the demolition works and Tank 101 demolition works;
- an outline of the proposed demolition works and Tank 101 demolition works program;
- relevant statutory requirements – including applicable licences and approvals;
- standards and/or performance measures for the relevant environmental issues associated with the demolition works and Tank 101 demolition works;
- a description of what actions and measures would be implemented to mitigate the potential impacts associated with the demolition works and Tank 101 demolition works and ensure that these works would comply with the relevant standards and/or performance measures;
- a description of the procedures to ensure all personnel and contractors are trained in regards to their responsibilities under the DEMP;

- a description of the procedures that would be implemented to register, report and respond to complaints during the demolition works and Tank 101 demolition works;
- a description of the procedures that would be implemented to manage environmental incidents and associated reporting requirements;
- identification of key personnel who would be involved in the demolition works and Tank 101 demolition works, and provide their contact numbers;
- monitoring procedures and a description of the process to be followed if any non-compliance is identified; and
- detailed sub-plans including:
    - Soil and Water Management Plan (incorporating the Contamination Management Plan, Acid Sulfate Soils Management Plan and Groundwater Management Plan);
    - Asbestos Management Plan (Management of Asbestos, Asbestos Containing Materials and Synthetic Mineral Fibres Guidance Document (Caltex, 2015);
    - Noise and Vibration Management Plan (NVMP);
    - Air Quality Management Plan (AQMP);
    - Traffic Management Plan (TMP);
    - Biodiversity and Weed Management Plan (BWMP); and
    - Demolition Waste and Resource Management Plan.

These items are consistent with the management measures presented in **Table 14-1**.

14.2.3 The OEMP

An Operational Environmental Management Plan (OEMP) has been recently developed for the Kurnell Terminal. This OEMP would be updated to include the measures outlined in **Table 14-1** above, should the Tank 101 demolition works be granted consent.

15.0 Revised Conditions of Consent

The conditions of consent provided in SSD 5544 (7 January 2014), SSD 5544 MOD1 (10 August 2015) were reviewed based on the outcomes of the assessments within this SEE to determine their relevance to the Tank 101 demolition works. **Table 15-1** identifies which conditions are relevant and if so, where a condition requires updating.

Table 15-1 Relevant Conditions of Consent for the Tank 101 demolition works

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544	Schedule A	Site Characteristics	Relevant - no change needed
SSD 5544	B1	Obligation to minimise harm to the environment	Relevant – update to include reference to this Modification and conditions of this consent
SSD 5544	B2	Terms of consent – in accordance with specified documents	Relevant – no change needed
SSD 5544	B3	Terms of consent – inconsistency of above documents	Relevant – no change needed
SSD 5544	B4	Terms of consent – comply with Director-General requirements	Relevant – no change needed
SSD 5544	B5	Terms of consent – public availability of documents	Relevant – no change needed
SSD 5544	B6	Limits of consent – not store in excess of 925 ML of refined product on the Site	Not relevant
SSD 5544	B7	Limits of consent – construction works shall not exceed five years from date of approval	Relevant – update to include timeframe for Tank 101 demolition works
SSD 5544 MOD1	B7A	The demolition works associated with the development shall not extend beyond three (3) years from the date of consent of MOD1	As above
SSD 5544	B8	Lapsing of consent – consent shall lapse five years from date of consent	Relevant – no change needed
SSD 5544	B9	Surrender of existing development consents	Not relevant - completed
SSD 5544	B10	Surrender of existing development consents Da 13/195 – stormwater drainage upgrade DA 12/0238 – Construction of a switch room	Not relevant
SSD 5544	B11	Nothing in this consent alters or modifies other development consents for the Site	Relevant – no change needed

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544	B12	Statutory requirements – all licences, permits and approval/consents are obtained	Relevant – no change needed
SSD 5544	B13	Amended environment protection licence (EPL) requirement – apply to vary the EPL to permit Development	Not relevant
SSD 5544 MOD1	B13A	Amended environment protection licence (EPL) requirement – apply to vary the EPL for demolition works	Not relevant
SSD 5544	B14	Structural adequacy – new buildings and structures and any alterations or additions are constructed in accordance with the Building Code of Australia	Not relevant
SSD 5544 MOD1	B15	DELETED	Not relevant
SSD 5544	B16	Operation of plant and equipment – ensure plant and equipment is maintained and operated in proper and efficient condition	Relevant – no change needed
SSD 5544 MOD1	B16A	Cooling Water Outlet Pipeline Removal	Not relevant
SSD 5544	B17	Protection of public infrastructure – prepare and submit a copy of the dilapidation report	Not relevant – completed
SSD 5544 MOD1	B17A	Protection of public infrastructure – prepare and submit a copy of the dilapidation report – demolition works	Not relevant – completed for demolition works
SSD 5544	B18	Protection of public infrastructure – repair./relocate public infrastructure that is damaged by the development	Relevant – no change needed
SSD 5544	B19	Staged submission of plans or programs – submit plans etc. on a progressive basis or combine plans etc.	Relevant – no change needed
SSD 5544	B20	Dispute resolution – refer matter to the Director-General	Relevant – no change needed
SSD 5544	B21	Compliance – employee, contractor and sub-contractor awareness of consent	Relevant – no change needed
SSD 5544	B22	Compliance – the Applicant is responsible for environmental impacts	Relevant – no change needed
SSD 5544	C1	Terms of Approval – carry out and implement measures and actions	Relevant – no change needed

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544 MOD1	C1A	Terms of Approval – carry out recommendation in the *Hazard and Risk Analysis of the proposed Caltex Kurnell Refinery demolition Works*	Relevant – no change needed
SSD 5544 MOD1	C1B	Terms of Approval – demolition works will be carried out in accordance with relevant Australian Standards / WHS Regulation 2011	Relevant – no change needed
SSD 5544 MOD1	C1C	Terms of Approval – major demolition works are undertaken by licensed demolition experts	Relevant – No change needed
SSD 5544	C2	Commissioning timetable	Not relevant
SSD 5544	C3	Pre-construction – prepare and submit studies	Not relevant
SSD 5544 MOD1	C3A	Pre-demolition – prepare and submit studies	Not relevant – completed
SSD 5544	C4	Pre-commissioning – prepare emergency plan and safety management system	Not relevant – superseded by condition C4A
SSD 5544 MOD1	C4A	Pre-demolition – prepare emergency plan	Relevant – no change needed
SSD 5544	C5	Pre-commissioning plan and pre-startup review checklists for assets in C2.	Not relevant
SSD 5544	C6	Pre-startup Compliance Report (C2 assets)	Not relevant
SSD 5544	C7	Post-startup Compliance Report (C2 assets)	Not relevant
SSD 5544 MOD1	C7A	Fire Safety Study Review – one month prior to completion of the demolition works	Relevant – no change needed
SSD 5544	C8	Ongoing – Hazard audits	Relevant – no change needed
SSD 5544	C9	Ongoing – further requirements, comply with measures in reports submitted	Relevant – no change needed
SSD 5544 MOD1	C9A	Fire Risk Management during demolition	Relevant – no change needed
SSD 5544	C10	Discharge of Water – comply with section 120 of the Protection of the Environment Operations Act 1997	Relevant – no change needed
SSD 5544	C11	Erosion and sediment control – implement suitable erosion and sediment control measures	Relevant – no change needed

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544 MOD1	C11A	Imported Soil – permitted to use only VENM or other material that meets the conditions of the Resource Recovery Order, record keeping	Relevant – no change needed
SSD 5544 MOD1	C11B	Implement suitable erosion and sediment control measures	Relevant – no change needed
SSD 5544)	C12	Water Management Plan – prepare and implement	Relevant – no change required
SSD 5544 MOD1	C12A	Soil and Water Management Plan – include measures for stockpiling and corrective actions	Relevant – no change required
SSD 5544 & SSD 5544 MOD1	C13 /13A	Groundwater – interception of groundwater	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C14 / 14A	Acid sulfate soils (ASS) management plan – prevent further oxidation and cease work	Relevant – no change needed
SSD 5544	C15	Contamination management – prepare and implement a contamination management plan	Relevant – no change needed
SSD 5544 MOD1	C15A	Contamination management – update the plan to include measures for identification, monitoring and management of potential contaminated soils and groundwater	Relevant – no change needed
SSD 5544 MOD1	C15B	Asbestos management – asbestos encountered during demolition work is monitored, handled, transport and disposed appropriately	Relevant – no change needed
SSD 5544 MOD1	C16	Construction noise limits – comply with specific criteria	Relevant – no change needed
SSD 5544	C17	Operation noise limits – comply with specific criteria	Relevant – no change needed
SSD 5544 MOD1	C18	Hours of construction and operation – comply with specified hours	Relevant – no change needed
SSD 5544 MOD1	C19	Hours of construction and operation – high noise generating construction to comply with specified hours	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C20	Hours of construction and operation – work outside of specified hours	Relevant – no change needed
SSD 5544	C21	Operating Conditions – comply with specified items during operation	Relevant – no change needed

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544	C22	Noise management plan – prepare and implement	Relevant – no change needed
SSD 5544 MOD1	C22A	Noise management plan – update to include demolition works	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C23	Construction vibration – aim to achieve specified vibration goals	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C24	Dust generation during construction – carry out all reasonable and feasible measures to minimise dust	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C25	Dust generation during construction – trucks to be covered, not to track dirt onto roads and remove dirt from public roads	Relevant – no change needed
SSD 5544	C26	Offensive odour – do not cause or permit emission of offensive odours during operation	Relevant – no change needed
SSD 5544	C27	Operating condition – implement dust and dour mitigation measures, prevent air quality impacts	Relevant – no change needed
SSD 5544	C28	Air quality management plan – prepare and implement	Relevant – no change needed
SSD 5544 MOD1	C28A	Air quality management plan – update the pan to include procedures for VOC, odour and dust monitoring	Relevant – no change needed
SSD 5544	C29	Air quality verification of operations - carry out study	Relevant – no change needed
SSD 5544	C30	Archival Record – heritage management	Not relevant - complete
SSD 5544	C31	Heritage Management Strategy	Relevant – no change needed
SSD 5544 MOD1	C31A	Heritage Management Strategy – continued implementation during demolition works	Relevant – No change needed
SSD 5544	C32	Heritage management and mitigation measures	Not relevant - complete
SSD 5544 MOD1	C32A	Adaptive reuse capabilities of significant buildings	Not relevant
SSD 5544 MOD1	C32B	Archival records of items to be demolished	Relevant – no change needed
SSD 5544 MOD1	C32C	Pipeline removal works on Silver Beach – implement recommendations in the Heritage Impact Assessment	Not relevant

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544 & SSD 5544 MOD1	C33	Potential for discovery of Aboriginal and Non-Aboriginal objects – cease works and notify (heritage objects)	Relevant – no change needed
SSD 5544	C34	Potential for discovery of Aboriginal and Non-Aboriginal objects – cease works and notify (Aboriginal objects)	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C35	Managing energy efficiency & greenhouse gas emissions – implement measures	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C36 / C36A	Traffic management plan – prepare and implement	Relevant – no change needed
SSD 5544 MOD1	C36B	Pipeline removal works along road reserves limited times	Not relevant
SSD 5544 & SSD 5544 MOD1	C37	Car parking – provide sufficient facilities for construction personnel	Relevant – no change needed
SSD 5544 MOD1	C37A	Review of Cook Street approach	Not relevant
SSD 5544	C38	Waste management on-site – minimise, store, handle and dispose of appropriately	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	C39	Waste management on-site – classification of waste	Relevant – no change needed
SSD 5544 MOD1	C39A	Hazardous materials identified in structures to be demolished are removed prior to demolition	Relevant – no change needed
SSD 5544 MOD1	39B	Reuse of materials on site must be fit for purpose and must not result in any adverse impacts to the environment	Relevant – no change needed
SSD 5544 MOD1	39C	Sort waste to maximise opportunities for the beneficial reuse and recycling of such waste materials	Relevant – no change needed
SSD 5544	C40	Waste management plan – prepare and implement	Relevant – no change needed
SSD 5544 MOD1	C40A	Waste management plan – prepare and implement	Relevant – no change needed
SSD 5544	C41	Waste management from off-site – do not cause, permit or allow waste generated from outside the site to be received at the site	Relevant – no change needed
SSD 5544 MOD1	C41A	Cooling water outlet pipeline removal – minimise disturbance of *Caulerpa taxifolia*	Not relevant
SSD 5544	C42	Biodiversity management plan – prepare and implement	Relevant – no change needed

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544 & SSD 5544 MOD1	C43 / 43A	Pest, vermin & noxious weed management – implement suitable management measures	Relevant – no change needed
SSD 5544 MOD1	43B	Continental Carbon Pipeline – strategy for weed management and removal	Not relevant
SSD 5544 MOD1	C43C	Cooling water outlet management plan – prepare and implement	Not relevant
SSD 5544	C44	Protection of Marton Park Wetland – measures implemented for sedimentation, erosion, contamination from stormwater.	Relevant – no change needed
SSD 5544	C45	Lighting – ensure lighting complies and relevant standard and does not cause a nuisance	Relevant – no change needed
SSD 5544	C46	Signage and fencing – no advertising to be installed	Relevant – no change needed
SSD 5544	C47	Site security – ensure fencing and security is installed and gates are locked	Relevant – no change needed
SSD 5544	D1	Construction environment management plan – prepare and implement	Not relevant – superseded by D1A
SSD 5544 MOD1	D1A	Demolition environment management plan – prepare and implement	Relevant – no change needed
SSD 5544	D2	Operation environmental management plan – prepare and implement	Relevant – no change needed
SSD 5544	D3	Management plan requirements – prepared in accordance with relevant guidelines and include specific items	Relevant – no change needed
SSD 5544	D4	Annual review – review environmental performance	Relevant – no change needed
SSD 5544	D5	Revision of strategies, plan & programs – within 3 months conduct reviews and audits	Relevant – no change needed
SSD 5544	D6	Incident reporting – notify incidents	Relevant – no change needed
SSD 5544	D7	Independent environmental audit – conduct audit	Relevant – no change needed
SSD 5544	D8	Independent environmental audit – submit a copy of the audit	Relevant – no change needed
SSD 5544 & SSD 5544 MOD1	D9	Access to information – make information available on the internet	Relevant – update to include reference to the Tank 101 demolition works SEE

Development Consent Document	Condition No.	Condition Title and Summary	Relevance to Tank 101 works
SSD 5544	Appendix A	Figure 2 – Proposed development plan	Relevant – update to include a Figure showing the Tank 101 demolition works area
SSD 5544	Appendix B	Consents to be surrendered	Not relevant
SSD 5544 & SSD 5544 MOD1	Appendix C	Management and mitigation measures	Relevant – update to include additional management measures associated with the Tank 101 demolition works

16.0 Evaluation and Justification

16.1 Introduction

This chapter provides an evaluation of the proposed Tank 101 demolition works and the outcomes of this SEE, including a discussion of the justification for proceeding with the Tank 101 demolition works. The chapter also provides:

- an environmental risk assessment (ERA);
- an assessment of the Tank 101 demolition works against the principles of Ecologically Sustainable Development (ESD);
- a description of the Tank 101 demolition works benefits;
- consideration of the consistency of the Tank 101 demolition works with the objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act); and
- the justification for the Tank 101 demolition works.

16.2 Environmental Risk Assessment

The following ERA provides an analysis of the environmental risks that have been identified and outlined as part of this SEE.

An initial qualitative environmental scoping exercise was completed in **Chapter 7.0 Environmental Scoping Assessment**. This exercise identified the key environmental issues for the Tank 101 demolition works, described them and categorised them according to their risk of impact.

The SEE process has confirmed the potential environmental impacts associated with the Tank 101 demolition works, proposed mitigation measures for those impacts and potentially significant residual environmental impacts which still exist after the application of the proposed mitigation measures.

This ERA was undertaken using the methodology described below to determine the risk associated with each environmental issue. The ERA has been based upon the methodology outlined in Standards Australia's document *HB 203:2006 Environmental Risk Management – Principles and Process*, Australian Standard AS/NZ 4360:2004 Risk Management, and AS/NZS ISO 31000:2009 *Risk Management – Principles and Guidelines*.

The analysis categorised levels of risk for a given event based on the significance of effects (consequences) and the manageability of those effects (likelihood). The measures of likelihood categories and the measures of consequences categories as well as the risk ranking matrix are detailed in **Table 16-1**, **Table 16-2** and **Table 16-3** below.

Table 16-1 Measures of probability categories for the ERA

Rank	Likelihood	Description
A	Almost Certain	Happens often and is expected to occur
B	Likely	Could easily happen and would probably occur
C	Possible	Could happen and has occurred elsewhere
D	Unlikely	Unlikely to happen but may occur
E	Rare	Could happen, but only in extreme circumstances

Table 16-2 Measures of consequent categories for the ERA

Rank	Consequence	Description
1	Extreme	Permanent and catastrophic impacts on the environment; large impact area; reportable incident to external agency; large fines and prosecution; operational constraints; substantial community concern.
2	Major	Permanent and detrimental impacts on the environment; large impact area; reportable incident to external agency; may result in large fines and prosecution; operational constraints; high level of community concern.
3	Moderate	Substantial temporary or minor long term detrimental impacts on the environment; moderate impact area; reportable incident to external agency; action required by reportable agency; community interested.
4	Minor	Minor detrimental impacts on the environment; small impact area; reportable incident internally; no operational constraints; some local community interest.
5	Low	Nil or temporary impacts on the environment; small or isolated impact area; not reportable incident; no operational constraints; uncontroversial project no community interest.

Table 16-3 Risk Matrix for ERA

		CONSEQUENCES				
		1 Extreme	2 Major	3 Moderate	4 Minor	5 Low
Likelihood	A (Almost Certain)	VH	VH	H	H	M
	B (Likely)	VH	H	H	M	M
	C (Possible)	H	H	M	M	L
	D (Unlikely)	H	M	M	L	L
	E (Rare)	H	M	L	L	L

Risk Matrix is defined as follows: VH = Very High, H = High, M = Medium and L = Low.

Taking into account the location and nature of the Tank 101 demolition works, the mitigation measures described in **Chapters 8.0** to **13.0**, the Cumulative Impact Assessment in **Chapter 13.0** and the commitments provided in **Chapter 14.0 Revised Management and Mitigation Measures**, **Table 16-4** provides an assessment of the mitigated risks associated with the Tank 101 demolition works, or the residual risk analysis. This has been completed for each potential environmental impact identified in **Table 16-4** based on the likelihood of occurrence and potential environmental consequence.

Table 16-4 Environmental Risk Analysis

Notes: PL: Potential Likelihood; PC: Potential Consequence; RP: Residual Likelihood; RC: Residual Consequence

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
Soils, Water and Contamination Chapter 8	Erosion of soils resulting in sedimentation of stormwater during demolition.	C	3	M	The Tank 101 demolition works would be undertaken in accordance with the existing Soils and Water Management Plan which forms part of the DEMP for the Project. This plan outlines management measures for soils that are excavated or stored on-site during the Tank 101 demolition works. Specific mitigation measures are contained in **Chapter 8.0 Soil, Water and Contamination**.	D	4	L
	Mobilisation of contamination from soils during excavation works.	C	3	M	The Tank 101 demolition works would be undertaken in accordance with the existing Soils and Water Management Plan which forms part of the DEMP for the Project. This plan outlines measures for managing contaminated soils and contaminated groundwater. Specific mitigation measures are contained in **Chapter 8.0 Soil, Water and Contamination**.	D	4	L
	Disruption of Acid Sulfate Soils (ASS) during excavation works.	D	3	M	The Tank 101 demolition works would be undertaken in accordance with the existing ASS Management Plan which has been prepared in accordance with the *ASS Manual (ASS Management Advisory Committee 1998)* if ASSs were encountered during the Tank 101 demolition works.	D	5	L

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
	Spills and leaks from demolition equipment and run-off from stockpiles potentially contaminating soil and groundwater.	C	3	M	The Tank 101 demolition works would be undertaken in accordance with the existing Soils and Water Management Plan which forms part of the DEMP for the Project. This plan recommends measures for management of spills and leaks. Other measures to be included in this plan are outlined in **Chapter 8.0 Soil, Water and Contamination**.	D	4	L
	Increased infiltration of groundwater during removal of hardstand/concrete areas.	D	3	M	The Tank 101 demolition works would be undertaken in accordance with the existing Soils and Water Management Plan which forms part of the DEMP for the Project. This plan outlines measures to help to prevent the infiltration of contaminated run off. It also requires annual groundwater monitoring to continue during the Tank 101 demolition works and contains a corrective action plan for if COPC increases are identified.	D	4	L

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
	Potential impacts on stormwater such as erosion, sedimentation impacts.	D	4	L	Management of stormwater and stockpiles soils would be in accordance with *The Blue Book* (Landcom, 2004). – Stormwater captured on-site would be managed through the existing systems (e.g. if impacted it would be diverted via the WWTP). A full list of mitigation measures are contained in **Chapter 8.0 Soil, Water and Contamination**. These are also contained in a Soil and Water Management Plan for the Tank 101 demolition works.	D	5	L
	Interaction of stormwater with hydrocarbon impacted soils.	C	4	M		D	4	L
	Stormwater contaminated by leaks and spills from demolition vehicles, plant and equipment.	D	4	L		D	4	L
	Potential adverse impacts to stormwater flows and discharge.	D	4	L		D	4	L

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
Noise and Vibration **Chapter 9**	The Tank 101 demolition works could cause acoustic impacts at identified sensitive receptors.	C	4	M	Working hours and noise limits would be limited to within those specified in the conditions of consent for SSD 5544. The Tank 101 demolition works would be coordinated with other demolition works being undertaken in the vicinity. A full list of mitigation measures are contained in **Chapter 9.0 Noise and Vibration**. These would also be contained in the existing Demolition Noise and Vibration Management Plan for the Tank 101 demolition works.	D	4	L
Air Quality and Odour **Chapter 10**	The Tank 101 demolition works could potentially generate air quality impacts such as dust, VOC emissions and odour.	C	4	M	The Tank 101 demolition works would be undertaken in accordance with the existing Air Quality Management Plan (AQMP) for the Project.	D	5	L
Heritage **Chapter 11**	The Tank 101 demolition works would have an impact on the locally significant Oil Refinery Site.	A	4	H	The Tank 101 demolition works would be undertaken in accordance with the existing Heritage Management Strategy was has been prepared for the Australian Oil Refinery site prior to shut-down of the refinery plant, to provide Caltex with a framework for the ongoing management of the Site's heritage during present and future works on Site. A full list of mitigation measures are contained in **Chapter 11.0 Heritage**.	B	4	M

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
Hazards and Risks Chapter 12.1	Damage to adjacent plant or equipment due to uncontrolled or unplanned falling of infrastructure, object or crane collapse.	D	1	H	A number of recommendations have been presented in **Section 12.1**. These include: demolition activities would be coordinated with terminal activities.	E	2	M
	Damage to live pipework during removal of pipes	E	1	H		E	2	M
	Introduction of an ignition source to the Site.	D	2	M	Additional precautions would be undertaken for floating roof tanks where pontoons may entrap flammable material which may not be detected during normal gas testing.	E	2	M
	Asbestos in the form of small fragments and fibres has been recorded on the Site in various places including in surface soil layers. This has the potential to cause a health risk to workers working with excavated soil.	D	2	M	Demolition staff would be inducted and provided with training prior to working on the Site, to prevent unnecessary disturbance. These measures are outlined in the DEMP. **Section 12.1** provides further detail.	E	2	M
	Potential soil contamination may pose a vapour risk for workers (e.g. in a deep trench).	D	3	M	The location of potentially contaminated areas would be noted and provided to demolition personnel. Safety training would be provided, including assessment of PPE requirements.	E	4	L

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
Waste Management Chapter 12.2	The Tank 101 demolition works could create additional waste streams that require management.	E	4	L	A Waste and Resource Management Plan is incorporated into the existing DEMP for the Tank 101 demolition works to manage waste streams and ensure that the maximum resource efficiency is maintained. A full list of mitigation measures are contained in **Section 12.2**.	E	5	L
Ecology Chapter 12.3	Potential impacts to natural features and man-made structures that are potential fauna habitat.	E	3	L	A Biodiversity and Weed Management Plan has been developed and would be implemented as part of the existing DEMP. This plan includes specific measures such as protocols prior to works which may affect potential fauna habitat.	E	4	L
	Discharge of stormwater run-off, sediment laden water, contaminated water and oily water off-site and into the groundwater system affecting nearby natural areas and GDEs;	D	4	L	Implementation of Soil and Water Management Plan. This plan includes measures to manage stormwater run-off.	E	4	L
	Tank 101 demolition works increase spread of noxious weed infestations.	D	4	L	The existing Biodiversity and Weed Management Plan would be implemented as part of the DEMP. This plan includes specific measures related to the control of noxious weeds.	E	4	L

Environmental Aspect	Potential Impacts Based On Unmitigated/ Inherent Risk	PL	PC	Potential Risk Before Mitigation	Actions/Proposed Mitigation Measures	RL	RC	Residual Risk Post Mitigation
Transport and Access **Chapter 12.4**	Demolition traffic could impact the local road network.	C	5	L	A Traffic Management Plan has been incorporated into the DEMP to manage the traffic impacts during the Tank 101 demolition works. A full list of mitigation measures are contained in **Section 12.4**. .	E	5	L

16.2.1 Summary of Risk Analysis

The Environmental Risk Assessment in **Table 16-4** illustrates how the assessments and mitigation measures contained within **Chapters 8.0** to **13.0** have helped understand the proposed Tank 101 demolition works and reduce the potential environmental risks. The implementation of the identified mitigation measures in **Chapter 14.0 Revised Management and Mitigation Measures**, and careful management would help avoid and mitigate potential impacts as far as practicable.

It can therefore be concluded that, provided the management and mitigation measures are implemented, remaining residual impacts would be negligible.

16.3 Ecologically Sustainable Development

16.3.1 The Principles

This section provides a review of the Tank 101 demolition works, their impacts and associated safeguards against the principles of ESD in accordance with *the Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The principles, as listed in the Section 7 of the EP&A Regulation, are as follows:

1. *"The **precautionary principle** - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;*
2. ***Inter-generational equity** - namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;*
3. ***Conservation of biological diversity and ecological integrity** - namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration; and*
4. ***Improved valuation, pricing and incentive mechanisms** - namely, that environmental factors should be included in the valuation of assets and services."*

These principles are discussed below.

16.3.2 Precautionary Principle

The precautionary principle deals with certainty in environmental and technical decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

A modification application undergoes a public process that allows for better examination of the potential effects of proposed activities or development. Thus, the assessment process can be defined as precautionary in nature. The requirement to assess the impacts of the Tank 101 demolition works is a form of regulation designed to identify and address uncertainty about the effects of these activities.

Caltex has commissioned specialists to conduct detailed assessments on several environmental aspects identified during the Environmental Risk Assessment process as outlined in **Chapter 7.0 Environmental Scoping Assessment**. These assessments provide sufficient scientific understanding of the Tank 101 demolition works, their interactions with the surrounding environment and implications they may have to enable a decision to be made that is consistent with this principle. The precautionary principle has driven the development of a number of management and mitigation measures presented within this SEE.

16.3.2.1 Modification Objectives

The Tank 101 demolition works would be undertaken in a manner that reduces the severity of potential impacts and to reduce likelihood of potential impacts occurring. The Tank 101 demolition works would also comply with environmental criteria, community expectations and the development consent, as well as relevant statutory requirements. This is achieved through the effective implementation of the proposed management and mitigation measures.

16.3.2.2 Tank 101 demolition works safeguards

A number of safeguards specific to the Tank 101 demolition works would ensure mitigation of impacts would be undertaken in a manner that would satisfy ESD principles. These include:

- **Spatial limits of the Tank 101 demolition works area footprint**: the area where the works would be undertaken would not extend beyond the boundary of the Tank 101 demolition works area, aside from some activities associated with waste management and vehicle movements. Mitigation measures to manage these impacts are largely consistent with those that have been developed for the approved demolition works. Additional measures have also been identified to minimise noise from the Tank 101 demolition works.
- **Updates to and implementation of the existing DEMP**: should the Tank 101 demolition works be approved, the DEMP would be updated to include specific measures for the Tank 101 demolition works. The DEMP would be implemented throughout the works.

16.3.3 Inter-Generational Equity

Inter-generational equity requires that the present generation pass onto the next generation an environment that does not limit the ability of those future generations to attain a quality of life at least equal to that of the current generation.

Through the implementation of mitigation and management measures for avoiding and minimising short-term or long-term environmental impacts, and the proposed rehabilitation of any disturbed areas, inter-generational social equality impacts have been addressed. Examples of matters that are relevant to the Tank 101 demolition works are described below.

16.3.3.1 Modification Objectives

The Tank 101 demolition works would contribute to the conversion of the Site into a safe and viable liquid fuel depot.

16.3.3.2 Tank 101 demolition works Safeguards

The proposed Tank 101 demolition works would maintain inter-generational equity by ensuring components of the existing bio-physical, social and economic environment available now would also be maintained for future generations. Aspects of the Tank 101 demolition works that would assist in achieving inter-generational equity include the following:

- no ecological features would be significantly impacted as a result the Tank 101 demolition works;
- potential contamination risks would be reduced by managing risks through a suite of measures and controls;
- the magnitude of potential cumulative noise impacts would be reduced by co-ordinating the Tank 101 demolition works with other nearby demolition works;
- preservation of the nominated heritage values of the Site despite the demolition of Tank 101, via the implementation of the Heritage Management Strategy;
- continue the use of the Site as a liquid fuel depot in a safe manner; and
- ongoing consultation and engagement with the local community to provide an opportunity to ask questions and identify and manage areas of concern.

16.3.4 Conservation of Biological Diversity and Ecological Integrity

This SEE includes an assessment of the ecological impacts of the Tank 101 demolition works. The Tank 101 demolition works would not cause significant ecological impacts. Measures to further minimise impacts are outlined in the DEMP for the Project.

16.3.5 Improved Valuation and Pricing of Environmental Resources

This ESD principle is premised on an assumption that all resources should be appropriately valued and that the value of environmental resources should be considered alongside any economic or cost benefit analysis for the life of the project.

Modification Objectives

The Tank 101 demolition works would allow for the continued safe operation of the finished product terminal at Kurnell, thereby allowing the Site to operate efficiently into the future.

16.3.5.1 Conclusion

The value placed by Caltex on environmental resources is evident from the extent of site-specific investigations, planning and environmental safeguards and measures that have been undertaken and which would be implemented to prevent damage to the local environment.

16.3.6 Compatibility with the Principles of ESD

The approach taken in undertaking the Tank 101 demolition works has been multi-disciplinary. Emphasis has been placed on the avoidance of impacts through careful design as well as management and mitigation measures to minimise potential negative environmental, social and economic impacts, during the Tank 101 demolition works. The principles of ESD have been incorporated into the proposed Tank 101 demolition works.

16.4 Objects of the Environmental Planning & Assessment Act 1979

Consideration has been given to the consistency of the Tank 101 demolition works with the objects of the EP&A Act as outlined below.

a) To encourage:

i. The proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.

The Tank 101 demolition works would allow for the safe and continued use of the Site in line with existing land use designations.

ii. the promotion and co-ordination of the orderly and economic use and development of land.

The *Sutherland Shire Local Environment Plan 2015* (SSLEP) provides for the land use and zoning for the Site and surrounding area. Pursuant to the SSLEP, the Site is majorly designated as IN3 Heavy Industrial, The objectives of this zone are: to provide suitable areas for those industries that need to be separated from other land uses; to encourage employment opportunities; to minimise any adverse effect of heavy industry on other land uses; and to support and protect industrial land for industrial uses. The Tank 101 demolition works would support the existing and permissible land use at the Site by ensuring that the Site would continue to be used as a liquid fuel depot, which is permissible under the land zones in the SSLEP and therefore is in line with orderly and economic use and development of land.

iii. the protection, provision and co-ordination of communication and utility services.

The Tank 101 demolition works would not directly impact on the provision and co-ordination of communication and utility services.

iv. the provision of land for public purposes.

The Tank 101 demolition works would not permanently impact on the provision of land for public purposes.

v. the provision and co-ordination of community services and facilities.

The Tank 101 demolition works would not impact on the provision of existing or future community services and facilities.

vi. the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.

The mitigation measures outlined within this SEE, would allow for the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.

vii. ecologically sustainable development.

An assessment of the Tank 101 demolition works against the principles of ESD has been provided in **Section 16.3** above.

viii. the provision and maintenance of affordable housing.

The Tank 101 demolition works would not affect the provision or maintenance of affordable housing.

b) To promote the sharing of the responsibility for environmental planning between the different levels of government in the State.

The Tank 101 demolition works is to be assessed as modification to a State Significant Development under Part 4 of the EP&A Act by the Department of Planning and Environment (DPE).

c) To provide increased opportunity for public involvement and participation in environmental planning and assessment.

Caltex undertakes regular consultation with the community through quarterly meetings. Proposed developments at the Site are presented to and discussed with the local community.

Since the announcement of the Project in July 2012, the quarterly briefings have discussed the works that were planned to occur at the Site (including demolition). These briefings have discussed both the progress and the upcoming works for conversion works and the demolition works.

The removal of Tank 101 has been discussed with the community for a number of years. Over the past 18 months the community has asked a number of times whether Caltex had plans to remove the tank. At the quarterly community meeting on the 28 March 2017, Caltex confirmed that following an internal review that the tank was no longer required and that they would demolish it. No other questions regarding the removal of the tank have been asked by the community. It is understood that the community are supportive of the demolition of Tank 101.

16.5 Project Justification

The Tank 101 demolition works are an important part of making the Site as safe and viable as possible. The works are linked to the ongoing process of converting the Site from an operation that contains both oil refining and liquid fuel depot land uses to a safe and viable finished fuel import terminal.

Demolishing Tank 101 would be mutually beneficial to both Caltex and the local community. The tank is currently approved for gasoline use under the consent for SSD 5544. The demolition of Tank 101 would eliminate ongoing maintenance costs, contribute to the commercial viability of the terminal and respond to regulator and community discussions regarding the tank. Maintaining a tank which serves no purpose and which both Caltex and the community would like to remove would not be in line with the objective of the Project as it would affect the viability of the terminal.

This SEE provides a comprehensive assessment of the Tank 101 demolition works and includes investigations regarding all relevant environmental issues.

Potential impacts have been assessed and strategies to avoid, minimise and mitigate those impacts form a key part of the SEE. The SEE includes a number of commitments to manage environmental impacts during the Tank 101 demolition works, which are largely consistent with the measures already in place for the approved demolition works.

The Tank 101 demolition works has, to the extent feasible, been designed to address the key issues of concern. Caltex has also considered impacts on the surrounding environment and community of

Kurnell. Caltex firmly believes it can undertake the Tank 101 demolition works in a manner which would safeguard local environment and public amenity in the area.

This SEE has concluded that the Tank 101 demolition works should proceed because they would:

- result in no long term adverse impacts to the environment or local community;
- ensure the primary objectives of the Project continue to be achieved; and
- satisfy the principles of Ecologically Sustainable Development as described in the EP&A Regulation.

This SEE has highlighted a range of issues which would be addressed through the careful undertaking of the Tank 101 demolition works.

On the basis of the findings detailed within this Statement of Environmental Effects, the Tank 101 demolition works are considered to be justified.

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Appendix A

Noise Impact Assessment

ACOUSTICS AND AIR

CALTEX KURNELL
TANK 101 DEMOLITION WORKS
DEMOLITION NOISE ASSESSMENT

REPORT NO. 17206
VERSION A

AUGUST 2017

PREPARED FOR

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WILKINSON MURRAY

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A	Draft	24 July 2017	Sean Flaherty	-
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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

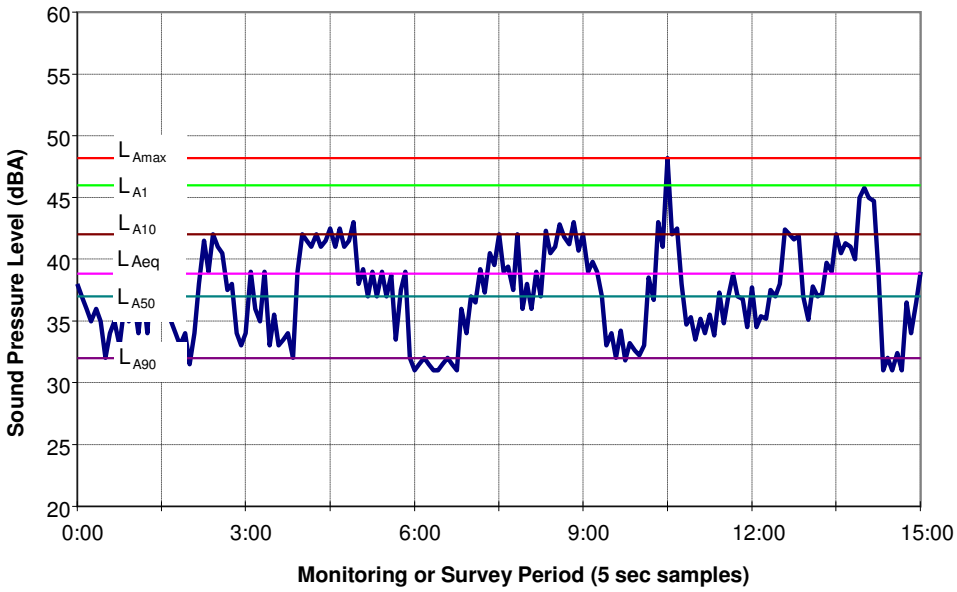
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

At the end of 2014, Caltex Australia Petroleum Pty Ltd (hereafter referred to as Caltex) closed the Kurnell Refinery and started operating the Kurnell site (the Site) solely as a fuel import terminal. The conversion works included closing the refinery, changing tank service, pipe upgrades etc. The conversion was assessed and consented as a State Significant Development (SSD 5544).

In 2015 Caltex submitted a modification application for the demolition works at the Site, involving the removal of redundant refinery infrastructure from the Site and surrounding land. These works were consented as a modification to SSD 5544 (SSD 5544 MOD1). At the end of 2016, Caltex submitted a second modification application for the Kurnell Asbestos Contaminated Soil (ACS) Management Project. This project proposes to place ACS from the Site in a containment cell. The modification application (SSD 5544 MOD 2) for this project is still being assessed.

Prior to completing the demolition works at the Site, Caltex has decided to demolish Tank 101. The demolition of Tank 101 was not consented under SSD 5544 MOD1. Therefore a modification to SSD 5544 is being sought for the demolition of this structure.

Wilkinson Murray Pty Limited (WM) has previously undertaken environmental noise assessments on behalf of Caltex in relation to the conversion works (SSD 5544), the demolition works (SSD 5544 MOD1) and the ACS management works (SSD 5544 MOD 2).

WM has now been engaged to provide a desktop noise assessment for the Tank 101 demolition works.

The location of the Site, Tank 101 and noise sensitive receivers considered by this assessment are shown in Figure 1-1.

Vibration effects are not expected due to the setback distances afforded to receivers and the work methods to be used. Therefore, this report does not consider vibration effects any further.

Figure 1-1 Tank 101 Demolition Works Area

2 MODIFICATION 3 DEMOLITION PROGRAM

It is anticipated that the Tank 101 demolition works would be undertaken within Q4 2017. The Tank 101 demolition works are expected to take up to 4 weeks to complete.

The Tank 101 demolition works are described in Table 2-1, along with the approximate duration for the works and where the works would take place on site. Additionally, the likely construction equipment required for the works and corresponding sound power levels are shown in the table. Further details relating to the works are provided in the Statement of Environmental Effects (SEE).

Table 2-1 Tank 101 Demolition Information & Equipment

Proposed Works	Approx. Duration	Location on Site	Construction Equipment	Equipment Quantities	Sound Power Level per Plant Item (dBA)	Activity Sound Power Level (dBA)
Demolition of Tank 101	Approx. 4 Weeks	Tank 101 Compound	Large Shearer	1	105	109
			Oxycutter	1	101	
			Mobile Crane	1	104	
			Vacuum Truck	1	93	
			Concrete Saw	1	105	
			Excavator	1	105	
			Jackhammer	1	110	

Note: It is unlikely that the mobile plant items identified would all concurrently operate at full capacity. The calculated total sound power level includes a -5dB correction to account for the operational on-time of the identified plant items.

2.1 Demolition Hours

In accordance with the conditions of the approved demolition works:

- Construction is to be completed between 7.00 am and 10.00 pm seven days a week;
- High noise generating construction and demolition works would be confined to less sensitive times of the day, and shall not be undertaken on Sundays or public holidays or outside the hours of 7.00 am to 6.00 pm Monday to Saturday; and
- Construction outside these hours would only be undertaken in unique circumstances.

3 NOISE SENSITIVE RECEPTORS

Potentially affected noise sensitive receptors, as identified by WM's previous assessments, are as follows:

- Receiver R1 – 44-64 Cook Street (Industrial Premises). Industrial premises adjacent to the Site to the west and sharing a common boundary.

- Receiver R2 – 30D Cook Street (Residential). Residential property adjacent to the Site to the west and sharing a common boundary.
- Receiver R3 – Reserve Road (Residential). Residential properties north of the Site.
- Receiver R4 – Prince Charles Parade (Residential). Residential properties close to the eastern right of way.
- Receiver R5 – Corner of Captain Cook Drive and Silver Beach Road (Residential). Residential properties north of the Site.
- Receiver R6 – Tasman Street (Residential). Residential property west of the Site.
- Receiver R7 – 35 Cook Street (Residential). Residential property north of the Site.
- Receiver R8 – End of Chisholm Road (Industrial Premises). Industrial premises adjacent to the Site to the west and sharing a common boundary.
- Receiver R9 – Sir Joseph Banks Drive (Industrial Premises). Industrial premises on the other side of Sir Joseph Banks Drive to the west of the Site.

Figure 1-1 shows the locations of the above receptors. It should be noted that these representative receptors were established for the assessment of noise effects from the main site.

There are no residential receivers to the south of the Site that could be affected by the noise from the Tank 101 demolition works.

4 NOISE CRITERIA

Consistent with the demolition noise assessment, this assessment considers the approved noise limits set out in the existing Development Consent for Application SSD 5544, pursuant to Section 89E of the Environmental Planning and Assessment Act 1979 in 2014. This is deemed appropriate as the noise limits were established using the typical minimum background levels and are consistent with the *Interim Construction Noise Guideline (ICNG)*.

4.1 Existing Development Consent Noise Limits

Condition C16 of SSD 5544 MOD1 requires that the construction / demolition noise does not exceed the criteria in Table 4-1.

Table 4-1 Construction Noise Limits in SSD 5544

Location	Day, $L_{Aeq,15min}$	Evening, $L_{Aeq,15min}$
R2 – 30D Cook Street	46	40
At any other residence or other noise sensitive receivers	50	45

5 DEMOLITION NOISE ASSESSMENT

Noise levels at surrounding residential receivers have been predicted using the "CadnaA" acoustic noise prediction software implementing the ISO 9613 noise prediction algorithm with consideration to the construction noise sources identified in Table 2-1. Factors that are addressed in the noise modelling are:

- equipment sound level emissions and location;
- receiver locations / ground topography[1];
- noise attenuation due to geometric spreading;
- ground absorption; and
- atmospheric absorption.

The CadnaA modelling software is accepted by the NSW Environment Protection Authority (EPA) for use in environmental noise assessments.

Table 5-1 sets out the worst-case noise levels predicted to arise during the Tank 101 demolition works together with the noise contributions predicted to arise from other potentially coinciding works and operations on the Kurnell site, these being:

- the ACS construction works (as identified by the WM report – Report No. 16284 Ver C dated September 2016);
- the refinery demolition works (as identified by the WM report – Report No. 14074 Ver C dated October 2014); and
- the Sustainable Soil Regeneration Facility (SSRF) operation (as identified by the WM report - Report No. URS14416 Ltr 100615).

The predicted cumulative noise levels that may result should all identified works and operational components occur concurrently are compared against the relevant criteria for each sensitive receptor in the table. These cumulative predictions are considered to be conservative as they assume all of the identified activities coincide.

[1] It is noted that Tank 101 is located within a 2.5 m high tank bund. This would provide effective acoustic shielding for the Tank 101 demolition works undertaken at ground level. However, for the purpose of providing a conservative assessment, the shielding effects from the bund have been disregarded. The levels predicted by this assessment assume a worst-case scenario where noise sources are assumed to be in an elevated position (above the height of the bund). For much of the time materially lower levels of off-site noise may be expected.

Table 5-1 Predicted Noise Levels – Mod3 - Tank 101 Demolition Works – $L_{Aeq,15min}$

#	Sensitive Receptors	Predicted $L_{Aeq,15min}$ Noise Level					Day Criteria 07:00-18:00h $L_{Aeq,15min}$ (dBA)	Eve Criteria 18:00-22:00h $L_{Aeq,15min}$ (dBA)	Complies with Criteria (Yes / No)	
		Tank 101	ACS Construct	Refinery Demolition	SSRF Operation	All			Day	Eve
R1	Cook Street (Industrial Premises)	47	38	51	26	53	75	75	Yes	Yes
R2	30D Cook Street (Residential Premises)	**53**	40	**50**	25	**55**	46	40	**No**	**No**
R3	Reserve Road (Residential Premises)	**50**	35	**50**	23	**53**	50	45	Yes	**No**
R4	Prince Charles Parade (Residential Premises)	35	28	40	24	42	50	45	Yes	Yes
R5	Corner of Captain Cook Drive and Silver Beach Rd (Residential Premises)	34	32	42	30	43	50	45	Yes	Yes
R6	Tasman Street (Residential Premises)	26	29	44	27	44	50	45	Yes	Yes
R7	Cook Street (Residential Premises)	44	33	45	28	**48**	50	45	Yes	**No**
R8	End of Chisholm Road (Industrial Premises)	23	34	45	41	47	75	75	Yes	Yes
R9	Sir Joseph Banks Drive (Industrial Premises)	19	37	47	44	49	75	75	Yes	Yes

Note: Operational noise levels from the Kurnell Terminal are predicted to have no material influence on the off-site levels shown in this table.

As shown in Table 5-1, the Tank 101 demolition works have the potential to generate exceedances of the established construction noise criteria at Receiver R2 by approximately 7 dB (daytime) and 13 dB (evening) and at Receiver R3 by approximately 5 dB (evening).

If the Tank 101 demolition works coincide with the refinery demolition works, cumulative noise levels may be expected to exceed criteria at R2 by up to approximately 9 dB (day) and 15 dB (evening). At R3 cumulative exceedances of up to 3 dB (day) and 8 dB (evening) may be expected. Additionally, at R7 cumulative noise levels of up to 3 dB above criteria are predicted (evening).

To reduce these exceedances, Caltex has committed to complete the Tank 101 demolition works within daytime hours and, as far as practicable, manage the potentially coinciding demolition works undertaken in the vicinity of Tank 101 such that cumulative noise is minimised.

Notwithstanding this, it is noted that the Tank 101 demolition would be undertaken over a limited duration of up to 4 weeks and as such, any impacts will be of a relatively short duration.

Whilst the works are predicted to at times exceed the construction/demolition noise management levels at the closest residential receivers, the predicted noise levels do not exceed the highly noise affected 75 dBA noise criterion from the *ICNG*.

Additionally, it should be noted that this assessment is conservative as the shielding effect of the tank bund has been disregarded. On this basis, the predicted cumulative noise increases are considered minimal in nature, particularly following the application of reasonable and feasible mitigation measures.

Section 6 provides further practical measures to limit noise impacts during the Tank 101 demolition.

6 MITIGATION MEASURES

This noise assessment has identified potential noise exceedances at sensitive receivers neighbouring the Tank 101 demolition works. However, impacts would be limited as the works will be undertaken only for relatively short durations (up to 4 weeks).

To reduce impacts, it is recommended that the following noise management strategies are implemented during the works:

- High noise generating works be confined to 7.00 am to 6.00 pm Monday to Saturday as per Condition C19 for SSD 5544;
- The Tank 101 demolition works would be coordinated with other nearby demolition works to reduce the magnitude of potential cumulative impacts;
- Plant and equipment with low noise emission levels to be used where practicable;
- Community consultation with local residents and building owners to assist in the alleviation of community concerns. Previous experience on similar projects has demonstrated that affected noise sensitive receptors may be willing to endure higher construction noise levels for a shorter duration if they have been provided with sufficient warning in the place of intermittent but extended periods of construction noise at lower levels. The existing 24-hour Community Concerns Hotline would continue to be operated for the Tank 101 demolition works;
- Maintaining a suitable complaints register. Should noise complaints be received, noise monitoring can be considered at the locations concerned. Reasonable and feasible measures would be implemented to reduce noise impacts. All complaints would be managed through the existing feedback process at the Site;
- Conduct demolition noise monitoring to determine compliance or otherwise with construction / demolition noise criteria and provide recommendations to reduce noise levels in the case of material exceedances;
- Educate and train demolition staff to be noise aware. Strategies should focus on:
    - Ensuring work occurs within approved hours;
    - Locating noisy equipment away from sensitive receivers;
    - Ensuring plant and equipment is well maintained and not making excessive noise; and

- Turning off machinery when not in use.

- Caltex would ensure that the demolition noise generated by the Development does not exceed the criteria defined in Table 4-1 (from Condition of Consent C16 of SSD 5544) unless the reasonable and all feasible noise mitigation strategies have been implemented.

With regards to community consultation, it is understood that Caltex's current approach to managing complaints (from noise or otherwise) would continue. As discussed above, this approach includes a 24-hour hotline number for the local community. This number forms part of an established community complaints process where the community complaint or enquiry is emailed and texted to an Operations representative, the Shift Manager, the Environment Protection Superintendent, the Community Relations and Communication Advisor, amongst other Caltex personnel.

The complaint is responded to and investigated to determine the source of the noise and then, if required, operational adjustments are made to mitigate the noise. The resident is generally updated on the action(s) taken and asked about whether they consider that the operational adjustments have been effective. This consultation procedure has been effectively implemented for a number of previous projects.

It is noted that the demolition and rebuild of Tank 102 (located directly to the south east of Tank 101) in late 2013 did not receive any community complaints. Provided the Tank 101 demolition works are managed in a similar manner, community complaints are not expected, particularly given the broad community support for the removal of the tank.

7 OFF-SITE TRAFFIC NOISE ASSESSMENT

Noise criteria for assessment of road traffic noise are set out in the NSW Government's *NSW Road Noise Policy (RNP)*.

Demolition staff already working at the Site would complete the Tank 101 demolition works. Therefore no incremental traffic movements would be generated, beyond the volumes previously assessed. As such no off site traffic noise impacts are expected.

8 CONCLUSION

Caltex seeks to modify its existing approval to allow for the demolition of Tank 101.

Wilkinson Murray has undertaken a desktop construction noise assessment in relation to these works.

This assessment has conservatively identified the following:

- The demolition of Tank 101 has the potential to generate exceedances of the approved limits at the closest receivers located to the north of the Site. However, the impacts would be brief (up to 4 weeks);
- To reduce potential impacts, Caltex has committed to complete the Tank 101 demolition works within daytime hours and, as far as practicable, manage the potentially coinciding demolition works undertaken in the vicinity of Tank 101 such that cumulative noise is minimised;
- Whilst the works may at times exceed the construction/demolition noise management levels at the closest residential receivers, the predicted noise levels do not exceed the highly noise affected 75 dBA noise criterion recognised by the *ICNG*;
- A number of reasonable and feasible mitigation measures to manage the short-term impacts have been identified;
- The incremental increase in noise effects, with respect to those previously assessed by the refinery demolition assessment, are considered to be minimal in nature;
- Adverse community reaction is not anticipated given the relatively low levels of noise predicted to occur, the brief duration of the works, the application of mitigation measures and Caltex's proactive community liaison approach, the presence of the tank bund and the broad community support for the removal of the tank.

Appendix B

Statement of Heritage Impact

Caltex Kurnell Tank 101 Demolition Works

Statement of Heritage Impact

Caltex Kurnell Tank 101 Demolition Works

Statement of Heritage Impact

Client: Caltex Refineries (NSW) Pty Ltd

ABN: 000

Prepared by

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24-Aug-2017

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 AS/NZS4801 and OHSAS18001.

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Figures

Plates

1.0 Introduction

AECOM Services Pty Ltd (AECOM) has been commissioned by Caltex Refineries (NSW) Pty Ltd (hereafter referred to as Caltex) to prepare a Statement of Heritage Impact (SOHI) for the proposed demolition of Tank 101 (the Tank 101 demolition works). This SOHI report is to support the Statement of Environmental Effects (AECOM, 2017) prepared in support of the proposed modification to SSD 5544. The purpose of this assessment is to identify potential impacts to the heritage significance of both Tank 101 and the broader Caltex Site.

1.1 Background

1.1.1 Overview

Caltex currently operates the Kurnell Terminal (the 'Site') on the southern side of Botany Bay, in Kurnell, NSW (refer to Figure 1). Between 1956 and 2014 the Site was used as both an oil refinery and a fuel terminal. In July 2012, Caltex announced that it would progress with converting the refinery to a finished product terminal (the 'Project'). In 2014 refining ceased and the main purpose of the Site became a fuel import terminal, although other ancillary and related operations also occur. A Heritage Impact Assessment was undertaken in 2014 by Australian Museum Consulting (Australian Museum Consulting, 2014a) to assess the conversion of the Site to operate as a terminal, and the demolition and removal of redundant infrastructure. Australian Museum Consulting also prepared a Heritage Management Strategy for the Kurnell Refinery Site.

The proposed works include the removal of Tank 101, including excavation which may extend to 1 meter below ground level. This tank is located in the north eastern corner of the Site. The Site is listed as an 'archaeological site' under Part 2 of Schedule 5 of the *Sutherland Shire Local Environment Plan 2015* (SSLEP) as the '*Australian Oil Refinery*'. The Site and Tank 101 have been identified in the Heritage Management Strategy as having heritage significance, as they form part of this significant industrial place. As such, a Statement of Heritage Impact (SOHI) is required to identify any impacts from the removal of Tank 101 to the identified heritage values of the Site and against the endorsed management strategies for the Site.

1.1.2 Heritage Management Strategy

A Heritage Management Strategy was prepared in 2014 in response to the proposed conversion of the refinery to a finished fuel import terminal (Australian Museum Consulting, 2014b). The Heritage Management Strategy reviewed the historic context and heritage values of the place, outlined a revised assessment and statement of heritage significance, and outlined key strategies to conserve and manage these values as part of its ongoing industrial use and during future periods of change. These strategies included measures to mitigate the loss of heritage values arising from removal and remediation of the refinery plant (Australian Museum Consulting, 2014b).

The key management measures outlined in the Heritage Management Strategy included the need to recognise and conserve the heritage significance of the Kurnell Refinery, outline and prepare an interpretation strategy at the refinery site, as well as the creation of a publication; and, the need to ensure that key maintenance and management strategies are implemented to ensure the significance of refinery (Australian Museum Consulting, 2014b).

1.1.3 The Site

The Site is located on the Kurnell Peninsula within the Sutherland Shire Local Government Area (LGA), approximately 15 km south of Sydney's Central Business District (refer to Figure 1). The Site is approximately 187 ha in size and consists of a number of lots and deposited plans.

The Site is bounded by the Kamay Botany Bay National Park to the south and east, Captain Cook Drive to the north west and Sir Joseph Banks Drive to the south west. The northern Site boundary is bordered by Solander Street, a small southern section of Cook Street, undeveloped land, light industry and residences off the eastern side of Cook Street, and undeveloped land on the southern side of Reserve Road.

The Site is listed as an 'archaeological site' under the SSLEP as the '*Australian Oil Refinery'*.

Tank 101 falls in an area referred to as the Eastern Tank Farm Area, on the north eastern boundary of the Site (refer to Figure 1).

1.2 The Project

The process to convert the refinery to a terminal has involved a number of related activities including numerous upgrades and changes to operational infrastructure, as well as the removal and demolition of redundant infrastructure. This process is ongoing. The objective of the Project was and remains "*to establish a viable, safe, reliable and sustainable finished product import terminal at Kurnell*". This includes providing a safe working environment at the terminal and also ensuring that the operation is not burdened by unnecessary costs.

The Project has been divided into two phases:

1. converting infrastructure to allow the Site to operate as a terminal and shutdown the refinery (the conversion works); and
2. demolition and removal of redundant infrastructure (the demolition works).

1.2.1 Conversion works

The conversion works involved the conversion of tanks and installation of pumps and associated pipelines to allow for the cessation of refining at the Site and to allow for the expansion of terminal operations.

Caltex received development consent for the conversion works in January 2014 (SSD 5544). Cessation of refinery operations occurred in Q4 of 2014. By the end of 2016 all of the works approved under this initial development consent for the Project were completed. The Kurnell Terminal continues to use part of the Site in a manner similar to the refinery, i.e. for the storage and distribution of petroleum products.

1.2.2 Demolition works

The demolition works involve the following activities:

- demolition, dismantling or removal of:
  - refinery process units and associated infrastructure;
  - redundant tanks and associated infrastructure;
  - redundant pipeways and above and underground pipelines; and
  - redundant buildings and services.
- associated civil works with the works outlined above;
- waste management activities including concrete crushing; and
- returning the works areas to ground level.

Caltex received development consent for the demolition works in August 2015 and this consent is valid for three years. The demolition works are ongoing and due to be complete in early 2018. The majority of the refinery process units have been removed and a number of tanks demolished.

1.3 Tank 101 demolition works

The subject of this SoHI is the proposed demolition of Tank 101. Tank 101 is located on the north eastern corner of the Site (refer to Figure 1). The Tank 101 demolition works area is shown in Figure 2. The demolition of this tank would be undertaken using the same approach used for the demolition of the other tanks under the approved demolition works (SSD 5544 MOD1). The tank has already been cleaned and is currently empty awaiting demolition. The tank is predominantly made of metal.

The works to remove the tank include the following activities:

- disconnection of the tank from the existing pipework;
- demolition and dismantling of Tank 101 and associated infrastructure;

- associated civil works with the works outlined above;
- intermediate storage of the demolished material at the former Caltex Lubricant Oil Refinery (CLOR) prior to disposal or recycling; and
- returning the works areas to ground level.

These works may require excavation which may extend down to 1 metre below ground level. The bunds associated with the demolished tanks would remain intact and in situ. The demolition of Tank 101 would be undertaken within the boundary of the Site.

1.4 Objectives

The key objectives of the SoHI are to:

- Identify the significance of Tank 101 as part of the Eastern Tank Farm Area and as part of the Site;
- Identify all known and potential impacts the removal of Tank 101 would have on the heritage significance of the Site as identified in the Caltex Kurnell Refinery Heritage Management Strategy (HMS) (Australian Museum Consulting, 2014b);
- Assess the impacts from the removal of the tank against the heritage management strategies endorsed in the HMS; and
- Provide mitigation options and recommendations based on the outcomes of this assessment.

1.4.1 Report Limitations

The purpose of this report is to identify and assess the impact of the Tank 101 demolition against the HMS prepared for the Caltex Kurnell Refinery only. It is not anticipated the Tank 101 demolition works would have any direct or indirect impacts to other nearby heritage items, including the National Heritage Listed Kurnell Peninsula Headland, the State listed Kamay Botany Bay National Park (North and South) and Towra Point National Reserve, the 21 registered sites that are located within Kamay Botany Bay National Park, or other locally listed items under the SSLEP located outside the Site. A summary table of these items is presented in Section 6.5 of this report.

A summary of the statutory requirements regarding historical heritage for the Caltex Kurnell Refinery is provided in Section 2.0. The summary is provided based on the experience of the author with the heritage system in Australia and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the report should satisfy themselves that the statutory requirements have not changed since the report was written.

LA PEROUSE

Botany National Park

Kurnell Wharf

Captain Cooks Landing Place Park

Silver Beach

Prince Charles Pde

Captain Cook Dr

KURNELL

Marton Park

Marton Park Wetland

Kamay Botany Bay National Park

Towra Point Nature Reserve

Captain Cook Dr

Sir Joseph Banks Dr

Kamay Botany Bay National Park

Cape Bally Lighthouse (Commonwealth Heritage List))

KEY

- The Site
- Tank 101 Demolition Works Area
- Eastern Tank Area
- Four wheel drive track
- Towra Point Aquatic Reserve
- Protected Area
- Towra Point Nature Reserve

N

0 200 400 800 m

AECOM

SCALE	1:20,000
SIZE	A3
SHEET	01 of 01
COORDINATE SYSTEM	GDA 1994 MGA Zone 56

TITLE

FIGURE 1 - LOCATION OF THE SITE

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT

CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	23-Aug-17	G014 01		60546439
CHECK	DATE			

AECOM GIS Printed:Date: 23-Aug-17 \\ausyd1fp001\Projects\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G014_01_A3P_RecordedHistoricHeritage_170818.mxd

KEY

The Site

Tank 101 Demolition Works Area

0 50 100 200 m

AECOM

SCALE 1:8,000 | SIZE A3

SHEET 01 of 01 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 2 - TANK 101 DEMOLITION WORKS AREA

PROJECT

TANK 101 DEMOLITION WORKS

CLIENT

CALTEX PETROLEUM AUSTRALIA PTY LTD

DRAWN	DATE	MAP #	REV	Project
MA	16-Aug-17	G012 01		60546439
CHECK	DATE			

AECOM GIS Printed:Date: 16-Aug-17 P:\605X\60546439\4. Tech work area\4.3 GIS\02_Maps\G012_01_A3P_MOD3_Works_Area_Heritage_170816.mxd

2.0 Legislative Context

2.1 Introduction

A number of planning and legislative documents govern how heritage is managed in New South Wales and Australia. The following section provides an overview of the requirements under each as they apply to the Tank 101 demolition works and the Site.

2.2 Commonwealth Legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) defines 'environment' as both natural and cultural environments and therefore includes Aboriginal and non-Aboriginal historical cultural heritage items. Under the Act protected heritage items are listed on the National Heritage List (NHL) (items of significance to the nation) or the Commonwealth Heritage List (CHL) (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE). The RNE has been suspended and is no longer a statutory list; however, it remains as an archive.

Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance (known as a controlled action under the Act), may only progress with the approval of the Commonwealth Minister for the Department of the Environment and Energy (DotEE). An action is defined as a project, development, undertaking, activity (or series of activities), or alteration. An action will also require approval if:

- It is undertaken on Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land; and,
- It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

2.2.1 Listings

The Kurnell Peninsula Headland is located on the eastern end of the Kurnell peninsular and is registered in the NHL. The south east corner of the Site is located within the boundary of this listing, however the Tank 101 demolition works area is located 180 metres to the southwest of this listing (refer to Figure 3**Error! Reference source not found.**).

Table 1 National Heritage Listings

Place ID	Name	Address	Property Description	Significance
105812	Kurnell Peninsula Headland	Cape Solander Dr, Kurnell, NSW, Australia	About 400 ha, at Kurnell, comprising Botany Bay National Park, Lot 1 DP91704, the road reserve extending from Cape Baily Lighthouse in the east to the Park boundary in the west and the area between the seaward boundaries of the National Park and Lot 1 DP91704 and the Low Water Mark.	National

The National Heritage Listing for the Kurnell Peninsula Headland includes the following Statement of Significance:

"Kurnell Headland (comprising Botany Bay National Park and the Sydney Water land at Potter Point), Kurnell Peninsula, is of outstanding heritage value to the nation as the site of first recorded contact between Indigenous people and Britain in eastern Australia. The place symbolically represents the birthplace of a nation, and the dispossession of Indigenous people. The first landing at Kurnell

Peninsula in April 1770 by Lt James Cook has been commemorated since 1822. The Meeting Place Precinct, including Captain Cook's Landing Place, features memorials and landscape plantings celebrating the events. Attributes specifically associated with its Indigenous values include the watering point and immediate surrounds, and the physical evidence of Indigenous occupation in the area broadly encompassed by the watering place and the landing stage. The story of Cook's first landing on the east coast of Australia is nationally important and an integral part of Australian recorded history and folklore.

Cooks' running-survey of the east coast of Australia in 1770 and his survey of Botany Bay as a safe harbour, was an outstanding technical achievement, enabling the continental characteristics of Terra Australis *to be defined for the first time, with the exception of Bass Strait, building on the work of earlier maritime explorers. Cook's first landfall in Australia at Botany Bay in 1770 informed the subsequent British declaration of* terra nullius *and began the process which led to British possession of the Australian continent by 1830. The headland area of Kurnell Peninsula, comprising most of Botany Bay National Park, and described by Cook in his Journal as a significant coastal landmark at the entrance to Botany Bay, is significant to the nation as the destination of the First Fleet under Captain Arthur Phillip in 1787.*

On this, Cook's first of three voyages to the Pacific, Joseph Banks was botanist, assisted by Daniel Solander and the artists Sydney Parkinson, Alexander Buchan and Herman Sporing, were to produce botanical, zoological and ethnographic drawings. Banks and Solander collected 83 specimens whilst at Botany Bay, many of which are now the type specimens of species and genera, including Banksia*, named after Joseph Banks. Kurnell Headland, was the first site on the eastern coast of the Australian continent to be explored by scientists from Britain, with many of the first type-specimens of flora collected at the Kurnell Peninsula landing site by both Banks and Solander. Cape Banks and Point Solander have defined the entrance to Botany Bay since 1770. Cook's naming of 'Botany Bay' in 1770 would result in its adoption as an emotive term for a distant destination, which came to be associated with convictism for much of the nineteenth century* (Kurnell Peninsula Headland National Heritage Listing, (ID 105812), 2004)*."*

There is also one nomination that is located adjacent to the Site. The Kamay Botany Bay nomination includes the eastern end of Kurnell Peninsula as well as Towra Point. This nomination overlaps the registered Kurnell Peninsular Headland site (refer to **Error! Reference source not found.**).

Table 2 Current Nominations to the National Heritage List

Place ID	Name	Address	Property Description	Significance
106162	Kamay Botany Bay	Captain Cook Dr, Kurnell, NSW, Australia	Approximately 1060 ha, Kurnell and La Perouse, Botany Bay, comprising the whole of Botany Bay National Park and Towra Point Nature Reserve.	National

Kamay Botany Bay's nomination to the NHL has been made to include all the values encompassed in the current Kurnell Peninsula Headland NH place (ID 105812) within a broader boundary and recognises additional associative values that:

- *reflect the significance of the first meeting place between the traditional Aboriginal owners of the Botany Bay area and British explorer James Cook in 1770, ahead of the establishment of the colony by the First Fleet at Sydney Cove in 1788;*
- *recognise the international significance of Botany Bay, as the place where Joseph Banks and Daniel Solander first collected botanical specimens from the Australian continent, as part of the further development of Linnaean systematic biology;*
- *encompass the waters into which explorer James Cook's HM Bark Endeavour, the ships of the Governor Phillip's First Fleet, and French explorer the Comte de La perouse sailed and anchored in 1770 and 1788 respectively; and*

- *more fully recognise the association of Botany Bay with convict transportation in sentencing and the popular imagination, notwithstanding the fact that no convicts were landed at Botany Bay.*

(Kurnell Peninsula Headland National Heritage Listing, (ID 105812), 2004)

The Cape Baily Lighthouse is listed on the CHL (Table 3) and is located 1.25 kilometres south of the Site (Figure 3).

Table 3 Commonwealth Heritage items within the vicinity of the Project area

Place ID	Name	Address	Property Description	Significance
105571	Cape Baily Lighthouse	Sir Joseph Banks Dr, Kurnell NSW, Australia	Off Sir Joseph Banks Drive, Botany bay National Park, Kurnell.	National

2.3 State Legislation

2.3.1 Heritage Act 1977 (NSW)

The *Heritage Act 1977* (as amended) was enacted to conserve the environmental heritage of New South Wales. Under Section 32, places, buildings, works, relics, moveable objects or precincts of heritage significance are protected by means of either Interim Heritage Orders (IHO) or by listing on the NSW State Heritage Register (SHR). Items that are assessed as having State heritage significance can be listed on the SHR by the Minister on the recommendation of the NSW Heritage Council.

Archaeological relics (any relics that are buried) are protected by the provisions of Section 139. Section 4(1) of the *Heritage Act 1977* (as amended 2009) defines 'relic' as follows:

> any deposit, artefact, object or material evidence that:
>
> (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and
>
> (b) is of State or local heritage significance.

Under this section it is illegal to disturb or excavate any land knowing or suspecting that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. In such cases an excavation permit under Section 140 is required. Note that no formal listing is required for archaeological relics; they are automatically protected if they are of local significance or higher.

Proposals to alter, damage, move or destroy places, buildings, works, relics, moveable objects or precincts protected by an IHO or listed on the SHR require an approval under Section 57(1). Demolition of whole buildings will not normally be approved except under certain conditions (Section 63). Some of the sites listed on the SHR or on LEPs may either be 'relics' or have relics associated with them. Approval under Section 60 is required prior to commencing any works or for any disturbance to relics associated with an item listed on the SHR.

Section 57(2) of the *Heritage Act 1977* allows the Minister for Heritage to delegate approval under Section 57(1) to a person or agency through the gazettal of the provisions of the exemptions. These exemptions cover minor works ranging from painting through to emergency repairs and demolition of non-significant fabric. Exemptions cannot be sought for works where there are registered Aboriginal archaeological sites or heritage values present.

Under Section 170 of the *Heritage Act 1977*, NSW Government agencies are required to maintain a register of heritage assets. The Register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items.

State Heritage Register

There is one site listed on the SHR within vicinity of the Site.

Table 4 Items Listed on the State Heritage Register

Ref	Name	Address	Property Description	Significance
01918	Kamay Botany Bay National Park (North and South) and Towra Point National Reserve	Cape Solander Drive, Kurnell, NSW 2231	LOT 1 DP 1014443 LOT 1 DP 1030269 LOT 5 DP 1110408 PART LOT 456 DP 1137279 LOT 7334 DP 1162374 LOT 31 DP 217907 LOT 3 DP 232077 LOT 101 DP 555205 LOT 1 DP 556396 LOT 1 DP 706164 LOT 4 DP 732257 LOT 119 DP 752064 LOT 145 DP 752064 LOT 101 DP 777967 LOT 102 DP 777967 LOT 103 DP 777967 LOT 104 DP 777967 LOT 105 DP 777967 LOT 106 DP 777967 LOT 107 DP 777967 LOT 108 DP 777967 LOT 109 DP 777967 LOT 114 DP 777967 PART LOT 2 DP 856868 LOT 71 DP 908 LOT 72 DP 908 LOT 73 DP 908 LOT 74 DP 908 LOT 75 DP 908 LOT 76 DP 908 LOT 85 DP 908 LOT 1 DP 90998	State

The heritage curtilage for this listing includes the Kamay Botany Bay National Park and Towra Point Nature Reserve (Figure 3).

The SHR listing for the site includes a Summary of Significance for the place (Kamay Botany Bay National Park and Towra Point Nature Reserve SHR listing (ID 01918)):

Kamay Botany Bay National Park and Towra Point Nature Reserve are of outstanding state heritage significance as a rare place demonstrating the continuous history of occupation on the east coast of Australia. The place holds clear and valuable evidence of Indigenous occupation prior to European settlement and the natural history of the state. It is also the place where the shared history of Indigenous and non-Indigenous Australia began. It was the place where Lieutenant James Cook first stepped ashore to claim the country for Britain and plays a central role in the European history of arrival, the history of Indigenous resistance, dispossession and devastation through illness, land grants, cultivation and development.

Traditional Aboriginal custodians of the land and the current Aboriginal community have strong historical association with Kamay Botany Bay National Park and Towra Point Nature Reserve. Gweagal warriors resisted the arrival of Cook and continue to be important symbols of Aboriginal resilience. There are two important burial repatriation sites within the curtilage which are designated Aboriginal Places and have high social significance for the Aboriginal community.

The place is also significant for its historical association with important European explorers and

scientists and their life's work. These include James Cook, Joseph Banks, Daniel Solander, Compte de Laperouse, Pere Receveur and Joseph Lepaute Dagelet. It is also associated with the First Fleet and the first Governor of NSW, Arthur Phillip.

The place is of state significance for the technical achievement of Banks and Solander who during their visit in 1770 made the first important collection of fauna and flora from Australia which included some items that had never before been described and classified. Previous archaeological excavations indicate that Kamay Botany Bay National Park and Towra Point Nature Reserve have significance for their high level of archaeological potential.

Kamay Botany Bay National Park and Towra Point Nature Reserve have aesthetic value as landmark headlands and natural areas with a collection of historic monuments that, combined, have important symbolism to the state of NSW. Both northern and southern parts of the national park, together with the nature reserve, contain a valuable research resource relating to Indigenous occupation, the natural history of the State and the early settlement of the colony.

Kamay Botany Bay National Park and Towra Point Nature Reserve are of state heritage significance as they contain rare remnant vegetation and flora communities and are a critical link in the network of parks and reserves that conserve the biodiversity of NSW.

The La Perouse part the national park provides evidence of the history of French exploration in the Pacific in the late 19th century and continues to have ongoing cultural associations with the French community today.

Heritage and Conservation Registers

Under Section 170 of the *Heritage Act 1977*, NSW Government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items. The Office of Environment (OEH) and Heritage is the owner and manager of historical and archaeological sites present within the Kamay Botany Bay National Park. There are 21 registered sites that are located within Kamay Botany Bay National Park. These are presented in the table below.

Table 5 Heritage items listed on the OEH Section 170 Heritage and Conservation Register in the vicinity of the Site

Ref	Name	Address	Significance
1402	Alpha Farm Site and Kurnell Accommodation House (Complex)	Botany Bay National Park, Sutherland	National
3366	Banks Memorial	Botany Bay National Park, Sutherland	National
1377	Captain Cook's Landing Place Monuments (Complex)	Botany Bay National Park, Sutherland	National
10646	Commemorative Tree Plantings (Complex)	Botany Bay National Park, Sutherland	National
3361	Cook's Landing Rock memorial	Botany Bay National Park, Sutherland	National
3364	Cook's Monument	Botany Bay National Park, Sutherland	National
3357	Cook's Well	Botany Bay National Park, Sutherland	National
1401	Discovery Centre	Botany Bay National Park, Sutherland	National
3365	Forby Sutherland Monument	Botany Bay National Park, Sutherland	National
3360	Foreshore Pines near Flagstaff	Botany Bay National Park, Sutherland	National
3373	Foreshore seawall course stone	Botany Bay National Park, Sutherland	National
11029	Freshwater Steam Plaque	Botany Bay National Park, Sutherland	National
3367	Inscription Point Plaque	Botany Bay National Park, Sutherland	National
11028	Isaac Smith Memorial	Botany Bay National Park, Sutherland	National
10984	Kurnell Peninsula Meeting Place Precinct (Complex)	Botany Bay National Park, Sutherland	National
3362	Landing Place Memorial	Botany Bay National Park, Sutherland	National
3358	Main Flagstaff	Botany Bay National Park, Sutherland	National
3368	Prince's Tree Memorial	Botany Bay National Park, Sutherland	National
3355	Queen Elizabeth II Tree	Botany Bay National Park, Sutherland	National
3363	Solander Memorial	Botany Bay National Park, Sutherland	National

Ref	Name	Address	Significance
3359	Trust Wharf Abutment	Botany Bay National Park, Sutherland	National

2.3.2 Environmental Planning and Assessment Act 1979 (NSW)

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) allows for the preparation of planning instruments to direct development within NSW. This includes Local Environment Plans (LEP), which are administered by local government, and principally determine land use and the process for development applications. LEPs usually include clauses requiring that heritage be considered during development applications and a schedule of identified heritage items be provided. The SSLEP 2015 applies to the Tank 101 demolition works and is discussed below. The EP&A Act also allows for the gazettal of State Environmental Planning Policies (SEPP).

2.4 Local legislation

2.4.1 Sutherland Shire Local Environmental Plan 2015

The Site is located within the Sutherland Shire local government area.

Part 5, Section 5.10 of the SSLEP deals with heritage conservation within the area covered by this LEP. All heritage items listed on the LEP are included in Schedule 5. The SSLEP states:

(1) The objectives of this clause are as follows:

- *a. to conserve the environmental heritage of the Sutherland Shire,*
- *b. to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
- *c. to conserve archaeological sites,*
- *d. to conserve Aboriginal objects and Aboriginal places of heritage significance.*

(2) Development consent is required for any of the following:

- *a. demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*
  - *i. a heritage item,*
  - *ii. an Aboriginal object,*
  - *iii. a building, work, relic or tree within a heritage conservation area,*
- *b. altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*
- *c. disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation would or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*
- *d. disturbing or excavating an Aboriginal place of heritage significance,*
- *e. erecting a building on land:*
  - *i. on which a heritage item is located or that is within a heritage conservation area, or*
  - *ii. on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*
- *f. subdividing land:*
  - *i. on which a heritage item is located or that is within a heritage conservation area, or*

ii. on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

The Australian Oil Refinery is included in a listing as an archaeological item of environmental heritage on Schedule 5 of the SSLEP, identified as #A2524.

There are two other items located within or adjacent to the Site, comprising the Four Wheel Drive Track (#A2523), and Silver Beach and Roadway (#2506).

The Four Wheel Drive Track traverses the Site. The track originally connected Kurnell Village with Cronulla to the southwest, and was largely overlaid in 1953-56 by the construction of Captain Cook Drive, which in turn facilitated construction of the Kurnell Refinery. Much of the alignment of Captain Cook Drive reflects that of the original track. However, a short section of Captain Cook Drive along the western boundary of the Site by-passes the original route of the track where it intersected the refinery property.

Silver Beach is a long, picturesque white sand beach along the northern side of the Kurnell Peninsula.

Figure 3: Location of heritage items listed on the NHL, CHL and SHR in relation to the Site.

3.0 Historical Background

A detailed history has been compiled in the HMS. A detailed history of the Site, specifically relating to the construction of the oil refinery and the Kurnell Peninsula Headland are discussed in this strategy (Australian Museum Consulting, 2014b).

3.1 Industrial Development

The earliest industries in the Botany Bay area focused on the water-based resources of the bay and shoreline. Commercial fishing was established on the north side of the bay as early as 1790, and by the 1850s fishermen had also built shacks on the shores of Boat Harbour, Weeney, Woolooware and Quibray Bays, sending their catch by water to the markets in Sydney. Shell-gathering or digging was also important, particularly as a source of lime for lime putty mortar, used in the construction of masonry buildings, stuccoing, and plastering over other inferior building materials (Salt, 2000).

From 1864, Thomas Holt began experimenting with oyster farming for the food industry, establishing farms in Gwawley and Weeney Bays at Towra Point. Holt used convict labour to establish the first European spawning and maturing areas. Holt's venture proved to be an expensive failure; however, once established, the oyster farming industry continued in Botany Bay and the Georges River for much of the twentieth century (Salt, 2000).

The relative isolation of the Kurnell Peninsula from suburban Sydney also attracted the attention of the noxious industries trade, which had been pushed to the outskirts of the city following the passing of the 1848 Slaughter House Act. Before widespread understanding of germ theory, it was commonly accepted that disease was spread by bad smells or miasmas, and that these industries were therefore a danger to public health. Between 1881 and 1886, the government considered various proposals to reserve a site for noxious trades, such as abattoirs, tanneries and a cemetery, including 2,970 acres of land at Kurnell for noxious trades (Fitzgerald, 2008). Although the bill enforcing the reservation was never formally enacted, much of the Kurnell Peninsula was kept free of residential development, and in the post-War period various heavy industries established factories and other operations on the land, including sand mining, the Australian Oil Refinery (AOR), two carbon black manufactories, and various chemical and pharmaceutical manufactories (Figure 4 & Figure 5) (Salt, 2000:87-96).

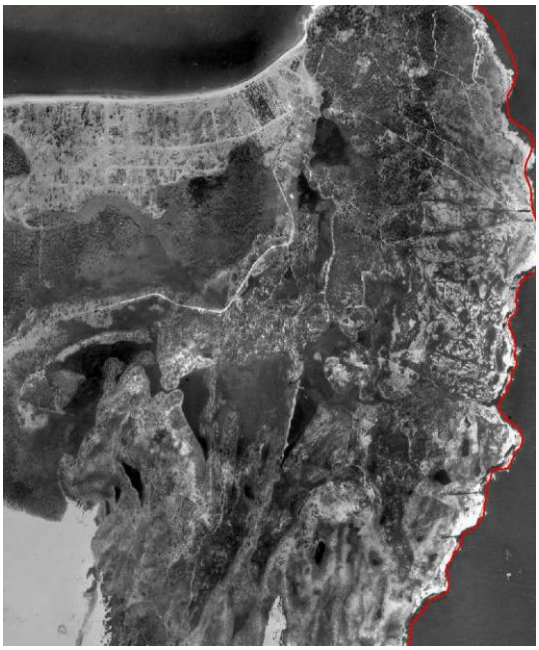

Figure 4 **Aerial photo of Kurnell peninsula, 1943, prior to the establishment of AOR (Source: Sutherland Shire Maps).**

Figure 5 **Aerial photo of Kurnell peninsula, 1978, after the establishment of Australian Oil Refinery and Australian Lubricating Oil Refinery (Source: Sutherland Shire Maps).**

The reclamation of foreshore land and associated dredging activities for industrial development around Botany Bay has changed the original shape of the shoreline. In 1890, a sewage farm was established on the northern shore of the bay, adjacent to the mouth of the Cooks River. This land was redeveloped in the mid-twentieth century as part of the expansion of Kingsford Smith Airport, and the Cooks River was diverted to a new outlet in the bay. Dredging and construction of the Kurnell Oil Refinery wharf and Banksmeadow Oil Terminal (1953-56), and the Port Botany Container Terminal (from 1970), have further altered the local environment (Salt, 2000).

The construction of the Australian Oil Refinery, and the ongoing heavy industrialisation of the Kurnell Peninsula, was resisted by many community groups, including environmental groups concerned that the industry would destroy the natural heritage and recreational values of the area, and others concerned that industrial facilities would desecrate the historical and social significance of the Captain Cook Landing Place Reserve (Kirkby, 1973; Nugent, 2005).

3.2 Australian Oil Refinery

The modern petroleum industry emerged in the mid-nineteenth century, when increasing demand for kerosene as a lighting fuel led to the development of commercial oil wells in Azerbaijan, Poland, Romania, USA and Canada. The US firm Vacuum Oil was the first oil company to establish a presence in Australia, setting up an office in Melbourne in 1895, and the Vacuum-Colonial company dominated the oil import industry for the first two decades of the twentieth century. However, several other international oil companies also established branches in Australia during this period, including Shell (1900), Neptune (1909) and the Texas Company (1918) (Murray, 2001; Wilkinson, 2006).

In approximately 1901, Shell opened a bulk kerosene receiving terminal at Gore Bay in Port Jackson. At about the same time, the Colonial Oil Company established a major oil storage depot at Pulpit Point in Hunters Hill, and began importing kerosene and motor spirits (also known as benzene or petrol) into Australia. The Colonial Oil Company merged with Vacuum Oil in 1908, and in 1924 Vacuum Oil opened its first bulk petroleum products terminal at the Pulpit Point site. Vacuum Oil (which later became Mobil) operated its Hunter's Hill depot until 1988. The Texas Company (later Caltex) also operated an import terminal at Ballast Point in Balmain from 1928 until 1994 (ExxonMobil, 2008; Tropman & Tropman Architects, 2004; Wilkinson, 2006).

The introduction of the Model T Ford to Australia in 1909 marked the beginning of the age of mass-produced motor vehicles. The internal combustion engine required a higher quality fuel than could be distilled from shale, which led to a dramatic increase in oil imports. In 1913, an Australian shipping agent, HC Sleigh, also began to import oil, using the brand name Golden Fleece (Murray 2001; Wilkinson 2004). In 1916, the petrol pump and storage system invented by SF Bowser & Co of Canada was introduced to most roadside garages, and removed the need for the cumbersome 'funnel and can' method for refuelling (Wilkinson 2004). In 1920, Golden Fleece opened a chain of 20 service stations in Melbourne, Sydney and Adelaide, exclusively marketing its own oil products. However most garages continued to sell multiple brands of petrol until the 1950s, when the major brands began to introduce their own service stations and focus on solo marketing (Wilkinson, 2004).

In 1920, as motor vehicles became more popular in Australia, the Australian Federal Government formed the Commonwealth Oil Refineries (COR) and by 1924 it had built Australia's first oil refinery, at Laverton in Victoria. Crude oil feedstock for the Laverton refinery was imported from Iran. By 1926, John Fell and Company had also begun refining petroleum at Clyde in Sydney. The Clyde site had originally been established to refine kerosene shale oil from Newnes in the Central Tablelands. The Clyde refinery was purchased by The Shell Company of Australia Ltd in 1928, and Shell continued to operate the refinery on the site until September 2012. The COR refinery was purchased by the Anglo-Iranian Oil Company (later British Petroleum [BP]) in 1952, and closed in 1955 (Murray 2001; Shell 2012).

Australia's third and fourth major oil refineries were constructed in the late 1940s, specialising in the production of bitumen from heavy crude oil feed stocks: the Bitumen and Oil Refining Australia Ltd (BORAL) plant (part owned by Caltex) at Matraville on Botany Bay opened in 1948; and the Standard-Vacuum Oil Company plant at Altona near Melbourne, VIC opened in 1949 (Wilkinson 2004).

In the years following WWII, motor car use and aviation technology boomed. Petrol rationing was lifted in 1950, and the main petroleum companies quickly began to take advantage of the world-wide supply

of cheap oil to invest in new Australian-based refineries. In 1951-1952, Vacuum proposed to upgrade its refinery at Altona VIC, Shell proposed a new refinery at Geelong VIC, BP proposed a new refinery at Kwinana WA, and Caltex proposed a new refinery at Botany Bay (The Sydney Morning Herald, 1951a, 1951b, 1951c; Wilkinson, 2006). The Caltex refinery, known as the Australian Oil Refinery, began operations at Kurnell on the south side of Botany Bay in 1956. At the same time, Caltex established a finished products terminal on the north side of the bay, at Banksmeadow, and ceased storing petrol at its Balmain terminal.

At the beginning of the twenty-first century, the profitability of the Australian refining industry has come under pressure from two main sources: competition from new larger-scale refineries in Asia, and the need to upgrade aging equipment to comply with Federal clean fuel regulations. Australia's mid-twentieth century era refineries are smaller and less technologically sophisticated than the Asian refineries, and have higher labour and engineering costs. At the same time, all of the extant Australian refineries have carried out upgrades to enable them to treat a wider variety of crude types (Vivoda, 2012; Wilkinson, 2004). In July 2011, Shell announced that it was going to shut down its refining operations at Clyde and convert the refinery into a fuel import terminal. In July 2012, Caltex followed suit and announced the conversion of its Kurnell Refinery, the last refinery in NSW, to an import terminal (Vivoda, 2012). Shell ceased refining operations at its Clyde plant from 30 September 2012 (Shell, 2012). Caltex ceased refining operations at Kurnell in 2014.

3.3 Initial Development of the Australian Oil Refinery

Caltex originally considered several locations along the NSW coast for its new refinery before settling on the Kurnell Peninsula. The Kurnell location offered close proximity to Botany Bay, for the supply of crude oil by ship, and close proximity to Sydney's Kingsford Smith Airport, which was an important user of fuel and which was, at that time, being upgraded to accommodate two new runways and an international terminal. The location also enabled easy distribution of petrol to other local markets, good access to labour, good access to water needed to cool the plant, and room to expand (Caltex, 1984; Wilkinson, 2006). The biggest problems with the site were the dredging of Botany Bay, required to provide large ships access to the refinery, and proximity to Captain Cook's Landing Place Reserve.

Cumberland County Council initially rejected Caltex's application to build the new £25 million oil refinery at Kurnell, in an area then zoned as Open Space. Sutherland Shire Council had also objected to Caltex's proposed refinery site of 300-400 acres at Kurnell because of its proximity to Captain Cook's landing place, which they regarded as 'consecrated soil', and the overall 'effect of such a dominating industry in the locality' (Kirkby 1973). Caltex argued that the refinery would not produce smoke nuisance of any kind, and that some 600 employees would be recruited locally. Sutherland Shire Council later withdrew its objection, although its reasons were not specified, and in June 1952 the State Government approved the project, provided that the company bear the cost of dredging and constructing a wharf, which would have to be as far as possible from the Captain Cook's Landing Place Reserve, and bear the cost of necessary roads and other infrastructure (Sydney Morning Herald 28 March 1952; 11 June 1952; Kirkby 1973).

Caltex was originally established as an international company in 1936, as a joint venture of the Texas Company (later called Texaco) and the Standard Oil Company of California (Socal, later called Chevron). The proposed Kurnell Refinery would enable Caltex to process and distribute oil from its successful Minas Oil Fields in Sumatra, Indonesia (Hill and Knowlton Pty Ltd, 1956). Prior to construction, Caltex established an Australian subsidiary company to construct and operate the refinery, Australian Oil Refining Pty Ltd (AOR) (Caltex 1984; Salt 2004). Engineers responsible for the planning and design of the refinery were based in New York and London. However much of the refinery workforce was recruited in Australia and, during the construction, the company sent Australian scientific and technical trainees to Bahrain, Japan and the Philippines to learn how to operate the refinery (Hill and Knowlton Pty Ltd, 1956).

Caltex initially purchased 174 hectares of swampland at Kurnell, and subsidised construction by Sutherland Shire Council of the access road from Cronulla, now known as Captain Cook Drive. Historical film and photographs document the progressive clearing of native vegetation, levelling of sand hills, and reclamation of swampland to prepare the site. Construction of the main refinery began in December 1953 and was completed early in 1956 (Figure 6). During the peak of construction in 1955, approximately 3,000 people were employed at the site, with most arriving at work each day by

bus from Cronulla. The principal contractor was EB Badger and Sons Pty Ltd, a subsidiary of EB Badger and Sons (Great Britain) of London, which built the process units, power plant, main workshop, and installed the piping. The Chicago Bridge and Iron Company built 56 tanks for crude oil and finished product storage. Fletcher-Merritt-Raymond Construction Company of New Zealand built and laid a submarine pipeline between Kurnell and the terminal at Banksmeadow, designed to transport jet fuel to the airport and other refined oils to the dockyards for sea transport, and built a wharf 3600 feet (1.1 km) long on the south shore of Botany Bay. The wharf was designed by the London office of Danish civil engineering firm Christiani & Nielson, which specialised in maritime projects and was renowned for its pioneering work in reinforced concrete. The wharf incorporated 877 reinforced concrete piles, 15 oil and oil product pipelines, one fresh water and one salt water pipeline, a cooling water pump house, shipping office, breasting island capable of berthing two large tankers, and a mooring and turning dolphin (a marine structure that extended above the water level without connecting to shore) (Hill and Knowlton Pty Ltd, 1956; Salt, 2000). Australian Dredging and General Works Pty Ltd of Williamstown in Victoria were contracted to dredge a channel, turning circle and berths alongside the wharf. Over 2,600,000 tons of sand and sediments were removed from the wharf area and deposited on the refinery site prior to construction (Larkin, 1998; Maritime Services Board, 1959; The Sunday Herald, 1953).

By February 1956 the refinery had approximately 500 permanent employees and was pumping finished fuel products across Botany Bay, via the submarine pipelines to the Banksmeadow Terminal, where they were transferred to road and rail tankers for further distribution throughout NSW. Fuel products were also shipped out from the Kurnell wharf via a fleet of small Australian-flag tankers (Hill and Knowlton Pty Ltd, 1956; Wilkinson 2006).

Figure 6 Australian Oil Refinery under construction, 1954 (Source: State Library of NSW, Australian Photographic Agency – 42956).

3.4 Expansion and Development of the Australian Oil Refinery

From the late 1950s, through the 1960s and 1970s, Australia had one of the fastest growing petroleum markets in the world, largely due to the rapid increase in popularity of motor cars. The Kurnell Refinery was progressively expanded to accommodate the increased demand for petrol and other refinery products (Figure 7 to Figure 10 inclusive). A major period of expansion began in 1961, and by 1964 refinery capacity had been increased by over 400%, to 90,000 barrels of crude per day (Caltex 1984). Aerial photographs indicate that additional crude oil distillation and fluid catalytic cracking units as well

as an alkylation unit had been added to the process line. Five larger crude oil tanks had also been constructed on the west side of the site.

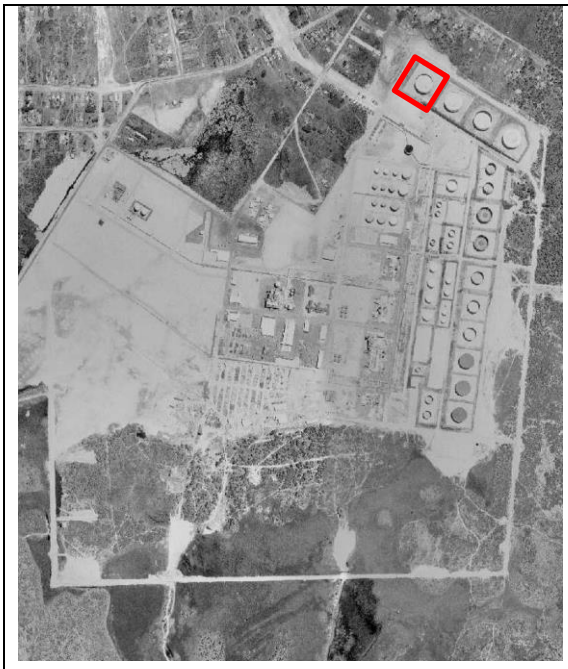

Figure 7 Australian Oil Refinery during construction, 1955 (Tank 101 outlined in red) (Source: Sutherland Shire Maps).

Figure 8 Australian Oil Refinery, 1961 (Tank 101 outlined in red) (Source: Sutherland Shire Maps).

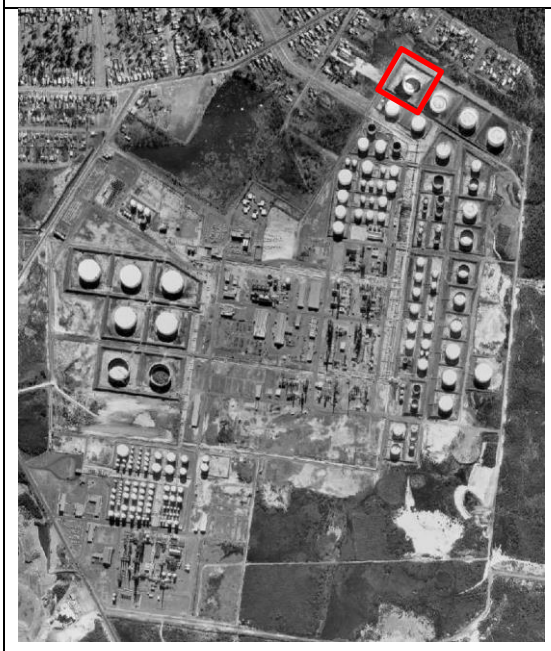

Figure 9 Australian Oil Refinery 1970 (Tank 101 outlined in red) (Source: Sutherland Shire Maps).

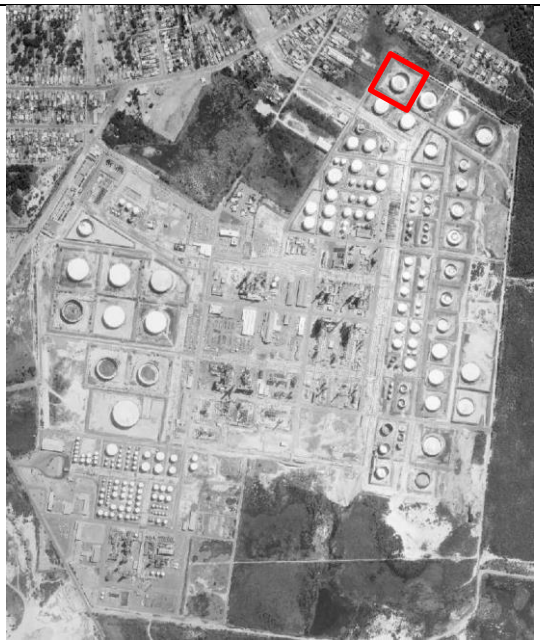

Figure 10 Australian Oil Refinery 1978 (Tank 101 outlined in red) (Source: Sutherland Shire Maps).

From 1961, the Australian Lubricating Oil Refinery (ALOR, later known as the Caltex Lubricating Oil Refinery or CLOR) was also constructed on Crown Land adjacent to the main refinery (Figure 11). ALOR was Australia's first lubricating oil refinery, initially conceived as a joint venture by Caltex (50%), Golden Fleece (25%) and Ampol (25%). The joint venture ensured that the refinery would have sufficient bulk output to make it profitable, and that it would be 50% Australian-owned (The Australian

Women's Weekly, 1961). ALOR began operating in 1963, importing Arabian crude oil to produce base stocks for lubricants and greases, naphthenic products, and waxes used in waterproofing, building products and cosmetics (Caltex, 1984; Salt, 2000). Caltex later acquired Golden Fleece (1981) and merged with Ampol (1995) (Caltex, 1984; Wilkinson, 2006).

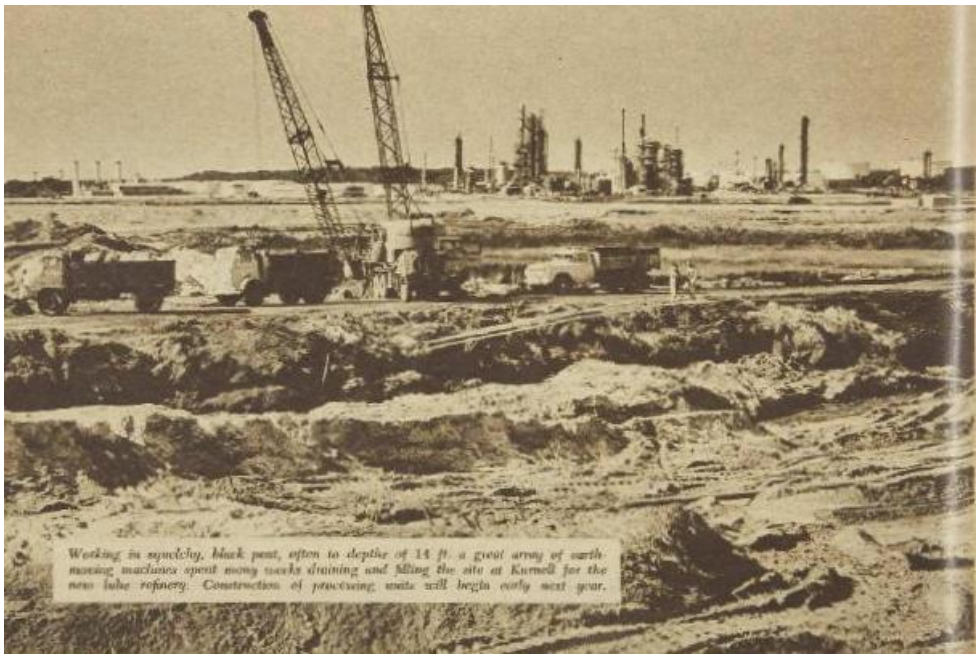

Figure 11 Site preparation for the ALOR, with the main refinery behind (Source: The Australian Women's Weekly 20 December 1961).

From the early 1980s, the Kurnell Refinery has undergone a number of major upgrades, in particular to accommodate new health, safety and environmental standards, consumer pressure for improved engine performance, as well as repairs to aging equipment. Unleaded petrol became mandatory for new vehicles after 1986 (when catalytic converters became compulsory on new cars), and production of low lead and unleaded petrol required changes to the refinery plant. Also in the 1980s, in response to a worldwide issue of contamination of jet fuel by the fungus *Cladisporium resinae*, Caltex redesigned its jet fuel storage systems to ensure exacting quality standards for this product. The floating roof jet fuel tanks were converted to a fixed roof style, automatic draining systems were installed, and tank and pipeline systems for transporting jet fuel were completely segregated (Caltex, 2006; Wilkinson, 2006). In approximately 1990, refinery operations were switched from manual to computerised systems, and were centralised in a new Central Control Building. In 2000 a serious problem developed in one of the plant's fluidised catalytic cracking units. A faulty 67 metre high stack was demolished and replaced with a new one (Wilkinson, 2004). Between 2004 and 2006, Caltex constructed a new Benzene Saturation Plant (BENSAT) and upgraded the existing Diesel Hydro-Treating Unit (DHTU) to reduce benzene levels in petrol and lower sulphur content in diesel fuels, to comply with new specifications implemented by the Federal Government as part of its clean air program (Wilkinson, 2006). In the late 2000s, in response to the 2005 BP Texas City explosion, administrators and technical staff housed in buildings at the centre of the site were progressively relocated away from the main plant to new buildings at the periphery of the site, outside the 'blast zone'.

In 2009, Caltex announced that it would close ALOR (by then known as CLOR) due to the fact that the plant was manufacturing outmoded lubricant products and faced declining feedstock sources. The plant closed in 2011 and has been demolished. The closure led to the loss of approximately 70 jobs and the associated closure of a downstream supplier. In July 2012, Caltex announced that it would also close the main refinery, and convert parts of the site to store additional finished fuel so that it would operate wholly as a finished products terminal (Sydney Morning Herald 26 July 2012; 27 July 2012).

The conversion from a refinery to a terminal has been completed. Demolition works of all redundant buildings associated with the approved demolition plans has commenced.

4.0 Physical context

4.1 Site Inspection

A site inspection was not undertaken as part of this assessment. Existing photography taken on 6 July 2017 of the Tank 101 demolition works area were provided to AECOM. In order to assess the impacts to the significance of the Site and to the Tank 101 photographs of the demolition works area were reviewed (see Plate 1 to Plate 4).

Plate 1 **Tank 101 view east**

Plate 2 **Tank 101 view east**

Plate 3 **Tank 101 and adjacent Tank 102 view south-west**

Plate 4 **Tank 101 (left partial) and adjacent Tank 202 view north-west**

4.2 Heritage Potential

There is no known or potential for historical archaeological sites to be present in the vicinity of Tank 101 in either surface or subsurface contexts. The tank is located on a modified flat area with an asphalt hardstand base. The ground beneath the hardstand was heavily disturbed during the construction of the refinery. As such, there is not expected to be any unknown historical archaeological relics in this area.

4.3 Archaeological potential

The archaeological potential for the Kurnell Refinery site was previously assessed as part of the HMS. The report found that the overall land surface has been extensively disturbed, by the initial land clearance and reclamation works, construction of the refinery and associated sewerage, pipeline roads

and other infrastructure, such that there is unlikely to be any subsurface archaeology extant on the site which pre-dates the history of the refinery. (Australian Museum Consulting, 2014b).

4.4 Summary

Based on an understanding of the history of the Site and of the current site layout of the demolition works area, the following observations following observations can be made. The site formation associated with clearing of the land and the creation of the hardstand area has caused heavy disturbance to, and immediately around, the location of Tank 101. This is likely to have resulted in the removal of any potential historical archaeological relics or deposits present within the demolitions works area. This statement is also supported by the archaeological assessment made in the HMS that states there is unlikely to be any subsurface archaeology extant on the site which pre-dates the history of the refinery (Australian Museum Consulting, 2014b).

5.0 Assessment of Significance

5.1 Assessment Criteria

In order to understand how a development will impact on a heritage item it is essential to understand why an item is significant. An assessment of significance is undertaken to explain why a particular item is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in The *Australia ICOMOS Charter for Places of Cultural Significance 2013* (the Australian ICOMOS Burra Charter, 2013) as meaning "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" (Article 1.2). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is of significant to us now may change as similar items are located, more historical research is undertaken and community tastes change.

The process of linking this assessment with an item's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance*, part of the NSW Heritage Manual (NSW Heritage Office, & NSW Department of Urban Affairs and Planning, 1996). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (i.e. to the people living in the vicinity of the site), at a State level (i.e. to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

In accordance with the guideline *Assessing Heritage Significance* (NSW Heritage Office, 2001), an item will be considered to be of State significance if it meets two or more criteria at a State level or local heritage significance if it meets one or more of the following criteria:

Criterion (a) *– an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).*

The site must show evidence of significant human activity or maintains or shows the continuity of historical process or activity. An item is excluded if it has been so altered that it can no longer provide evidence of association.

Criterion (b) *– an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local to area).*

The site must show evidence of significant human occupation. An item is excluded if it has been so altered that it can no longer provide evidence of association.

Criterion (c) *– an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).*

An item can be excluded on the grounds that it has lost its design or technical integrity or its landmark qualities have been more than temporarily degraded.

Criterion (d) *– an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.*

This criterion does not cover importance for reasons of amenity or retention in preference to proposed alternative.

Criterion (e) *– an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area). Significance under this criterion must have the potential to yield new or further substantial information.*

Under the guideline, an item can be excluded if the information would be irrelevant or only contains information available in other sources.

Criterion (f) *– an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area). The site must show evidence of the element/function etc proposed to be rare.*

Criterion (g) *– an item is important in demonstrating the principal characteristics of a class of NSW's (or local area's):*

- *Cultural or natural places; or*
- *Cultural or natural environments.*

An item is excluded under this criterion if it is a poor example or has lost the range of characteristics of a type.

The Heritage Council require the summation of the significance assessment into a succinct paragraph, known as a Statement of Significance. The Statement of Significance is the foundation for future management and impact assessment.

5.2 Assessment of Significance

The HMS (Australian Museum Consulting, 2014b) has prepared a revised assessment of significance for the whole of the Caltex Oil refinery. The original significant assessment was prepared in 1992 for the Sutherland Shire Council and was revised as part of the preparation of the HMS. This is presented below unamended. However, it is noted that the Site is no longer operating as a refinery, as it has been converted to a terminal. As a result, much of the infrastructure that contributed to this listing has since been demolished.

5.2.1 Kurnell Caltex Oil Refinery

Criterion a) *An item is important in the **course or pattern** of NSW's **cultural or natural history** (or the cultural or natural history of the local area)*

The Caltex Kurnell Refinery is historically associated with the expansion of the oil refining industry in Australia in the mid-twentieth century, and more broadly with the rapid expansion of motorised transport and associated industry in the post WWII era. It is one of only three crude oil refineries to have operated historically in NSW, the others being the Shell refinery at Clyde (originally John Fell and Company) and the BORAL refinery at Matraville, and is the only refinery still operating in the State. The refinery is scheduled to close in 2014, when the site will be converted to a finished fuel products terminal, at which point there will be no operational crude oil refineries in NSW and only five oil refineries in other States across Australia.

Throughout its history, the Caltex Kurnell Refinery has made an important contribution to the economic development of NSW, providing a significant proportion of all transport fuels used within the State. It began operating in 1956 as the Australian Oil Refinery, the largest industrial facility then built by private enterprise in the State, and the first major industrial facility on the Kurnell Peninsula. The refinery underwent several major periods of expansion in the 1960s and 70s, responding to increasing consumer demand for fuel, better motor engine performance, and the inception of locally produced crude from new oil fields in Bass Strait. More recent upgrades have responded to new health, safety and environmental standards, and associated government regulations. Closure of the refinery is a result of decreasing profitability in the Australian oil refining industry in the twenty-first century, commonly associated with competition from newer, larger-scale refineries in Asia, and the need to upgrade aging equipment to comply with Federal clean fuel regulations.

Criterion b) *An item has strong or special **associations with** the life or works of **a person, or group of persons, of importance in NSW's cultural or natural history** (or the cultural or natural history of the local area)*

The Kurnell Refinery has a strong association with the Caltex brand of petroleum products, and the philanthropic activities of the Caltex company in the local area. It is also has a special association with Australian Oil Refining Pty Ltd (AOR), a Caltex subsidiary company established in Australia to construct and operate the refinery.

The group of six staff houses within the original Australian Oil Refinery complex are associated with the work of architect Harry Seidler, who is generally regarded as Australia's best-known modernist architect in the post-WWII era.

Criterion c) *An item is important in demonstrating **aesthetic characteristics** and / or a high degree of **creative or technical achievement** In NSW (or the local area);*

The Kurnell Refinery is important in demonstrating key elements of oil refining technology introduced to Australia in the post-WWII period. The refinery continues to operate using a combination of original and updated plant and equipment, including three elements of plant from the original process line (Crude Distillation Unit No. 1, Fluid Catalytic Cracking Unit No. 1, and the Polymerisation Unit) and the original power plant.

The refinery site also retains its original layout and various elements of original supporting infrastructure, including the Kurnell wharf, tank farm, workshops, stores, cafeteria, laboratory, administrative and amenities buildings, and on-site staff housing. Each of these elements has been incrementally modified, upgraded, and in some cases adapted to new uses as part of the ongoing operation of the refinery. The overall plant and supporting infrastructure retains a distinctly modernist character, representative of the technological expertise and optimistic social outlook of the 1950s and the post-WWII era.

Administrative and amenities buildings within the original Australian Oil Refinery complex and the later Australian Lubricating Oil Refinery were designed by notable post-WWII architectural firm Bunning and Madden. The overall grouping of administrative and amenities buildings designed by Bunning and Madden have aesthetic significance as important examples of mid-twentieth century modernist architectural design and construction in an industrial setting in NSW, and are illustrative of the progressive nature of the Caltex company when the refinery was established. The ALOR cafeteria and amenities buildings also incorporate sculptural panels with significant aesthetic value, representative of a desire to introduce a human element to the otherwise austere, machine-age character of the modernist buildings.

A group of six staff houses within the original Australian Oil Refinery complex were designed by major Australian post-WWII architect Harry Seidler. The houses have aesthetic significance as a local representative example of Seidler's early work in Australia, and more broadly as a rare early example of a Seidler group housing project, designed to ensure modern economies through mass-production. Seidler introduced variety and privacy to the group by reversing the plan of some of the houses, and by the subtle placement of solid and pierced brick screen walls around and garages between the buildings.

The refinery complex is a prominent industrial landmark within the local area, with tall elements of plant and much of the tank farm clearly visible from the waters of Botany Bay and beyond. These elements, however, detract from the State and National heritage values of the neighbouring Kamay Botany Bay National Park.

Criterion d) *An item has strong or special **associations with a particular community or cultural group** in NSW (or the local area) for **social, cultural or spiritual reasons**;*

The Caltex Kurnell Refinery site, and individual work areas within the site, has strong or special associations for current and former employees of the company. The physical appearance, smell, and sounds of the site are commonly associated with the development of individual and collective skills and life histories. The physical experience of the place can trigger memories of special people or events, such as the installation of new technologies, personal advancement to a new job or level of skill, or the discovery and repair of a fault at the plant.

Historic images and documents regarding the history of the site can also have strong or special associations for current and former employees. A large number of images, Caltex company magazines, uniforms, and other 'memorabilia' have been collected by former staff members. The Kurnell Refinery library contains copies of many of staff collected images and magazines, providing an

important social document of the people who worked at the plant, their social experiences, and Caltex's social and philanthropic initiatives within the broader community.

The Caltex Kurnell Refinery has strong associations with the local Kurnell community, and Caltex has been one of the largest employers in the local area. Throughout the history of the refinery, Caltex has taken active steps to support the health and well-being of its employees, and many employees have spent their whole working life at the site. Caltex is also recognised as a regular sponsor of other social initiatives in the broader community.

Criterion e) *An item has **potential to yield information** that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);*

While operational, the physical evidence of the Kurnell Refinery plant and the knowledge and experience of the operational staff have the potential to yield information about this technology which is not available from other sources. Following closure of the plant, some elements of machinery, equipment, signage or other ephemera may provide an important industrial heritage reference collection, which would contribute to future interpretation and/or understanding of the refining technology used at the site.

There is little or no potential for sub-surface archaeological relics which pre-date the operation of the refinery to be present on the site.

Criterion f) *An item possesses **uncommon, rare or endangered** aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);*

With the closure of Shell's Clyde refinery in September 2012, Caltex's Kurnell Refinery is the only operational oil refinery in NSW. The refinery site contains a rare collection of oil refining technology of the mid-twentieth century, as well as original equipment and ephemera associated with the operation of the refinery.

The Caltex Kurnell Refinery site contains a rare collection of technical drawings, photographs, and memorabilia, which document the original design and construction of the refinery; later upgrades, maintenance and repairs to the refinery; products of the refinery; Caltex's social and philanthropic initiatives associated with staff of the refinery.

Criterion g) *An item is important in **demonstrating** the **principal characteristics of a class of NSW's cultural or natural** places; or cultural and natural environments.*

The Kurnell Refinery is a large-scale industrial complex, which is important in demonstrating the principle characteristics of an Australian oil refinery. The site contains a representative collection of oil refining technology of the mid-twentieth century, as well as supporting infrastructure associated with the original operation of the refinery. Other plant and infrastructure illustrate key periods of change within the oil refining industry, including the inception of locally produced crude from new oil fields in Bass Strait in the 1970s, and more recent environmental standards, including requirements to reduce lead and benzene levels in petrol and sulphur content in diesel.

5.3 Grading of Significant Elements

Grading of individual elements that make up the Kurnell Refinery was prepared in the HMS. The grading of individual components of a place identifies those components that contribute to the heritage items overall heritage value. The heritage management strategy identified that Kurnell Refinery has a high degree of original built fabric, and that the ongoing maintenance, adaptation and/or reconstruction of the site as part of the refinery's use has only had a minor impact to the overall significant fabric of the place (Australian Museum Consulting, 2014b).

The HMS identified the place that includes Tank 101 as the Eastern Tank Area. It was described as follows:

Table 6 Grading of Significant Elements

Element	Grading	Comments
Eastern Tank Area • c.1954-1955, consisting of 56 tanks constructed, included 4 tanks along north boundary • between 1956-1961, Eastern Tank Area expanded to the east • Between 1961-1963, Eastern Tank Area expanded to the south • Between 1970-1978; Eastern Tank Area expanded to south	High	Original tank area. Alterations do not detract.

6.0 Impact Assessment

6.1 The Tank 101 demolition works

Caltex proposes to remove Tank 101 from the Site. This will include excavation up to 1 metre below the current hard stand level on the Site. Further detail on the proposed Tank 101 demolition works is provided in Section 1.3

6.2 Heritage Conservation Strategy

The works have been assessed against strategies outlined in the HMS (Australian Museum Consulting, 2014b). These strategies were created to provide for ongoing care and management of the Caltex Kurnell Refinery site as an operational industrial heritage site. Of relevance to the Eastern Tank Farm Area (within which the Tank 101 demolition works area falls) are the management strategies 1, 6, 10, 13 and 17. These strategies are outlined below.

Strategy 1 looks at the continued conservation of the heritage significance of the refinery through its ongoing use. The aim is to conserve a representative sample of significant refinery infrastructure in use as part of the proposed fuel impact terminal. The strategy also includes consideration for retaining significant fabric in use wherever possible.

Strategy 6 places consideration options for “mothballing” highly significant buildings or infrastructure that cannot be immediately reused as part of the import terminal, but could conceivably be used to fulfil future planning needs.

Strategy 9 outlines the potential to undertake an audio-visual recording of the refinery plan while it is still in operation. This is to record and preserve the history and technology of the plant in operation and to interview former and existing operators to explain the processes before and now.

Strategy 10 commits to undertaking an archival photographic recording of the refinery while the Site is still in operation, during refurbishment of tanks, and during demolition or dismantling activities. An archival quality photographic recording should be prepared in accordance with guidelines for *Photographic Recording of Heritage Items Using Film or Digital Capture*.

Strategy 17 recommends that communication of the history and significance of the Kurnell Refinery is understood by Caltex staff and the broader community. This is to include displays of memorabilia and historic photos, signage and interpretation panels.

Of specific relevance to the Tank 101 demolition works are Strategies 1, 6 and 10. Strategies 9 and 17 relate to the recording of the refinery as a whole, and are not specific to the proposed works.

6.3 Previously Approved Demolition Works

As part of the conversion of the Kurnell Caltex Refinery to a finished fuel import terminal, preparations were made for the demolition, dismantling and/or removal of redundant infrastructure. A Heritage Impact Assessment (HIA) was prepared to address the proposed demolition works, and the impacts the proposed works would have on the nearby National, State and locally significant historical heritage items, and to the heritage significance identified in the HMS (see Section 5.2 of this report).

In relation to the Eastern Tank Area, 64 cylindrical tanks were proposed to be demolished as part of the approved demolition works, leaving eight tanks, including Tank 101. The HIA determined that the approved demolition works would significantly impact on the layout of the Eastern Tank Area. However, the HIA identified that the proposed retention and ongoing use of at least three large pre-1955 (6,300,000 gallon) tanks in the Eastern Tank Area along the northern boundary of the site, three pre-1955 tanks to the west of the Oil Movements Centre (OMC) and three large pre-1955 tanks in the Western Tank Area, that are consistent with the industrial history of the site, would mean that the tank farms would continue to have some representative value. The individual rarity and representative

value of the remaining original/early tanks would also increase (Australian Museum Business Services, 2013).

The HIA recommended that the impact be mitigated by the retention of *at least* six original tanks within the Eastern Tank Area, which were to include three along the northern boundary.

The report concluded that the overall heritage significance of the site would be significantly impacted by the demolition works. However, implementation of the HMS for the Site would provide some mitigation for the loss of heritage value, by:

- Preserving a representative sample of significant refinery infrastructure in use as part of the fuel import terminal, including examples of original tanks, workshops, administrative and amenities buildings. These remnant buildings and structures were originally constructed to support the operation of the refinery. Ongoing use of these items in terminal operations is consistent with the identified heritage values of the site, and would contribute to the conservation of these heritage values into the future.
- Preserving a representative sample of significant original/early modernist buildings in use across the site. Consideration should be given to preparing detailed conservation management plans for highly significant buildings.
- Creating a permanent archival collection of records and moveable heritage items that documents the engineering history, social history, and unique character of the site. A permanent and accessible archive would be a basic resource for people wishing to understand or interpret the heritage significance of the site to present and future generations.
- Communicating the history and significance of the refinery to Caltex staff and the broader community.

The HIA determined that the demolition works would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National Park and Kurnell Peninsula Headland. This site is listed on the National Heritage Listing and on the State Heritage Register as a place of State Significance. The positive outcome coincides with:

> *"…reducing the vertical scale and prominence of the site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*" (Australian Museum Business Services, 2013).

Therefore it is unlikely there would be any negative adverse impact from the removal of Tank 101 to the National and State heritage listed Kamay Botany Bay National Park and Kurnell Peninsula Headland. In fact, the Tank 101 demolition works would contribute to a further positive long term impact on these sites.

6.4 Heritage Impact Assessment

Heritage impacts have been assessed according to standard heritage terminology, as provided in Table 7. The impacts of the Tank 101 demolition works are assessed against each of the heritage criterion from the assessment of significance prepared in the HMS shown in Table 8. However, it is noted that the HMS was prepared prior to the cessation of operation of the Kurnell Refinery and conversion of the refinery to a terminal. In addition, much of the infrastructure that contributed to the significance of this listing has also been removed.

Table 7: Impact type definitions

Impact Type	Definition
Major negative impacts	Substantially affects fabric or values of state significance
Moderate negative impacts	Irreversible loss of fabric or values of local significance; minor impacts on State significance
Minor negative impacts	• Reversible loss of local significance fabric,

Impact Type	Definition
	or • Where mitigation retrieves some value of significance, or • Loss of fabric not of significance but which supports or buffers local significance values
Negligible or no impacts	Does not affect heritage values either negatively or positively
Minor positive impacts	Enhances access to, understanding or conservation of fabric or values of local significance
Major positive impacts	Enhances access to, understanding or conservation of fabric or values of state significance

Table 8 Assessment against heritage criterion

Criterion (as identified in the Heritage Management Strategy)	Activity: Demolition of Tank 101
a) Historical significance: The Caltex Kurnell Refinery site is historically associated with the expansion of the oil refining industry in Australia in the mid-twentieth century, and more broadly with the rapid expansion of motorised transport and associated industry in the post WWII era. It was one of only three crude oil refineries to have operated historically in NSW, the others being the Shell refinery at Clyde (originally John Fell and Company) and the BORAL refinery at Matraville, and was the last refinery still operating in the State until it cessed operations in 2014. By the end of 2017 all of the works approved under this initial development consent for the Project would be completed.	The tank is one of the first 54 tanks built in the Eastern Tank Area on the Site when the refinery was opened and is considered to be highly significant. The approved demolition works proposed removal of all but eight cylindrical tanks from this area. With the demolition of Tank 101, only seven would remain. The HIA recommended that *at least* six tanks should remain in the Eastern Tank Area, as well as recommending that at least three of the four tanks on the northern boundary continue to be used to mitigate the loss of the other 64 tanks and retain the significance of the Kurnell Caltex Refinery. The three adjacent tanks (Tanks 102-104) would be retained, which are of similar age and style as Tank 101. The removal of Tank 101 would not detract from the historical significance of the Site as the conservation policies state that at least six tanks in the Eastern Tank Farm should be retened, including three remaining tanks on the northern boundary..
b) Strong association with the life or works of a person or group of persons: The Kurnell Refinery has a strong association with the Caltex brand of petroleum products, and the philanthropic activities of the Caltex Company in the local area. It is also has a special association with Australian Oil Refining Pty Ltd (AOR), a Caltex subsidiary company established in Australia to construct and operate the refinery. The group of six staff houses within the original Australian Oil Refinery complex are associated with the work of architect Harry Seidler, who is generally regarded as Australia's best-known modernist architect in the post-WWII era.	The demolition of Tank 101 would not impact on the association of the refinery to Caltex. Tank 101 is not associated with Harry Seidler and therefore would not impact the significance under this criterion.
c) Aesthetic significance: The Kurnell Refinery is important in demonstrating key elements of oil refining technology introduced to Australia in the post-WWII period. The refinery continued to operate using a combination of original and updated plant and equipment, including three elements of plant from the original process line (Crude Distillation Unit No. 1, Fluid Catalytic Cracking Unit No. 1, and the Polymerisation Unit) and the original power plant. The refinery site also retained its original layout and various elements of	Tank 101 is one of four prominent tanks located on the northern boundary of the Eastern Tank Area and designated to be retained as part of the original approved demolition works. The demolition of Tank 101 is considered to be of moderate negative impact to the aesthetic layout of Kurnell Caltex Refinery, the reuse of the three adjacent tanks, as recommended in the HIA, would minimise further aesthetic impacts through their retention.

Criterion (as identified in the Heritage Management Strategy)	Activity: Demolition of Tank 101
original supporting infrastructure, including the Kurnell wharf, tank farm, workshops, stores, cafeteria, laboratory, administrative and amenities buildings, and on-site staff housing. Each of these elements has been incrementally modified, upgraded, and in some cases adapted to new uses as part of the ongoing operation of the refinery.	
d) Social significance. The Caltex Kurnell Refinery, and individual work areas within the Site, has strong or special associations for current and former employees of the company. The physical appearance, smell, and sounds of the site are commonly associated with the development of individual and collective skills and life histories. The physical experience of the place can trigger memories of special people or events, such as the installation of new technologies, personal advancement to a new job or level of skill, or the discovery and repair of a fault at the plant. Historic images and documents regarding the history of the site can also have strong or special associations for current and former employees. A large number of images, Caltex company magazines, uniforms, and other 'memorabilia' have been collected by former staff members. The Kurnell Refinery library contains copies of many of staff collected images and magazines, providing an important social document of the people who worked at the plant, their social experiences, and Caltex's social and philanthropic initiatives within the broader community.	The Tank 101 demolition works are unlikely to reduce the social significance of the Kurnell Caltex Oil Refinery under this criterion.
e) Research significance. While operational, the physical evidence of the Kurnell Refinery plant and the knowledge and experience of the operational staff had the potential to yield information about this technology which is not available from other sources. Following closure of the plant, some elements of machinery, equipment, signage or other ephemera may still provide an important industrial heritage reference collection, which would contribute to future interpretation and/or understanding of the refining technology used at the site. There is little or no potential for sub-surface archaeological relics which pre-date the operation of the refinery to be present on the site.	The Tank 101 demolition works are not expected to have an impact on the significance under this criterion. There is not anticipated to be archaeological deposits or relics in the vicinity of Tank 101. Aa review of historical aerials revealed the area was heavily modified during the initial construction of the oil refinery. Any potential archaeological deposits would have been impacted by these works. The three adjacent tanks (Tanks 102-104) would be retained, which are of similar age and style as Tank 101.

Criterion (as identified in the Heritage Management Strategy)	Activity: Demolition of Tank 101
f) Rarity significance. With the closure of Shell's Clyde refinery in September 2012, Caltex's Kurnell Refinery was the last operational oil refinery in NSW. The refinery site contained a rare collection of oil refining technology of the mid-twentieth century, as well as original equipment and ephemera associated with the operation of the refinery. The Refinery cessed operating in 2014. A representative sample of significant buildings remain on the site today. The Caltex Kurnell Refinery site contains a rare collection of technical drawings, photographs, and memorabilia, which document the original design and construction of the refinery; later upgrades, maintenance and repairs to the refinery; products of the refinery; Caltex's social and philanthropic initiatives associated with staff of the refinery.	The demolition of Tank 101 would increase the rarity and significance of the seven remaining tanks in the Eastern Tank Area. However, there are no technical aspects or technology that would be lost as a result of the removal of this tank.
g) Representative significance. The Kurnell Refinery is a large-scale industrial complex, which is important in demonstrating the principle characteristics of an Australian oil refinery. The site contains a representative collection of oil refining technology of the mid-twentieth century, as well as supporting infrastructure associated with the original operation of the refinery. Other plant and infrastructure illustrate key periods of change within the oil refining industry, including the inception of locally produced crude from new oil fields in Bass Strait in the 1970s, and more recent environmental standards, including requirements to reduce lead and benzene levels in petrol and sulphur content in diesel.	The demolition of Tank 101 adds to the 64 tanks demolished in the Eastern Tank Area. The removal of this additional tank would compound the impact to the size of the large scale industrial complex. The carrying out of the conservation strategies as detailed in the HMS have mitigated against this loss through the completion of archival photographic recording, retention of all important construction plans and creation of the refinery documentary.

6.5 Summary to Impacts to other nearby listed heritage items

The following table outlines the impacts the proposed demolition works will have to the nearby heritage listed items.

Item	Impact	Summary
National Heritage Listing		
- Kurnell Peninsula Headland	Visual impact – the removal of Tank 101 can be seen from the northern section of the Kurnell Peninsula	The HIA determined that the demolition works, including the removal of tanks in the Eastern Tank Farm would have a major positive long term impact on the landscape setting of the neighbouring Kurnell Peninsula Headland. The positive outcome coincides with: *"…reducing the vertical scale and prominence of the site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*" (Australian Museum Business Services, 2013). Therefore the works would not have any negative adverse impact from the removal of Tank 101 to the National heritage listing but will in fact would contribute to a further positive long term impact on these sites.
- Kamay Botany Bay (Nomination)	Visual impact – the removal of Tank 101 can be seen from the northern section of the Kurnell Peninsula	The HIA determined that the demolition works, including the removal of tanks in the Eastern Tank Farm would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National that is included in this NHL nomination. The positive outcome coincides with: *"…reducing the vertical scale and prominence of the site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*" (Australian Museum Business Services, 2013). Therefore the works would not have any negative adverse impact from the removal of Tank 101 to this National heritage listing nomination.

Item	Impact	Summary
Commonwealth Heritage Listing		
- Cape Baily Lighthouse	No Impact	Tank 101 is no visible from the Cape Baily Lighthouse and therefore will not have any direct or indirect impacts to the significance of the lighthouse.
State Heritage Register		
- Kamay Botany Bay National Park (North and South) and Towra Point National Reserve		The HIA determined that the demolition works, including the removal of tanks in the Eastern Tank Farm would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National Park that is included in the SHR listing. The positive outcome coincides with: *"…reducing the vertical scale and prominence of the site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*" (Australian Museum Business Services, 2013). Therefore the works would contribute to a further positive long term impacts to this SHR listing.
Office of Environment and Heritage Section 170 Register		
- 21 Listed items located within the Kamay Botany Bay National Park	No impacts	There will be no direct or indirect impacts from the removal of Tank 101 on these 21 items listed on the OEH Section 170 Heritage and Conservation Register as these sites are located over 500 metres away and are not visible from the refinery.
Sutherland Shire Local Environmental Plan 2015		
- Australian Oil Refinery	No Impacts	Construction of the refinery in the 1950s has caused heavy disturbance within the Eastern Tank Farm area. This has effectively removed any archaeological potential that may be present within the demolition works area.
- Silver Beach and roadway	No impacts	There will be no direct or indirect impacts from the removal of Tank 101 on this item, as this site is not located within the vicinity of the Tank 101 demolition works area.
- Four wheel drive track	No impacts	Construction of the refinery in the 1950s effectively erased this section of the track from the landscape. Considering that there is no physical evidence of the former Four Wheel Drive Track still existing within the Site boundary today, and that the Tank 101 demolition works are not located near this item, the modifications would not impact on significant fabric or the

Item	Impact	Summary
		historic significance of the local heritage item.

7.0 Statement of Heritage Impact

7.1 Introduction

The objective of the Statement of Heritage Impact is to evaluate how the Tank 101 demolition works would affect the heritage value of the site and/or place, and how the heritage value can be conserved or maintained.

This report has been prepared in accordance with the NSW Heritage Office & Department of Urban Affairs and Planning *NSW Heritage Manual* (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996) and NSW Heritage Office's *Statements of Heritage Impact* (NSW Heritage Office, 2002). The Guidelines pose a series of questions as prompts to aid in the consideration of impacts arising from a project based on the proposed changes. The questions vary in the guideline, depending on the nature of the impact to the item, for example demolition of a structure, change of use, additions etc. or questions can be tailored to the specific project and its impacts. The questions relating to the minor demolition of an element within a heritage listed item are:

- Have all options for retention and adaptive re-use been explored?
- Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?
- What aspects of the proposal could have a detrimental impact on the heritage significance?
- Are important features of the item affected by the demolition?

These questions are further discussed in the following sections.

7.2 Impact Assessment

Have all options for retention and adaptive re-use been explored?

The HMS included strategies for the adaptive reuse of some of the significant heritage built across the site, including for the potential reuse of tanks as storage for finished fuels. Caltex has previously indicated in the HIA undertaken to assess the approved demolition works (SSD 5544 MOD1) that, following the conversion, fewer buildings would be required to accommodate the operational requirements of the terminal, and that all buildings that can be reused for the terminal operations are being retained (AECOM Australia Pty Ltd, 2017). The only impact assessed here is for the removal of Tank 101 as there are no reuse options and 'mothballing' Tank 101 would result in its deterioration.

Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?

The condition and structural integrity of Tank 101 would continue to deteriorate and may present a risk to the operational workforce if it is not removed. Maintaining the tank would require ongoing maintenance which would have an associated cost. Maintaining a tank which serves no purpose and which both Caltex and the community would like to remove would not be in line with the objective of the Project as it would affect the viability of the terminal.

What aspects of the proposal could have a detrimental impact on the heritage significance?

The removal of Tank 101 would contribute to impacts identified as part of the previously approved demolition works. That is, the removal of the tank would impact on the remaining heritage fabric, historical and technical significance associated with the former Kurnell Refinery. Removing Tank 101 would further reducing the number of retained tanks to seven and contribute to the reduction of the physical integrity of the original tank farm layout. The removal of Tank 101 itself is seen as a minor negative impact as mitigation measured implemented and completed by Caltex for the previously approved demolition works have retrieved some values of the significance of the tank.

In contrast, the removal of Tank 101 would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National Park and Kurnell Peninsula Headland. This site is listed on the National Heritage Listing and on the State Heritage Register as a place of State Significance.

Are important features of the item affected by the demolition?

Tank 101 has been identified as being a part of the heritage significance of the Kurnell Caltex Refinery, and has been identified within the HMS as being highly significant heritage fabric associated with the Eastern Tank Farm. The removal of this tank would remove an important feature of the Eastern Tank Area and of the refinery site as a whole.

7.3 Heritage Management Strategies

Conservation Strategies were developed for each individual element of the Kurnell Refinery as part of the HMS. These strategies were created to provide for ongoing care and management of the Caltex Kurnell Refinery as an operational industrial heritage site.

These strategies support the refinery's future conservation as an item of local and potential State heritage significance, taking into account key constraints and opportunities arising from the heritage values of the place, the principles of the Australia ICOMOS Burra Charter, owner's and user's requirements, statutory requirements, and the physical condition of the place.

The strategies present options to mitigate the removal of Tank 101 from the Eastern Tank Area. Consideration has to also to be taken into account for the approved demolition works assessed in the HIA, and the mitigation options and strategies presented therein.

Of particular note in relation to Tank 101, the HIA recommended the following strategies, all of which have been progressed, or finalised:

- Conservation of a representative sample of significant refinery infrastructure in use as part of the finished product terminal, including examples of original tanks, original workshops, administrative and amenities buildings. At least six original tanks would be retained in use in the Eastern Tank Area, including three along the northern boundary of the site and three to the west of the OCM; while three early tanks within the Western Tank Area between Roads O and P would be retained in use. The original OMC, Plant1/Plant 33 Control Room, Main Workshop, Storehouse, Firehouse, Main Office, Main Change Rooms and Group of six houses would be retained in use or adapted to a new use in the terminal.
- Preparation of audio-visual recording of the refinery while it is still in operation. Caltex engaged film-maker John Marsh to prepare a 30 minute documentary explaining how the Site works, its work culture, and the roles and responsibilities of employees across the site. This has been completed.
- Preparation of an archival quality photographic recording of the refinery plant and infrastructure while it is still in operation, and during demolition works, in accordance with Heritage Council guidelines for *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006). Caltex engaged Freeman Ryan Designs to prepare the recording, which is in progress. The photographic recording has been lodged with appropriate long-term storage facilities with public access, including Sutherland Shire Library and the NSW State Library.
- Preparation of an archival quality catalogue of original plans, drawings, photographs and audio-visual media associated with construction and development of the plant and supporting infrastructure. This archival quality catalogue has been completed, and is kept in a memorabilia library at the Site.

(Australian Museum Business Services, 2013)

As outlined above, these strategies have been implemented or have been finalised. A representative sample of significant buildings, including tanks, have been preserved as part of the conversion works. This includes ensuring at least six tanks, including at least three of the four northern boundary tanks in the Eastern Tank Farm Area are converted and retained as part of the conversion of the refinery to a finished fuel terminal. Tanks 102, 103 and 104 will be retained and reused as part of the conversion works after the demolition of Tank 101.

An archival photographic recording and video of the operations at the refinery have been completed prior to the commencement of the current demolition works on the Site. This has included significant elements identified in the HMS located in the Eastern Tank Farm Area.

As these strategies have been completed, or are in the process of completed, they are considered to be acceptable mitigation against the loss of Tank 101 and the impact to the significance of the Kurnell Caltex Refinery site.

The HIA also made recommendations against the HMS strategies regarding the ongoing conservation of tanks after the demolition works have been undertaken. As part of these recommendations, the HIA states that at least three of the four tanks present on the northeast boundary of the Eastern Tank Farm Area will be converted and reused as part of conversion of the Kurnell Refinery as a finished fuel terminal. These include Tanks 101 to 104 respectively. The removal of Tank 101 will leave the three remaining tanks to fulfil this conservation recommendation.

7.4 Summary Statement of Heritage Impact

7.4.1 Kurnell Caltex Refinery

The removal of Tank 101 would contribute to the significant adverse impact on the physical fabric, historical and technical significance identified in the HMS prepared for the Site. The removal would contribute to the diminishing characteristics of the site as an operational industrial heritage site, as well as contribute to the overall historical and physical integrity of the site.

These impacts from the Tank 101 removal works would be mitigated by Caltex's implementations of the HMS and the site specific strategies that relate to the tank. These strategies, including the archival photograph recoding, audio-visual documentary and the archival report of plans, documents and drawings have already been completed. As such, the appropriate mitigation measures for the removal of Tank 101 have been completed, and no additional mitigation measures are required for the proposed demolition works

Retaining and converting Tanks 102, 103 and 104 along the northeast boundary of the Eastern Tank Farm Area for continued use will also ensure the conservation recommendations in the HIA report are maintained.

8.0 Findings and Recommendations

The demolition of Tank 101 would contribute to the impact the previously approved demolitions works would have to the significance of the former Kernell Refinery. Namely, impacts to the historical, aesthetic and technical significances. However; the tank is being removed as it is disused and maintaining the tank would require ongoing maintenance which would have an associated cost.

A HMS has been prepared for the Site for the ongoing management and conservation of the Site during and after its conversion to a finished fuel terminal. Since that time a demolition plan for all non-required buildings and structures was prepared as part of the conversion of the Site. A separate HIA was undertaken to assess the impact form the approved demolition works on the heritage significance associated with the Kurnell Refinery as identified in the HMS. With regard to the Eastern Tank Farm Area, 64 tanks were listed as to be demolished, leaving eight tanks, including Tank 101. The HIA recommended the loss of these tanks could be mitigated by:

- Preserving a representative sample of significant refinery infrastructure in use as part of the fuel import terminal, including examples of original tanks, workshops, administrative and amenities buildings. These remnant buildings and structures were originally constructed to support the operation of the refinery. Ongoing use of these items in terminal operations is consistent with the identified heritage values of the site and would contribute to the conservation of these heritage values into the future.
- Preserving a representative sample of significant original/early modernist buildings in use across the site. Consideration should be given to preparing detailed conservation management plans for highly significant buildings.
- Creating a permanent archival collection of records and moveable heritage items that documents the engineering history, social history, and unique character of the site. A permanent and accessible archive would be a basic resource for people wishing to understand or interpret the heritage significance of the site to present and future generations.
- Communicating the history and significance of the refinery to Caltex staff and the broader community.

The above mitigation measure has been completed and implemented, or are in the process of being completed. A representative sample, as outlined in the HMS, has been preserved as part of the conversion works. This includes ensuring at least six tanks, including at least three of the four northern boundary tanks in the Eastern Tank Farm Area be converted and retained as part of the conversion of the refinery to a finished fuel terminal. Tanks 102, 103 and 104 will be retained and reused as part of the conversion works after the demolition of Tank 101.

An archival photographic recording has been completed prior to the commencement of the approved demolition works on the Site. This has included significant elements identified in the HMS located in the Eastern Tank Farm Area. The community documentary has also being finalised.

The HIA determined that the demolition works would have a major positive long term impact on the landscape setting of the neighbouring Kamay Botany Bay National Park and Kurnell Peninsula Headland. This site is listed on the National Heritage Listing and on the State Heritage Register as a place of State Significance. The positive outcome coincides with:

> *"…reducing the vertical scale and prominence of the Site in significant views of the headland, thereby enhancing the natural beauty of the headland and its symbolic importance to the State of NSW and to the Nation. There would be no change to the historic values of the place*"
>
> (Australian Museum Business Services, 2013).

The removal of Tank 101 would contribute to the impact identified as part of the previously approved demolition works to the significance of Kurnell Refinery HIA (Australian Museum Business Services, 2013). The Tank 101 demolition works would contribute to the diminishing characteristics of the site as an operating oil refinery, as well as, contribute to the decline in the overall historical and physical integrity of the Site.

Mitigating impacts outlined for the original demolition works included undertaking an archival recording of refinery prior to demolition works. It is understood the archival recording of the refinery, including the Eastern Tank Farm Area where Tank 101 is situated, has been completed. Additionally the audio-

visual documentary and the archival report of plans, documents and drawings has also been completed and catalogued while the refinery was still in operation. As such, additional archival recording is no longer required.

Retaining and converting Tanks 102, 103 and 104 along the northeast boundary of the Eastern Tank Farm Area for continued use would also ensure the conservation recommendations in the HIA report are maintained by ensuring three of the four pre-1955 tanks located along the northern boundary of the Eastern Tank Farm Area are retained.

As such, the overall impact from the removal of Tank 101 has been assessed and graded as being of minor negative impact as previous mitigation measures completed for the approved demolition works have recorded the heritage value and significance of the tank. In association, the conservation measures included in the HMS have also been preserved and retained through the reuse of the three existing pre-1955 tanks. No further heritage mitigation measures are considered to be necessary prior to the removal of Tank 101.

8.1 Recommendations

Based on the findings in this assessment, including the historical research, site inspection and analysis of archaeological and heritage approvals, the following recommendations are made:

1. Caltex should ensure that the strategies as outlined in the HMS are fulfilled and that long term conservation of the remaining significant buildings, including the three tanks along the northern boundary of the Eastern Tank Farm Area are maintained.

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