

RESPONSE TO SUBMISSIONS



Kurnell Refinery Conversion

September 2013

URS



CALTEX

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Appendix A	Submissions Received
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Abbreviations

Abbreviation	Description
ACT	Australian Capital Territory
AMBS	Australian Museum Business Services
AQIA	Air Quality Impact Assessment
dB	Decibel
CEMP	construction environmental management plan
CMZs	Contamination Management Zones
COPC	contaminants of potential concern
DP	deposited plan
DP&I	Department of Planning and Infrastructure
DPI – Fisheries	NSW Department of Primary Industries – Fisheries
EFRT	External Floating Roof Tank
EIS	Environmental Impact Statement
EMP	environmental management plans
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPL	environment protection licence
FRNSW	Fire and Rescue NSW
GBD	Green Bean Design
HIA	Heritage Impact Assessment
HIPAP	Hazardous Industry Planning Advisory Paper
IFRT	Internal Floating Roof Tank
LOC	loss of containment
LOPA	Layers of Protection Analysis
MAE	Major Accident Events
MHF	Major Hazardous Facility
MI	Mega Litre
MIIB	Major Investigation Board Report
MOV	motorised valves
NHL	National Heritage List
NOW	NSW Office of Water
NSW	New South Wales
NSW DPI	NSW Department of Primary Industries
OEH	NSW Office of Environment and Heritage
OTS	overfill protection system
P&ID	pipng and instrumentation diagram
PAC	NSW Planning Assessment Commission
PHA	Preliminary Hazard Analysis
PPE	Personal Protective Equipment
PRP	Pollution Reduction Program
SIL	Safety Integrity Level
SMP	Stormwater Management Plan
SSC	Sutherland Shire Council
SSD	State Significant Development
VAC	Visual Absorption Capacity

Abbreviations

Abbreviation	Description
VOC	Volatile Organic Compounds
WHS	Work Health and Safety
WWTP	waste water treatment plant

Introduction

1.1 Project Context

Caltex Refineries (NSW) Pty Ltd (Caltex) is seeking approval for the conversion of the Kurnell Refinery (the 'Site') to a Finished Product Terminal (the 'Project'). The Project is required to allow for the continual provision of a reliable supply of fuel to Caltex's marketing operation and the NSW and ACT economies. The refinery is at the heart of Caltex's supply chain for NSW and the ACT and is the only Caltex location in NSW and the ACT that can import petroleum products. Following a review of refining operations, which was initiated in 2011, Caltex concluded that the Kurnell Refinery was no longer financially viable under its current configuration due to increasing competition from more modern and efficient Asian refineries, the inability to meet changing fuel requirements and exacerbated by other impacts such as a strong Australian dollar. The Project is required to ensure that Caltex's operations within Australia remain viable, whilst ensuring that the company can assure a safe, reliable and sustainable supply of petroleum fuels to NSW and the ACT.

An Environmental Impact Statement (EIS) was prepared under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for this Project and placed on exhibition for a period of 36 days up to and including 28 June 2013. Following exhibition of the EIS, the DP&I provided Caltex with a number of submissions. This report responds to and addresses these submissions. Further detail in relation to the assessment process is provided in **Section 1.3**.

1.2 Project Location and Description

Kurnell Refinery is located in the south eastern part of Metropolitan Sydney on the Kurnell Peninsula, south of Botany Bay and approximately 15 km from Sydney CBD. The Site is legally described under 38 Lot and deposited plan (DP) numbers, these are listed in **Chapter 3 Project Location and Existing Environment** of the *Proposed Kurnell Refinery Conversion Environmental Impact Statement* (the EIS) (URS, 2013)¹.

The Caltex Refinery has been operating since 1956 and currently supplies around 40% of all transport fuels in Australia. The refinery processes crude oil into petrol, diesel and jet fuel. The refinery also operates as a terminal where product is stored temporarily before being distributed via trucks, ships and pipeline. The area where the conversion work would take place (the 'Project Area') is predominantly located within the eastern and western portions of the Site. The Site contains few environmental receptors due to its disturbed nature, however the refinery operation is considered to have some local heritage value.

The Project would involve the conversion of tanks and installation of pipelines, pumps and infrastructure within the Project Area to allow for the expansion of existing terminal operations for the storage and distribution of petroleum products.

Further details regarding the Project can be found in **Chapter 4 Project Description** of the EIS.

1.3 Project Approval Process

The Project has been identified as a State Significant Development (SSD) in accordance with Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*, and is subject to the provisions of Part 4 of the EP&A Act. The Project will undergo assessment by the NSW Department of Planning and Infrastructure (DP&I) and determination by the Minister for Planning and

¹ http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=5544

1 Introduction

Infrastructure. The Minister may delegate this determination to the NSW Planning Assessment Commission (PAC).

An Environmental Impact Statement (EIS) was prepared under Part 4 of the EP&A Act to document the environmental assessment undertaken for the Project.

An EIS is part of a larger assessment process in which the proponent of a project:

- identifies a need;
- considers alternatives and identifies a preferred option;
- assesses the likely environmental impacts and identifies mitigation measures;
- presents the EIS to the DP&I for public exhibition;
- compiles an official Response to Submissions (RTS); and
- provides a copy of the EIS and RTS to DP&I for their consideration.

The EIS was placed on public exhibition between 23 May and 28 June 2013. Submissions were invited from anyone with an interest in the Project, including government authorities, private industry and members of the community. A total of 12 submissions were received by DP&I during the exhibition period. The DP&I sent these submissions to Caltex on 8 July 2013.

This RTS report has been prepared to respond to the issues raised in the submissions that were received. This report will also outline and assess any changes made to the Project since the exhibition of the EIS. In light of any changes, should alterations be required to the management and mitigation measures contained in the EIS, this report will also include a table summarising the revised management and mitigation measures.

The DP&I will now assess the EIS alongside this report. The Director General of the Department of Planning and Infrastructure will then authorise an assessment report for the Project, taking into account any comments received from relevant stakeholders. The assessment report would then be submitted to the Planning Assessment Commission (PAC) for determination under powers delegated from the Minister.

1.4 Design Modifications

Since the exhibition of the EIS, a minor design change has been proposed by Caltex. Caltex is now proposing to install external domes on top of three of the tanks within the Project Area. The purpose of these domes is to further ensure that small amounts of rainwater do not enter these tanks and contaminate the product during heavy rainfall events. At present the majority of the product storage tanks on the Site have floating roofs. These roofs keep out the vast majority of the rainwater, however during heavy and prolonged rain events very small amounts of water can enter the tanks and affect the quality of the finished product. This water is removed from the finished product through a number of processes on-site, however Caltex would like to provide increased protection to three tanks to ensure that enough quality product is available to the NSW and ACT market.

The external domes would rest on support brackets welded to the outside of each of the tanks. The domes overhang the tank's shell slightly at the roof line forming an eave around the shell periphery. At the centre of the dome the height of the tank structure would increase by a maximum of 10 m.

These design changes were discussed with DP&I at a meeting on the 3 July 2013. It was agreed that the changes to the Project would require additional assessments to determine whether the conclusions within the EIS remain valid and whether the changes would result in an increased impact.

1 Introduction

To understand whether the impacts of the Project are likely to have changed or whether any new impacts are likely, the following supplementary assessments have been completed:

- A visual impact assessment;
- A heritage assessment confirming any changes to the assessment within the EIS;
- An air quality assessment confirming any changes to the assessment within the EIS; and
- A hazard and risks assessment confirming any changes to the assessment within the EIS.

The potential visual impact of the increase in tank height is the key environmental aspect requiring further assessment. As such, the assessment has included three photomontages to compare the appearance of the existing Site to the appearance of the Site once the heights of the tanks have been increased.

A summary of the supplementary assessments can be found in **Section 12** of this report. Complete versions of the supplementary assessments are provided in **Appendix B**.

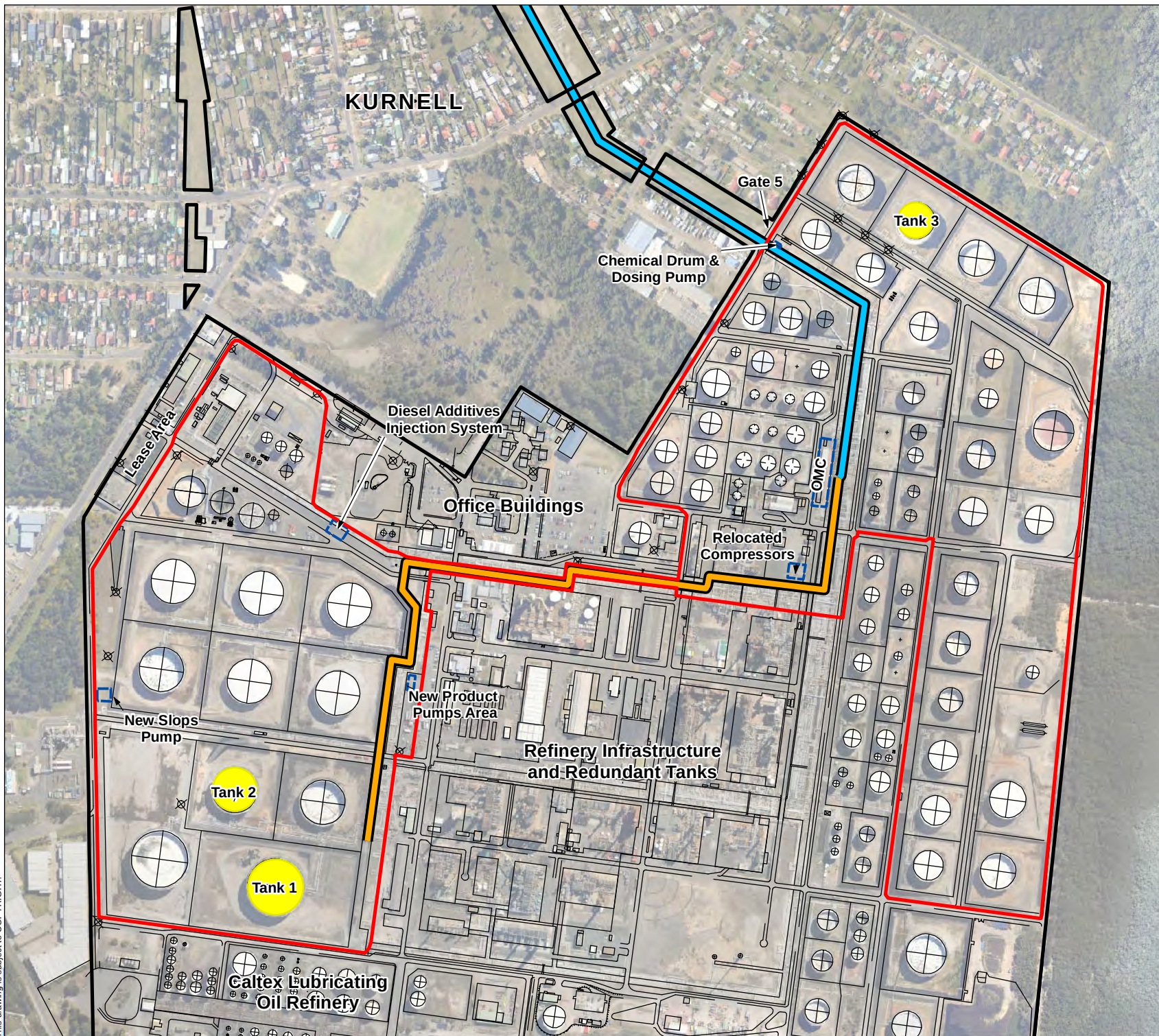
1.5 Document Structure

This report comprises the following:

- Section 1: Introduction including background and context.
- Section 2: Summary of consultation during the Exhibition stage.
- Sections 3 – 11: Response to the submissions.
- Section 12: Assessment of Design Changes.
- Section 13: Additional Management and Mitigation Measures for the Project.

The submissions report is supported by the following Appendices:

- Appendix A: A copy of the submissions received in full.
- Appendix B: Supplementary assessments.



Legend

- The Site
- Project Area
- New Infrastructure
- Pipeline
- Pipeline Easement 1
- Pipeline Easement 2

Revisions

- Tank Height Revisions



Coordinate System: GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter
0 50 100 200 Meters

Source: Aerial Imagery - Nearmap Hypertiles 2012

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NSW PTY LTD

KURNELL REFINERY
CONVERSION

PROPOSED DESIGN REVISIONS

URS

Figure: 1-1
Rev. A A4

Exhibition Consultation

2.1 Stakeholder Consultation

Caltex has undertaken consultation with relevant stakeholders and the community prior to, and throughout the development approval process. Caltex personnel maintain an ongoing and open dialogue with residents who live and work on the Kurnell Peninsula. Regular community meetings, announcements and feedback sessions with the residents are part of this consultation process.

The consultation strategy undertaken as part of the EIS was used to identify and discuss potential issues that the local community and wider stakeholders may have with the Project. This consultation process was discussed with the DP&I and outlined within the EIS. The consultation effort up to exhibition is explained in detail within **Chapter 6 Consultation** of the EIS.

The State Significant Development process, under Part 4 of the EP&A Act, requires that the EIS be exhibited for at least 30 days unless the exhibition period falls over a school holiday in which case this period can be extended to 45 days. As stated above, the Project EIS was placed on exhibition for a period of 36 days from Thursday 23 May to Friday 28 June 2013. During this time, members of the public, statutory agencies and other stakeholders were invited to comment on the Project via a submission to the DP&I.

Caltex held a community information session (as part of the quarterly community briefing) to allow members of the community to speak directly to the Project team. This session was held at the refinery on Tuesday 11 June 2013 from 6:00 to 7:00 pm. In total, eleven stakeholders attended, one from the NSW Environmental Protection Agency (EPA), and 10 from the Kurnell community. A range of issues were discussed. Those relevant to the Conversion Project are present alongside a response in **Table 2-1** below.

Table 2-1 Community Information Session Questions

Community Question	Caltex Response
Will there be more trucks coming to the terminal than to the refinery?	With the reduction in employees from approximately 900 to approximately 100 and cessation of routine road haulage at the Site, the number of vehicles generated by the terminal would be significantly fewer than the number of vehicles generated by the existing refinery. The changes would result in a net reduction in traffic volumes along Captain Cook Drive. Therefore it can be concluded that terminal operations would result in an improvement to the local traffic environment and a beneficial transport impact.
Will the separators still be needed for the terminal?	Caltex would determine the requirements for the Waste Water Treatment Plant/Separators in the first year of terminal operation. If needed, operation for the Waste Water Treatment Plant/Separators would be automated.
Will the cooling water right of way still be required? If not, what will happen to the land?	Terminal operations would not require a water cooling system. Caltex is yet to work through options for the cooling water return line right of way. This would occur over the coming months.
Will the terminal be more dangerous/volatile/explosive?	The amount of material utilised/stored on the Site that is classified as "Dangerous Goods" would decrease significantly with the Site

2 Exhibition Consultation

Community Question	Caltex Response
	operating as a terminal. To further minimise the risk of incidents, the terminal would operate multiple safety systems and procedures. All staff who are employed at the terminal would be required to understand the potential incidents which might occur, their role in preventing them and how to respond immediately and efficiently to any incident. As a terminal, Caltex would continue to work with government authorities, regulatory groups and emergency services to help make sure operations are safe for our people, our neighbours and the environment.

Caltex has also held a number of meetings with NSW Workcover, EPA and DP&I during and following exhibition to clarify certain comments and to confirm the approval process.

2.2 Summary of Submissions

A total of twelve submissions on the Project were received by DP&I. Of the submissions received, three (submissions from NSW Rural Fire Service, Sydney Water and Crown Lands (Sydney)) stated that they had no concerns regarding the Project. Three stakeholders (Sydney Ports, NSW Ports, and Ausgrid) confirmed they would not be making a submission. No submissions were received from members of the public. Submissions requiring a response were received from the following statutory agencies and local council:

- NSW Environmental Protection Agency (EPA);
- NSW WorkCover;
- NSW Health - South Eastern Sydney Local Health District Public Health Unit;
- Fire and Rescue NSW;
- NSW Office of Environment and Heritage (OEH);
- NSW Education and Communities;
- NSW Department of Primary Industries – Fisheries (DPI – Fisheries);
- NSW Office of Water (NOW);
- Sutherland Shire Council (SSC).

Appendix A provides a copy of the submissions in full.

Sections 3-11 of this report provide a response to the issues raised by each of the public bodies listed above.

NSW EPA

Introduction

A submission was received from the NSW EPA on 1 July 2013. The submission made comments relating to licencing and environmental management, water quality, noise, air quality, waste management and reporting. The submission raised no objections to the Project and the EPA was satisfied that comments they previously provided on the draft EIS were adequately addressed. The text below summarises the EPA submission.

3.1 Issue 1 - Licensing and Environmental Management

The part of the EPA submission relating to licensing and environmental management discussed three related but distinct issues:

1. The environment protection licence (EPL) for the Site;
2. The EIS and development and implementation of environmental management plans (EMPs); and
3. The removal of refinery infrastructure and the remediation of the Site.

These are discussed below.

3.1.1 Environment Protection Licence

The EPA noted that all works and activities associated with the Project must comply with the conditions of the EPL 837 at all times. The EPA submission goes on to state that should the Project be approved, Caltex will need to submit a Licence Variation Application. The EPA submission also states that upon completion of the conversion works and cessation of refining activities, Caltex will need to vary the EPL from a petroleum refinery licence to a terminal operations licence.

Response

Caltex would complete all works and activities associated with the Project in line with the conditions of the EPL 837 at all times unless separate measures have been agreed for specific works. Caltex would continue to work closely with the EPA to ensure that the Site is appropriately licenced throughout the conversion works. Prior to cessation of the refinery activities and the commencement of terminal activities on Site, Caltex would work with the EPA so that the existing licence is amended appropriately.

3.1.2 EIS and EMPs

The submission stated that all management plans and related site procedures detailed within the EIS must be completed before works commence. The EPA stated: *"Appropriate procedures should also be developed for reviewing and improving the requirements of each plan to allow for adaptive management and to address any contingencies that may arise over the life of the project."*

3 NSW EPA

Response

Caltex is currently preparing the construction environmental management plan (CEMP), associated sub-management plans and site procedures to ensure the management and mitigation measures outlined within the EIS are adequately implemented on the Site. All Site procedures detailed within these plans would be implemented throughout the construction of the Project.

Further, any additions to the current management mitigation and measures (made in response to issues raised in the submissions) would be incorporated into the management plans and associated site procedures. The additional management and mitigation measure is presented within **Section 13** of this report.

Should the Project be approved, any additional provisions within the conditions of consent would also be addressed in the appropriate EMP for the Site.

3.1.3 Demolition and Remediation

The EPA also discusses a number of requirements relating to the future demolition and remediation of the Site.

Response

Caltex notes these requirements and will continue to discuss future works at the Site with the EPA to ensure that any works relating to these projects are correctly approved and licenced.

3.2 Issue 2 - Water Quality

The EPA advised Caltex that they must continue to operate the waste water treatment plant (WWTP) in accordance with the EPL until refinery operations cease. When the Refinery has been decommissioned and the Site is used primarily as a terminal, the: *"...EPA will attach a PRP (Pollution Reduction Program) to the licence for the characterisation of terminal wastewater streams and investigation of alternative treatment options. Further variations to the licence in relation to discharge limits and monitoring requirements will occur upon completion of the PRP."*

Response

Caltex acknowledges this request and would continue the use of the existing WWTP, in accordance with the EPL for the Site, until EPA develops an appropriate PRP. Caltex looks forward to discussing the content of the PRP and any subsequent revisions with EPA as works on the Site progress.

3.3 Issue 3 - Noise

The part of the EPA submission relating to noise discussed four issues:

1. The construction noise management plan;
2. Project Specific Noise Criteria;
3. Respite periods; and
4. Amendments to the $LA_{10(15min)}$ noise limits.

These are discussed below.

3 NSW EPA

3.3.1 Construction Noise Management Plan

The EPA asks that a noise management plan be developed in consultation with the EPA to address potential noise impacts associated with construction. They ask that this plan include noise mitigation measures and details of proposed performance evaluation procedures to assess the effectiveness of these measures.

Response

Caltex is currently preparing the CEMP and its associated sub-management plans. One of the sub plans is a Noise Management Plan which will outline how the noise mitigation measures presented in the EIS in **Chapter 12 Noise and Vibration** would be implemented as the conversion works are completed. This sub plan would also detail how the effectiveness of these measures would be monitored. Should the Project be approved, the CEMP and its sub plans would be updated following a review of the conditions of consent. At this point the EPA would be asked to comment on the plans prior to them being finalised.

3.3.2 Project Specific Noise Criteria

The submission requests that all construction activities for the Project comply with the Project Specific Noise Criteria as specified within the EIS. The EPA state that only activities related to the day-to-day refinery operations may be regulated under the existing EPL limits for noise.

Response

Caltex and the EPA have had a number of discussions regarding appropriate construction noise limits for the Project. These discussions have centred on two key points:

1. The majority of the conversion works are the same as or broadly consistent with Caltex's existing day-to-day operation.
2. The noise assessment has concluded that the conversion works are not expected to adversely impact the acoustic amenity of the surrounding receptors.

Therefore discussions between the EPA and Caltex agreed that whilst the majority of the conversion works for the Project would typically be completed between 7.00 am and 10.00 pm seven days a week, some works consistent with Caltex's existing day-to-day operational and maintenance procedures could be completed over a 24 hour period as regulated by the refinery EPL for the Site.

Section 12.8 of the EIS goes on to note that, *'prior to the operation of the new terminal, Caltex would agree appropriate noise limits (if required) for the Site with the EPA.'* Caltex expects that this discussion would occur as the terminal operations licence for the Site is being agreed.

3 NSW EPA

3.3.3 Respite Periods

The EPA has requested that appropriate respite periods be implemented to address any noise complaints associated with any construction noise and any loud construction works.

Response

It should be noted that the construction of the Project is not expected to adversely impact on the acoustic amenity of the surrounding residential or commercial receptors. Nevertheless **Section 12.8** of the EIS outlines a number of management and mitigation measures that would be implemented as part of the Project.

These measures include those that are currently contained within Caltex's existing approach to managing complaints. These measures include a 24 hour hotline number for the reporting of acoustic disturbance by the local community and maintenance of a suitable complaint register following these reports.

Given that no adverse noise impacts are expected, should noise complaints be received, noise monitoring would be undertaken at the locations concerned to understand any impacts and reasonable and feasible measures would be implemented if required. Whilst respite periods may be appropriate in certain circumstances, Caltex would not immediately implement respite periods to address any and all noise complaints. Reasonable and feasible measures consistent with the level of impact would be implemented in discussion with the affected party. Respite periods would be one of a number of options available.

3.3.4 Amendments to the LA_{10 (15min)} Noise Limits

The submission noted that the EPA proposes to amend the LA_{10 (15min)} noise limits in the EPL to reflect the noise limits presented within the EIS. They note that this licence variation would be developed in discussion with Caltex prior to commencement of the conversion works and that further revisions may be required when refining activities cease.

Response

Caltex maintain an ongoing dialogue with the EPA regarding the various limits within the EPL for the Site and note the EPA's comment.

3.4 Issue 4 - Air Quality

The EPA advised that Caltex must continue the existing programs for the management of air emissions and odour until the refinery operations cease to ensure compliance under the EPL. The licence requirements would be reviewed following the cessation of refinery operations.

Response

Caltex acknowledges this request, and would continue the existing programs until the refinery operations cease. Any new or amended programs under the revised EPL for the terminal would also be implemented.

3 NSW EPA

3.5 Issue 5 - Waste Management

The part of the EPA submission relating to waste management discussed three issues:

1. The management of oily wastes / sludges;
2. The management of asbestos; and
3. The management of contaminated soils and waste materials.

These are discussed below.

3.5.1 Management of Oily Wastes / Sludges

The submission notes that Caltex has committed to evaluating alternative options for the management of oily wastes/sludges. It notes that where reasonable and feasible, Caltex should minimise the quantity of oily wastes/sludges placed in the landfarm during the conversion works to assist with the future remediation of the area.

Response

Caltex confirms its commitment to, where reasonable and feasible, minimise the quantity of oily wastes/sludges placed in the landfarm during the conversion works.

3.5.2 Management of Asbestos

The EPA requested, due to the presence of asbestos on certain parts of the Site, that the CEMP include appropriate measures to prevent disturbance (where possible) of contaminated material under the works, and outline appropriate procedures for the management and disposal of contaminated material in accordance with relevant legislation. Consultation with NSW Health and WorkCover regarding this matter was also recommended.

Response

Caltex is currently preparing the CEMP and its associated sub-management plans. These plans would include appropriate management measures to prevent the unnecessary or excessive handling of asbestos contaminated material and ensure that this material does not adversely affect the environment or human health. As discussed in **Section 10.8** of the EIS, construction staff would be inducted and provided with training prior to working with potentially contaminated soil to prevent unnecessary disturbance. The location of potentially contaminated areas would be noted within the CEMP and provided to construction personnel involved in soil excavation and handling. Where necessary, safety training and appropriate Personal Protective Equipment (PPE) would be provided. Construction work on Site would continue to operate under the 'permit to work' system. This system includes current practices described in **Chapter 9 Soils, Groundwater and Contamination** of the EIS.

The CEMP would also include the proposed methodology for handling, storing, transporting and disposing of any asbestos waste. This work would be completed in accordance with the relevant legislation as discussed in **Chapter 9 Soils, Geology and Contamination** and **Chapter 10 Human and Ecological Risk** of the EIS.

3 NSW EPA

3.5.3 Management of Contaminated Soils and Waste Materials

The EPA stated that all contaminated soil and associated waste materials must be managed in accordance with the *Protection of Environment Operations Act 1997* (PoEO Act) and associated regulations and characterised in accordance with the EPA's *Waste Classification Guidelines*.

Response

Caltex can confirm that the legislation and guidance noted by the EPA will be adhered to during the conversion works.

NSW WorkCover

Introduction

A submission was received from NSW WorkCover dated the 26 June 2013. The submission did not raise any objections to the Project, provided the issues outlined in the submission are addressed. The following text provides a summary of the key issues raised in the NSW WorkCover submission.

4.1 Issue 1 – Firewater Supply

The submission stated: *“There was no specific mention of a tank cooling/deluge system. Confirmation is required that fresh firewater supply is sufficient to operate in a Major Accident Events (MAE) situation without requirement of sea water to supplement water supply.”*

Response

Caltex confirms there is adequate freshwater to respond to identified MAEs. No additional water would be required via means of sea water extraction. As outlined in **Chapter 8 Hazards and Risk** of the EIS, fire response for a MAE has been based upon use of Caltex installed firewater storages (16 mega litres).

As discussed in **Section 11.6.4** of the EIS, maximum firewater demand and storage was determined as part of the fire safety study. A maximum firewater demand case was identified and assessed in accordance with AS1940:2007 requirements for a full-surface tank fire. This included all requirements for supplementary firewater. The assessment concluded that the 16 mega litre (ML) firewater storage available on-site significantly exceeds the maximum freshwater storage requirement. Therefore the performance of the current firewater system has been deemed adequate to satisfy demand under the proposed Project and seawater would not be required to supplement the supply.

4.2 Issue 2 – Frequency Number Chart

The submission requested clarification: *“...about where Caltex's MAEs are plotted on the Frequency-Number chart provided at figure 5”* contained within the **Appendix C** of the EIS.

Response

Figures 1 and 9 in the Preliminary Hazard Assessment report (refer to **Appendix C1** of the EIS) provide the plot of the cumulative societal risk for the proposed terminal. Figure 5 is included only to illustrate the societal risk criteria referenced for the comparison to Hazardous Industry Planning Advisory Paper (HIPAP) No. 4.

The societal risk plot for the Project is shown as the lower black line in the negligible risk region of the plot in Figures 1 and 9.

4.3 Issue 3 – Pipeline Fire

The submission requested clarification regarding the size of a pipeline fire event detailed in **Appendix C** of the EIS. NSW WorkCover advised that by stating the diameter of the fire was limited to the trench width, there is the potential underestimation of fire size, as: *“...trenches are longer than they are wide...”*

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Response

The approach taken in the Preliminary Hazard Analysis (PHA) for the Project (refer to **Appendix C1** of the EIS) was to assume that the “pipe way trench” (defined by the retaining walls running along the edges of the trench) would contain a release and prevent an overflow into surrounding areas. If ignited, the subsequent pool fire would also be contained and its size would be constrained by the width of the pipe way at the release point. The maximum pipe way width is 35 m. This width was used in the modelling as the upper limit for the size of the pool fire. This upper limit was applied along the length of each pipe way route, except for sections where the pipe way trench significantly narrows, whereby a conservative width of 20 m was applied. In calculating the risk profile along the pipe way route the PHA distributed the release frequency along the pipe way route at an interval spacing of 10 m. For each interval, the consequences associated with defined failures are repeated. This was considered to be a reasonable representation of the influence that the pipe way width and central drainage channel would have on the size of potential pool fires.

To further test the sensitivity of the PHA results to these scenarios Caltex has reviewed the risk effects of pool fires in the pipe way trench using a more conservative approach of allowing the worst case ‘rupture’ release to not be constrained by the pipe way trench walls. This has involved representing the largest possible fire event using the “equilibrium diameter” pool fire. Use of this more conservative modelling approach was applied and did not materially change the risk conclusions of the PHA for the Project.

The approach taken in the PHA is considered to be a reasonable representation of the influence that the pipe way width and characteristics would have on the size of potential pool fires. A more conservative approach using equilibrium pool diameters has demonstrated that the risk conclusions are not impacted by these assumptions. The separation distance between the terminal pipe ways and the facility boundary has a dominant effect.

4.4 Issue 4 – Flammable Liquids

The submission requests confirmation: “...that pumps and fittings are oriented in such a way (or that risk controls measures are in place) that prevents flammable liquids under pressure spraying outside of the kerbed area (e.g. flange failure, pipe rupture).”

Response

Pumps and associated pipework have been designed and orientated by Caltex's design team who have extensive knowledge of both external and internal standards and extensive experience on Caltex sites.

In designing the layout of the Site, Caltex has referenced its own internal standard for layout of refinery process and offsite equipment. This standard references API 2610 Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities and is based on refinery / terminal experience. All equipment spacing on any new pump installation on Caltex sites is based on these Standards.

All new pump installations are based on the relevant Caltex internal standard. This references requirements of API 610-Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries and includes the requirement for cartridge mechanical seals designed to API 682 Pump Shaft Sealing Systems for Centrifugal Pumps.

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As further risk reduction, each gasoline pump and new jet and diesel pump mechanical seal on the Site would be fitted with an API Plan 65 seal leak detection system that would quickly pick up any sign of leakage and would alarm back to Operations.

A mechanical seal is deemed as having the largest risk of failure on a pump slab. As a secondary risk reduction, each gasoline pump on the Site would be fitted with an automated foam solution deluge system triggered from an IR flame detection system.

Consistent with Caltex's design standards, pipework flanges are limited to the piping connecting directly to the pumps and valving located around the pumps which are located within the confines of the pump kerbed areas.

All piping is hydro-tested significantly above its operating pressure and is designed to handle the maximum head of the associated pump. Caltex's internal standards for the testing of piping are consistent with API 1110 Pressure Testing of Steel Pipelines for the Transportation Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide.

4.5 Issue 5 – Detection and Isolation

The submission notes that *"It has been stated that figure 6 (on page 28) (in Appendix C of the EIS) would incorporate detection and isolation times, however figure 6 does not feature these times. Clarification is required."*

Response

Figure 6 (page 28) of **Appendix C1** of the EIS was included as an example of the event tree structure. This is explained in the final paragraph on page 27 of **Appendix C1** of the EIS. The purpose of including this in the EIS was to show that both 'Successful' as well as 'Unsuccessful' outcomes for detection and isolation were considered in the event tree structure. In general, as described in the paragraph beneath Table 6, detection and isolation mitigation was only included in the event tree where it substantially influenced the consequence.

The Preliminary Hazard Analysis for the Project adopted a conservative position of allowing no credit in the event tree analysis for detection and isolation controls for pool fire scenarios. The only allowance for detection and isolation was made in the event tree analysis for Vapour Cloud Explosion (VCE) events where new detection and isolation controls are proposed (refer to Table 7, **Appendix C1** of the EIS). For pool fire scenarios, the time for the dispersed flammable material to reach steady state was less than the estimated detection and isolation times. Therefore, the action of such mitigation controls was conservatively assumed to not alter the calculated impacts.

4.6 Issue 6 – Standards for Explosion Control

The submission stated: *"Caltex should confirm the use of relevant standards such as AS60079- 'Explosive atmospheres- Equipment- General requirements' - and HB 139-2012 (related to repair)..."* in identifying prevention controls.

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Response

The Project has referenced the following standards for hazardous areas in the design of the terminal:

- AS/NZS 3000/2007 Australian/New Zealand Wiring Rules;
- AS/NZS 2380 Electrical equipment for explosive atmospheres explosion protection techniques;
- AS/NZS 2381 Electrical equipment for explosive gas atmospheres;
- AS/NZS 2381-1 General requirements;
- AS/NZS 60079 Electrical apparatus for explosive gas atmospheres; and
- AS/NZS 60079-10 Classification of hazardous areas.

Upon investigation, HB139 provides detailed guidance on integrating the requirements of AS/NZS ISO 9001:2000, AS/NZS ISO 14001:1996 and AS/NZS 4801:2001 into a single management system. The Refinery safety management system is currently accredited to both ISO 9001 (first accredited December 2004, current until June 2014) and ISO 14001 (first accredited November 2011, current until November 2014). Caltex has an integrated Operational Excellence management system.

4.7 Issue 7 – Bund Sizes

The submission requested clarification around the choice of bund size, outlined on page 31 of **Appendix C** of the EIS. The submission states: *“Two events identified on the table were for Full Bund Fires up to 8000m² and 25,500m². Why were these two figures chosen as the arbitrary limits for bund fire sizes? Is the ‘distance to fatality’ measured from the centre of the bund or from the outer edge?”*

Response

The quantitative risk assessment performed for the PHA has used actual bund surface areas for each compound. The two figures (8,000 m² and 25,500 m²) do not represent arbitrary limits used in the modelling. The modelling for each bund was based on the area of that bund.

The distances are measured from the centre of the storage tank / bund (as stated in the paragraph preceding Table 10 in **Appendix C1** of the EIS).

The purpose of Table 10 is to summarise the typical impact distances for the various fire scenarios considered.

The two bund surface areas selected to illustrate typical impact distances in Table 10 (8,000 m² and 25,500m²) were selected on the following basis;

- 8,000 m² is representative of the maximum bund surface areas for the tanks located in the north east corner of the Project Area (refer to **Figure 1-1** of this Report).
- 25,500 m² was conservatively representative of the largest Class 3 flammable liquid storage bund (12,000 m²) contained in either the eastern gasoline storage area or the existing western crude tank storage area which will be converted to diesel and jet fuel service.

Note: the largest ‘combustible’ (diesel) storages have bund surface areas of 24,500 m² and 30,000 m² respectively.

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4.8 Issue 8 – Loss of Containment

The submission asks “Has loss of containment (LOC) due to operator error been considered in the hazard assessments?”

Response

Loss of containment has been discussed in **Section 8.6.1** of the Main Report of the EIS.

Output from Caltex's process hazard analysis studies (PHA Studies) have been a significant source of hazard scenario identification data for the Preliminary Hazard Analysis (refer to **Appendix C1** of the EIS). PHA study output represents Caltex's collective knowledge of the nature and type of hazards associated with existing and proposed operations at the Site. These studies have also provided the means by which specific improvements have been incorporated into the design of the Project.

Caltex's process for process hazard study incorporates hazard identification via use of a suitable guideword set or What If checklist. Both of these approaches systematically tests for incident potential due to human error (e.g. misdirected flow) as well as human factors.

Specifically, the PHA identified where human error may cause the following:

- initiate an event of concern; e.g. block valve closed or opened in error;
- result in failure to mitigate the consequences of an event; and
- reduce the effectiveness of safeguards that would normally mitigate the risk associated with a cause/consequence scenario, e.g. procedural errors by operators.

Design or procedural features that impact human performance (e.g. equipment accessibility, labelling, clarity of procedures) were assessed using a specific human factor checklist at the final stage of the PHA study.

Caltex's risk consultant was provided access to output from PHA studies to test the suitability of sourced industry failure frequency data. Information from the PHAs specific to the facility, were also used to compile the various event trees used in the preliminary hazard analysis (e.g. consideration of response times).

The information provided on Page B.1 of **Appendix C1** of the EIS provides further insight as to why it is considered reasonable to apply industry standard failure frequency data to the preliminary hazard analysis.

4.9 Issue 9 – Control Valves

The submission notes that on page A4 of **Appendix C** in the EIS, “It is stated that ‘where possible, ESDVs were nominated as the isolation points rather than control valves’. *Identification of where control valves are being used to isolate process lines with reference to a piping and instrumentation diagram (P&ID) is required.*”

Response

The design of the terminal includes an additional 427 motorised valves (MOVs). These MOVs include tank shell valves and pipeline isolation valves. The shell valves on each tank and the isolation valves at the wharf are designated as the primary isolation valves for terminal operation. These are not control valves but are intended to isolate in the event of an incident or escalating event (e.g. tank extra

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high level). The tank shell valves are part of the automated high level protection and isolation of all of the product tanks.

All of the products stored at the Site are in fully segregated line systems in the terminal for product integrity. The MOVs throughout the facility allow automated control of all these line systems to allow the efficient and reliable operation of the terminal, manifolding of line systems and isolation for maintenance purposes.

The Preliminary Hazard Analysis (refer to **Appendix C1** of the EIS) has identified isolatable sections for:

- wharf and sub-berth (isolatable section data includes flow rate and discharge pressure; event tree includes time to isolate);
- tank farm (isolatable section is maximum tank volume);
- pipelines (isolatable section is distance between MOVs as described above); and
- pumps (isolatable section data includes flow rate and discharge pressure; event tree includes time to isolate).

Caltex considers the analysis undertaken for the Project to be conservative. No allowance has been made for the isolation of smaller sections using manual isolation or control valves.

The above is a summary of the underlying approach in the assessment. Including a full set of marked-up terminal P&IDs in this report would be expansive (greater than 550 P&IDs).

4.10 Issue 10 – Safety Critical Items

The submission required clarification whether safety critical items would be Safety Integrity Level (SIL) rated and/or Fire rated?

Response

A HAZOP study was conducted for the Project to fully detail all of the risks and consequences associated with the operation of the terminal. This formed the basis for the SIL and Layers Of Protection Analysis (LOPA) reviews. The results of these studies were used to develop the basis of the design for the terminal safety systems. The final design architecture was then verified by a third party to ensure that detailed design met the requirements of the LOPA and achieved the required system integrity and reliability.

These reviews determined that Caltex are required to achieve a SIL 1 level of integrity for the tank over fill protection systems. It was determined that all the components of the system have reliability that allows them to meet the requirements of a SIL 1 capable system.

The tank shell valves and associated cabling would be fire rated (refer to **Section 4.14** below) to ensure that they are capable of isolating the tank in the event of any emergency. The remainder of the components in the loop do not require fire protection as they have a fail-safe that would take the required action in the event of an emergency or failure.

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4.11 Issue 11 – Loss of Containment under Terminal Operation

The submission requested confirmation that the systems outlined to prevent loss of containment for terminal operations in the EIS would be implemented prior to tank commissioning.

Response

All the systems that form part of the terminal design would be installed, commissioned and fully operational prior to the completion of the conversion works and commissioning of tanks in terminal mode. Individual risk improvements would be progressively implemented on individual tanks prior to their return to service under terminal operating mode.

4.12 Issue 12 – Proof Testing and SAAB Radar Gauges

The submission questioned the frequency of proof testing under management systems for maintenance, and requested clarification that the SAAB radar gauges are SIL rated.

Response

The SAAB radars are SIL rated, and the configuration is SIL 3 capable. The design has an integral proof testing ring installed as part of the radar installation that is capable of testing the overfill protection *in situ* on demand and would be routinely tested on an annual basis. The radar's operation is also continually verified as the radar is a dual head device that will be monitoring the differential between the two readings.

4.13 Issue 13 – Standards for Tank Overfill Protection

The submission requested clarification that API 2350 has been used as a guidance standard for protection of tank overfills.

Response

API 2350 has been used to determine all of the operating limits and overfill protection settings for the tanks. Tank levels have been calculated and documented on the basis of a Category 3 overfill protection system (OTS).

4.14 Issue 14 – Fire Shut Off Valves

The submission requested that the relevant section of API 6D relating to '*certain periods of fire as required by API 6D*' should be provided as a reference.

Response

There is no specific reference to a burn period in API 6D. However, it notes that fire testing needs to meet one of a number of recognised standards under the umbrella of ISO 10497.

API 6D D.5 requires that the fire-resistance design of valves shall be qualified by fire type-testing in accordance with ISO 10497. Fire resistance designs already qualified to ISO 10497, API 6FA, API 6FC, API 6FD or API 607 are also acceptable.

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Valve datasheets for hydrocarbon service at the terminal would specify that the valves are to be in line with API 6D. The type of valve determines the particular test method. However all test methods would be as per API 6D D.5 requirements.

4.15 Issue 15 – Remote Operation Shut Off Valves

The submission requested clarification about when the detail of the safety case, relating to remote operation shut off valves (as discussed within **Appendix C2** of the EIS), will be reviewed and finalised.

Response

The new MOVs installed as part of the Project in the isolatable sections of the terminal have been selected consistent with Caltex internal guidelines, the PHA study team's knowledge of hazard scenarios, and the existing experience of control performance on the Site. Reference to HSG244 would be incorporated in the ALARP review for the terminal safety case. The timing of the submission of the terminal safety case submission is yet to be finalised.

4.16 Issue 16 – Ante-tank Design Proposal

The submission requested a reference to a detailed analysis be provided (if available) regarding the assessment behind Caltex's decision to reject the ante-tank design proposal.

Response

The ante-tank design proposal would involve tapping into the side of a tank via small bore piping to fit an external small tank in which the independent high level sensor and switch would sit.

This suggestion carries with it a number of identified hazards which could in fact increase the risk of tank overfill rather than reduce it. The following illustrate some of Caltex's concerns:

- Small bore piping may become blocked thereby rendering the control measure ineffective. At present, tanks are taken out of service every ten years for inspection. To ensure operability and reliability with the suggested design change, inspection at a more frequent interval would be required;
- Small bore piping is more vulnerable to corrosion;
- Small bore piping and light gauge equipment are more vulnerable to damage in service;
- Floating roof tanks at the tapping point would be open to the atmosphere at normal operating levels. This would make the tapping point vulnerable to blockage from external environmental sources (e.g. insects);
- Rain water ingress via the tapping points could result in false readings and alarms. Unreliable alarms lead to a range of risks (human) in responding to alarms.
- If the tapping point was lower on the tank to avoid this problem, product would be filling into a small diameter tube tank throughout normal operation. Caltex assumes the small tank would be a simple lidded tank. If so, vapour displacement would need to be managed to control the potential increased emissions;
- In the event that a floating roof or floating blanket encounters any slight resistance as it rises, there could be a potential for product to preferentially surge into the small diameter ante-tank and overfill this tank. This would result in a LOC, despite the main tank level sitting below the high fill point. In

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the event of a serious roof problem the product may surge through the small diameter vessel resulting in a LOC.

- Any small bore piping or fittings open to the working head in the tank need to be of sufficient robustness to withstand the rigour of tank operation over many years. Sight tubes, small bore fittings etc. are rarely of the strength required for this service. If they were designed for this purpose it is likely the cost would be significant.

In summary, Caltex considers there are preferable alternatives to incorporating external vessels which are prone to complications.

Point 2 of Annex 4 of the Major Incident Investigation Board Report (MIIB) is relevant and supported. It states that *"the intention is to encourage industry to move away from the use of simple switches for ultimate high level indication and towards the use of more advanced sensors that incorporate 'on line' diagnostics and can therefore be considered fail-safe"*. To respond to this recommendation, Caltex uses either Drexelbrook capacitance probes or SAAB radar technology which incorporates sophisticated on-line diagnostics. In the case of the SAAB radar system, it has the additional advantage of being able to be reliably verified against the independent gauging system throughout normal operation periods, thereby providing ongoing assurance of reliability. Both types of switches can be reliably tested without bringing the liquid level in the tank up to the ultimate high level.

The discussion regarding the use of ante-tanks has been an important consideration when determining alternatives to the proposed design. However, it has been determined that it is far less reliable and far less safe than the system adopted at Caltex. As discussed in **Appendix C2** of the EIS, the Buncefield Incident prompted Caltex to rigorously review its tank alarming requirements including a review of practical response times between the three main alarm levels.

Caltex has reviewed the various Buncefield recommendations with other major oil corporations, as an industry cooperative of Major Hazardous Facilities (MHFs), and agree the suggestion made in the MIIB report regarding ante-tank design has not been properly and thoroughly tested for safe operation. Thus, the suggestion is rejected at this time as a suitable means of bulk tank level control.

Caltex will continue to monitor emerging standards in the industry and address opportunity for further risk reduction consistent with good risk management practices.

4.17 Issue 17 – Hydrocarbon Vapour Detectors

The submission notes that **Appendix C2** of the EIS states that *'additional hydrocarbon vapour detectors have been installed in several existing tanks ... and will .be installed in suitable locations ...'*. The submission requests clarification as to *"whether this action been scheduled and when it is due for completion."*

Response

Table 8-1 of the EIS provides a summary of the additional leak detection measures for the terminal. Further detail is provided in the fire safety study for the Project. In summary, this includes:

- LEL detection in all gasoline tank compounds in vicinity of valves and mixers;
- Seal leak detection system fitted to all pumps (low and high flash point products); and
- LEL detection adjacent to low flashpoint pumps (gasoline, slops).

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These controls would be progressively installed as the tanks are converted. All tanks operating in terminal mode (post Q4 2014) would have the new risk controls installed. Some tanks will be taken out of service in Q4 2014 for the purpose of conversion. These tanks will have the new risk controls installed prior to their return to operational service.

Completion of the terminal conversion (last tank converted) is forecast as December 2016.

4.18 Issue 18 – Site Security Review

The submission requested clarification about when the site security review, currently being undertaken, will be completed and when any identified actions will be implemented.

Response

Caltex has a corporate security review process based on a 3 year cycle of physical security review, review of the security plan and action tracking. This is a key element in Caltex's safety case for security arrangements. The existing refinery has completed this cycle. This process would continue with the planned terminal arrangements. It is a continuous improvement process rather than a discrete activity.

4.19 Issue 19 – Bund Walls

The submission requested clarification over how Caltex has ensured: “...*bitumen encased bund walls are fire resistant in line with Buncefield recommendations.*”

Response

The information contained on page C2-7, **Appendix C2** of Volume 2 of the EIS outlines Caltex's underlying principles to progressively addressing the recommendations of the various Buncefield reports.

The Major Incident Investigation Board (MIIB) Report notes that it may not be practicable to fully upgrade bunding and drainage at existing sites. Further, the MIIB recommends that revised standards should be applied for new build sites and to new partial installations. Caltex has adopted improved standards for bund construction for all new tank construction activities since the Buncefield incident. This has included installation of impermeable liners.

Caltex's first priority in addressing the MIIB recommendations in the context of the Project has been to undertake works to ensure that bunds are leak tight and survivable in the event of a large spill of product to the bund. The Project includes a substantial work scope to bring all remaining tank bunds up to a consistent standard. The current standard of bitumen encased bund walls provides an element of fire resistance. Caltex continues to monitor the development of regulatory guidance and will continue to respond consistent with its approach of reducing risk to as low as reasonably practicable. At present, this approach engenders preferential investment in prevention measures (tank LAHHS, mechanical integrity inspections), early detection (LEL monitors), isolation (new MOVs) and rapid response to spills to prevent fire (upgraded fire response equipment).

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4.20 Issue 20 – Auto Ignition Temperatures

The submission recommended a review of the auto ignition temperatures outlined in the Material Safety Data Sheet (MSDS) previously provided by Caltex to NSW WorkCover, as the temperatures: *“...seem high compared to other similar products distributed in this country. An incorrectly assessed and published temperature could be a source of error, for example when specifying electrical motors.”*

Response

Caltex will review flash point and auto ignition temperatures published in its product MSDS to ensure they are aligned with appropriate industry standards. This has already commenced and will be completed by end September 2013.

The Project design team have confirmed that design has referenced an auto ignition temperature of 280°C consistent with published values and that all gasoline areas take a Zone 1 classification approach for electrical and instrumentation design purposes.

NSW Health

Introduction

A submission was received from the NSW Health - South Eastern Sydney Local Health District Public Health Unit dated 17 June 2013. The submission did not raise any objections or request further clarification on any issues. The following text provides a summary of the key provisions the NSW Health South Eastern Sydney Local Health District Public Health Unit noted should be observed as part of the Project.

5.1 Issue 1 – Planning Policy and Guidelines

The submission requested the works comply with the relevant legislation outlined in the submission, including the following relevant policy and guidelines:

- The *National Environmental Protection (Assessment of site contamination) Measure 1999*, Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater. Schedule B (6) Guideline on Risk Based Assessment of Groundwater contamination, and Schedule B (7a) Guideline on Health-Based Investigation Levels when assessing the contamination risk on the Site;
- The *Australian and New Zealand Guidelines for Fresh and Marine Water* (ANZECC, 2000) when assessing and managing the impact of activities on waterways, aquatic ecosystem and primary contact recreation;
- *Worksafe National Code of Practice and Guidance on Asbestos and Disposal* when undertaking work to minimise the disturbance of soil and the release of asbestos; and
- The *Protection of the Environment Operations (Clean Air) Regulation 2010* and the *National Environment Protection (Air Toxics) Measure 2004* for air quality and odour compliance.

Response

Caltex acknowledges this request and would ensure, where relevant, works related to the Project would be undertaken in accordance with the legislation and guidelines outlined in the submission. Relevant provisions relating to the legislation and guidelines provided in the submission would be provided within the CEMP for the Project and the EMPs for operation of the terminal.

Fire and Rescue NSW

Introduction

A submission was received from Fire and Rescue NSW (FRNSW) dated 4 June 2013. The submission outlined FRNSW's assessment of the Project relating to Hazard and Risk. FRNSW noted satisfaction that previous comments provided in relation to the Environmental Scoping Assessment were adequately addressed in the EIS and particularly the Preliminary Hazards Assessment in **Appendix C** of the EIS. The following text presents the single query raised in the submission.

6.1 Issue 1 – Hazards Assessment Process

FRNSW noted that the submission process had not followed the normal process outlined in the NSW Planning and Infrastructure's Hazardous Industry Planning and Advisory Papers No. 2 and No. 6.

Response

Consistent with the intent of *HIPAP No. 2 Fire Safety Study Guidelines* Caltex has undertaken fire safety studies early in the design of the Project. Consultation with Fire & Rescue NSW has occurred early in the design phase to assess the broad acceptability of the proposed approach for fire safety at the terminal as opposed to post-approval, which is the usual process. Caltex continues to consult with Fire and Rescue NSW to deliver an effective design for fire protection systems.

NSW Office of Environment and Heritage

A submission was received from the NSW Office of Environment and Heritage (OEH) dated 28 June 2013. The submission outlined OEH's assessment of the Project relating to impacts on biodiversity. Overall, OEH was satisfied that the proposed content of the management plans for the Project is sufficient in managing indirect impacts on sensitive receptors via disturbance and risks associated with the mobilisation off-site of contaminated material. OEH also noted that only remnant areas of vegetation lie within the Project boundary, which, as outlined in the EIS, would not be affected by the works. The OEH submission made a request to the DP&I but did not raise any issues for Caltex to address in this report.

NSW Education and Communities

Introduction

A submission was received from NSW Education and Communities (NSWE&C) dated 25 June 2013. The submission outlined NSWE&C's assessment of aspects of the Project related to hazard and risk, traffic, consultation, and management and mitigation. The submission noted the refinery is approximately 500 m from a primary school and the Botany Bay Environmental Education Centre. NSWE&C detailed several positive impacts resulting from the Project including, but not limited to, air quality and traffic improvements. The following text provides a summary of the key issues raised in their submission.

8.1 Issue 1 – Hazard and Risk

The submission expressed concern over risks associated with the handling of flammable liquids and the potential for accidents resulting in harmful emissions.

Response

Caltex continues to be committed to meeting the intent and requirements of the NSW *Work Health and Safety Act 2011* (WH&S), the NSW *Work Health and Safety Regulation 2011*, and the Site's existing requirements as a major hazard facility. As outlined in the EIS: *"There would be no changes to the existing precautions observed at the Site. In particular, this would include standards and requirements relating to the handling and management of flammable liquids. All 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."*

In relation to risks associated with the transition period from refinery to terminal, as stated in **Chapter 8 Hazards and Risk** of the EIS: *"The Caltex organisation has extensive knowledge and experience in the shutdown, isolation and de-inventory of the refinery process units. This has typically been performed on at least a five year cycle for each of the existing refinery process units. Existing shutdown and decontamination procedures, shutdown safety management plans and experienced refinery team members would allow this work to be undertaken in a safe and efficient manner."* This experience includes the management of the recent closure and demolition of the Caltex Lubricating Oil Refinery.

The proposed terminal would comply with all the land use safety risk criteria specified in Hazardous Industry Planning Advisory Paper (HIPAP) No. 4. Following completion of conversion works, the Site would no longer store or handle any significant quantities of materials with Dangerous Goods classification of 2.1, which includes flammable gas. These changes result in a significant reduction of the on-site and off-site risks associated with the handling of flammable liquids throughout the operational phase of the Project.

Under the proposed terminal, a modification to the existing safety case would be required. Several meetings have already taken place between Caltex and WorkCover NSW MHF Team to ensure that the required modifications would be managed effectively and in accordance with the WHS Regulation.

8 NSW Education and Communities

8.2 Issue 2 – Botany Environmental Education Centre

The submission states that the Botany Environmental Education Centre was omitted from the Preliminary Hazard Assessment (refer to **Appendix C** of the EIS), and understands that revisions are being made to the hazard assessment to address the issue.

Response

Caltex has reviewed the location of the Botany Bay Environmental Education Centre with respect to impact from any of the potential identified major accident events for the Project. It was concluded that:

- The centre is outside of the 4.7KW/m² radiant heat zone for all tank top and bund fire scenarios. Radiant heat from events would be non-detectable.
- The centre is outside of the 7kpag zone for overpressure associated with the extremely unlikely event of a vapour cloud explosion.
- Inclusion of the centre population, independent of its occupancy rate, would not alter the reported societal risk profile or determined risk conclusions to HIPAP No. 4 criteria.

Caltex will acknowledge the location of the Botany Bay Environmental Education Centre as a sensitive land use location in the final hazard analysis report for the Project.

8.3 Issue 3 – Traffic

The submission expresses concern over the potential for construction traffic to cause congestion by impacting on road and intersection performance.

Response

The existing road network around the Site already experiences congestion issues during peak periods. As discussed in **Section 16.5.3** of the EIS the number of trips generated by construction activities is very minor (approximately 1%) when compared with the background volumes on Captain Cook Drive. Whilst the construction works would temporarily result in a very minor increase in traffic volumes, the Level of Service on the road would not change. Therefore it can be concluded that the construction traffic impact would be negligible.

8.4 Issue 4 – Consultation and Mitigation

The submission requested consultation be undertaken with the local schools to identify issues and mitigate impacts throughout the course of the Project. The submission suggested that the CEMP include references to: “...include school consultation during key stages which may affect school operational issues such as vehicular traffic access.”

Response

Caltex is in regular contact with the Principal of Kurnell Public School. The public school is included in letterbox drops to the Kurnell community and the Principal is invited to the quarterly community meetings. Caltex will continue their engagement with the Public School in line with their existing programs and practices.

NSW DPI Fisheries

A submission was received from NSW Department of Primary Industries (Fisheries) on 2 July 2013. The submission raised no objections to the Project. It noted that it is important that the proposed mitigation measures for Soils, Groundwater and Contamination and Surface water, Wastewater and Flooding be implemented to “...*manage potential flow on effects to nearby aquatic environments...*”. These mitigation measures would be implemented through the CEMP and operational EMPs for the Project.

NSW Office of Water

Introduction

A submission was received from NSW Office of Water (NOW) on 18 July 2013. The submission outlined the NOW's assessment of aspects of the Project relating to surface water (stormwater) and groundwater. The submission also included a request to the consent authority to include a condition of consent if the Project is approved. The following text provides a summary of the key issues raised in the NOW submission.

10.1 Issue 1 – Surface Water (stormwater)

The submission supported the proposed management measure to undertake stormwater flow monitoring (in consultation with the EPA), given there are three sensitive receiving environments for the stormwater discharge. NOW stated: *"It is important the EPA is satisfied that the sensitive downstream receiving environments are adequately protected."*

Response

Under the existing EPL for the Site, Caltex is required to prepare a stormwater management plan for the Site, which included for the provision of a stormwater management strategy and completion of a number of stormwater management measures in a staged manner. This management plan was submitted to the EPA in October 2012. The EIS outlined the strategy and related actions to be contained within the stormwater management plan. These included:

- Maintenance of the existing stormwater system (ongoing).
- Implementing a number of projects to improve the infrastructure, reduce the potential for the Site to flood, and prevent contaminated stormwater leaving the Site (commenced in 2012).
- Working with the OEH, 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 (commenced in 2012).
- Carrying out stormwater flow monitoring from 2013 through to 2014.
- 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 (yet to commence)."

Caltex works closely with all relevant Government agencies to reduce the impact of its operations on the environment surrounding the Site. The management and mitigation measures presented in **Chapter 11 Surface Water, Wastewater and Flooding** of the EIS have been developed to ensure that potential adverse impacts on local water quality from construction or operational activities are either avoided or mitigated. Caltex will continue to implement the stormwater management plan and stormwater flow monitoring from 2013 through to 2014 in consultation with the EPA.

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10.2 Issue 2 – Conditions of Consent

Whilst the NOW agreed that it would be unlikely that the groundwater at the Site would be intercepted and that any impacts would be negligible, the submission did recommend the following condition of consent be included should the Project be approved:

"In the event that groundwater is intersected during works, the proponent is to:

- 1. Make application to the NSW Office of Water for a determination of any required water approvals, and*
- 2. Develop a Groundwater Management Plan for the testing dewatering, storage, movement and treatment of any groundwater in consultation with the NSW Office of Water."*

Response

Chapter 9 Soils, Groundwater and Contamination of the EIS concludes that the conversion works are unlikely to intercept groundwater and NOW agrees with this conclusion. Nevertheless the management and mitigation measures for the Project take a precautionary approach and commit Caltex to including a number of groundwater protection measures within the CEMP for the Project. In the event that groundwater is intersected during the Project construction, Caltex would consult with the NSW Office of Water. If necessary, following these discussions, Caltex would make an application to NOW for a determination of the required water approvals and would develop a Groundwater Management Plan, for the testing, dewatering, storage, movement and treatment of groundwater.

Sutherland Shire Council

Introduction

A submission was received from Sutherland Shire Council (SSC) on 28 June 2013. The submission outlined SSC's assessment of aspects of the Project relating to general environmental improvements, surface water and flooding, soil and groundwater, noise, heritage, and management and mitigation measures. SSC noted the Project: *"...whilst having long term and significant adverse economic impacts on Kurnell and the Sutherland Shire due to job losses, is acknowledged to have significant potential for improvements to the environment."* The submission also supported: *"...the proposed environmental improvements which are part of the conversion, such as installation of improved safety measures, upgrading bunding, removal of chlorine storage near wharf, decreased traffic, reduction in waste and emissions and reduced water use."*

The submission requested further clarification from DP&I: *"...whether in light of the contents of this EIS, consideration is being given to reassessing the refinery risk impact on the Kurnell Area and the department's current prohibition on development which would increase population density in the area (such as subdivisions and dual occupancies)."* This request has not been addressed in this report, as it is a matter for the consent authority to respond to separately.

11.1 Issue 1 – Surface Water, Wastewater and Flooding

The submission requested that additional flood investigations be undertaken: *"...either prior to determination of the application or by way of a schedule the subject of consent conditions."*

Response

As discussed in **Chapter 11 Surface Water, Wastewater and Flooding** in the EIS, whilst small parts of the Site were identified as having a 'medium risk' from flooding, the Project is not expected to change the flood risk profile of the Project Area. The Project would not increase the existing flood risk in the local area and would not result in increased flooding on the Site.

To address stormwater management on the Site, Caltex have prepared a Stormwater Management Plan (SMP) in discussion with the EPA. This requirement followed flooding incidents that occurred in 2010/11 which were caused by localised flooding at the WWTP and adjacent properties, resulting in off-site oily water discharge. As stated in the EIS, the stormwater plan included for the implementation of a number of projects: *"...to improve the infrastructure, reduce the potential for the Site to flood, and prevent contaminated stormwater leaving the Site (commenced in 2012)."* The measures within this SMP are outlined in greater detail in **Section 11.5.6** and **Section 3.2.6** of **Appendix E Water Management Report** in the EIS.

The implementation of the SMP and further changes to the stormwater system following completion of the Project and following any future demolition or remediation works would result in changes to flood risk profile for the Site. As such, Caltex has committed to reassess flood risk during the remediation works to ensure that any future flood risks to the Site are understood and appropriately managed. This commitment is also formalised as management and mitigation measure E6 (refer to **Table 21-1** of the EIS). It states:

"Caltex will reassess the Site's flood risk during the future remediation works that would be completed once the conversion works are complete to ensure that any future flood risks to the Site following conversion, demolition and remediation are understood and appropriately managed."

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In subsequent discussions with SSC, Caltex have agreed that the company would commence a flood study within three months of completion of demolition works at the Site and that Caltex would remain in consultation within SSC as this study progressed.

11.2 Issue 2 – Asbestos

The submission requested that: *“Precautions be taken with regard to the potential for asbestos on the site to impact on construction workers and others on and near the site.”*

Response

As outlined in **Chapter 10 Human Health and Ecological Risk** of the EIS: *“Asbestos has been noted on the Site in various places, mainly associated with pipeline easements and waste areas”*, and it has been noted that its presence has the potential to pose a health risk to the workers working with excavated soil. The chapter goes on to state that the Site is protected from gusts of wind that could potentially mobilise asbestos dust, resulting in a low potential for the dust to be transported off-site and impact on those near the Site.

Caltex currently has procedures in place for working in the areas where asbestos is likely to be present, and procedures for identifying potential asbestos on the Site. To assist in managing any risks associated with asbestos, a register identifying known contaminated areas is available at the Site.

Caltex is currently preparing the CEMP and its associated sub-management plans. These plans would include appropriate management measures to prevent the unnecessary or excessive handling of asbestos contaminated material and ensure that this material does not adversely affect the environment or human health. As discussed in **Section 10.8** of the EIS, construction staff would be inducted and provided with training prior to working with potentially contaminated soil to prevent unnecessary disturbance. The location of potentially contaminated areas would be noted within the CEMP and provided to construction personnel involved in soil excavation and handling. Where necessary, safety training and appropriate Personal Protective Equipment (PPE) would be provided. Construction work on Site would continue to operate under the ‘permit to work’ system. This system includes current practices described in the EIS in **Chapter 9 Soils, Groundwater and Contamination**.

The CEMP would also include the proposed methodology for handling, storing, transporting and disposing of any asbestos waste. This work would be completed in accordance with the relevant legislation as discussed in **Chapter 9 Soils, Geology and Contamination** and **Chapter 10 Human and Ecological Risk** of the EIS.

11.3 Issue 3 – Soils Groundwater, and Contamination

The submission requested further assessment be undertaken to determine the ‘high risk’ areas on Site with regards to contamination. SSC requested that any areas identified as high risk (and likely to be disturbed by the Project) are either remediated prior to Project completion, or at a minimum, a remediation program is prepared: *“...to progressively remediate these areas.”*

Response

Caltex has completed a number of investigations on Site in order to identify and characterise key contaminants of potential concern (COPCs) and therefore understands which parts of the Site would

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be considered 'high risk'. Recent investigation completed in 2007 and 2011 divided the Site into Contamination Management Zones (CMZs) to assist with classifying and managing the types of contaminants found on Site. A summary of the COPCs found in each CMZ is provided in **Section 9.5.4** of the EIS. Contaminants have been identified throughout these and other works, and there is an existing register of the known contaminated areas available at the Site.

The management of potential contamination risks would continue throughout the life of the Project. Caltex would continue to conduct quarterly groundwater monitoring to identify any potential migration of contaminants. Caltex also operates a risk reduction program on the Site to manage potential off-site human-health and environmental risks associated with TPH and BTEX in the groundwater.

The CEMP would include measures to mitigate and manage any adverse impacts or contamination risks associated with the Project, and would be prepared in accordance with the required relevant regulations and guidelines. As part of the CEMP, a Contamination Management Plan would be prepared, to outline measures for testing, handling, storing and management contaminated soils and groundwater.

Once the terminal is operational, much of the Site's infrastructure would be refurbished and upgraded, reducing the risk of contamination to the underlying soils and groundwater. There would also be a significant reduction of wastewater volume and contaminant load following the cessation of refining activities. As such, the EIS concluded that: *"...the future terminal is likely to result in less contamination impacts."* Refer to **Chapter 9 Soils, Groundwater and Contamination** for a summary of the proposed management and mitigation measures should Project approval be granted.

Caltex are currently assessing their options with regard to the future use of the Site. This options analysis will feed into a number of other studies that will help define the final remediation strategy for the Site. Until these various studies are finalised, any remediation program for the Site would not be able to be efficiently and accurately completed. As these various studies are being completed, Caltex will consult with various stakeholders (e.g. EPA) to ensure that relevant legislation and guidance is followed.

11.4 Issue 4 – Noise

The submission requested that construction works associated with the Project are only undertaken between 7am and 10pm, particularly any works being undertaken near Cook Street and Reserve St.

The submission advised that the Project would likely result in cumulative adverse noise impacts on nearby residents, given the other projects that would be undertaken in the area during the same period.

Response

As outlined in the EIS, the majority of construction works would be undertaken between the hours of 7am and 10pm, however: *"...some works consistent with Caltex's existing maintenance procedures would need to occur over a 24 hour period."* These works would be consistent with the activities that Caltex currently carries out as part of their on-going maintenance and turnaround and inspection (T&I) work. Any works undertaken between the hours of 10.00 pm and 7.00 am would not exceed 65 dB (A) as required under the existing EPL for the Site. All other Project noise would also meet the requirements of the existing or revised EPL for the Site.

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Further, the Project is not expected to result in any adverse impacts to the acoustic amenity of surrounding receptors. The EIS outlined the predicted construction noise levels to be 34 dB (A) at Prince Charles Parade and 28 dB (A) at the Rangers' House. This would result in a noise contribution (under the Project) that would have "*an acoustically insignificant contribution to the construction noise levels from the Kurnell Port and Berthing Project*" (refer to **Chapter 12 Noise and Vibration** and **Appendix F** of the EIS). Cumulative road traffic noise impacts were identified in the EIS as negligible, as both the Project and the Port and Berthing Project would generate only a small volume of vehicle movements, resulting in a cumulative increase of less than 2 dB (A).

11.5 Issue 5 – Heritage

The submission supported "*...the proposed photographic recording of the site prior to cessation of refinery operations.*"

Response

Caltex is committed to undertaking the following measure to manage and mitigate impacts on heritage, as outlined in the EIS: "*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 or 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 Sutherland Shire Library and the NSW State Library.*"

11.6 Issue 6 – Management and Mitigation Measures

SSC noted that certain information would be provided in the CEMP and requested the opportunity to provide comment on the CEMP prior to the commencement of conversion works.

Response

Caltex acknowledges this request and has amended the management and mitigation measures to allow for review and comment of the CEMP by SSC. Refer to **Section 13.2** for the additional management and mitigation measure.

Design Modifications

12.1 Introduction

Section 1.4 of this report presented a proposed design change to the Project. This change involves providing three finished fuel tanks on Site with increased rainwater protection to ensure that enough quality product is available to the NSW and ACT market. This increased protection would involve installing external domes on three tanks. The external domes would rest on support brackets welded to the outside of each of the tanks. The domes overhang the tank's shell slightly at the roof line forming an eave around the shell periphery. At the centre of the dome the height of the tank structure would increase by a maximum of 10 m.

This design change was not assessed in the EIS for the Project. Discussions between Caltex, URS and DP&I confirmed that additional assessment work would be required to understand if this design change is likely to result in significant adverse impacts. To this end four supplementary assessments have been completed. These consist of:

- A visual impact assessment;
- A heritage assessment confirming any changes to the assessment within the EIS;
- An air quality assessment confirming any changes to the assessment within the EIS; and
- A hazard and risks assessment confirming any changes to the assessment within the EIS.

This chapter summarises the conclusions of these four supplementary assessments. Where the supplementary assessments are extensive, they have been presented in full in **Appendix B**.

12.2 Supplementary Visual Assessment

12.2.1 Introduction

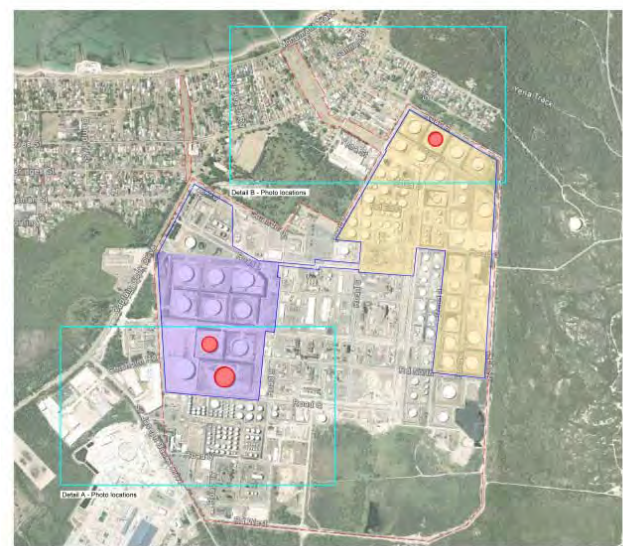
A visual assessment was undertaken by Green Bean Design (GBD) to determine impacts to the visual amenity of the area as a result of the proposed design revision. The assessment initially consisted of a desktop study of topographic maps and aerial photographs of the Site and surrounding landscape. This was undertaken to address visual character of the Site and identify view locations within the surrounding area. This desktop work was followed by a site inspection, conducted to determine and confirm the extent to which the modifications would be visible from the identified view locations. The full supplementary visual assessment is provided in **Appendix B1**. This section summarises the results of conclusions of this assessment.

12.2.2 Photo Panoramas and Photomontages

Photographs taken during the site inspection were electronically stitched to form photo panoramas of views from publically accessible areas surrounding the Site. The photo panorama locations (numbered K1 to K11) are shown in **Figure 12-1** below. The photo panoramas are presented in Figures 2 to 5 of **Appendix B1** and illustrate the generally restricted nature of views toward the three tanks affected by the design change from areas of residential dwellings and publically accessible locations surrounding the Site.

Photomontages were prepared to illustrate the proposed modifications from three of the photo panorama locations including K2 Chisholm Road, K3 Cook Road and K8 access track adjoining the Site. The photomontages are illustrated in Figures 6 to 8 of **Appendix B1** and are also shown in **Figures 12-2 to 12-4** below.

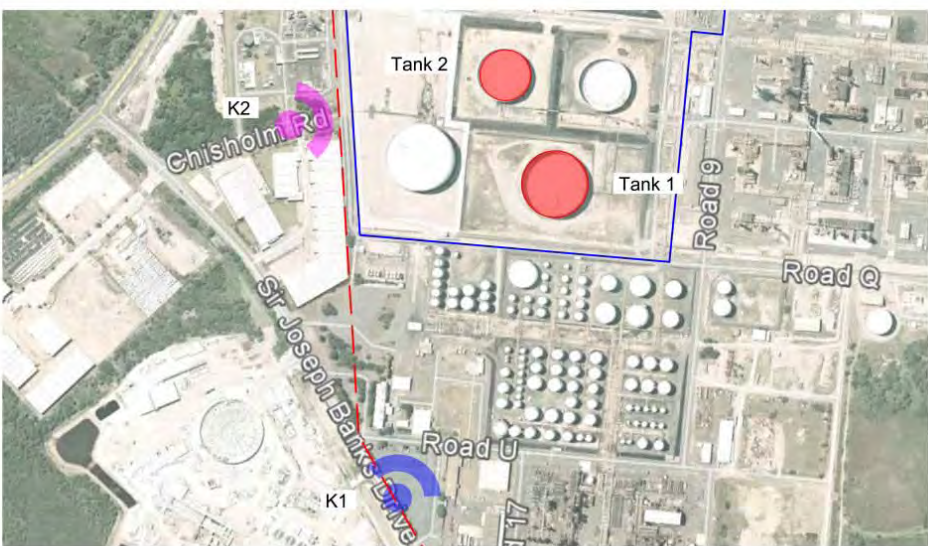
Figure 12-1 Photo and Photomontage Locations



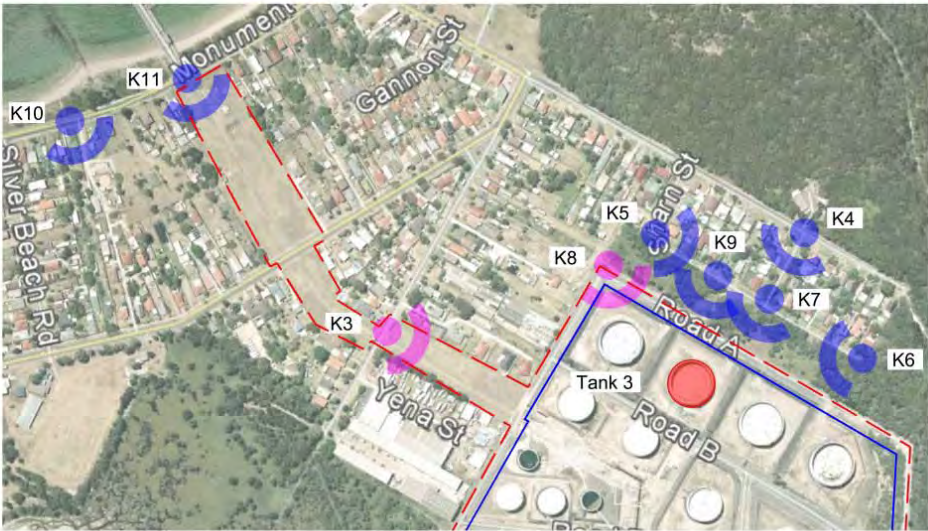
General location plan

Not to scale

- Legend
- Caltex Refinery Site
 - Project Area
 - Western Tanks Area
 - Eastern Tanks Area
 - Existing tank with proposed low profile domed roof conversion
 - K5 Panorama photo location
 - K2 Panorama photo and photomontage location



Detail A - Photo and photomontage locations



Detail B - Photo and photomontage locations

Figure 12-2 Existing and Proposed View from Chisholm Road (K2)



Photo Location K2 - Existing view toward Tank 2, Chisholm Road



Photo Location K2 - Proposed view toward Tank 2, Chisholm Road

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Figure 12-3 Existing and Proposed View from Cook Street (K3)



Photo Location K3 - Existing view toward Tank 3 from Cook Street



Photo Location K3 - Proposed view toward Tank 3 from Cook Street

Figure 12-4 Existing and Proposed View from Access Track (K8)



Photo Location K8 - Existing view toward Tank 3 from access track south west and parallel to Reserve Road



Photo Location K8 - Proposed view toward Tank 3 from access track south west and parallel to Reserve Road

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12.2.3 Assessment of Visual Impacts

Visual Absorption Capability

Visual Absorption Capability (VAC) is a classification system used to describe the relative ability of the landscape to accept modifications and alterations without the loss of landscape character or deterioration of visual amenity. VAC relates to physical characteristics of the landscape that are often inherent and quite static in the long term.

Given the extent and combination of existing industrial infrastructure within the Site, the capability of the landscape to absorb the supplementary works is considered to be high. The high VAC of the surrounding landscape is likely to reduce the potential visual significance of the modifications.

Change to the Existing Visual Environment

The scale of change in existing views, with respect to the addition of the modified roof structures, would be limited in both composition as well as the proportion of existing views occupied by the modifications. The modified roof structures would not be expected to have any significant impact on existing skyline views or block existing views across and beyond the Site.

Visual contrast between modified and existing tanks would be limited to the line and form of the geodesic dome. However, the Site contains a range of large structures and buildings, with a variety of roof types at various elevations. The overall contrast between the modifications and existing structures within the Site would be negligible.

Whilst there would be a marginal increase in the overall height of the three modified tanks, there would be similarities in the overall scale, colour and texture of both modified and existing tanks. The modified roof structures would tend to be readily integrated into the existing visual environment of the Site, which contains a variety of constructed industrial elements.

Whilst the roof profiles of the three tanks would be modified, the overall nature of visual change would be restricted by the availability of views due to partial screening restricting the majority of views to glimpses rather than full views from the majority of sensitive view locations, including surrounding residential dwellings and road corridors.

Predicted Visual Significance of the Supplementary Works

The limited scale of change and degree of contrast between the modifications and existing tanks would tend to reduce the visual significance of the supplementary works. Visual significance would also be limited by the extent and degree of screening between the tanks and surrounding view locations.

The visual significance of views would be limited for locations within close proximity to the Site, and more so from distant locations including water based views from Botany Bay and areas along the north portion of the Bay including La Perouse, Yarra Bay and Molineaux Point at Port Botany. It is unlikely that the modifications would have any additional visual significance on aerial views from aircraft approaching or departing Sydney Airport.

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12.2.4 Conclusion

Overall, the assessment has concluded that the addition of a geodesic dome to the three existing tanks would have an overall negligible visual significance on people living in or travelling through areas surrounding the Site. The overall negligible visual significance would be due to a combination of the following factors:

- limited visibility toward Tanks 1 and 2 and presence of existing industrial infrastructure surrounding the tanks;
- partial visibility toward Tank 3 and the presence of existing tree cover between the Site and residential dwellings along Reserve Road, north east of the site;
- limited scale of change in existing views with respect to supplementary modifications; and
- relatively small degree of contrast between the modifications and existing structures within the Site.

12.3 Supplementary Heritage Assessment

12.3.1 Introduction

A supplementary heritage assessment has been undertaken by Australian Museum Consulting (formerly Australian Museum Business Services (AMBS)). AMBS completed the Heritage Impact Assessment for the Project (refer to **Appendix H** of the EIS).

The supplementary assessment determined the likelihood of additional impacts as a result of the proposed design modifications. The assessment comprised a desktop study of information on the proposed modifications, provided by Caltex, and the supplementary Visual Assessment prepared by Green Bean Design (August 2013) (refer to **Section 12.2**). The supplementary heritage assessment was prepared in accordance with the following guidance:

- *NSW Heritage Manual* (NSW Heritage Office and Department of Urban Affairs and Planning 1996); and
- *Statements of Heritage Impact* (1996, revised 2002).

A full version of the supplementary heritage assessment is provided in **Appendix B2**. The rest of this section provides a summary of this assessment.

12.3.2 Assessment of Impacts

The supplementary assessment determined the proposed modifications would result in the following aspects that respect or enhance the heritage significance of the item or conservation area:

- The modification of existing tanks at the Caltex Refinery to store a range of finished petroleum products supports the conservation of a sample of original Australian Oil Refinery storage tanks onsite, and as such respects the historical association of the Site with the development of the Australian petroleum industry. The changes are consistent with the ongoing use of the Site and the associated necessity to update infrastructure to current operational standards.
- The proposed works would not impact on significant fabric of the National Heritage List (NHL) Kurnell Peninsula Headland, and there would be no change to the historic or social values of the place.
- The proposed works would not alter the existing experience of significant views of the Kurnell Peninsula Headland from Botany Bay or the overall landscape setting of the Kurnell Peninsula

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Headland. At present, there are no direct views between the Meeting Place Precinct of the Kurnell Peninsula Headland and the main refinery Site, and only limited distant views from the Cape Bailey Lighthouse, and from the coastal walking track. The proposed modifications involve minimal change to the bulk or vertical scale of the existing refinery infrastructure, which is currently dominated by the refinery process units, and would not impact on the existing view corridors associated with the national heritage values of the place.

The supplementary assessment determined the proposed modifications would result in the following aspects that could detrimentally impact the heritage significance of the item or conservation area:

- Installation of the geodesic domes on three tanks and the associated change in the profile of the tanks would have minor adverse impacts on the technical significance and representative value of tanks at the Site. However these impacts would be mitigated by the ongoing use of the Site by the petroleum industry, which involves updating the existing infrastructure to current operational standards.

12.3.3 Statement of Heritage Impact

Australian Oil Refinery

Installation of the geodesic domes on three tanks, and the associated change in the profile of the tanks, would have minor adverse impacts on the technical significance and representative value of the Australian Oil Refinery site. However, these impacts would be mitigated by the ongoing use of the Site by the petroleum industry. The proposed modifications respect the historical association of the Site with the development of the Australian petroleum industry.

Kurnell Peninsula Headland

The proposed modifications would not impact on significant fabric of the NHL Kurnell Peninsula Headland, and there would be no change to the identified historic or social values of the place. The proposed modifications would not significantly alter the existing landscape setting of the Kurnell Peninsula Headland or otherwise impact on the existing view corridors associated with the national heritage values of the place.

12.3.4 Conclusion

The assessment of impacts outlined above is consistent with the original HIA (refer to **Appendix H** of the EIS). The proposed modifications to the three tanks would not result in a change to the level of impact on the heritage values of the Australian Oil Refinery or the Kurnell Peninsula Headland as previously assessed.

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12.4 Supplementary Air Quality Assessment

A supplementary air quality assessment was undertaken to determine whether any air quality impacts were likely to change from those stated within the Air Quality Impact Assessment (AQIA) for the Project (refer to **Appendix G** of the EIS) as a result of the proposed modifications. The supplementary air quality assessment involved a desktop study which is attached in **Appendix B3**.

As described in **Section 3.2.1** of the AQIA, the action of wind over External Floating Roof Tanks (EFRTs) is one of the mechanisms through which emissions to atmosphere occur. It is likely that the fitting the three EFRTs with dome roofs would act to reduce the flow of wind across the tanks. This conclusion is supported by the following references:

- Reference Document on Best Available Techniques on Emissions from Storage (IPCC, 2006); and
- National Pollution Inventory Emission Estimation Technique Manual for Fuel and Organic Liquid Storage (NPI, 2012).

These references note a reduction in emissions with the addition of a roof to an EFRT. The emission factors in *NPI* (2012) indicate an emission reduction in the order of 70-75% between an EFRT and an Internal Floating Roof Tank (IFRT), it is anticipated that a similar reduction would be experienced following installation of the proposed modifications. In the context of the AQIA, the design change to these tanks is estimated to reduce estimated emissions by up to 5% across the Site (Benzene and total VOCs). This minor reduction in estimated emissions would result in model predictions either equal to or less than those presented in the EIS, and would be unlikely to significantly alter the outcomes presented within the AQIA.

12.5 Supplementary Hazards and Risk Assessment

The proposed modifications would not increase tank capacity. As such, they do not change the inventory amounts present in the event of a loss of containment or the anticipated number of annual tank fill and empty movements. This would result in no material change to the risk profiles presented in the EIS.

Additionally, the proposed changes would not impact on tank reliability or integrity. As such, they present no material change to any scenario likelihood of occurrence or to overall risk profiles for the Site.

12.6 Conclusions

Four supplementary assessments have been completed as part of this Report. These were undertaken to assess the potential impacts of the amended design of three tanks within the Project Area (from that which was presented in the EIS). The conclusions from these assessments include the following:

- the revised design would have an overall negligible visual impact on people living in or travelling through areas surrounding the Site;
- the revised design would not result in a change to the level of impact on the heritage values of the Australian Oil Refinery or the Kurnell Peninsula Headland as previously assessed;
- the revised design would result in a minor reduction in the emissions presented in the EIS and would be unlikely to significantly alter the outcomes presented within the Air Quality Impact Assessment (refer to **Appendix G** of the EIS); and

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- the revised design would not increase tank capacity and as such would not materially change the risk profiles presented in the EIS.

As such, the design changes proposed within this Report would not increase the overall environmental impact of the Project as presented in the EIS.

Additional Management and Mitigation Measures

Introduction

The measures detailed in **Section 21.1** of the EIS are still relevant to the Project. The following Section outlines where one additional measure has been agreed following the exhibition of the EIS. This is in response to the above submissions.

13.1 Additional Measures

One additional measure is proposed following receipt of submissions. This is presented in **Table 13-1** below.

Table 13-1 Additional Management and Mitigation Measure

Item	Mitigation and Management Measures	Implementation of Mitigation Measures		
		Design	Implementation	Operation
General				
A6	Caltex would provide Sutherland Shire Council the opportunity to review and comment on the CEMP prior to the commencement of conversion works.		✓	

Glossary

Term	Description
amenity	An agreeable feature, facility or service which makes for a comfortable and pleasant life.
the ANZECC Guidelines	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
bunded areas	Refers to the bunded impermeable areas surrounding oil-filled tanks to prevent spills.
bunding	Area within a structure designed to prevent inundation and prevent spillage from tanks.
Contaminants Of Potential Concern (COPC)	Refers to chemicals that are potentially site-related and whose data are of sufficient quality for use in a quantitative risk assessment.
Consequence	The severity associated with an event in this instance the heat radiation from the pool fire events, i.e. the potential effects of a hazardous event.
Cumulative Effects/Impacts	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Decibel (dB)	A unit of sound level measurement that uses a logarithmic scale.
Dewatering	The process of removing groundwater to lower the water table below the lowest level of excavation.
easement	Is a right given to another person or entity to trespass upon land that person or entity does not own.
environment	The physical, biological, cultural, economic and social characteristics of an area, region or site.
Environmental Impact Statement	The orderly and systematic evaluation of a proposal, including alternatives and objectives, and its effects on the environment, including the mitigation and management of these effects.
Environmental Management	That part of the overall management system which includes organisational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining environmental policy. (Refer to related term Environmental Management System).
Environmental Management Plan	The control, training and monitoring measures to be implemented during the design, construction and operation phases of a project in order to avoid, minimise or ameliorate potentially adverse impacts identified during environmental (being socio-economic, cultural, physical, biological) assessments. Prepared within the framework of Defence policies, objectives, strategies and actions.
finished product	Refers to finished fuel as opposed to crude oil products which need to be refined.
firewater	Water designated for use in the event of a fire emergency.
Frequency	The number of occurrences of an event expressed per unit time. It is usually expressed as the likelihood of an event occurring per annum.
Hazard	A physical situation with the potential for human injury, damage to property, damage to the environment or some combination of these.
Hazardous Industry	A building or place used to carry out an industrial activity that would, when carried out and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the activity from existing or likely future development on other land in the locality), pose a significant risk in the locality to human health, life or

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Term	Description
heritage	property, or to the biophysical environment.
indigenous	is a broad concept that encompasses Natural, Indigenous and Historic or Cultural inheritance.
Indirect Impacts	Native to a land or region.
Individual Risk	Impacts on the environment, which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
LA _{eq}	The frequency at which an individual may be expected to sustain a given level of harm from the realisation of specified hazards.
Petroleum Hydrocarbons	A-weighted equivalent continuous noise level. This parameter is widely used and is the constant level of noise that would have the same energy content as the varying noise signal being measured.
Petroleum Product	The letter "A" denotes that the A-weighting has been included and "eq" indicates that an equivalent level has been calculated. This is referred to as the ambient noise level. (See Ambient Noise).
Receptor	Organic compounds found in petroleum, primarily composed of carbon and hydrogen.
Risk	Useful materials derived from refining crude oil.
Topography	Receivers of impacts under the proposed works.
Volatile Organic Compound (VOC)	The combination of frequency and consequences, the chance of an event happening that can cause specific consequences
	Refers to the study of distribution, position and elevation of natural and man-made features of a landscape.
	Organic chemicals that have a higher vapour pressure in room-temperature conditions. This is due to a lower boiling point, causing many of the molecules to evaporate and enter the surrounding air.

References

Buncefield Major Incident Investigation Board (December 2008), *The Buncefield Incident 11 December 2005, The Final Report of the Major Incident Investigation Board*.

Coffey (2007). *Soil and Groundwater Contamination Assessment, Classification and Risk Ranking Report*

Coffey (2011), *Annual Groundwater Monitoring, Fourth quarter*.

New South Wales Government, Department of Planning (January 2011), *Hazardous Industry Planning Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning, (HIPAP No. 4)*.

New South Wales Government (January 2011), Department of Planning, *Hazardous Industry Planning Advisory Paper No. 6, Hazard Analysis (HIPAP No. 6)*.

URS (2013) *Kurnell Refinery Conversion Environmental Impact Statement*, URS Australia, Pty, Ltd, Sydney (EIS)

WMAwater (2009). *Sutherland Shire Council Kurnell Township Flood Study, Final Report*, May 2009.

Limitations

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

It is 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 Report.

It is prepared in accordance with the scope of work and for the purpose outlined in the contract dated 25 July 2012.

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Appendix A

Submissions Received



Planning & Infrastructure

Contact: Pascal van de Walle
Phone: 02 9228 6412
Fax: 02 9228 6466
Email: pascal.vandewalle@planning.nsw.gov.au
Our ref: SSD 5544
File: 12/15149

Ms Lauren Engel
Process Engineering Support
RRIP Major Projects Group
Caltex Refineries (NSW) Pty Ltd
2 Solander Street
Kurnell NSW 2231

8 July 2013

Dear Lauren

Caltex Kurnell Refinery Conversion (SSD 5544)

Request for Response to Submissions

The exhibition of the Environmental Impact Statement (EIS) for the above proposal ended on 28 June 2013.

The EIS has been reviewed by Sutherland Shire Council (Council) and relevant government agencies. The submissions received have been provided to you and/or your planning consultant previously, however they are now also provided in Attachment 1 and are also available on the department's website at www.planning.nsw.gov.au.

I would appreciate it if you would provide a response to these submissions as soon as possible.

Submissions have not yet been received from Roads and Maritime Services or NSW Office of Water, and these will be forwarded to you as soon as they are received. The Department has, however, received confirmation from Crown Lands (Sydney), Sydney Ports, NSW Ports, Ausgrid and NSW Rural Fire Service that they raise no concerns or that they will not be making a submission.

Furthermore, note that under clause 113(7) of the Environmental Planning and Assessment Regulation 2000, the days occurring between the date of this letter and the date on which you provide your response to submissions to the department are not included in the deemed refusal period.

Your contact officer, Pascal van de Walle, can be contacted on the details provided at the top of this letter. Please mark all correspondence to the attention of the contact officer.

Yours sincerely

Nick Hall
**A/Team Leader – Industry
Development Assessment Systems and Approvals**

ATTACHMENT 1 - Council and Government Agency Submissions

Sutherland Shire COUNCIL



Christine Edney - 9710 0838
File Ref: DN13/0007

27 June 2013



PCU045815

Major Projects Assessment
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001



Attention : Pascal van de Walle

Dear Sir,

Development Referral No. DN13/0007

Proposal: Conversion of Kurnell Refinery to Finished products Terminal (SSD 5544)

Property: 160-166 Captain Cook Drive KURNELL

I refer to your referral of the above development proposal for Council's comment.

Following a review of the proposal and the information provided, Council wishes to make the following comments:

- The proposal, whilst having long term and significant adverse economic impacts on Kurnell and the Sutherland Shire due to job losses, is acknowledged to have significant potential for improvements to the environment.
- Council supports the proposed environmental improvements which are part of the conversion, such as installation of improved safety measures, upgrading bunding, removal of chlorine storage near wharf, decreased traffic, reduction in waste and emissions and reduced water use.
- Council asks that
 - (i) Additional investigations be carried out regarding flooding either prior to determination of the application or by way of a schedule the subject of consent conditions.
 - (ii) Precautions be taken with regard to the potential for asbestos on the site to impact on construction workers and others on and near the site.
 - (iii) Further assessment be conducted regarding contamination of the site and the identification of areas of high risk. Where identified areas of high risk may be impacted by the Refinery Conversion process, either by excavation works or construction works, that Caltex considers remediating these areas prior to

Administration Centre
4-20 Eton Street, Sutherland
NSW 2232 Australia

Please reply to:
General Manager,
Locked Bag 17,
Sutherland NSW 1499
Australia

Tel 02 9710 0333

Fax 02 9710 0265

DX4511 SUTHERLAND

Email ssc@ssc.nsw.gov.au

www.sutherlandshire.nsw.gov.au

ABN 52.018 204 808

Office Hours

8.30am to 4.30pm

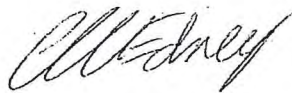
Monday to Friday

completion of the refinery conversion or at a minimum develop a remediation program to progressively remediate these areas.

- (iv) Noisy construction activities being restricted to between 7 am and 10 pm (or earlier) in particular any works near to Cook Street and Reserve Street. As construction is in part concurrent with works on the Kurnell Port and Berthing Project there is likely to be a cumulative adverse impact on Kurnell residents.
- Council is supportive of the proposed photographic recording of the site prior to cessation of refinery operations.
- There seems to be a great deal of information that will be provided in the Construction Environmental Management Plan (CEMP) such as the management of acid sulfate soils, contaminated soils and groundwater, operational impacts, mitigation and management plans, noise management plan, Air Quality Management Plan, Biodiversity and Weed Management Plan etc. Council would appreciate the opportunity to comment on the CEMP prior to refinery conversion works commencing.
- Council would appreciate advice from the Department of Planning and Infrastructure whether in light of the contents of this EIS, consideration is being given to reassessing the refinery risk impact on the Kurnell Area and the departments' current prohibition on development which would increase population density in the area (such as subdivisions and dual occupancies).

Should you need to discuss any aspect of this matter further, please do not hesitate to contact Council's Development Assessment Officer Christine Edney on 9710 0838 during normal business hours, Mondays to Thursdays.

Yours faithfully



Christine Edney
for J W Rayner
General Manager



WorkCover

WorkCover Authority of NSW Major Hazard Facilities Unit
Level 10, Centennial Plaza, Building C, 300 Elizabeth Street
Surry Hills, NSW 2010
PO Box 1476 Strawberry Hills NSW 2012
mhf@workcover.nsw.gov.au
WorkCover Assistance Service 13 10 50
workcover.nsw.gov.au

Date: 26/06/2013

Our Ref: 10131 / 2009/002752-03

Your Ref: SSD 5544 / 12/15149

Mr Chris Ritchie
Manager – Industry
Major Projects Assessment
NSW Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Attn: Mr. Pascal van de Walle

Dear Mr Ritchie,

Caltex Refineries Kurnell
Conversion to a Finished Product Terminal (SSD 5544)
Notification of Lodgement of Response to Environmental Impact Statement

Thank you for your letter received by WorkCover on 21 May 2013 inviting WorkCover NSW to review the Environmental Impact Statement (EIS) and to advise the Department of Planning and Infrastructure of any further issues with the proposal.

The EIS has been reviewed with respect to WorkCover related matters and our comments are attached to this letter.

Should you have any queries please contact me on telephone (02) 9598 3326 or email abe.lau@workcover.nsw.gov.au.

Yours sincerely,

Abe Lau

Inspector

Major Hazards Facilities Unit

WorkCover Authority of NSW

ATTACHMENT

1. EIS Vol 1, 8.4.2 - Fire and Rescue NSW (page 8-6)

There was no specific mention of a tank cooling/deluge system. Confirmation is required that fresh firewater supply is sufficient to operate in a Major Accident Events (MAE) situation without requirement of sea water to supplement water supply.

2. EIS Vol 2, Figure 5 - Indicative Societal Risk Criteria

Clarification is required about where Caltex's MAEs are plotted on the Frequency-Number chart provided at figure 5.

3. EIS Vol 2, Pipelines (page 24)

It is stated that 'the diameter of the fire was limited to the trench width'. Typically trenches are longer than they are wide, so the assumption of limiting fire size to trench width would tend to underestimate this fire event, unless the spill was relatively minor. Clarification is required.

4. EIS Vol 2, Pumps (page 25)

It is stated that 'the pool size was limited to the kerbed area'. Confirmation is required that pumps and fittings are oriented in such a way (or that risk controls measures are in place) that prevents flammable liquids under pressure spraying outside of the kerbed area (-eg flange failure, pipe rupture).

5. EIS Vos 2, 8.2 - Event Tree Analysis (page 27)

It has been stated that figure 6 (on page 28) would incorporate detection and isolation times, however figure 6 does not feature these times. Clarification is required.

6. EIS Vol 2, Table 7 (page 29)

Under identified 'Controls' for 'Prevention Controls', the EIS does not refer to relevant and current Australian Standards applicable to explosive atmospheres. Caltex should confirm the use of relevant standards such as AS60079 - 'Explosive atmospheres - Equipment - General requirements' - and HB 139-2012 (related to repair).

ATTACHMENT

7. EIS Vol 2, Table 10 (page 31)

Two events identified on the table were for Full Bund Fires up to 8000m² and 25,500m². Why were these two figures chosen as the arbitrary limits for bund fire sizes? Is the 'distance to fatality' measured from the centre of the bund or from the outer edge? Clarification or provision of the basis for the selection of Bund size is required.

8. EIS Vol 2, Assumption no. 1 (page A3)

Has loss of containment (LOC) due to operator error been considered in the hazard assessments? Confirmation is required.

9. EIS Vol 2, Assumption no. 2 (page A4)

It is stated that 'where possible, ESDVs were nominated as the isolation points rather than control valves'. Identification of where control valves are being used to isolate process lines with reference to a piping and instrumentation diagram (P&ID) is required.

10. EIS Vol 2, Appendix C2 (page C2-2)

- a) Systematic assessment of safety integrity levels (SIL): Are safety critical items to be SIL rated? Fire rated? Clarification is required.
- b) Independent levels of protection: Confirmation is required that these systems will be installed before the tanks are recommissioned.
- c) Management systems for maintenance - 'Proof testing and inspection regimes': What is the frequency of testing? Are the SAAB radar gauges SIL rated?

11. EIS Vol 2, Appendix C2 (page C2-3)

- a) Is API 2350 used as a guidance standard for tank overfill protection? Clarification is required.
- b) The 'certain periods of fire as required by API 6D' mentioned in relation to fire shut off valves is without a reference to the relevant section of API 6D, which should be provided.

ATTACHMENT

12. EIS Vol 2, Appendix C2 (page C2-4)

In the section regarding remote operation shut off valves (ROSOVs), it is stated that 'the safety case detail will be reviewed', but clarification is required as to when this review is scheduled to take place and when it will be finalised by.

13. EIS Vol 2, Appendix C2 (page C2-5)

In the section regarding overfill protection system design, it is stated that 'Caltex rejects the "ante-tank" design proposal'. Reference to a detailed analysis relating to this assessment should be given, if available.

14. EIS Vol 2, Appendix C2 (page C2-6)

- a) It is stated that 'additional hydrocarbon vapour detectors have been installed in several existing tanks... and will be installed in suitable locations...'. Clarification is required over whether this action been scheduled and when it is due for completion.
- b) It is stated that a 'site security review is currently being undertaken'. Clarification is required over when this action is due for completion and when any identified actions will be completed.

15. EIS Vol 2, Appendix C2 (page C2-7)

It is stated at point 3 that 'all bund walls are sealed with bitumen or are concrete encased'. Clarification is required over how Caltex has ensured that bitumen encased bund walls are fire resistant in line with Buncefield recommendations.

16. In a MSDS previously provided to WorkCover by Caltex, the physical data for ULP, PULP and SPULP98 states that:

- Flash points are all the same -ie -40°C; and
- Auto ignition temperatures are all the same -ie 370°C.

It is recommended that a review of auto ignition temperatures be undertaken as they seem high compared to other similar products distributed in this country. An incorrectly assessed and published temperature could be a source of error, for example when specifying electrical motors.



Our reference: LIC06/45-34:DOC13/23650:CP
Contact: Craig Patterson (02) 4224 4100

Department of Planning and Infrastructure
(Attention: Pascal van de Walle)
GPO Box 39
SYDNEY NSW 2001

Dear Mr van de Walle

EXHIBITION OF ENVIRONMENTAL IMPACT STATEMENT (SSD 5544)
CALTEX KURNELL REFINERY CONVERSION PROJECT, BOTANY BAY

I am writing in response to the above State Significant Development and the exhibition of the Development Application and Environmental Impact Statement (EIS) from 23 May to 28 June 2013.

The Environment Protection Authority (EPA) has reviewed the proposal and has no objection to the proposal proceeding as described in the EIS subject to the comments outlined in this letter and attachment. All comments provided by EPA in relation to the draft EIS have been satisfactorily addressed.

In assessing the proposal EPA identified a number of issues that Department of Planning and Infrastructure (DP&I) should consider and clarify in its overall assessment of the application. These issues are included in **Attachment A** and include the following:

1. Licensing and Environmental Management
2. Water Quality
3. Noise
4. Air Quality
5. Waste Management
6. Reporting

Should project approval be granted, Caltex will need to submit a Licence Variation Application to EPA to vary the Environment Protection Licence for the Kurnell Refinery (Licence 837). The application will need to be submitted prior to the conversion works commencing and any new licence conditions will be developed in discussion with Caltex.

EPA would appreciate receiving a copy of Caltex's response to the submissions to ensure that EPA issues have been adequately addressed. EPA also requests an opportunity to review the draft Conditions of Consent for the proposal prior to finalisation, to ensure there are no consistency issues with any future licences for the project.

It should be noted EPA's comments relate to the development as proposed in the documents and information currently provided to EPA. In the event that the development is modified either by the applicant prior to the granting of consent or as a result of the conditions proposed to be attached to the consent, it will be necessary to consult with EPA about the changes before the consent is issued. This will enable EPA to make additional comments on whether it still considers the proposal appropriate.

Should you have any further enquiries, please contact the officer above.

Yours sincerely



1/7/13

PETER BLOEM
Manager Illawarra
Environment Protection Authority

Att

(N:\EPRO\PLANNING\2013\CALTEX KURNELL REFINERY CONVERSION\DOC13-23650 - CALTEX - REFINERY CONVERSION - EXHIBITED EIS DOC)

ATTACHMENT A

ENVIRONMENT PROTECTION AUTHORITY COMMENTS ON EXHIBITED ENVIRONMENTAL IMPACT STATEMENT

Licensing and Environmental Management

1. Caltex Refineries (NSW) Pty Ltd currently holds an Environment Protection Licence (EPL) 837 under the *Protection of the Environment Operations Act 1997* for the operation of a petroleum refinery at Kurnell. All works and activities associated with the Kurnell Refinery Conversion must comply with the conditions of the licence at all times.
2. Section 3.2.3 of the Environmental Impact Statement (EIS) states that a number of amendments to the existing licence will be required to reflect proposed changes to the storage capacities and operational capabilities of the site. It also states that these amendments will be carried out in a staged manner as agreed with EPA. Should project approval be granted, Caltex will need to apply to vary the licence to permit the proposed conversion works prior to the project commencing. The amendments to the licence will be developed in discussion with Caltex. They will likely involve the removal of Tabbagai Gap discharge point and associated monitoring conditions, changes to noise limits and the addition of a Pollution Reduction Program (PRP) to characterise wastewater during terminal operations.
3. Upon completion of the conversion works and cessation of refinery activities, Caltex will need to apply to vary the licence to convert the licence from a petroleum refinery licence to a terminal operations licence for the storage and distribution of petroleum products.
4. All works and activities associated with the Kurnell Refinery Conversion Project must be carried out in accordance with the following documents except as expressly provided by a condition of the EPL or as otherwise agreed in writing by EPA:
 - a) EIS and associated Appendix prepared by URS Australia dated May 2013
 - b) Construction Environmental Management Plan and associated sub plans including but not limited to:
 - Soil and Erosion Management Plan
 - Contamination Management Plan
 - Stormwater Management Plan
 - Noise Management Plan
 - Air Quality Management Plan; and
 - Waste and Resource Management Plan.
5. Prior to the commencement of the Kurnell Refinery Conversion Project, all Environmental Management Plans and associated site procedures must be completed. Appropriate procedures should also be developed for reviewing and improving the requirements of each plan to allow for adaptive management and to address any contingencies that may arise over the life of the project.
6. Section ES1.1 of the EIS states that the removal of the refinery infrastructure and any related remediation (should it be required) will be subject to approval under a separate development application. On 17 June 2013, EPA issued Caltex a Preliminary Investigation Order under Section 10 of the Contaminated Land Management Act 1997 to ensure that all contamination legacies are addressed in a timely and comprehensive manner through the development of a transparent holistic remediation strategy. Caltex must continue to progress the requirements of this Notice in conjunction with the proposed Kurnell Refinery Conversion works.

Water Quality

7. Section 11.6.2 of the EIS states that during terminal operations there will be a significant reduction in wastewater volume and contaminant load and that the existing wastewater treatment plant (WTP) will need to be reassessed. EPA has advised Caltex that it must continue to operate the existing WTP in accordance with the licence until refinery operations cease. When the Refinery has been decommissioned and terminal operations are the main activity carried out at the premises, EPA will attach a PRP to the licence for the characterisation of terminal wastewater streams and investigation of

alternative treatment options. Further variations to the licence in relation to discharge limits and monitoring requirements will occur upon completion of the PRP.

Noise

8. The Noise Management Plan should be developed in consultation with EPA to address potential noise impacts associated with the construction activity. The Plan should include the recommended feasible and reasonable noise mitigation measures and detail the proposed performance evaluation procedures (including noise monitoring) to assess the effectiveness of these measures and any potential impacts on sensitive receptors.
9. All construction activities associated with the Kurnell Refinery Conversion Project must comply with the Project Specific Noise Criteria as specified in the EIS and Noise Management Plan. Only activities related to the day-to-day refinery operations may be regulated under the existing licence limits for noise.
10. Appropriate respite periods should be implemented to address any noise complaint(s) associated with any construction noise and any loud construction works.
11. Section 12.9.4 of the EIS details predicted noise levels for the site with all plant operating including the Refinery. These noise levels are based on a report prepared by HFP Acoustic Consultants. Based on the values provided in Table 12-12, EPA proposes to amend the LA10 (15 minute) noise limits in the licence to reflect appropriate LAeq (15 minute) noise levels. This Licence Variation will be developed in discussion with Caltex prior to the commencement of the proposed conversion works. Further revision of the licence noise limits will occur when refinery activities cease.

Air Quality

12. The EPL for the Kurnell Refinery includes a number of programs for the management of air emissions from the premises including an Odour Reduction Program and Leak Detection and Repair Program. Until refinery operations cease, Caltex must continue to progress these programs to ensure compliance with the licence, particularly in regards to the emission of potentially offensive odours from the premises. The licence requirements (including discharge limits and associated monitoring) will be reviewed when refinery operations cease.

Waste Management

13. The proposed conversion works include the cleaning and modification of some of the existing tanks on site to store refined product. Section 9.7.1 of the EIS states that measures will be implemented to contain and collect any potentially contaminating product for appropriate disposal either to the onsite waste system or the landfarm. As part of Caltex's Licence, the Company has committed to evaluating alternative options for the sustainable management of oily wastes/sludges that will facilitate the cessation of land farming at the premises. Where reasonable and feasible, Caltex should minimise the quantity of oily wastes/sludges placed in the landfarm during the conversion works to assist with the future remediation of this area.
14. Section 10.6.1 of the EIS states that asbestos has been noted on the site in various places mainly associated with pipeline easements and waste areas. The Construction Environment Management Plan must identify appropriate management measures to prevent unnecessary or excessive disturbance of asbestos contaminated material to ensure the protection of the environment and human health. It should also detail the proposed methodology for handling, removing and disposing of any asbestos contaminated material generated by the conversion activities. The storage, disposal and transport of asbestos waste must be undertaken in accordance with the *Protection of the Environment Operations (Waste) Regulation 2005*. EPA also recommends that Caltex consult with NSW Health and Workcover in regards to this matter.
15. All contaminated soil and associated waste materials must be managed in accordance with the *Protection of the Environment Operations Act 1997* and associated regulations and characterised in accordance with the EPA's *Waste Classification Guidelines*.

Reporting

16. In accordance with the existing licence, Caltex or its employees must notify EPA of any incident that is causing or is likely to cause environmental harm as soon as the person becomes aware of the incident.



Health

South Eastern Sydney
Local Health District
Public Health Unit

17 June 2013



PCU045411

Chris Ritchie
Manager- Industry
Development Assessment Systems and Approvals
Major Projects Assessment
23-33 Bridge Street
Sydney NSW 2000

Department of Planning

20 JUN 2013

Scanning Room

Dear Mr Ritchie

Conversion of Caltex's Kurnell Refinery to a Finished Product Terminal (SSD 5544)

Thank you for inviting the Public Health Unit of South Eastern Sydney Local Health District to comment on the Environmental Impact Statement (EIS) for the above premises. We have reviewed the EIS and wish to advise that in proceeding with the conversion, the following provisions should be observed:

1. Compliance with *National Environmental Protection (Assessment of site contamination) Measure 1999*, schedules B (1) Guideline on the Investigation Levels for Soil and Groundwater, B (6) Guideline on Risk Based Assessment of Groundwater contamination, and B (7a) Guideline on Health-Based Investigation Levels;
2. When assessing and managing the impact of activities on waterways, aquatic ecosystem, primary contact recreation (swimming and other primary contact with water) please refer to the *Australian and New Zealand Guidelines for Fresh and Marine Water* (ANZECC, 2000) ;
3. To minimise disturbances of the soil and the release of asbestos into the air, work should be in accordance with the *Worksafe National Code of Practice and Guidance on Asbestos and disposal*, and with the requirements of the NSW WorkCover Authority;

/2

Public Health Unit

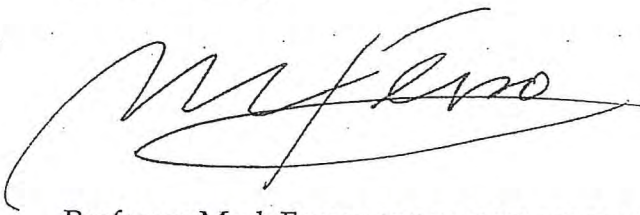
South Eastern Sydney Local Health District
ABN 70 442 041 439

Building 23 (Hut U), Easy Street, Prince of Wales Hospital Campus, Randwick
Postal Address: Locked Bag 88 Randwick NSW 2031
Tel (02) 9382 8333 Fax (02) 9382 8334

4. That air quality and odour should comply with the Protection of the Environment Operations (Clean Air) Regulation 2010 and with the requirements of the *National Environment Protection (Air Toxics) Measure 2004*.

Should you need additional information do not hesitate to contact Santo Cannata, Senior Environmental Health Officer on 9382 8333.

Yours sincerely

A handwritten signature in black ink, appearing to read 'M. Ferson', with a large, sweeping underline that extends to the left and loops around the bottom of the signature.

Professor Mark Ferson MPH MD FRACP FAFPHM FRSPH
Director & Public Health Officer

File Ref. No: NFB/00841 (3039)
TRIM Doc. No: BFS13/4120
Contact: Alan Bruce

4 June 2013

NSW Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: pascal.vandewalle@planning.nsw.gov.au

CC: rrutled@caltex.com.au

Attention: Chris Ritchie

Dear Sir

Re: Caltex Kurnell Refinery Conversion, (SSD-5544) 2 Solander St, KURNELL, NSW

I refer to your correspondence dated 21 May 2013, requesting Fire and Rescue NSW (FRNSW) review and comment on an Environmental Impact Statement (EIS), including a Preliminary Hazard Analysis (PHA), contained in Appendix C, for Caltex's Kurnell Refinery Conversion (SSD -5544).

The EIS, authored by Rachel O'Hara of URS Australia Pty Ltd and dated May 2013, has been prepared as State Significant Development under part 4 of the Environmental Planning and Assessment Act 1979.

As outlined in the Director General's Environmental Assessment Requirements, (Section 78A(8A) of the Environmental Planning and Assessment Act – State Significant Development), during preparation of the EIS, the proponent must consult with the relevant Local, State or Commonwealth Government authorities, including FRNSW.

FRNSW has reviewed the submitted EIS (including the PHA), and with regards to the Director General's requests, the following comments are provided:

1. FRNSW notes that, in this instance, the submission process did not follow the normal Hazards Related Assessment Process sequence as detailed in the Executive Summary of the NSW Planning and Infrastructure's Hazardous Industry Planning and Advisory Papers No.2 and No.6.

2. FRNSW previously provided comment on an Environmental Scoping Assessment in a letter dated 15 October 2012. The purpose of these comments was to provide information for the preparation of the Director Generals requirements (DGR) to form the content of an EIS. FRNSW is satisfied that those comments and recommendations have been satisfactorily addressed in the current EIS and PHA and consequently FRNSW have no specific concerns with the latest submissions.

Should you have any further enquiries regarding any of the above matters, please do not hesitate to contact the Building Fire Safety Unit.

Yours faithfully



Peter Nugent
Acting Manager
Building Fire Safety Unit





Office of
Environment
& Heritage

Your Reference SSD 5544
Our reference: Doc13/23599
Contact: Susan Harrison
 9995 6864

Chris Ritchie
Manager - Industry
Development Assessment Systems and Approvals
Department of Planning and Infrastructure
GPO Box 39
Sydney NSW 2001

Attention: Pascal van de Walle

Dear Mr Ritchie

I refer to your letter dated 21 May 2013 inviting comment from the Office of Environment and Heritage (OEH) on the Environmental Impact Statement (EIS) for the Conversion of Caltex's Kurnell Refinery to a Finished Product Terminal (SSD 5544).

The project boundary excludes most of the areas likely to support biodiversity values on the Kurnell Refinery site apart from three small patches of vegetation, one of which is degraded. According to the EIS, the proposed works will not impact on these remnants.

The only potential impacts on biodiversity are likely to be indirect impacts during construction associated with the disturbance of contaminated material and its mobilisation off-site into surrounding sensitive areas, including the adjoining national park plus the direct impacts of trenching on threatened amphibians, such as Green and Golden Bell Frog (Kurnell Key Population), which may move through and use habitat at the site. However the EIS states that both of these issues will be managed through the preparation and implementation of a Construction Management Plan which would include a Biodiversity and Weed Management Plan and Soils and Erosion Management Plan. The outline of what would be covered by each of these plans is adequate for OEH's purposes.

Please note that OEH does not agree to the inclusion of a consultative, approval or signoff role for the OEH in any of the conditions of consent without prior discussion and written agreement between OEH and DP&I.

Yours sincerely

S. Harrison 28/06/12

SUSAN HARRISON
Senior Team Leader Planning
Greater Sydney
Regional Operations



Education & Communities

Major Projects Assessment
Department of Planning & Infrastructure
23-33 Bridge Street
SYDNEY NSW 2000

Our reference : DOC13/235841
Your Reference: SSD 5544 (File 12/15149)

Dear Mr Van De Walle

RE: Submission Kurnell Refinery Conversion

I write in response to your letter of 21 May 2013 to the Minister for Education, the Hon Adrian Piccoli MP, advising of the exhibition of the Development Application to convert the Kurnell Refinery to a Finished Product Terminal. The Minister has asked me to respond on his behalf.

The existing Kurnell oil refinery processing plant is approximately 500 metres from the Botany Bay Environmental Education Centre and Kurnell Primary School.

The Department notes that the conversion from oil refinery to storage facility only should be positive because the project would result in:

- A significant reduction in risk of hazardous accidents.
- A significant improvement in air quality.
- Some reduction in the volume of traffic using Captain Cook Drive.

Some areas of concern that the project may result in comprise:

- Potential site accidents which could release harmful emissions and/or risks associated with handling of flammable liquids.
- Traffic generated during the construction phase may impact on road and intersection performance and thereby cause congestion.

It is noted that the *Preliminary Hazard Analysis* includes risk assessment of sensitive land uses like schools. However whilst the analysis includes Kurnell Primary School it appears to omit the Botany Bay Environmental Education Centre. It is understood that planning officers at the Department have identified this issue and that it will be addressed in a revised hazard assessment.

We also request that applicant communicate with and work with the schools to identify issues and mitigate impacts throughout the course of project. This should include implementation of a *Construction Environment Management Plan* with specific references to include school consultation during key stages which may affect school operational issues such as vehicular traffic access.

Thank you for the opportunity to provide feedback on this project. Please contact Martin Karm on 9561 8147 or email martin.karm@det.nsw.edu.au if you require any further assistance.

Yours Sincerely

Tony McCabe
Director, Planning and Delivery

25 June 2013

All communications to be addressed to:

Headquarters
NSW Rural Fire Service
Locked Mail Bag 17
GRANVILLE NSW 2142

Telephone: (02) 8741 5175
e-mail: csc@rfs.nsw.gov.au

Headquarters
NSW Rural Fire Service
15 Carter Street
HOMEBUSH BAY NSW 2127

Facsimile: (02) 8741 5433



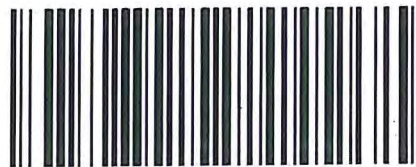
Director General
Dept. Of Planning - Urban
GPO Box 39
Sydney NSW 2001

Your Ref: -

Our Ref: S13/0019

DA10051969451 WS

Attention: Chris Ritchie



6 June 2013

Dear Sir/Madam,

Re; Development for The Caltex Kurnell Refinery, 2 Solander Street Kurnell

I refer to your letter dated 22 May 2013 seeking key issue and assessment requirements regarding bush fire.

The Service has reviewed the plans and documents received for the proposal and subsequently raise no concerns or issues in relation to bush fire.

For any enquiries regarding this correspondence please contact Wayne Sketchley.

Yours faithfully,

Mark Hawkins
A/ Team Leader, Development Assessment



The RFS has made getting additional information easier. For general information on *Planning for Bush Fire Protection 2006*, visit the RFS web page at www.rfs.nsw.gov.au and search under *Planning for Bush Fire Protection 2006*.

Pascal VanDeWalle - Kurnell refiner EIS

From: <wayne.jones@dpi.nsw.gov.au>
To: <Pascal.VanDeWalle@planning.nsw.gov.au>
Date: 02/07/13 2:27 PM
Subject: Kurnell refiner EIS
CC: <greg.paine@industry.nsw.gov.au>, <carla.ganassin@dpi.nsw.gov.au>

Hi Pascal

Still waiting on comments from NSW Office of Water but here are Fisheries comments as requested. Crown Lands have no issues.

Fisheries

Fisheries NSW has considered the policies and provisions under the *Fisheries Management act* in its assessment of this proposal. Fisheries NSW has no objections to this proposal. To manage potential flow on effects to nearby aquatic environments it is important that the proposed mitigation measures for 'Soils, Groundwater and Contamination' and 'Surface water, Wastewater and Flooding' are implemented.

Regards

Wayne

Wayne Jones | Administrative Officer
Department of Primary Industries
Level 48, MLC Centre, 19 Martin Place Sydney NSW 2000
T:02 9338 6708 | E: wayne.jones@industry.nsw.gov.au

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Pascal VanDeWalle - SSD 5544 - Caltex Kurnell Refinery Change to Finished Product Terminal -

From: Pascal VanDeWalle
To: pascal.vandewalle@planning.nsw.gov.au
Date: 28/06/13 9:15 AM
Subject: SSD 5544 - Caltex Kurnell Refinery Change to Finished Product Terminal -

ATTENTION: PASCAL VAN DE WALLE

Dear Mr Ritchie,

Thank you for your letter of 21 May, 2013 advising Sydney Water about the above development proposal.

Sydney Water has reviewed the EIS. As the change of use will not result in an increased demand for water or wastewater services and no Sydney Water assets will be impacted we have no comments regarding this proposal.

If you require any further information, please contact the Urban Growth Branch on 02 8849 5241 or e-mail urbangrowth@sydneywater.com.au

Regards

Corrine Manyweathers | Student Town Planner
Urban Growth Strategy | Sydney Water
Level 6, 1 Smith Street Parramatta NSW 2150
PO Box 399 Parramatta NSW 2124
T 8849 4014
corrine.manyweathers@sydneywater.com.au | sydneywater.com.au

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Miles, William

From: Nicholas Hall <Nicholas.Hall@planning.nsw.gov.au>
Sent: Thursday, 18 July 2013 10:30 AM
To: Miles, William
Subject: Fwd: Fw: Kurnel refinery conversion

Will,

I have just received this one in Pascal's absence.

Have you received it already?

Nick

Nick Hall
A/Team Leader - Industry Projects
Major Projects Assessment
NSW Department of Planning & Infrastructure | GPO Box 39 | SYDNEY NSW 2001
T 02 9228 6438
F 02 9228 6466
E nicholas.hall@planning.nsw.gov.au



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>>> <greg.paine@industry.nsw.gov.au> 18/07/2013 9:21 am >>>
Nicholas - forwarded in Pascal's absence.

Greg Paine

----- Forwarded by Greg Paine/DII/NSW on 18/07/2013 08:55 AM -----

From: "Pascal VanDeWalle" <Pascal.VanDeWalle@planning.nsw.gov.au>
To: <greg.paine@industry.nsw.gov.au>
Date: 18/07/2013 08:51 AM
Subject: Re: Kurnel refinery conversion
Sent by: Postmaster@planning.nsw.gov.au

I am out of the office from 15/7/2013 until 14/8/2013. I will respond to your email upon my return. If you have any urgent enquiries, please contact Nicholas Hall on 9228 6438 or nicholas.hall@planning.nsw.gov.au

>>> <greg.paine@industry.nsw.gov.au> 07/18/13 08:51 >>>

Pascal,

Copy of advice of Department of Primary Industries below. Will follow

under formal DPI letterhead shortly.

Greg Paine
Business Services
Department of Primary Industries

Tel: 9338 6778

Comment by Fisheries NSW

Fisheries NSW advise:

- (i) The proposal has been considered in relation to the policies and provisions under the Fisheries Management Act.
- (ii) No objections are raised.
- (iii) To manage potential flow-on effects to nearby aquatic environments it is important that the proposed mitigation measures for 'Soils, Groundwater and Contamination' and 'Surface water, Wastewater and Flooding' are implemented.

For further information please contact Carla Ganassin, Conservation Manager (Wollongong office) on 4254 5527, or at:
carla.ganassin@dpi.nsw.gov.au.

Comment by NSW Office of Water

The NSW Office of Water advises as follows:

- (i) The environmental assessment notes the stormwater discharge quality from the site is not currently measured and there is no data available on the majority of stormwater quality discharged from the site (page 11-9, Vol 1). As stormwater from the site is discharged to three receiving environments, namely the environmentally sensitive Quibray Bay (adjacent to the Towra Point Nature Reserve Ramsar site), Botany Bay and the freshwater Marton Park wetland (see page 11-7, Volume 1), the proposed management measure to undertake stormwater flow monitoring in consultation with the EPA is supported (see pages 11-20 and 21-6). It is important the EPA is satisfied that the sensitive downstream receiving environments are adequately protected.

- (ii) In respect to groundwater, potential ground disturbing works include:

- modification to pipelines
- tank refurbishment; and
- pump installation activities.

Should groundwater be encountered during these works, the environmental assessment has indicated that a Groundwater Management Plan (GWMP) would be developed and included in the CEMP to outline measures to manage the testing, dewatering, storage, movement and treatment of any groundwater during the construction phase (pages 9-19 and 9-22). The proposed measures as listed on page 9-19 and the inclusion of this mitigation measure C10 in Table 21-1 is supported.

The inclusion of mitigation measure D4 in Table 21-1 is also supported (see page 21-5), that is, that 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.

As groundwater is not expected to be intersected within the groundwater works, impacts to the local or regional groundwater system are expected to be negligible.

Considerations of the Aquifer Interference Policy are not required as the project will have a minimal (if any) impact on water-dependant assets.

Should the application be approved, the following condition is recommended:

In the event that groundwater is intersected during works, the proponent is to:

1. Make application to the NSW Office of Water for a determination of any required water approvals, and
2. Develop a Groundwater Management Plan for the testing dewatering, storage, movement and treatment of any groundwater in consultation with the NSW Office of Water.

Should you require further information please contact Janne Grose, Planning and Assessment Coordinator (Penrith office) on 4729 8262, or at: Janne.Grose@water.nsw.gov.au.

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Supplementary Assessments

Supplementary Visual Impact Assessment

Kurnell Refinery Conversion



Supplementary Visual Assessment

Prepared for:

URS



August 2013

Prepared by:

GREEN BEAN DESIGN

landscape architects

Project: Kurnell Refinery Conversion

Project Number: 13-175

Report Title: Supplementary Visual Assessment

Revision: Final Issue

Author: Andrew Homewood, Registered Landscape Architect, AILA, MEIANZ
Grad. Dip. Landscape Management, BSc.Dual Hons (Landscape Architecture & Archaeology), Nat. Dip. Horticulture

Date 8 August 2013

Green Bean Design Capability Statement

Green Bean Design is an experienced landscape architectural consultancy specialising in landscape and visual impact assessment. As an independent consultant Green Bean Design provide professional advice to a range of Clients involved in large infrastructure project development.

Green Bean Design Principal Landscape Architect Andrew Homewood is a Registered Landscape Architect and member of the Australian Institute of Landscape Architects. With over 18 years continuous employment in landscape consultancy, Andrew has completed numerous landscape and visual impact assessments for a variety of large scale infrastructure projects including industrial, mining, renewable energy and electrical infrastructure developments.

GREEN BEAN DESIGN

landscape architects

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1.1 Introduction

Caltex Refineries (NSW) Pty Ltd (the Proponent) is seeking approval for the conversion of the Kurnell Refinery (the Site) to a Finished Product Terminal (the Project). An Environmental Scoping Assessment for the Project was lodged with the NSW Department of Planning on 14 August 2012. The Director General's Requirements (DGRs) were issued to the Proponent on 12 September 2012 to inform and guide the work required in assessing the Project. The final revision of the Environmental Impact Statement for the Project was lodged with the NSW Department of Planning in May 2013 and placed on exhibition by the Department from 23 May 2013 to 28 June 2013.

1.2 Environmental Impact Statement – Visual Assessment

The Project Environmental Impact Statement (EIS) stated that *“although the DGRs ask that a visual impact assessment be undertaken as part of the EIS, this assessment has not been included as the Project and associated plant and equipment would be of a similar industrial nature, and locate adjacent to, existing structures at the Site. No demolition of the major structures on Site is included as part of this Project. Therefore, all works associated with the Project are considered to be negligible in terms of visual impacts and as such a visual impact assessment was not considered necessary for this Project”*.

1.3 Submissions

There were no submissions received with direct reference to visual impacts in response to the exhibition of the Project Environmental Impact Statement.

1.4 Supplementary works

Following the Project exhibition period the Proponent incorporated supplementary works that include a proposal to modify the roof structure of 3 existing storage tanks within the Site (Refer to **Figure 1** for location). This Supplementary Visual Assessment (SVA) has been prepared to assess and determine any potential visual significance associated with these modifications.

1.5 Methodology

This SVA included the following activities:

- desktop study addressing visual character and identification of view locations within the surrounding area;
- fieldwork and photography;
- preparation of photomontages; and
- assessment and determination of visual significance.

1.6 Desktop study

A desktop study was carried out by reference to 1:25,000 scale topographic maps as well as aerial photographs of the Site and surrounding landscape. Topographic maps and aerial photographs were also used to identify the locations and categories of potential view locations that could be verified during the fieldwork component of the assessment.

1.7 Fieldwork and photography

The fieldwork involved:

- a site inspection to determine and confirm the potential extent of visibility of the modifications; and
- determination and confirmation of the various view location categories and locations from which the modifications could potentially be visible.

1.8 Photomontages

Photomontages have been prepared from 3 view locations to illustrate the nature and potential visibility of the modifications following construction. The photomontage locations were selected and photographed by Green Bean Design (GBD). The photomontage locations were selected to provide representative views from within the vicinity of residential dwellings as well as publically accessible areas including road corridors. The photomontage locations are shown in **Figure 1** and the photomontages in **Figures 6 to 8**.

1.9 Assessment of visual significance

The visual significance of the modifications on surrounding view locations would result primarily from a combination of the potential visibility of the works and the characteristics of the landscape between, and surrounding, the view locations and the modifications. The potential degree of visibility and resultant visual significance would be partly determined by a combination of factors including:

- visual absorption capability of the landscape within and surrounding the modifications;
- the degree of contrast between the modifications and existing Site features; and
- potential nature and extent of change to the existing visual environment.

2.1 Site location

The Site is located on the Kurnell Peninsula within the Sutherland Shire Council Local Government Area. The Site is approximately 15 km south the Sydney Central Business District. The Site location is shown in **Figure 1**.

2.2 Existing Site and surrounding land uses

The Site is approximately 187 hectares in area. The existing visual environment is largely characterised by storage and processing tanks, import and export pipelines as well as refining infrastructure including hydrocarbon crackers and associated pipework.

Land uses surrounding the Site are as follows:

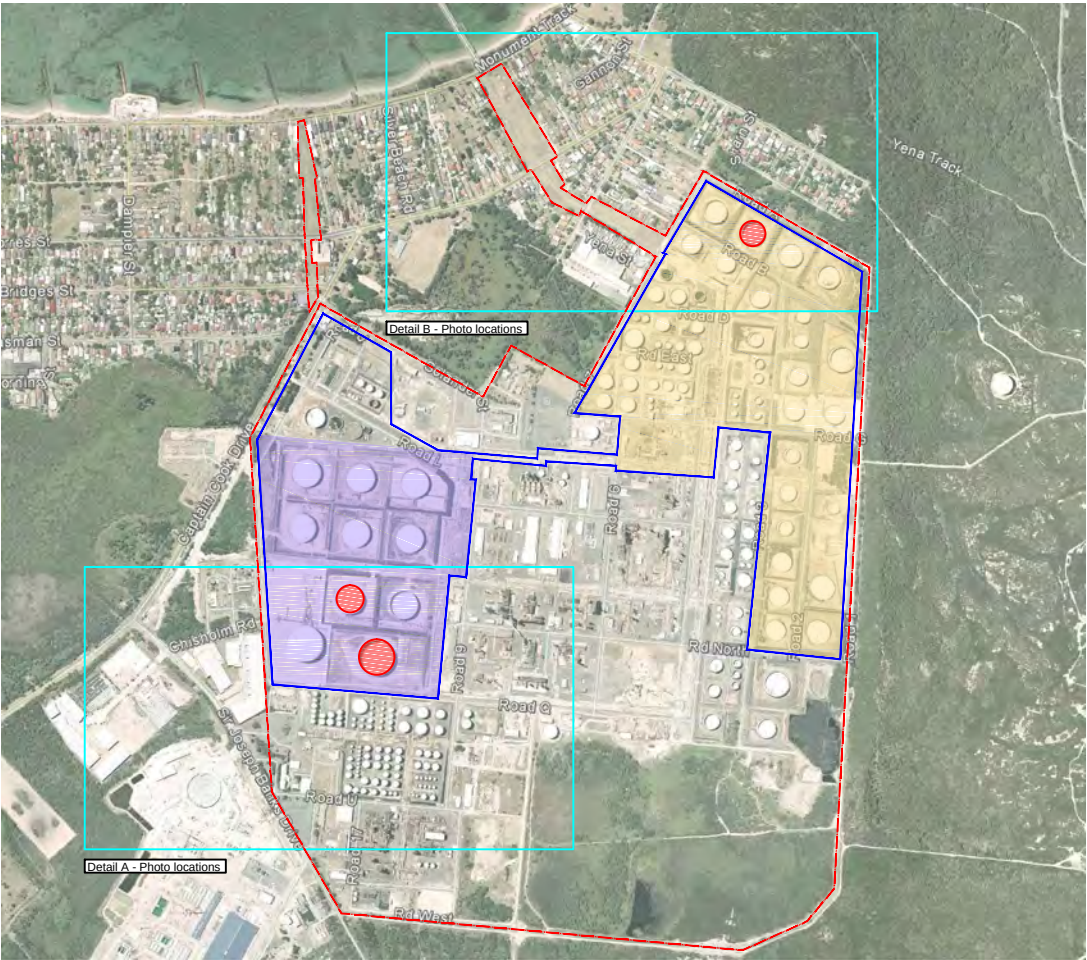
- to the east and south of the Site is the southern portion of the Kamay Botany Bay National Park;
- to the north-west of the Site is Kurnell village;
- to the west of the Site is Quibray Bay; and
- land to the south west comprises industrial development.

2.3 Modification works

The modifications would include changes to 3 existing tanks within the Site. The 3 tanks are located within the Western and Eastern Tank Areas and for the purpose of this SVA have been identified as Tank 1, Tank 2 and Tank 3. The tank locations are identified in **Figure 1**. The modification works would include the installation of a geodesic dome over the tanks. The domes would increase the overall height of each tank by approximately 8 to 10 meters in height at the centre of the dome. The final height would be subject to detailed engineering requirements. The general design and form of the geodesic domes are illustrated in the photomontages (refer **Figures 6 to 8**). For the purposes of this assessment a worst case scenario of 10 meters for each dome has been assessed.

Tanks 1 and 2 are located within the Western Tank Area. Tank 1 is predominantly visually contained by existing industrial infrastructure within the Site, whilst Tank 2 is visible from Chisholm Road. Tanks 1 and 2 are not visible from private residential dwellings within Kurnell village and are largely screened by existing tree cover from views along the Captain Cook Drive and Sir Joseph Banks Drive road corridors.

Tank 3 is located within the Eastern Tank Area and is partially screened by existing and surrounding tanks within the Site. Tank 3 is visible from a small portion of Cook Street adjoining the pipeline easement as well as an unsealed access track running alongside the north east Site boundary. Tank 3 is partially visible from a small number of residential dwellings; however, views toward Tank 3 are partially screened from surrounding view locations by surrounding infrastructure as well as tree planting with a dense canopy between the Site and residential dwellings along Reserve Road to the north east of the Site.

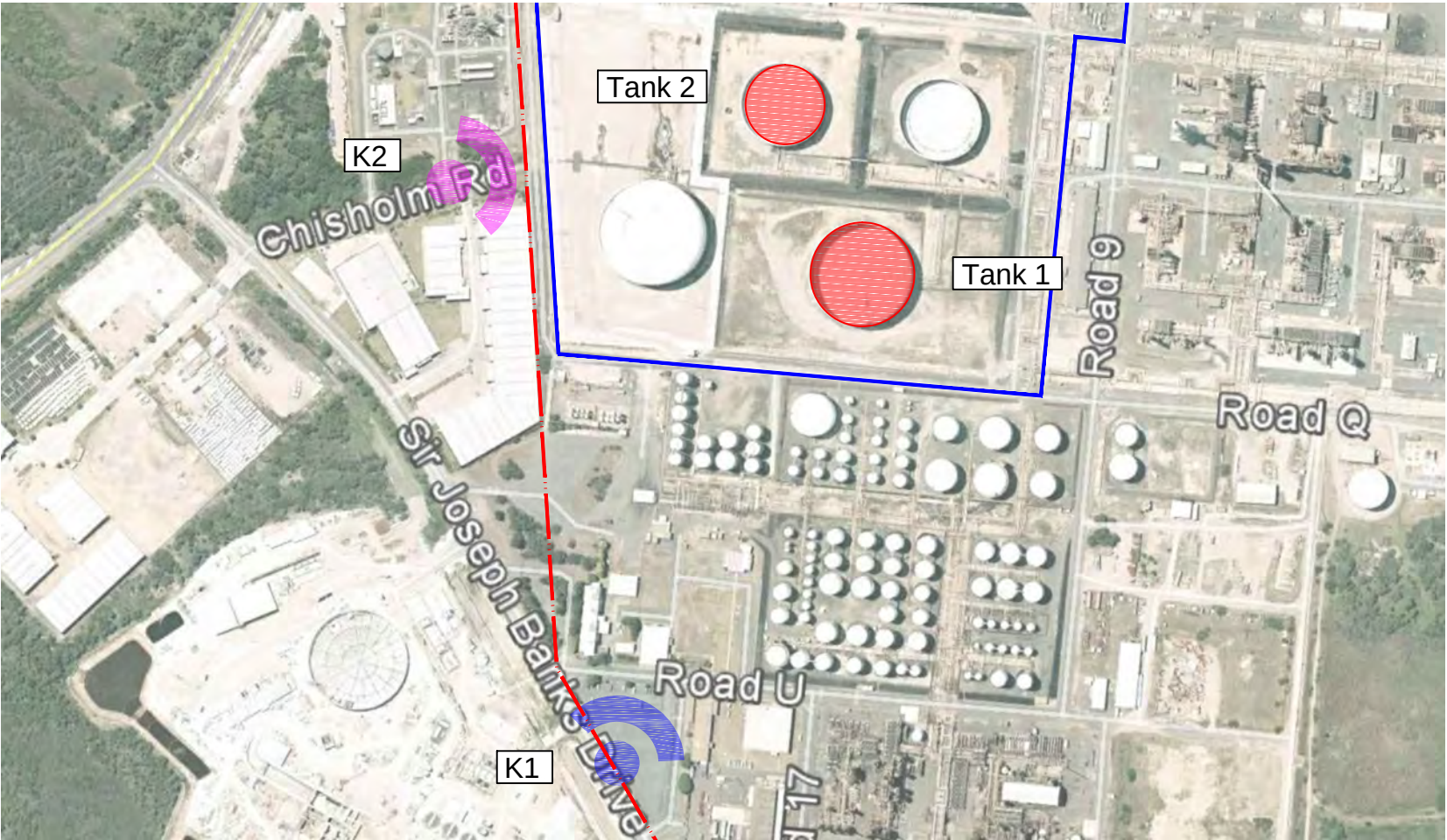


General location plan

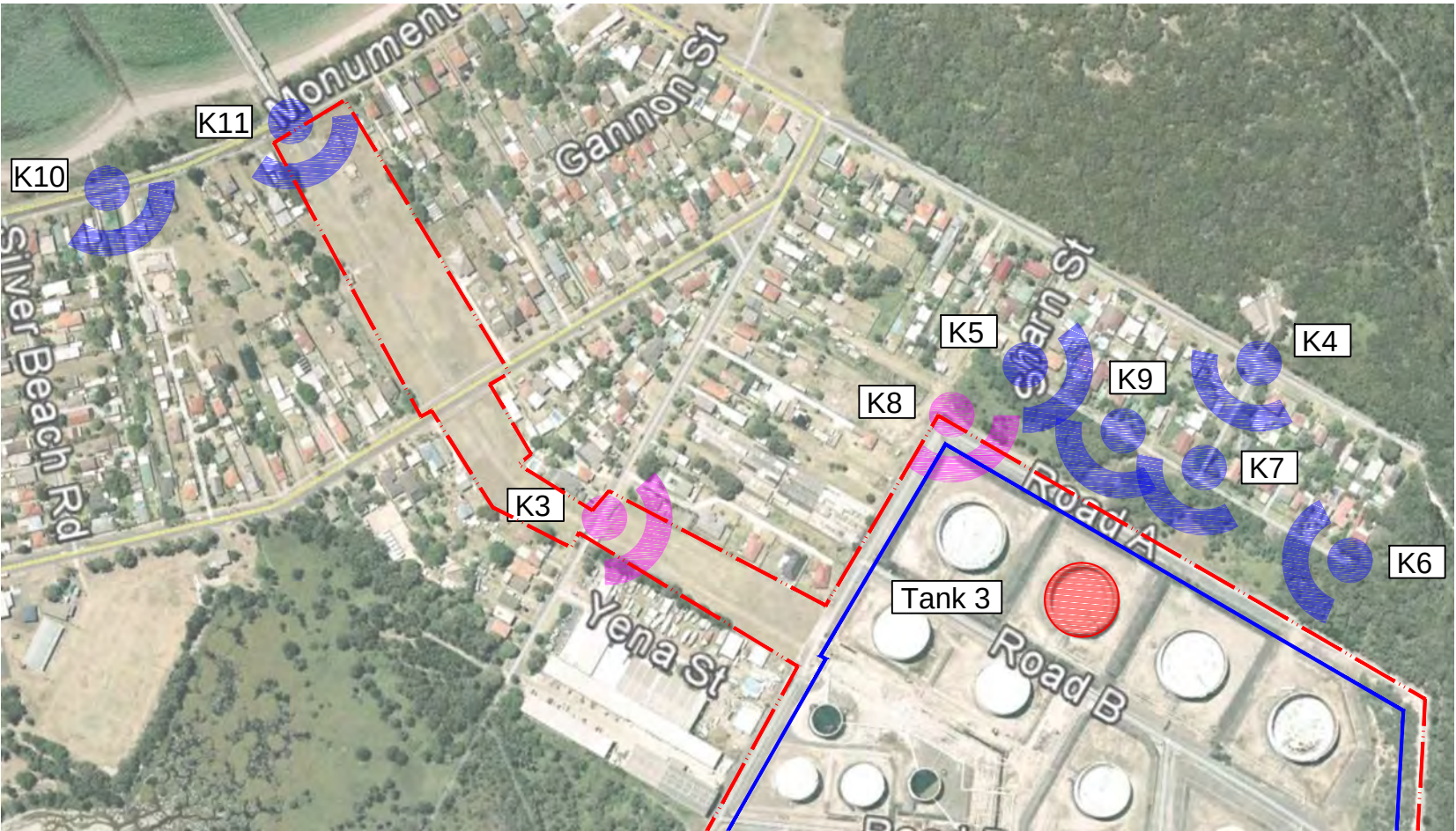
Legend

- Caltex Refinery Site
- Project Area
- Western Tanks Area
- Eastern Tanks Area
- Existing tank with proposed low profile domed roof conversion
- K5 Panorama photo location
- K2 Panorama photo and photomontage location

Not to scale



Detail A - Photo and photomontage locations



Detail B - Photo and photomontage locations

Kurnell Refinery Conversion

Figure 1
Photo and photomontage locations

3.1 Photo panoramas

Photographs taken during the site work have been electronically stitched to form photo panoramas of views from publically accessible areas surrounding the Site. The photo panoramas presented in this SVA have been annotated to identify key features or structures located within the existing view including Tanks 1, 2 and 3. The photo panorama locations (numbered K1 to K11) are illustrated in **Figure 1**. The photo panoramas are presented in **Figures 2 to 5**.

The photo panoramas illustrate the generally restricted nature of views toward Tanks 1, 2 and 3 from areas of residential dwellings and publically accessible locations surrounding the Site.

3.2 Photomontages

Photomontages have been prepared to illustrate the proposed modifications from 3 of the photo panorama locations including K2 Chisholm Road, K3 Cook Road and K8 access track adjoining the Site. The photomontages are illustrated in **Figures 6 to 8**.

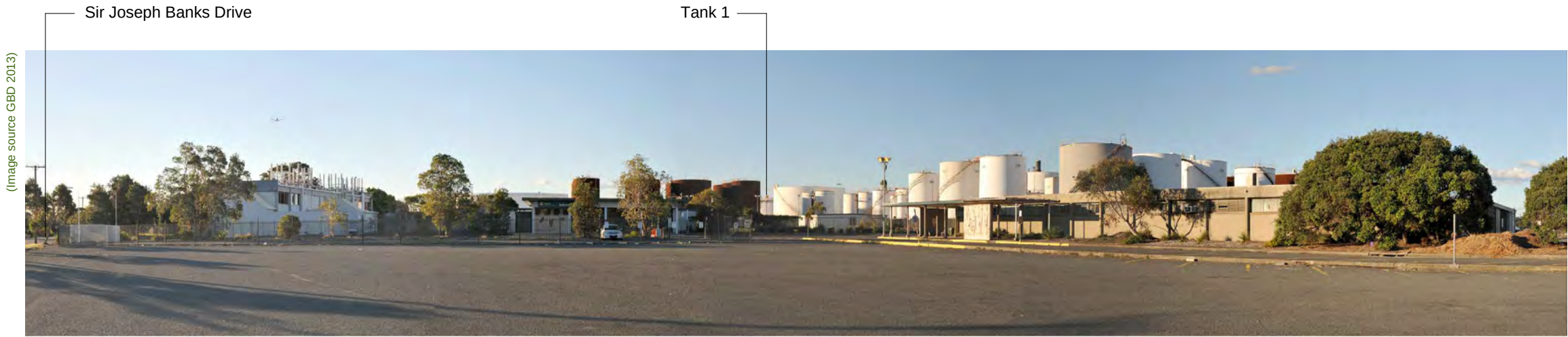


Photo Location K1 - View toward Tank 1 from Caltex car park adjacent to Sir Joseph Banks Drive

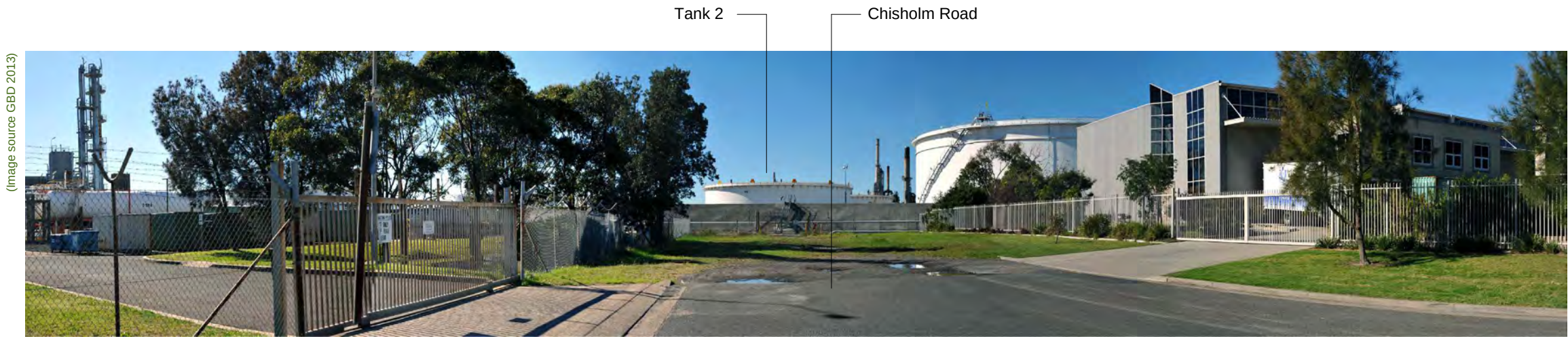


Photo Location K2 - View toward Tank 2 from Chisholm Road

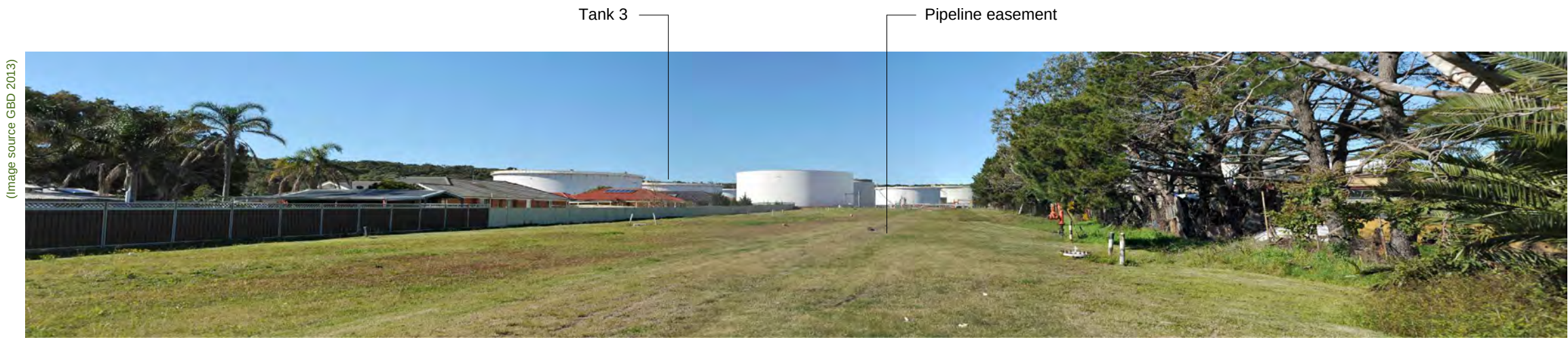


Photo Location K3 - View toward Tank 3 from Cook Street

Figure 2
Photo Sheet 1

Kurnell Refinery Conversion

(Image source GBD 2013)

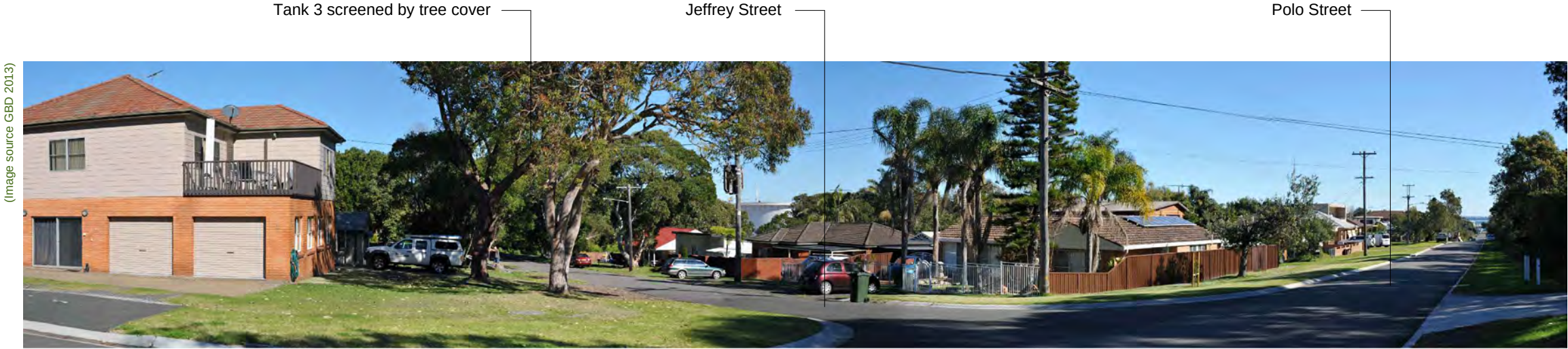


Photo Location K4 - Polo Street

(Image source GBD 2013)



Photo Location K5 - Reserve Road

(Image source GBD 2013)



Photo Location K6 - Reserve Road

Figure 3
Photo Sheet 2

Kurnell Refinery Conversion

(Image source GBD 2013)

Views toward Tank 3 partially screened by existing tree cover south of Reserve Road

Reserve Road

Jeffery Street



Photo Location K7 - Reserve Road

(Image source GBD 2013)

Tank 3

Eastern Tanks Area



Photo Location K8 - Access track south west and parallel to Reserve Road

Reserve Road

Tank 3

(Image source GBD 2013)



Photo Location K9 - Reserve Road

Figure 4
Photo Sheet 3

Kurnell Refinery Conversion

(Image source GBD 2013)

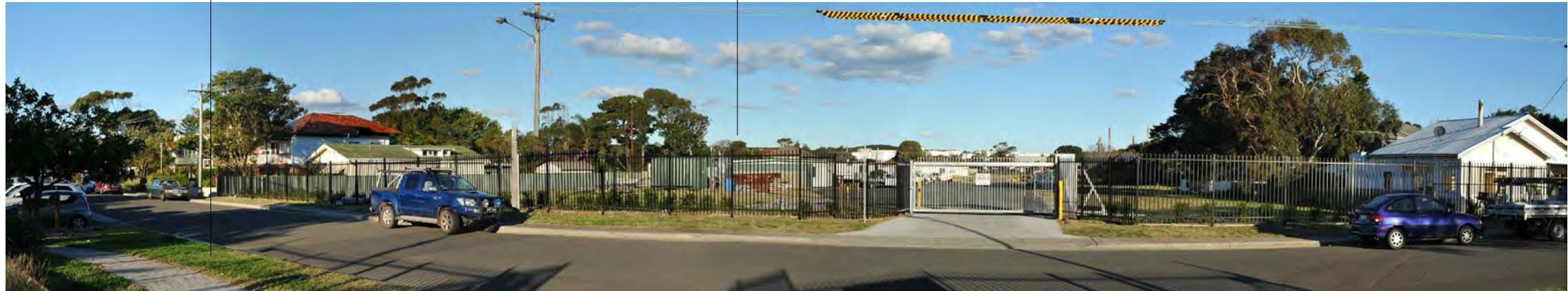


Prince Charles Parade

No view toward tanks within Eastern
or Western Tanks Area

Photo Location K10 - Prince Charles Parade

(Image source GBD 2013)



Prince Charles Parade

No view toward Tank 3

Photo Location K11 - Prince Charles Parade

Figure 5
Photo Sheet 4

(Image source GBD 2013)



Photo Location K2 - Existing view toward Tank 2, Chisholm Road

(Image source GBD 2013)



Photo Location K2 - Proposed view toward Tank 2, Chisholm Road

Figure 6
Photomontage Sheet 1

(Image source GBD 2013)



Photo Location K3 - Existing view toward Tank 3 from Cook Street

(Image source GBD 2013)



Photo Location K3 - Proposed view toward Tank 3 from Cook Street

(Image source GBD 2013)



Tank 3

Photo Location K8 - Existing view toward Tank 3 from access track south west and parallel to Reserve Road

(Image source GBD 2013)



Tank 3

Photo Location K8 - Proposed view toward Tank 3 from access track south west and parallel to Reserve Road

Figure 8
Photomontage Sheet 3

4.1 Visual Absorption Capability

Visual Absorption Capability (VAC) is a classification system used to describe the relative ability of the landscape to accept modifications and alterations without the loss of landscape character or deterioration of visual amenity. VAC relates to physical characteristics of the landscape that are often inherent and often quite static in the long term.

Given the extent and combination of existing industrial infrastructure within the Site, the capability of the landscape to absorb the supplementary works is considered to be high. The high VAC of the surrounding landscape is likely to reduce the potential visual significance of the modifications.

4.2 Change to the existing visual environment

The scale of change in existing views, with respect to the addition of the modified roof structures, would be limited in both composition as well as the proportion of existing views occupied by the modifications. The modified roof structures would not be expected to have any significant impact on existing skyline views or block existing views across and beyond the Site.

Visual contrast between modified and existing tanks would be limited to the line and form of the geodesic dome, which would contrast with the flat roof profiles of existing adjoining tanks. However, the Site contains a range of large scale industrial structures and buildings, with a variety of roof types and vertically constructed elements. The overall contrast between the modifications and existing structures within the Site would be negligible.

Whilst there would be a marginal increase in the overall height of the 3 modified tanks, there would be similarities in the overall scale, colour and texture of both modified and existing tanks. The modified roof structures would tend to be readily integrated into the existing visual environment of the Site, which contains a variety of constructed industrial elements.

Whilst the roof profiles of the 3 tanks would be modified, the overall nature of visual change would be restricted by the availability of views due to partial screening restricting the majority of views to glimpses rather than full views from the majority of sensitive view locations, including surrounding residential dwellings and road corridors.

4.3 Predicted visual significance of the supplementary works

The limited scale of change and degree of contrast between the modifications and existing tanks would tend to reduce the visual significance of the supplementary works. Visual significance would also be limited by the extent and degree of screening between the tanks and surrounding view locations.

The visual significance of views would be limited for locations within proximity to the Site, and more so from distant locations including water based views from Botany Bay and areas along the north portion of the Bay including La Perouse, Yarra Bay and Molineaux Point at Port Botany. It is unlikely

that the modifications would have any additional visual significance on aerial views from aircraft approaching or departing Sydney Airport.

5.1 Summary

This SVA concludes that the modifications (comprising the addition of a geodesic dome to 3 existing tanks within the Site), would have an overall negligible visual significance on people living in or travelling through areas surrounding the Site. The overall negligible visual significance would be due to a combination of the following factors:

- limited visibility toward Tanks 1 and 2 and presence of existing industrial infrastructure surrounding the tanks;
- partial visibility toward Tank 3 and the presence of existing tree cover between the Site and residential dwellings along Reserve Road, north east of the site;
- limited scale of change in existing views with respect to supplementary modifications; and
- relatively small degree of contrast between the modifications and existing structures within the Site.

Limitations

GBD has prepared this SVA in accordance with the usual care and thoroughness of the consulting profession for the use of URS Australia Pty Ltd and only those third parties who have been authorised in writing by GBD to rely on the report. It is 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 report. It is prepared in accordance with the scope of work and for the purpose outlined in the GBD Proposal dated 5 July 2013.

The methodology adopted and sources of information used are outlined in this report. GBD has made no independent verification of this information beyond the agreed scope of works and GBD assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to GBD was false.

This report was prepared between July 2013 and August 2013 and is based on the conditions encountered and information reviewed at the time of preparation. GBD disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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Supplementary Heritage Impact Assessment

AM Consulting Ref: 120949 L1

8 August 2013

William Miles
URS Australia Pty Ltd
Level 4, 407 Pacific Highway
Artarmon NSW 2064



Dear Will

*Caltex Kurnell Refinery Conversion: Heritage Impact Assessment
Addendum to Report*

Caltex Refineries (NSW) Pty Ltd (Caltex) is proposing to convert its Kurnell Refinery (the Site) to a finished fuel terminal facility. In January 2013, Australian Museum Business Services (AMBS) submitted a Heritage Impact Assessment (HIA) to URS Australia Pty Ltd (URS) on behalf of Caltex addressing the Aboriginal and Historic heritage issues associated with the conversion. The HIA formed a Technical Appendix to the Environmental Impact Statement (EIS) for the project.

The Site is listed on the *State Environmental Planning Policy (Kurnell Peninsula) 1989* as an industrial archaeological item with local heritage value, Australian Oil Refinery. The neighbouring Kurnell Peninsula Headland is included on the National Heritage List (NHL). The EIS was submitted to the NSW Department of Planning in May 2013 and placed on exhibition by the Department from 23 May 2013 to 28 June 2013. Following exhibition, Caltex has proposed supplementary works, including modifications to the roof structure of three existing tanks at the Site. The following addendum reviews the impact of these modifications on the historic heritage values of the Australian Oil Refinery site and the Kurnell Peninsula Headland.

The following assessment is based upon a desktop review of information provided by Caltex via URS regarding the proposed supplementary works, including a Supplementary Visual Assessment prepared by Green Bean Design (August 2013). The following heritage impact assessment has been prepared in accordance with guidelines of the *NSW Heritage Manual* (NSW Heritage Office and Department of Urban Affairs and Planning 1996) and the associated document *Statements of Heritage Impact* (1996, revised 2002).

Please note: On 1 July 2013, AMBS changed its business name to Australian Museum Consulting.

Should you require any additional information or if I can be of assistance in any way please contact me on (02) 9320 6032 or email <libby.percival@austmus.gov.au>.

Yours sincerely

Libby Percival
Australian Museum Consulting Project Manager, Historic Heritage

Addendum to Heritage Impact Assessment

Supplementary Works

The proposed supplementary works include modifications to three existing tanks within the Site. One tank is located in the Eastern Tank Area, between Road A and Road B. This tank was identified in the main HIA as one of the original refinery tanks, installed in the 1950s as a crude oil tank and currently used for finished product storage. This tank is planned to be replaced with a similar tank with the same function on a new foundation. The remaining two tanks are in the Western Tank Area, between Road P and Road Q. Most of the large tanks in this area were originally constructed in the 1960s and 1970s to contain crude oil.

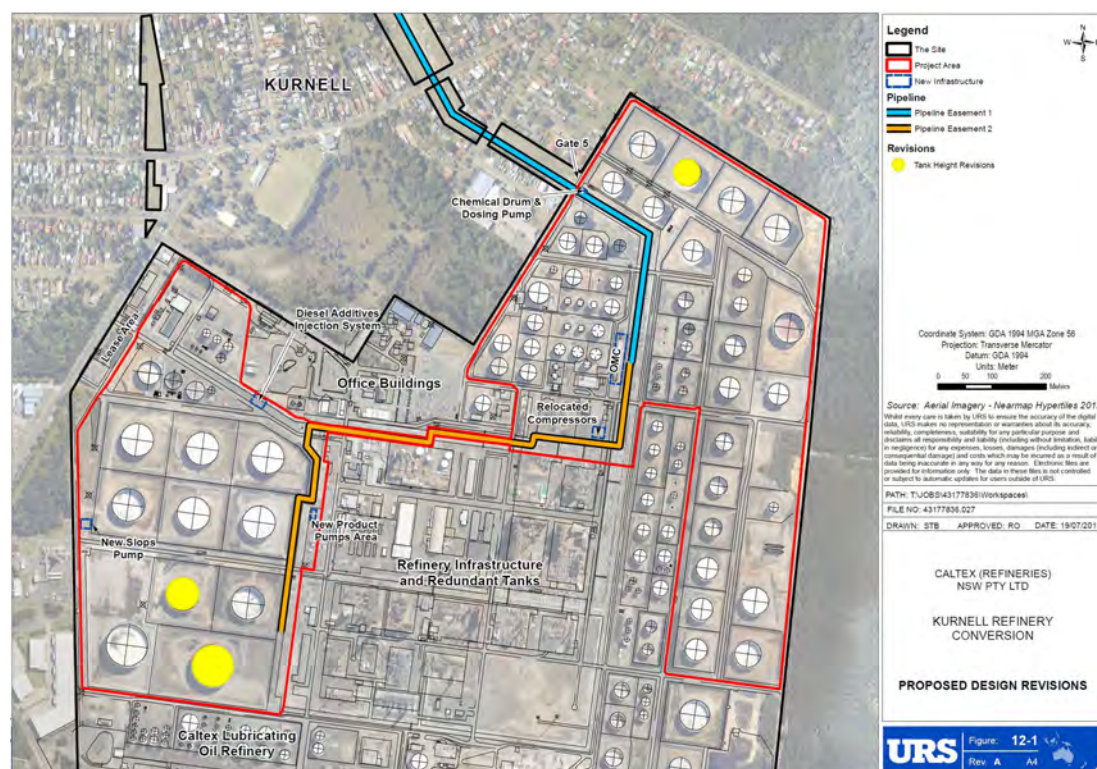


Figure 1. Location of three tanks, which are the subject of the proposed modifications.

The proposed modifications include the installation of a geodesic dome over each of the three tanks. The purpose of the domes is to ensure that small amounts of rainwater do not enter these tanks and contaminate the product during heavy and prolonged rainfall events. The domes would rest on support brackets welded to the outside of each tank. The domes overhang the tank's shell slightly at the roof line forming an eave around the shell periphery. The single tank in the Eastern Tank area is currently 14.6m tall with a diameter of 50m; the proposed dome would add 4.6-6.7m to the height of the tank. The larger of the two tanks in the Western Tank area is currently 18.3m tall with a diameter of 76.2m; the proposed dome would add 7.0-10.2m to the height of the tank. The general design and form of the geodesic domes is illustrated in photomontages prepared for the Supplementary Visual Assessment (refer Figures 6 to 8 in that report).

The Supplementary Visual Assessment indicates that the modified roof structures would be readily integrated into the existing visual environment of the Site, although the overall form and profile of the geodesic domes would contrast with the roof profiles of the surrounding tanks. The potential degree of visibility and resulting impact of changes to distant views would be limited,

including water based views from Botany Bay and areas along the north portion of the Bay including La Perouse, Yarra Bay and Molineaux Point at Port Botany.

Assessment of Heritage Impact

The following questions consider the impact of the modifications on the historic heritage values of the Australian Oil Refinery and the Kurnell Peninsula Headland.

The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:

- The modification of existing tanks at the Caltex Refinery to store a range of finished petroleum products supports the conservation of a sample of original Australian Oil Refinery storage tanks on site, and as such respects the historical association of the Site with the development of the Australian petroleum industry. The changes are consistent with the ongoing use of the Site and the associated necessity to update infrastructure to current operational standards.
- The proposed works would not impact on significant fabric of the NHL Kurnell Peninsula Headland, and there would be no change to the historic or social values of the place.
- The proposed works would not alter the existing experience of significant views of the Kurnell Peninsula Headland from Botany Bay or the overall landscape setting of the Kurnell Peninsula Headland. At present, there are no direct views between the Meeting Place Precinct of the Kurnell Peninsula Headland and the main refinery Site, and only limited distant views from the Cape Bailey Lighthouse, and from the coastal walking track. The proposed modifications involve minimal change to the bulk or vertical scale of the existing refinery infrastructure, which is currently dominated by the refinery process units, and would not impact on the existing view corridors associated with the national heritage values of the place.

The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:

- Installation of the geodesic domes on three tanks and the associated change in the profile of the tanks would have minor adverse impacts on the technical significance and representative value of tanks at the Site. These impacts would be mitigated by the ongoing use of the Site by the petroleum industry, which involves updating the existing infrastructure to current operational standards.

The following sympathetic solutions have been considered and discounted for the following reasons:

- The previous HIA assumed that the single tank in the Eastern Tank Area would be replaced by a floating roof tank with a similar profile to the existing tank, and that the two tanks in the Western Tank Area would retain their existing floating roof structure, albeit with some modifications. Although the existing floating roofs keep out the vast majority of rainwater, very small amounts of water can enter the tanks during heavy and prolonged rain events, affecting the quality of the finished product. Therefore Caltex's preferred option is to provide increased protection to the three tanks to ensure that enough quality product is available to the NSW and ACT market.

Statement of Heritage Impact

Australian Oil Refinery

Installation of the geodesic domes on three tanks, and the associated change in the profile of the tanks, would have minor adverse impacts on the technical significance and representative value of the Australian Oil Refinery site. However, these impacts would be mitigated by the ongoing use of the site by the petroleum industry. The proposed works respect the historical association of the site with the development of the Australian petroleum industry.

Kurnell Peninsula Headland

The proposed modifications would not impact on significant fabric of the NHL Kurnell Peninsula Headland, and there would be no change to the identified historic or social values of the place. The proposed modifications would not significantly alter the existing landscape setting of the Kurnell Peninsula Headland or otherwise impact on the existing view corridors associated with the national heritage values of the place.

Conclusion

The assessment of impacts outlined above is consistent with the original HIA. The proposed modifications to the three tanks do not result in a change to the level of impact on the heritage values of the Australian Oil Refinery or the Kurnell Peninsula Headland as previously assessed.

Supplementary Air Quality Impact Assessment

Date: 06 August 2013

To: Caltex Refineries (NSW) Pty Ltd

From: URS Australia

Subject: Tank Design Modifications in relation to the Air Quality Impact Assessment for the Kurnell Refinery Conversion

As described in **Section 1.4** of the Response to Submission Report for the Project, design changes are proposed to three of the External Floating Roof Tanks (EFRT's) in the form of the addition of an aluminium dome roof structure to each tank. The domes would rest on support brackets that are welded to the external circumference of the tank, and would overhang the tank shell, forming an eave around the shell periphery. The floating roofs associated with these tanks would remain, effectively becoming internal floating roofs. The domes would act to reduce rainfall ingress, and hence reduce the quantity of waste water produced from these tanks. Two of the tanks affected by this change are proposed to store diesel, whilst the third would store ULP.

As described in **Section 3.2.1** of the Air Quality Impact Assessment (AQIA) for the Project (refer to **Appendix G** of the Environmental Impact Statement (EIS)), the action of wind over EFRT's is one of the mechanisms through which emissions occur. It is likely that the retrofitting the three EFRTs with dome roofs would act to reduce the flow across the tank, in a manner resembling an Internal Floating Roof Tank (IFRT). This conclusion is supported by the following references:

- (IPCC, 2006) *Reference Document on Best Available Techniques on Emissions from Storage*; and
- (NPI, 2012) *National Pollution Inventory Emission Estimation Technique Manual for Fuel and Organic Liquid Storage*

These references note a reduction in emissions with the addition of a roof to an EFRT. The emission factors in NPI (2012) indicate an emission reduction in the order of 70-75% between an EFRT and an IFRT. In the context of the AQIA the design change to these tanks is estimated to reduce estimated emissions by up to 5% across the Site (Benzene and total VOCs). This minor reduction in estimated emissions would result in model predictions either equal to or less than those presented in the EIS, and would be unlikely to significantly alter the outcomes presented within the AQIA.

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