

*Environment Effects Act 1978*

*Pipelines Act 2005*

*Planning and Environment Act 1987*

**Inquiry, Advisory Committee and Panel Report No. 1**

# Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

**Report No. 1: Key considerations, findings and recommendations**

**22 February 2021**

*Environment Effects Act 1978*

Inquiry report pursuant to section 9(1)

*Pipelines Act 2005*

Panel report pursuant to sections 40 and 47

*Planning and Environment Act 1987*

Advisory Committee report pursuant to section 151

**Report No. 1: Key considerations, findings and recommendations**

Crib Point Gas Import Jetty and Crib Point – Pakenham Gas Pipeline

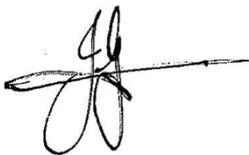
22 February 2021



Kathy Mitchell, Chair



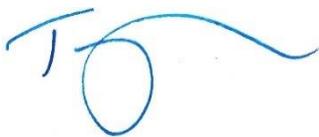
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## Glossary and abbreviations

ACCC	Australian Competition and Consumer Commission
AEMO	Australian Energy Market Operator
AGL	AGL Wholesale Gas Limited
APA	APA Transmission Pty Ltd
ASS	Acid sulfate soils
BC	<i>Batrachochytrium dendrobatidis</i>
BLCAC	Bunurong Land Council Aboriginal Corporation
BOC	Brominated Organic Compounds
CEG	Combined Environment Groups (Environment Victoria, Save Westernport Inc and the Victorian National Parks Association)
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CPO	Chlorine Produced Oxidants
CPRF	Crib Point Receiving Facility
CPS	Critical Components, Processes and Systems
CSIRO	Commonwealth Scientific and Industrial Research Organisation
D	Document number
DAWE	Department of Agriculture, Water and Environment
dB	Decibels
DELWP	Department of Environment, Land, Water and Planning
EES	Environment Effects Statement
EES Act	<i>Environmental Effects Act 1978</i>
EOLSS	End of Line Scrapper Station
EPA	Environment Protection Authority
EPRs	Environmental Performance Requirements
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESV	Energy Safe Victoria
EVC	Ecological Vegetation Class
FICA	French Island Community Association
FSRU	Floating Storage and Regasification Unit
GDE	Groundwater Dependent Ecosystems
GHG	Greenhouse gas
GIJW	Gas Import Jetty Works

GV	Guideline Value
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HCMT	High Capacity Metro Rail
HDD	Horizontal Directional Drilling
HHRA	Human Health Risk Assessment
HIPAP	Hazardous Industry Planning Advisory Papers
IAC	Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Inquiry, Advisory Committee and Panel
ISO	International Organisation for Standardisation
IWRG	Industrial Waste Resource Guidelines
Jetty	Crib Point Jetty
KP	Kilometre Point
LAC	Limits of Acceptable Change
$L_{eq}$	Equivalent continuous sound level
LNG	Liquefied Natural Gas
LSC	Light Spill Calculations
LSIR	Location Specific Individual Risk
mg/L	Milligrams per litre
MHF	Major Hazard Facility
ML	Megalitres
MLA	Marine Loading Arm
MLV	Mainline Valve
MM	Mitigation Measure
mmscf/d	million standard cubic feet per day
MNES	Matters of National Environmental Significance
MPLPS	Mornington Peninsula Localised Planning Statement
MPPS	Mornington Peninsula Planning Scheme
MSL	Monopole Sound Level
NO <sub>x</sub>	Nitrogen oxides
NO <sub>2</sub>	Nitrogen dioxide
NSW ICNG	New South Wales Interim Construction Noise Guidelines
OEMP	Operations Environmental Management Plan
PC	<i>Phytophthora cinnamoni</i>

PDF	Pakenham Delivery Facility
PDS	Port Development Strategy
PHDA	Port of Hastings Development Authority
PIG	Pipeline Inspection Gauge
PM	Particulate Matter
PML	Pipeline Measurement Length
POS	Performance Objectives and Standards (Pipeline CEMP, Appendix J)
ppb	Parts per billion
Proponents	AGL Wholesale Gas Limited and APA Transmission Pty Ltd
PSP	Precinct Structure Plan
PTV	Public Transport Victoria
QRA	Quantitative Risk Assessment
RFI	Request for Further Information
ROW	Right of Way
RSA	Road Safety Audit
S	Submission number
SCO	Specific Controls Overlay
SEL	Sound Exposure Level
SIL	Safety Integrity Level
SO <sub>2</sub>	Sulfur dioxide
Save Westernport	Save Westernport Inc
Scoping Requirements	Scoping requirements for the Gas Import Jetty and Pipeline Project Environmental Effects Statement
SEPP	State Environment Protection Policy
SFAIRP	So Far As Is Reasonably Practicable
SMS	Safety Management Study
SPL	Sound Pressure Level
TAC	Time Averaged Concentration
TBH	Tribromophenol
the Project	Gas Import Jetty and Pipeline Project
TIA	Traffic Impact Assessment
TMP	Traffic Management Plan
TN	Technical Note
TOC	Total organic carbon

TRH	Total Residual Chlorine
µg/L	Micrograms per litre
UNESCO	United Nations Economic, Scientific and Cultural Organisation
VOC	Volatile organic carbon
VPA	Victorian Planning Authority
VRCA	Victorian Regional Channels Authority
VTS	Victorian Transmission System
WAA	Works Approval Application

## Executive summary and recommendations

### Overview

AGL Wholesale Gas Limited (AGL) and APA Transmission Pty Ltd (APA) propose to develop a Gas Import Jetty Facility at Crib Point and 57 kilometre gas transmission pipeline (the Project) to supply imported liquified natural gas (LNG) into the Australian gas market for industrial, commercial and residential purposes. AGL and APA are joint Proponents for the Project.

The Proponents prepared an Environment Effects Statement (EES) to provide for the integrated assessment of the Project, which was placed on public exhibition for eight weeks in July and August 2020. A combined Inquiry, Advisory Committee and Panel (the IAC) was appointed by the Minister for Planning and the Minister for Energy, Environment and Climate Change to consider the EES, associated approvals and public submissions, and to hold a public Hearing to receive and consider evidence and submissions.

A total of 6,058 submissions were received in relation to the public exhibition, including one submission from Environment Victoria that contained an additional 4,853 attachments from individuals not included in the overall submission numbers. Overwhelmingly, most written and verbal submissions opposed the Project.

The Hearing was held for 37 days over 10 weeks from 12 October to 17 December 2020, at which the Proponents, four local Councils (Mornington Peninsula, Bass Coast, Casey and Cardinia), the Environment Protection Authority Victoria (EPA), Department of Environment, Land, Water and Planning (DELWP), Bunurong Land Council Aboriginal Corporation (BLCAC), Port of Hastings Development Authority (PHDA), various environment and community groups and individual submitters provided evidence and submissions to the IAC.

Due to COVID restrictions, the Hearing was held by video conference, and while presenting the occasional technical challenges, it enabled all parties and submitters seeking to be heard, the opportunity to present evidence and submissions to the IAC, as well as the ability to listen in at any stage of the proceedings.

The Proponents presented significant evidence in support of the Project. Jointly, Mornington Peninsula and Bass Coast Shire Councils provided counter evidence, as did the Combined Environment Group (CEG, comprising Save Westernport, Environment Victoria and Victorian National Parks Association). Additionally, various other parties provided evidence.

### Context for assessment

The starting point for this assessment is the locational context and policy settings for the Project. The site for the gas import works at the Crib Point Jetty is one of three jetties comprising the Port of Hastings, which is one of four state significant ports in Victoria. Crib Point is currently a receiving point for fuel that is then transported by pipe to a distribution hub. The Port of Hastings, which has been operating since the 1960s, is supported by State and local policy, is well established and has significant land holdings extending from Hastings to Stony Point. It sits in Western Port Bay on the east side of the Mornington Peninsula, south of the Koo Wee Rup agricultural area and west of French Island.

The Project will include the permanent mooring at Berth 2 (currently unused) of a large floating storage regasification unit (FSRU) for up to 20 years and the conversion of LNG to natural gas from up to 40 carriers a year.

The Project's location within the Port of Hastings needs to be balanced against the environment in which it is situated. The Port of Hastings is located in Western Port Bay, which is a Ramsar wetland of international significance, recognised for its inherent and diverse marine and coastal wetlands biodiversity and values. Further, Western Port Bay is recognised internationally as a United Nations Economic, Scientific and Cultural Organisation (UNESCO) Biosphere Reserve, the only such Reserve in Victoria. The tension between the Project's setting within the Port of Hastings and the environmental values of Western Port Bay has been a key consideration in the IAC's deliberations.

This report provides an analysis of the EES in response to the exhibited material, scoping requirements, evaluation objectives, evidence and submissions, and other material provided to the IAC during the Hearing.

The IAC has prepared two reports:

- Report No. 1 provides the key considerations, findings and recommendations of the IAC.
- Report No. 2 provides the Appendices, including:
  - Terms of Reference
  - List of submitters
  - Parties to the Hearing
  - Document list
  - Legislation and policy context
  - Recommended Incorporated Document
  - Recommended Environmental Performance Requirements (EPRs).

Report No. 1 has three Parts:

- Part A provides background information about the IAC process, a summary of the Project and the Project rationale and alternatives.
- Part B provides the review and analysis of each of the environment effects of the Project, using the same subject themes as in Volume 2 of the EES.
- Part C provides the summary and conclusions of the IAC in relation to Project implementation and its integrated assessment.

## **Summary of environmental effects**

The summary of findings of the IAC in relation to the environmental effects of the Project are:

- (i) Effects that are acceptable, no additional mitigation measures are required:**
  - Project rationale
  - Surface water
  - Groundwater
  - Business.
  
- (ii) Effects that are acceptable, subject to additional and/or revised mitigation measures and/or additional work:**
  - Terrestrial and freshwater biodiversity
  - Contamination and acid sulfate soils
  - Greenhouse gas
  - Air quality
  - Noise and vibration

- Landscape and visual
- Transport
- Safety, hazard and risk
- Land use
- Social
- Agriculture
- Heritage
- Pipeline alignment and options.

**(iii) Effects that are unacceptable:**

- Marine biodiversity:
  - Adequacy of assessments
  - Chlorine discharge
  - Coldwater discharge
  - Seawater intake and entrainment
- Matters of National Environmental Significance – Ramsar wetland.

## **Summary of findings, conclusions and recommendations**

Overall, the IAC concludes that while most effects can be effectively mitigated when considered in isolation, the direct and indirect effects on the marine environment are not sufficiently understood and cannot be satisfactorily mitigated to enable the Project to proceed with confidence. This results in impacts to Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* not being adequately addressed nor understood.

While the IAC accepts the clear policy and land use direction of the Port of Hastings and Crib Point as a State significant port, the significance of the site within a designated Ramsar wetland and a UNESCO Biosphere Reserve elevates the importance of the environmental considerations. It has not been demonstrated that the likely and potential environmental impacts on the marine environment are able to be mitigated to an acceptable level and the cumulative impacts of the Project, specifically the impacts associated with the FSRU, are considered unacceptable. In seeking to balance the role of the Port and the Project's impacts on the sensitive marine environment, the IAC does not consider the impact on marine biodiversity and overall cumulative impacts would achieve an acceptable environmental outcome.

The key reasons for these conclusions include:

- The Crib Point Jetty continues to be an important part of the Port of Hastings, but the recognition and understanding of the environmental significance of Western Port Bay has significantly changed in recent years.
- Western Port Bay is a tidal embayment with important intertidal mudflats that provide critical foraging habitat for migratory shorebirds protected under a number of International Conventions and agreements. It is one of few similar intertidal environments along the Victorian coast that support migratory shorebirds, and conservation of existing environmental values is of significance.
- Definition and understanding of the marine environment around the Crib Point Jetty is inadequate, resulting in uncertainty and the inability to:
  - enable a clear assessment of the extent of impacts

- establish a clear baseline for ongoing monitoring necessary to determine if impacts exceed what is modelled and predicted by the assessment.
- The Project would discharge a seawater plume that would alter the physico-chemical properties of the surrounding environment and marine ecosystem. The combination of acute lethality at the discharge and mortality from entrainment during intake would result in unacceptable environmental impacts in a wetland of international importance.
- Continuous operation of the FSRU, with its intake of seawater from Western Port Bay and discharge of altered seawater would have unacceptable impacts. Although direct impacts might be localised around the Crib Point Jetty, the IAC has concerns about the potential for broader indirect impacts and changes to the ecological character within the Ramsar wetland.
- The proposed 20 year operation of the FSRU within a water based environment results in a higher probability of a greater inter-connected level of impact with potential for unforeseen effects.

The construction and relatively benign operation of the pipeline component of the Project will primarily create short term and temporary effects that can be acceptably mitigated.

If the Project proceeds, the IAC provides recommendations to improve the mitigation measures as well as further actions to be undertaken.

## **Primary conclusion**

**Based on the reasons set out in this Report, the IAC concludes that while most of the Project's environmental effects can be acceptably managed, the Project would have unacceptable effects on the marine environment within an area of high conservation value and should not proceed.**

## **Recommendations**

**If the Project is approved, the IAC makes the following recommendations:**

### **1 For the whole Project:**

#### **Environmental Performance Requirements**

**1a) Adopt and apply the revised Environmental Performance Requirements provided at Appendix G of Report No. 2 to relevant components of the Project.**

#### **Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)**

**Adopt and apply the following changes:**

#### **1b) Revised Performance Objective and Standard R14:**

**The following measures will be implemented to reinstate area of Southern Brown Bandicoot habitat:**

- i. A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times frames and monitoring for rapidly re-establishing habitat which is impacted upon.**
- ii. Dense cover of suitable native shrubs or vegetation of similar structure will be reinstated, other than directly above the pipeline and a narrow track as**

identified in the Environmental Line List (Attachment G) to allow ground access for surveillance patrols. Easement agreements with landholders will require that this vegetation be reinstated and protected.

- iii. Rapid re-establishment of dense ground cover will be achieved at any of the sites of known or assumed presence for the Southern Brown Bandicoot impacted by the construction footprint, but not subject to HDD, by planting of semi-mature native shrubs, or fast-growing tubestock, at an appropriate density during rehabilitation. The aim is to re-establish dense understory vegetation in the 0.2-1 metre height range.

**1c) Revised Performance Objective and Standard B10:**

**Swamp Skink**

Implement the following measures where areas of Swamp Skink habitat are identified in the Environmental Line List (Attachment G), to reduce impacts:

- i. Clear and grade activities will occur preferentially in warmer months (late Spring to early Autumn) when skinks are more active and better able to avoid activities.
- ii. A suitably qualified and authorized fauna handler will complete an inspection of the habitat area immediately prior to any vegetation removal (including ground cover).
- iii. If clear and grade occurs during cooler months, when skinks may be in burrows (April to September or as determined by a fauna ecologist), a suitably qualified and authorized fauna handler will be present during topsoil stripping to monitor the area and inspect stripped material.
- iv. A suitably qualified and authorized fauna handler will complete an inspection of topsoil and vegetation stockpiles prior to respreading.
- v. Erosion and sediment controls and temporary fencing will be inspected for sheltering skinks prior to removal.
- vi. Relocate any individuals that are captured during the inspections described above to the nearest adjacent habitat away from the construction area.
- vii. A specific protocol will be developed for clearing Swamp Skink and Glossy Grass Skink habitat, in consultation with Mornington Peninsula Shire Council, which will refer to the Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula by Robertson and Clemann (2015).

**1d) Revised Performance Objective and Standard T11: (Contaminated Soils)**

Add the following dot point:

Intrusive soil contamination sampling at KP7.3 to KP7.6 in accordance with EPA IWRG 621 and IWRG 702, prior to excavation to confirm the presence or absence of contaminated soils.

**1e) Revised Performance Objective and Standard W3:**

Develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated with PFAS.

**1f) Revised Performance Objective and Standard T13:**

Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.

**1g) Revised Performance Objective and Standard HH3:**

**Rename HH3 ‘Unexpected cultural heritage finds procedure’.**

**1h) New Performance Objective and Standard B15:**

**Consider the opportunity for a contribution to predator control management along the pipeline alignment that would be developed in consultation with appropriate land managers and authorities.**

**1i) Revised POS E5**

**Remove reference to the independent and qualified environmental assessor. Approval of out of hours work is required by an independent environmental auditor.**

**1j) Revised POS E6: Managing noise from construction activities**

**Require site specific Construction Noise and Vibration Management Plans (CNVMP) which will include specific noise targets/triggers and mitigation measures for locations where critical works through townships or other sensitive regions are proposed. Each CNVMP is to be approved by an independent environmental auditor.**

**1k) Revised POS E7: Offsite noise management measures**

**Revise EPA Normal working hours to allow works on Monday to Friday between 7.00am and 6.00pm, Saturday 7.00am to 1.00pm, EPA Night hours and unavoidable hours 10.00pm to 7.00am.**

**Remove reference to the independent and qualified environmental assessor. An independent environmental auditor is required to approve night time works during the hours of 10.00pm and 7.00am.**

**Construction Environment Management Plan, Attachment G (Environmental Line List)**

**Adopt and apply the following changes:**

- 1l) Include the following sites where the removal of native vegetation and large scattered trees is to be avoided:**
- i. Pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings with Horizontal Directional Drilling**
  - ii. Tree #1 Manna Gum (Eucalyptus viminalis) a large scattered tree containing hollows and spouts located at the proposed access track entry off Stony Point Road just south and over the railway crossing and intersection with Frankston-Flinders Road through either a change to the track entry location or use of an alternative access point**
  - iii. Habitat Zone ID KOJH23 EVC175 with greater than 0.5 condition score located at the entry to access track off Frankston-Flinders Road that leads to KP4.5 and small scattered Tree #655 Swamp Gum (Eucalyptus ovata) located approximately 140 metres along the proposed access track through access entry design and changes to the track alignment**
  - iv. Tree #662 Manna Gum (Eucalyptus viminalis) a large patch tree at KP2.23 containing hollows through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling**
  - v. Between KP3.6 to KP4 Habitat Zone IDs KOJH13 and KOJH14 EVC53 Endangered Swamp Scrub with greater than 0.5 condition score in close proximity to Ramsar wetland and Warringine Park through Horizontal Directional Drilling**

- vi. From KP4.3 to the revised BJ-11 alignment at KP5 near Railway Crescent, Hastings associated with Habitat Zone IDs KOJH15 (EVC53 Swamp Scrub), KOJH16 (EVC83 Swampy Riparian Woodland) and KOJH21 (EVC175 Grassy Woodland) all with greater than 0.5 condition scores through Horizontal Directional Drilling
- vii. KP6.9 Tall Marsh EVC821 Habitat Zone ID HZ24 with condition score of 0.49 and wetland area through Horizontal Directional Drilling
- viii. Between KP13.7 to KP14.4 adjacent to the former Tyabb landfill area (can avoid exposure of contaminants) at Habitat Zone IDs JHCC56 and JHCC57 or Brett Lane's Peer Review report Habitat Zone ID NA8 - EVC83 avoiding fragmentation with adjoining vegetation areas and potential Southern Brown Bandicoot habitat through Horizontal Directional Drilling without impacting vegetation for pipe stringing
- ix. KP17.3 Tree #333 Manna Gum (*Eucalyptus viminalis*) a small scattered tree with hollows and Tree #337 a stag inside the proposed footprint containing hollows through changes to the pipeline alignment or Horizontal Directional Drilling
- x. Between KP18.5 to KP18.7 large patch of EVC 48 vegetation with numerous large trees to prevent fragmentation of habitat in close proximity south of Watsons Creek through Horizontal Directional Drilling
- xi. Between KP20 to KP20.3 coastal saltmarsh, Estuarine Scrub and potential Southern Brown Bandicoot habitat in close proximity to Ramsar wetland by eliminating right angle changes in direction and through diagonal crossing of private land and avoiding impacts from access which could be achieved from following the alignment of the pipeline from the south through Horizontal Directional Drilling
- xii. KP22.1 large scattered trees Tree #260 and 262 both Manna Gums (*Eucalyptus viminalis* subsp *pryoriana*) that contain spouts through changes to the pipeline alignment or Horizontal Directional Drilling
- xiii. KP26.1 Tree #36 containing hollows and nesting material through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.

#### **Aboriginal Cultural Heritage**

- 1m) Review and update Construction Environment Management Plan, Attachment J (Performance Objectives and Standards), Environmental Performance Requirements and other relevant approvals to include any necessary changes needed to implement the three Cultural Heritage Management Plans when approved.
- 1n) Review the documentation of Aboriginal places in Technical Report P in conjunction with the Bunurong Land Council Aboriginal Corporation and Aboriginal Victoria (for the relevant Cultural Heritage Management Plans) and update the relevant Cultural Heritage Management Plans where appropriate.

### **Pakenham Delivery Facility**

- 1o) Prepare a site specific Construction Environmental Management Plan for the Pakenham Delivery Facility in response to environmental ‘no-go’ zones associated with Southern Brown Bandicoot and Growling Grass Frog habitat and addresses:**
  - i. native vegetation removal**
  - ii. invasion by environmental weeds, pathogens or animals within retained native vegetation**
  - iii. habitat fragmentation and effects on ecosystem function**
  - iv. noise and vibration impacts causing stress/displacement of native fauna**
  - v. dust impacts on flora and fauna as an ecosystem function.**
- 2 For Works Approval Application number 1003907:**
  - 2a) Adopt and apply the relevant Environmental Performance Requirements provided at Appendix G of Report No. 2.**
  - 2b) Adopt and apply the relevant Construction Environment Management Plan requirements, including the changes in Recommendation 1.**
- 3 For draft Planning Scheme Amendment C272morn:**
  - 3a) Include the revised Incorporated Document provided at Appendix F of Report No. 2.**
  - 3b) Review the extent of the proposed Port Zone south of the Jetty to coincide with the existing Port boundary.**
- 4 For Pipeline Licence Application No. PL006610:**
  - 4a) Adopt and apply the relevant Environmental Performance Requirements provided at Appendix G of Report No. 2.**
  - 4b) Adopt and apply the recommended changes to the Construction Environment Management Plan, Attachment J (Performance Objectives and Standards) and Attachment G (Environmental Line List)**

## **PART A: INTRODUCTION AND BACKGROUND**

# 1 The inquiry process

## 1.1 The Inquiry, Advisory Committee and Panel

The Minister for Planning appointed a five-member Inquiry and Advisory Committee on 19 July 2020 pursuant to section 9 of the *Environment Effects Act 1978* and section 151 of the *Planning and Environment Act 1987* to inquire into and report on the proposed Crib Point Gas Import Jetty and Crib Point-Pakenham Gas Pipeline Project (the Project).

The Minister for Planning signed the Terms of Reference for the IAC on 1 June 2020 (Appendix A of Report No. 2).

The Minister for Energy, Environment and Climate Change appointed the IAC members as a Panel on 11 September 2020 pursuant to section 40 of the *Pipelines Act 2005* to consider submissions in relation to Pipeline Licence Application No. PL006610.

The IAC comprises:

- Ms Kathy Mitchell, Chair
- Mr Michael Kirsch, Deputy Chair
- Dr Jacqueline Gorski
- Mr Chris Harty
- Mr Trevor McCullough.

Clause 3 of the Terms of Reference provides for the IAC to seek additional specialist expert advice to assist it in undertaking its role. In this regard, the IAC retained the services of:

- Ms Sarah Auld – pipelines
- Ms Elizabeth Hui - noise
- Mr Colin McIntosh – air emissions.

The IAC retained the services of Mr Jason Kane of Counsel to provide legal advice and support.

The Project proponents are AGL and APA (the Proponents).

This is Report No. 1 of the IAC.

The Minister for Planning issued amended procedures and requirements under section 8B(5) of the *Environmental Effects Act 1978* on 1 July 2020. The amendments were in response to the various constraints associated with the COVID 19 pandemic and included:

- an increase in the EES exhibition period from 30 to 40 business days
- requirements relating to the notification of the EES and the provision of EES documents to parties and submitters
- provision for the Hearings to be held via video conference if necessary
- requirements relating to the recording of Hearings and their public availability.

## 1.2 The IAC's role

### 1.2.1 Terms of Reference

The Terms of Reference require the IAC to:

- Hold an inquiry into the environmental effects of the Project and report its findings and recommendations to the Minister for Planning.
- Review draft planning scheme Amendment C272morn and report its findings and recommendations to the Minister for Planning.

- Provide advice to inform the EPA’s consideration of the Works Approval Application (WAA).
- Provide advice to the Minister for Energy, Environment and Climate Change in relation to the Pipeline Licence Application.
- Provide advice to the Minister for Planning in relation to MNES pursuant to the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

Clause 23 notes the Project might require other approvals, including:

- Cultural Heritage Management Plans (CHMP) under the *Aboriginal Heritage Act 2006*.
- Consent for the use of Crown land under the *Marine and Coastal Act 2018*.
- A permit to remove listed flora and fauna under the *Flora and Fauna Guarantee Act 1988*.
- Authority to take or disturb wildlife under the *Wildlife Act 1975*.
- Consents for works on, over or under waterways under the *Water Act 1989*.

Clause 39 requires the IAC produce a written report containing:

- a. conclusions with respect to the environmental effects of the project and their significance and acceptability;
- b. findings on whether acceptable environmental outcomes can be achieved, having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
- c. recommendations and/or specific measures that it considers necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
- d. recommendations as to any feasible modifications to the design or management of the project that would offer beneficial outcomes;
- e. recommendations for any appropriate conditions that may be lawfully imposed on any approval for the project, or changes that should be made to the draft PSA in order to ensure that the environmental effects of the project are acceptable having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;
- f. recommendations as to the structure and content of the proposed environmental management framework, including with respect to monitoring of environmental effects, contingency plans and site rehabilitation;
- g. recommendations with respect to the structure and content of the draft PSA;
- h. recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a works approval if issued; and
- i. specific findings and recommendations about the predicted impacts on matters of national environmental significance and their acceptability, including appropriate controls and environmental management <sup>1</sup>.

The IAC provides its consolidated response to the Terms of Reference in Chapter 23.2.

The *Pipelines Act*, requires the Panel to consider all submissions referred to it (section 40), give the applicant and any submitter a reasonable opportunity to be heard (section 45), and prepare a report making recommendations as to the action that it believes should be taken with respect to the application (section 47).

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<sup>1</sup> Terms of Reference, Clause 39

### 1.2.2 Scoping Requirements

The EES draft evaluation objectives are included in the Scoping Requirements for the Gas Import Jetty and Pipeline Project EES January 2019 (Scoping Requirements Report).

Clause 25 of the Terms of Reference requires the IAC to:

- b. draw conclusions on the potential environmental effects of the project, their significance and acceptability, having regard to the draft evaluation objectives in the EES scoping requirements and relevant policy and legislation <sup>2</sup>.

The Scoping Requirements Report was issued by the Minister for Planning in January 2019 following a three-week public exhibition. It sets out the specific matters to be investigated and documented in the EES. It was prepared in the context of the Ministerial Guidelines for Assessment of Environmental Effects under the *Environmental Effects Act*.

The Scoping Requirements Report includes the following draft evaluation objectives that identify the '*desired outcomes in the context of potential project effects and legislation*' <sup>3</sup>:

**Energy efficiency, security, affordability and safety** – To provide for safe and cost-effective augmentation of Victoria's natural gas supply in the medium to longer term.

**Biodiversity** – To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

**Cultural heritage** – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

**Social, economic, amenity and land use** – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

**Waste** – To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions <sup>4</sup>.

Each of the draft evaluation objectives is supplemented by descriptions of key issues, priorities for characterising the existing environment, design and mitigation measures, assessment of likely effects and approach to managing performance.

The IAC discusses the draft evaluation objectives throughout this report and provides its consolidated response in Chapter 23.3.

### 1.3 Exhibition and submissions

The EES was exhibited from 2 July to 26 August 2020.

The Minister for Planning extended the exhibition period by 10 business days (from 30 to 40 business days) in response to the constraints associated with the COVID 19 pandemic.

Clause 24 of the Terms of Reference provided for submissions to be lodged through the Engage Victoria website and collected by Planning Panels Victoria.

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<sup>2</sup> Terms of Reference, Clause 25

<sup>3</sup> Scoping Requirements Report, page 10

<sup>4</sup> Scoping Requirements Report, page 11

A total of 6,058 submissions were received (Appendix B of Report No. 2), including:

- 1,086 individual submitters
- 4,853 submissions associated with the Environment Victoria submission
- 75 from community and environment groups
- 16 from businesses and industry groups
- 6 from State agencies
- 4 from local government municipalities
- 1 from a Commonwealth agency
- 17 unknown (where attachments had not been included).

The Environment Victoria submission (Submission (S) 3088) included various attachments, including a spreadsheet that included 9,484 supporting letters. The 9,484 supporting letters were reconciled with the 6,058 individual submissions received. From that, 4,702 had lodged their submission through the Engage Victoria platform and were included in the 6,058.

Due to submissions being incorrectly forwarded to and collected by DELWP from members of Environment Victoria, the submission period was further extended from 11.59pm on 26 August 2020 to 11.59pm on 1 September 2020.

## **1.4 Hearings**

The Directions Hearing was held via video conference on 17 September 2020 and approximately 200 people participated in or viewed this. At the Directions Hearing, the IAC introduced itself and its team, explained its role, made various declarations, discussed exhibition and submission issues, and discussed various directions in relation to the Hearing dates, site inspections, experts and cross examination, and the public availability of tabled documents.

The recording of the Directions Hearing was made available on the Engage Victoria website on 18 September 2020.

The main Hearing was held via video conference over 37 days between 12 October and 17 December 2020, including an accompanied site inspection on 2 December 2020. Typically, between 60 to 80 people participated in or viewed the Hearing each day. Daily recordings of the Hearing were made available on the Engage Victoria website, generally on the following business day. The Hearing participants are shown in Appendix C of Report No.2.

All documents and materials tabled during the IAC process were assigned a document number, recorded on the IAC's document list, and published on the Engage Victoria website generally within one business day of being provided. Tabled documents are shown in Appendix D of Report No. 2.

## **1.5 Site inspections**

The IAC undertook unaccompanied inspections prior to the Hearing on 8 and 10 September 2020. The first day included various public sites and areas associated with the Crib Point-Pakenham pipeline and the general area of the Project. The second day included a land-based inspection of the Crib Point area, including the Crib Point Jetty, and a boat based inspection of various areas and view lines extending from Cowes to Long Island. The itineraries and associated maps are shown in Document (D) 19.

The IAC undertook an accompanied inspection 2 December 2020. The inspection included a formal welcome and acknowledgment of Country provided by Uncle Shane Clarke on behalf

of the BLCAC. The inspection focussed on the Crib Point area, including the Crib Point Jetty (the Jetty), Woolleys Beach and the Victorian Maritime Centre, and included a boat trip from Stony Point to Tankerton Pier on French Island. The inspection included representatives from the Proponents and key parties, including the PHDA, Mornington Peninsula Shire Council (Mornington Peninsula), Bass Coast Shire Council (Bass Coast), the Combined Environment (CEG), which included Environment Victoria, Save Westernport Inc, and the Victorian National Parks Association (VNPA) and the French Island Community Association (FICA). The itinerary is shown in Document D502.

In addition, various IAC members undertook unaccompanied inspections of:

- sites and areas on French Island
- transport infrastructure, including rail infrastructure, roads and intersections
- sites and areas of native vegetation and habitat along the pipeline route
- Crib Point and the broader area when tankers were present at Berth 1 at Jetty.

## **1.6 Procedural and other matters**

### **1.6.1 Request for Further Information**

The IAC prepared a Request for Further Information (RFI) that was provided to the Proponents on 16 September 2020 and tabled at the Directions Hearing on 17 September 2020<sup>5</sup>.

The request directed further information from the Proponents about various matters, based on its preliminary review of the EES and submissions.

The Proponents subsequently responded to the request through submissions, evidence and 52 Technical Notes (TN).

### **1.6.2 Submission of the IAC's report**

In light of the number of submissions, the length of the Hearing and the intervening Christmas and new year period, the IAC requested the Minister for Planning to approve an extension of time for submission of its report. The Minister agreed to the request (D283) and issued revised Terms of Reference that required the report to be submitted within 30 business days from 11 January 2021.

### **1.6.3 Notice under s22 of the *Environment Protection Act***

On 19 November 2020, the EPA issued AGL with a notice under section 22(1) of the *Environment Protection Act* to provide further information by 1 February 2021<sup>6</sup>. The request was for the purpose of assessing the WAA and related to:

- demonstrating compliance with the State Environment Protection Policy (Waters) (SEPP Waters)
- analysis of options to optimise operations
- best practice justification
- revised environmental impact assessments.

The IAC noted this was a matter for the EPA and Proponents and it made no comment about that request at the Hearing.

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<sup>5</sup> D45

<sup>6</sup> A draft of the notice was provided to the IAC on 17 November 2020 (D431)

#### **1.6.4 Supplementary expert statements**

During the course of the Hearing, it became apparent that some experts had not had the opportunity to undertake site inspections as part of their preparation of expert evidence because of the COVID 19 restrictions on travel and movement. Following the lifting of those restrictions, the IAC invited experts to undertake inspections and provide supplementary evidence reports if necessary. Four supplementary reports were received and circulated (D494-497).

#### **1.6.5 Submissions in confidence and in camera**

The IAC agreed to a request from S70 that the submission be kept confidential.

The IAC agreed to a request from S487 that their submission be heard in camera and only by female members of the IAC and female representatives of the Proponents and Mornington Peninsula.

#### **1.6.6 Post hearing documents**

In its closing, the IAC affirmed that it would not receive any documents submitted post Hearing. If any documents or emails were provided, the IAC would upload these and give them a post Hearing document number. The Proponents provided some updated changes to the EPRs as they noted an error in the final version (D600, D601 and D602).

On 15 January, the Chair was forwarded an email from a DELWP staff member that had been sent by Mornington Peninsula to the Secretary of DELWP. The Chair read the letter, which made comments about some issues relating to the marine experts called by Mornington Peninsula and an issue raised on the final day by Mornington Peninsula in relation to the Proponents' final submissions. At that time, the Chair noted in the Hearing it would not make a ruling on the issue but would comment on it in the IAC's report.

The Chair sought an opinion from the IAC's Counsel assisting about disclosure of this letter. That advice made it clear the letter should be disclosed and it was then tabled as a post Hearing document. These documents are included in D603.

The parties who were invited to make an opening/closing submission were provided with a copy of the email/letter and invited to make any comment. Comments were received from:

- BLCAC (D604)
- The Proponent (D605)
- Save Westernport (D606)
- Cardinia Shire Council (D607).

The IAC has reviewed the issues raised in the responses to the email letter and it has found that none of the issues raised, either on the final day of Hearings and through the email letter and the responses received are determinative in the key considerations of the IAC in reviewing and considering the marine biodiversity matters.

### **1.7 Report structure**

The material before the IAC is significant. It includes the EES, over 6,000 submissions, over 45 statements of evidence, over 600 tabled documents and the submissions of many who spoke to the IAC at the Hearing. The IAC has distilled its considerations through identifying the key issues and what it considers to be the determinative issues.

The IAC has prepared two reports:

- Report No. 1 – Key considerations, discussion, findings and recommendations
- Report No. 2 – Appendices.

The IAC has included recommended versions of the Incorporated Document and EPRs at Appendices F and G in the event that that the Project is approved. Those versions include the changes recommended by the IAC and are based on the Day 4 versions of those documents (D587 and D602 respectively).

Changes to other approval documents such as the Pipeline Construction Environmental Management Plan (CEMP) are dealt with by individual recommendations based on the following versions of those documents:

- Pipeline CEMP Attachment J (Performance Objectives and Standards) (D583)
- Pipeline CEMP Attachment G (Environmental Line List) (D529).

Changes to other approval documents proposed by the Proponents are supported, unless otherwise recommended.

The report uses the term ‘mitigation measures’ as a generic reference to specific controls such as the EPRs, POS and Incorporated Document throughout this report.

## **1.8 Acknowledgements**

It is not possible to acknowledge all who contributed to the EES process, both through submissions and the evidence before it, and through those submitters who presented to the IAC.

The IAC thanks all who participated in this process through written submissions and those who supplemented their written submissions through evidence and/or by speaking at the Hearing. It appreciates the way in which all parties and submitters embraced that the Hearing could only be conducted by video conference, and while it presented some minor challenges at times, it all worked very well. One of the benefits was that anyone could log in at any time and listen to any aspect of the Hearing. The IAC acknowledges the Proponents for engaging AV Select to manage the video conferencing for the Hearing.

The IAC is aware that many submitters were new to this Hearing process and some felt confronted by the way in which some cross examination was conducted. In a highly contested process such as this, robust cross examination is critical for the IAC to ensure it can understand the extent and impact of the evidence before it. The IAC found the evidence and the cross examination useful in its deliberations.

The IAC particularly thanks the office of Planning Panels Victoria for its ongoing support and assistance throughout the process, with special acknowledgment to:

- Ms Andrea Harwood, Senior Project Manager
- Ms Georgia Thomas, Project Officer
- Mr Tom Milverton, Project Officer.

## 2 The Project

### 2.1 Introduction

This chapter provides a high level overview of the key elements of the Project drawn from the EES documentation, particularly EES Chapter 4. This provides context for the discussion of specific issues in Parts B and C of this report. Readers should refer to the relevant elements of the EES documentation for more specific or detailed information about the Project.

### 2.2 Project description

The Project involves the importation and supply of natural gas from interstate and international suppliers into the south-eastern Australian gas market for industrial, commercial and residential use.

The gas would be imported as liquefied natural gas (LNG) in LNG carriers and converted to natural gas on a Floating Storage and Regasification Unit (FSRU) moored at the Jetty. Following treatment, the natural gas would be piped to Pakenham East where it would join Victoria's gas network through the Victorian Transmission System (VTS).

The Project has two key components:

- Gas Import Jetty Works (GIJW) based at the Crib Point Jetty
- Pipeline Works to link the Crib Point facility with the VTS.

#### 2.2.1 Site descriptions

##### (i) The Crib Point Jetty

The Jetty is located within Western Port Bay and is part of the Port of Hastings (the Port) that is managed by the PHDA. It is located within Mornington Peninsula Shire.

##### Western Port Bay

Western Port Bay is a large tidal bay opening into Bass Strait. It encloses French Island. Most of Western Port Bay is within the Western Port Bay Ramsar site (Ramsar site) that covers approximately 59,950 hectares<sup>7</sup>.

The Bay has around 260 kilometres of coastline, connected to Bass Strait by a wide channel between Flinders and Phillip Island, and a narrow channel between San Remo and Phillip Island. The Bay has deep channels, extensive intertidal flats, mangroves, saltmarsh, seagrass beds, several small islands and two large islands (French Island and Phillip Island).

Six rivers from the north and east of the catchment flow into the northern and eastern shores of Western Port Bay and several minor rivers and creeks on the eastern slopes of the Mornington Peninsula drain into the western shores.

Western Port supports important feeding and roosting areas for numerous species of native and migratory shorebirds, many of which are listed under the international bilateral Migratory Birds Agreements Australia has with Japan, South Korea and China. The Bay periodically supports over 10,000 waders and 10,000 ducks and swans, and a rich invertebrate fauna of 1,381 species. There is intensive use by commercial shipping. Human activities include urban settlement, recreation, fishing, water extraction, and livestock grazing.

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<sup>7</sup> Ramsar Convention on Wetlands of International Importance 1971

## **The Port of Hastings**

The Port is a commercial port that has been used for the import and export of petroleum and other goods and products since 1965 when BP established a petroleum facility at Crib Point. The Jetty has three berths:

- Berth 1 is used by United Petroleum for transferring liquid fuels
- Berth 2 (the proposed FSRU berth) is not currently in use
- Berth 3 is used for offshore oil and gas pipe spooling projects.

The Port includes the Long Island Point precinct (to the north) that was established in 1969 to support the adjacent Esso refinery and provides for the processing, storage and distribution of petroleum products. This precinct contains the existing steel works wharf, owned by BlueScope Steel, and the Long Island Point Jetty, used by Esso for the movement of Liquid Petroleum Gas (LPG) and crude oil. The precinct includes a heavy industrial estate.

Port services, including tugboats, line boats and maintenance are provided out of Stony Point to the south. The Stony Point Jetty is used as a terminal for ferry services to French Island and Phillip Island.

The extent of the Port, including the associated channels, wharves and jetties, is shown in Figure 1. The PHDA advised that in recent years, the Port has accommodated approximately 100 – 140 ships per annum and has in the past accommodated over 700 ships per annum. It advised it has significant capacity to take more ships.

The PHDA is responsible for the provision and maintenance of port infrastructure and maintains and coordinates the Port of Hastings Emergency Management Plan and the Port of Hastings Maritime Security Plan. The Victorian Regional Channels Authority (VRCA) manages the Port's channels and anchorages, vessel navigation and maintenance, and Harbour Control. The VRCA and Harbour Master (employed by VRCA) are responsible for ship safety in port waters during approach and at berth, and for the Port's Safety and Environmental Management Plan.

### **(ii) Pipeline route**

The pipeline route is proposed to traverse approximately 57 kilometres from Crib Point to the Pakenham Delivery Facility (PDF), passing through the Mornington Peninsula Shire, City of Casey and Cardinia Shire. Most of the route is within agricultural areas, although some sections are within or in proximity to settlements such as Crib Point and Hastings.

Part of the pipeline route is within the Ramsar site (including Warringine Park), while some sections are adjacent to or in proximity to its boundary.

Some sections of the pipeline share or are adjacent to existing pipeline easements and infrastructure.

The location of the Project, including the key components, is shown in Figure 1.

Figure 1 Project location and pipeline route <sup>8</sup>



## 2.2.2 Gas Import Jetty Works

The GIJW include:

- the mooring of the FSRU at Crib Point Jetty Berth 2
- infrastructure, including Marine Loading Arms (MLA) and gas piping on the Jetty

<sup>8</sup> EES Summary Document, Figure 1

- the Crib Point Receiving Facility (CPRF).

The GIJW are proposed to operate for 20 years, after which the FSRU would depart and the associated infrastructure be decommissioned.

Figure 2 depicts the general arrangement of the FSRU berth, LNG carrier, the Jetty and the CPRF.

**Figure 2 Gas Import Jetty Works**<sup>9</sup>



### (i) Floating Storage Regassification Unit

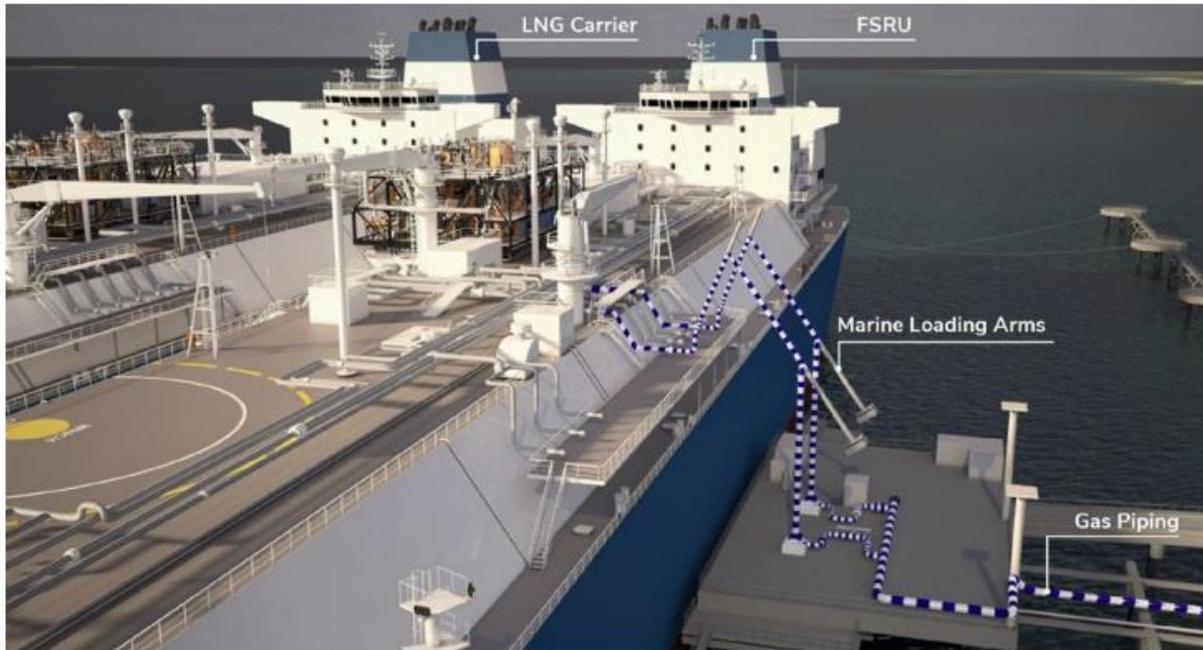
The FSRU would convert the LNG into natural gas. It would be approximately 300 metres long and 50 metres wide, with an air draft (highest point above sea level) of approximately 50 metres. It would have an LNG storage capacity of approximately 170,000 cubic metres. The FSRU would store LNG at minus 163°C until it is required to be supplied into the gas network and converted into gas.

The FSRU would be continuously moored at Berth 2 and would be supplied by LNG carriers on an 'as required' basis. The EES indicated that between 12 and 40 LNG carriers would supply the FSRU each year depending on gas demand and the capacity of the carriers. The refilling process would take up to 36 hours, after which the LNG carrier would depart. The LNG carriers would require the assistance of tugboats to moor at and depart from the berth.

Figure 3 depicts the gas transfer infrastructure, including the FSRU, LNG carrier and receiving works on the Jetty.

<sup>9</sup> EES Chapter 4, Figure 4-1

Figure 3 Gas transfer infrastructure<sup>10</sup>



The FSRU would use seawater:

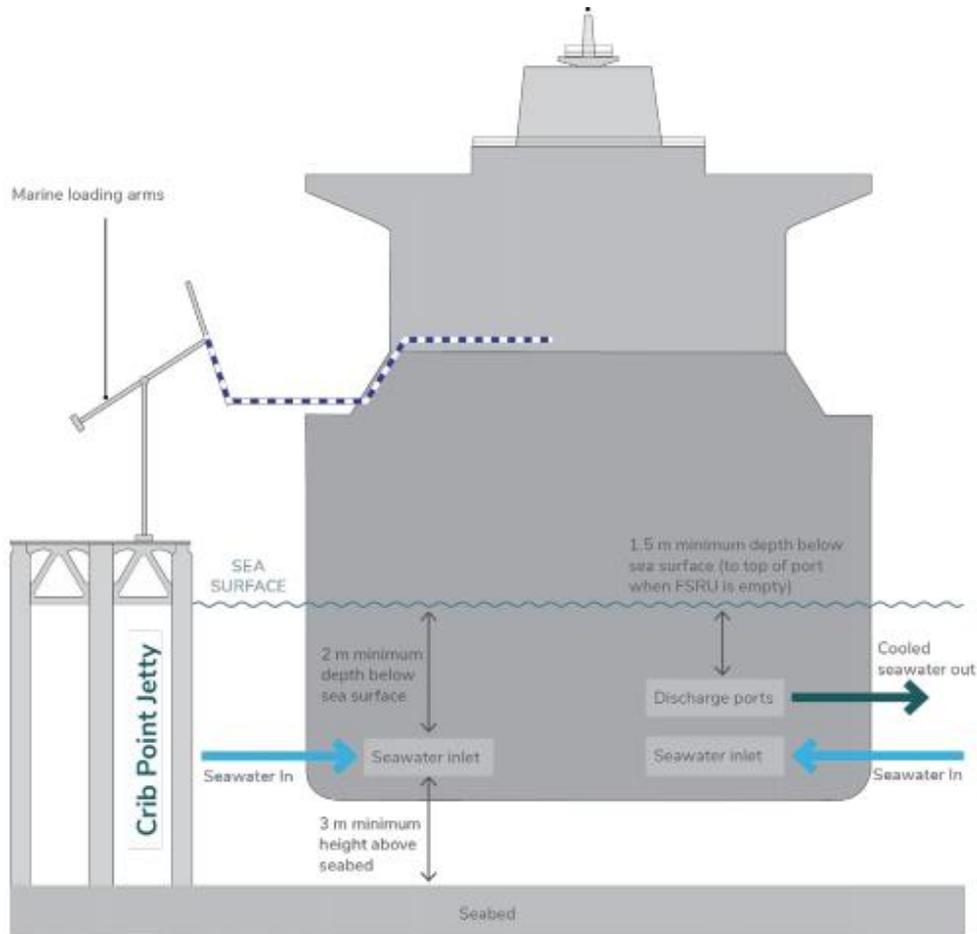
- to convert stored LNG into natural gas (regasification)
- for emergency fire water
- for a water curtain to protect the hull from cryogenic temperatures
- as ballast water to maintain the vessel's stability and longitudinal strength.

The regasification process involves warming the LNG with seawater to convert it to a gas and can be operated in 'open loop' or 'closed loop' modes. In the open loop mode, seawater is drawn into the FSRU and is used to heat the LNG and convert it into a gas. The cooled seawater is discharged back into Western Port Bay. In the closed loop mode, seawater is drawn into the FSRU and recirculated in the vessel, with steam generated on the FSRU continuously reheating the water. The Project proposes to primarily use the open loop regasification mode.

Figure 4 depicts the proposed seawater intake and discharge configuration in open loop regasification mode.

<sup>10</sup> EES Summary Document, Figure 3

**Figure 4** Simplified diagram of the proposed seawater intake and discharge configuration in open loop regasification mode <sup>11</sup>



## (ii) Jetty infrastructure

The Jetty infrastructure includes MLAs, gas piping and electrical and instrumentation equipment. Other works to Berth 2 necessary to accommodate the Project will be undertaken by the PHDA and have been separately approved.

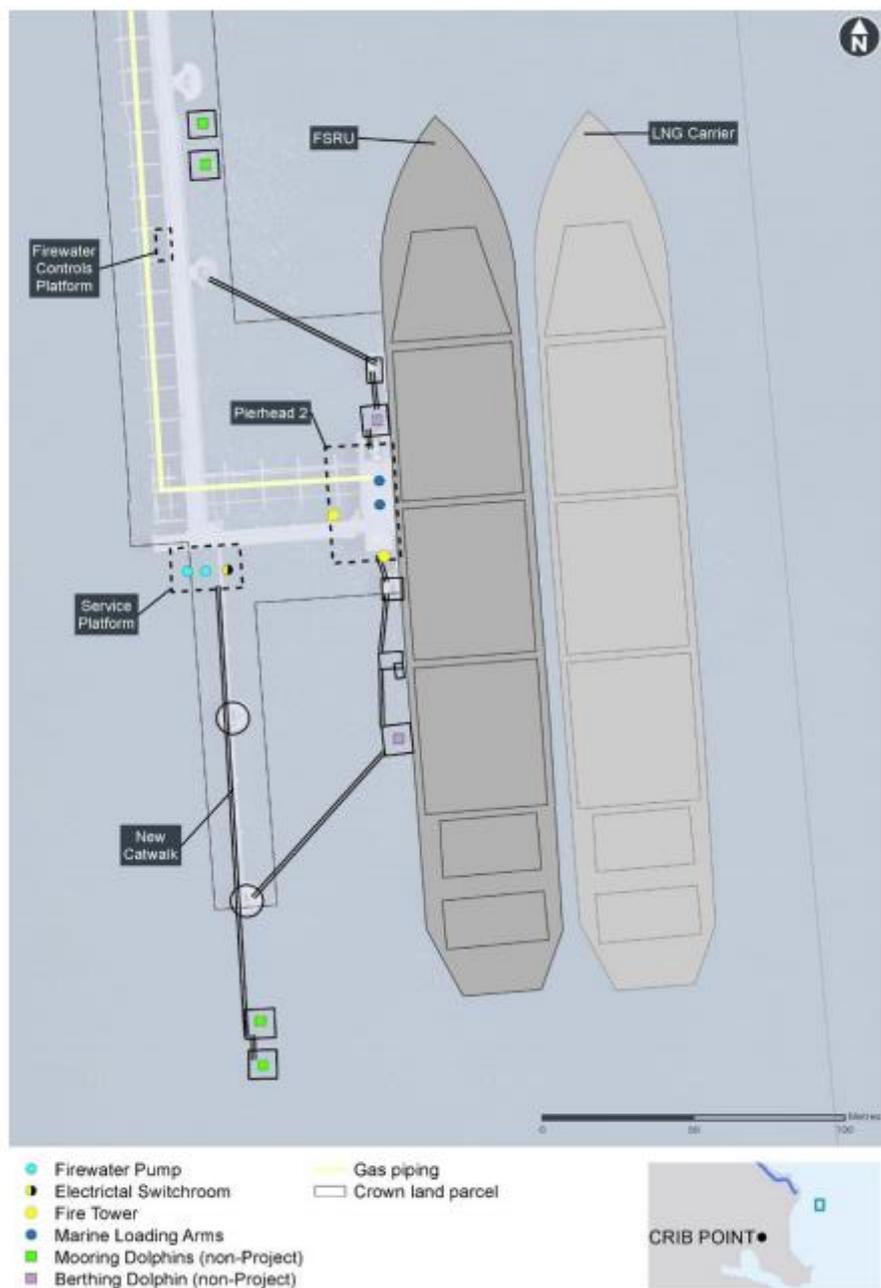
The key infrastructure works are shown on Figure 5 and include:

- two MLAs that will extend approximately 30 metres above the deck of the Jetty
- approximately 1.5 kilometres of piping to deliver the gas from the MLAs to the CPRF.

Associated infrastructure includes a hydraulic gangway tower to access the FSRU, a substation, air compressor, fire system, contaminated spill containment equipment, lighting and a CCTV security system.

<sup>11</sup> EES Chapter 4, Figure 4-7

Figure 5 Jetty infrastructure<sup>12</sup>



### (iii) Crib Point Receiving Facility

The CPRF would receive the natural gas from the FSRU via the Jetty piping and provide for:

- gas metering
- odorant injection (a safety requirement that enables the normally odourless gas to be smelled)
- nitrogen injection (to dilute the natural gas when required)
- measurement of gas composition.

The key elements of the CPRF are shown in Figure 6 and include one liquid nitrogen storage tank (approximately 20 metres high and 25 metres in diameter) and four vaporiser towers

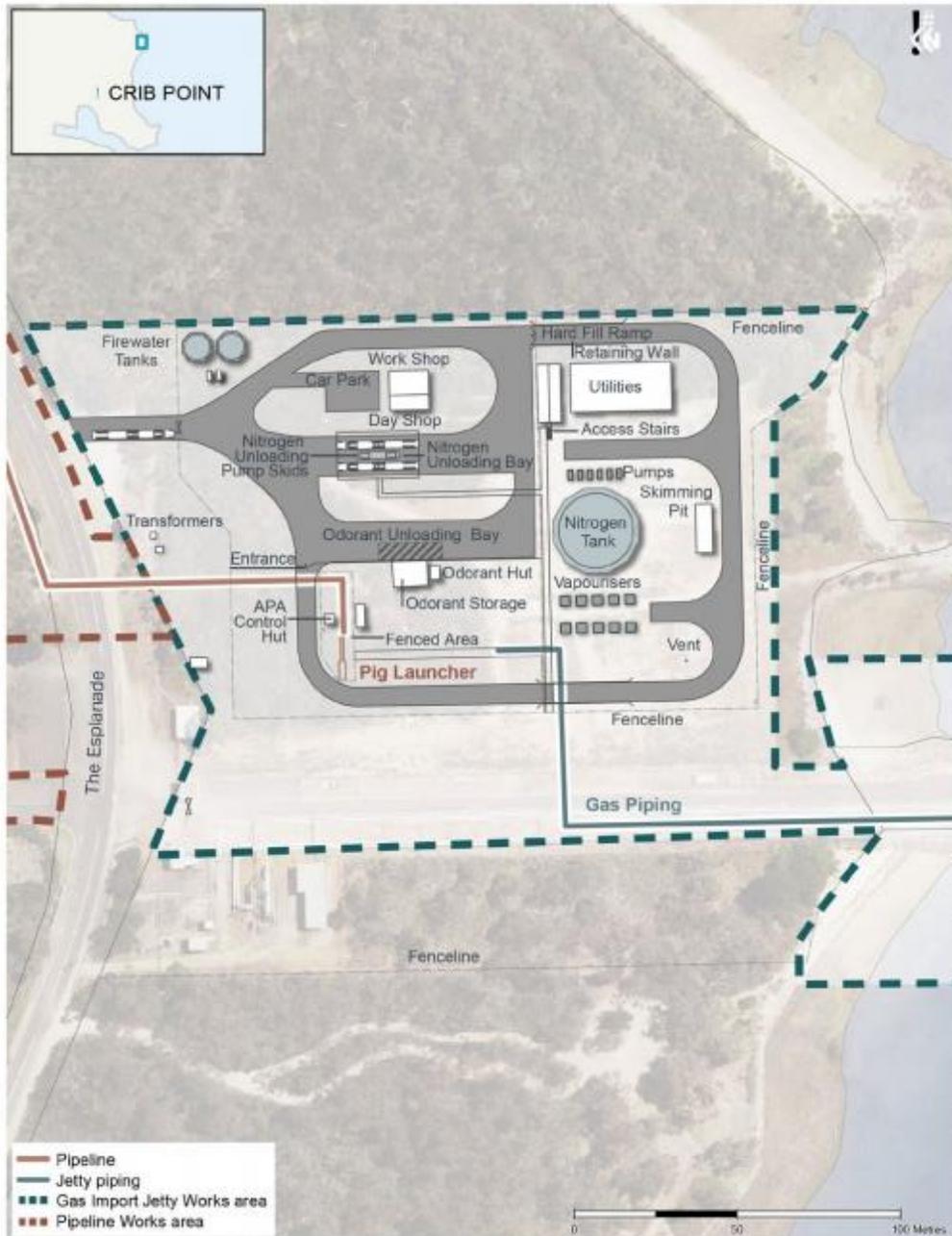
<sup>12</sup> EES Chapter 4, Figure 4-9

(approximately 15 metres high with a three metre by three metre footprint) to convert the liquid nitrogen into nitrogen gas using ambient air.

The nitrogen tank would be painted white, and the vaporiser towers would have stainless steel finishes. Trucks would deliver the liquid nitrogen, which would be unloaded via two nitrogen unloading gantries. Gas odorant would be delivered to the site via trucks and stored in tanks.

The CPRF would be automated and operate unmanned under normal operating conditions.

Figure 6 Crib Point Receiving Facility layout <sup>13</sup>



### 2.2.3 Crib Point to Pakenham East pipeline

The Pipeline Works comprise a gas transmission pipeline from the CPRF to the PDF, east of Pakenham, where it would connect to the VTS and have a design life of 60 years.

<sup>13</sup> EES Chapter 4, Figure 4-12

The key elements of the pipeline are shown on Figure 1 and include:

- Approximately 57 kilometres of underground gas pipeline with a nominal diameter of 600 millimetres, constructed within a temporary construction right of way (ROW) generally 30 metres wide and an operational easement generally 15 metres wide.
- Two mainline valve (MLV) stations that would enable isolation and depressurisation of the pipeline (via a temporary portable vent) if required during an emergency.
- A cathodic protection system to protect the pipeline from corrosion.
- A pipeline inspection gauge (PIG) launcher at the CPRF, with the PIG to be received at the PDF receiver once it has traversed the pipeline.
- The PDF, located adjacent to the Pakenham East Rail Depot at Pakenham, including a pig receiver, filtration, metering, heating, pressure control and a vent stack.
- The End of Line Scrapper Station (EOLSS), a buried facility located at the connection point to the VTS east of Pakenham.

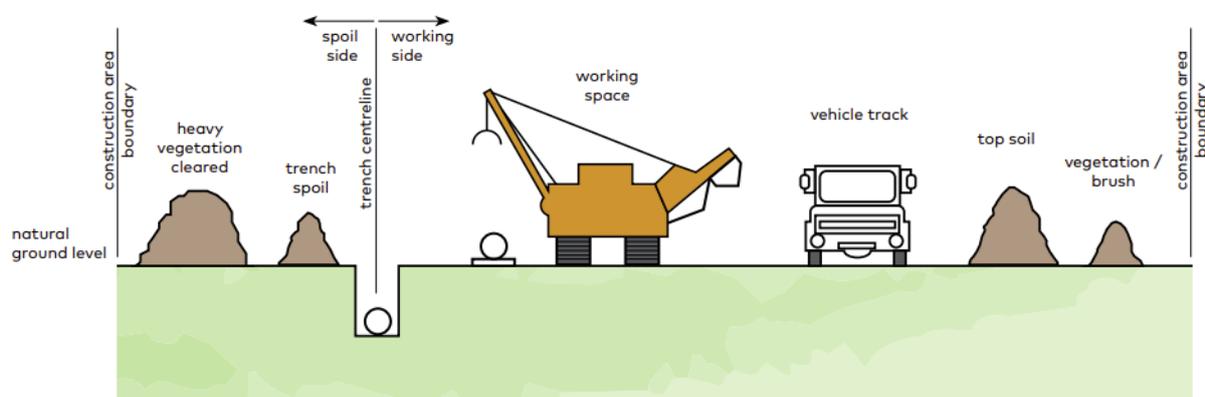
The EES included a number of minor pipeline alignment alternatives, generally within the same parcel of land. The EES indicated these options are intended to provide some flexibility to address specific landowner requirements (see Chapter 20).

### (i) Pipeline construction

The pipeline would be underground, other than at surface facility locations, and would have a minimum depth of cover of 1.2 metres. The pipeline would be bi-directional, to allow gas to flow in both directions as required. The pipeline wall would be thicker where the pipeline traverses an urban environment, sensitive locations, special crossings and possible future urban development as an additional protection measure.

The construction footprint would typically comprise a 30-metre-wide pipeline construction ROW, as well as extra workspace for temporary facilities to support construction. Indicative locations for extra workspace and temporary facilities have been identified. The typical layout of the construction ROW is shown in Figure 7.

**Figure 7** Typical layout of the construction right of way <sup>14</sup>



Most of the pipeline would be installed via open trenching, although in some areas or sites of ecological or other significance or where constraints exist, it would be constructed using

<sup>14</sup> EES Chapter 4, Figure 4-16

trenchless construction techniques such as Horizontal Directional Drilling (HDD) or shallow horizontal boring, to avoid construction disturbance.

HDD would generally be used for crossing major and sensitive watercourses where standard open cut methods would be less desirable from an environmental viewpoint. HDD might also be used for road, railway or third-party asset crossings as an alternative to shallow horizontal boring.

Shallow horizontal boring (referred to as thrust boring or micro-tunnelling) involves constructing a horizontal bore hole for installing the pipeline and would be used at sealed roads and other feature crossings, including railways, or where access is required on a 24-hour basis. The method is not suitable for boring under features where a greater depth is required, such as a major waterway. In these instances, HDD construction methodology would be used.

### **(ii) Mainline valves**

The pipeline would include two MLVs (Figure 1). The MLVs are in-line block valves that allow for isolation and depressurisation of sections of the pipeline for maintenance or during emergency conditions. The MLV sites would be acquired by APA. A typical MLV is shown at Figure 8.

**Figure 8** Typical mainline valve <sup>15</sup>



MLV1 would be located at approximately Kilometre Point 11.5 (KP) (south of Denham Road, Hastings) and have a construction footprint of approximately 50 metres by 18 metres.

MLV2 would be located at approximately KP40 (north of Bloomfield Lane) within a triangular area of land that measures 60 metres by 65 metres by 85 metres.

### **(iii) Pakenham Delivery Facility**

The PDF site would be approximately two hectares in area, located on land currently owned by Public Transport Victoria (PTV) adjacent to the Pakenham East High Capacity Metro Rail (HCMT) Depot. The land would be acquired for the Project.

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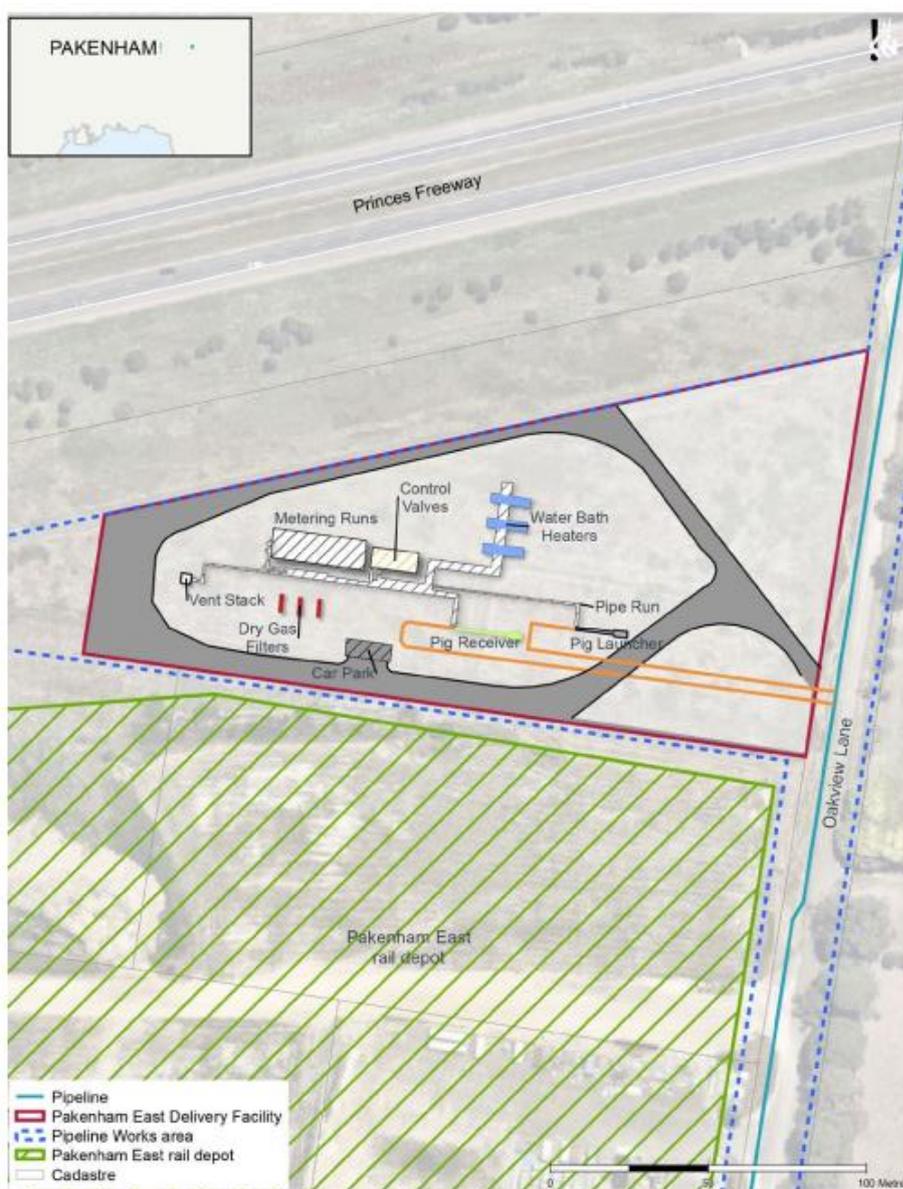
<sup>15</sup> EES Chapter 4, Figure 4-13

The PDF would include:

- filters for the removal of solid particulates from the gas
- meters for metering gas volume
- meters for the measurement of gas composition
- water bath heaters for the heating of the gas
- multiple gas flow valves for safety and pressure reduction
- a vent stack for use during emergency situations and during occasional maintenance.

The PDF would be automated and designed to operate unmanned under normal operating conditions. The indicative PDF layout is shown at Figure 9.

Figure 9 Indicative Pakenham Delivery Facility layout <sup>16</sup>



#### **(iv) End of Line Scrapper Station**

The EOLSS connects the pipeline into the VTS between the Longford to Dandenong Pipeline and the Bunyip to Pakenham Pipeline. The permanent footprint of the EOLSS would be fully contained within the existing 24 metre wide easement.

The EOLSS would be buried, with below ground valves and buried flange connections accessible via concrete pits. The EOLSS allows for connection of a temporary scraper station for pipeline pigging to inspect the pipeline during operation. During these events, excavation of the site would be required to enable access to the buried EOLSS.

#### **(v) Construction**

The EES outlined the indicative construction schedule for the various components of the Project<sup>17</sup>. It noted the Project construction would require various construction laydown and pipe stockpiling areas. These include:

- a construction laydown area on the CPRF site
- a construction laydown area to the west of The Esplanade and the CPRF site
- construction laydown areas within the PDF, MLV and EOLSS sites
- a 4.14 hectare pipe stockpiling site south of Denham Road (owned by BlueScope Steel) that would provide for the gas pipes to arrive by ship and be transported from the wharf to the pipe stockpiling area
- an additional 5.2 hectare pipe stockpiling site indicatively located at the intersection of the Koo Wee Rup Bypass and Railway Road, Koo Wee Rup.

Any additional laydown areas would be situated within existing commercial or industrial hardstand areas.

#### **(vi) Decommissioning**

The proposed operational life of the FSRU is 20 years, after which the ship would depart Crib Point. The CPRF and associated Jetty infrastructure would be decommissioned and removed under the requirements of the *Gas Safety Act 1997* and relevant legislative requirements at the time of decommissioning. The Jetty would remain as an operational jetty under the management of PHDA.

The pipeline would be designed and built with an operational life of 60 years although it could operate for longer if pipeline integrity was maintained. When the pipeline and associated facilities are no longer required, they would be decommissioned in accordance with Australian Standard AS2885 (Pipelines – Gas and Liquid Petroleum) (AS2885) and relevant legislative requirements at the time of decommissioning. A detailed decommissioning or abandonment plan and rehabilitation program would be developed and implemented in consultation with landholders and the appropriate regulator/s at the relevant time. The Proponents advised that decommissioning would be subject to separate environmental assessment and does not form part of the EES.

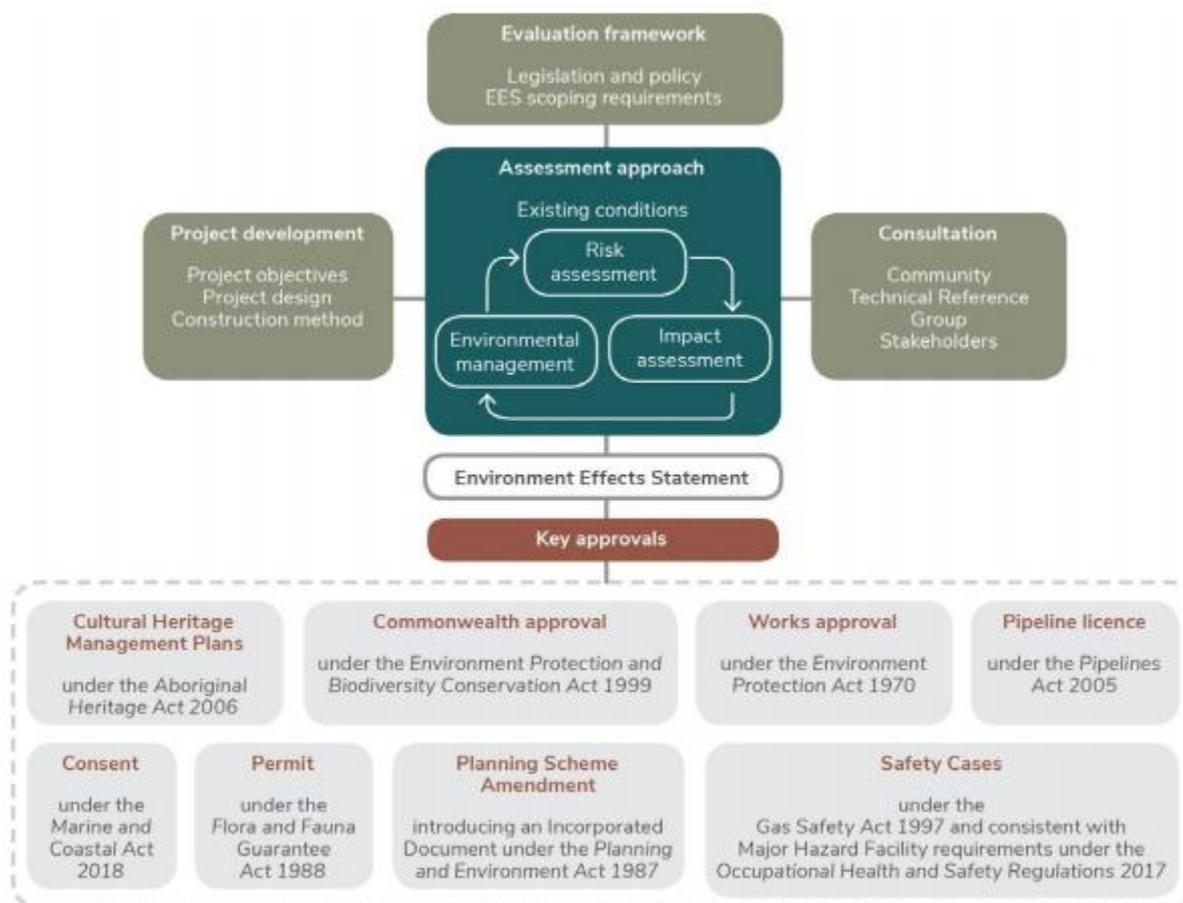
### **2.3 Project assessment and approvals**

Figure 10 outlines the EES assessment framework as described by the Proponents.

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<sup>17</sup> EES Chapter 4, Tables 4-8 to 4-12

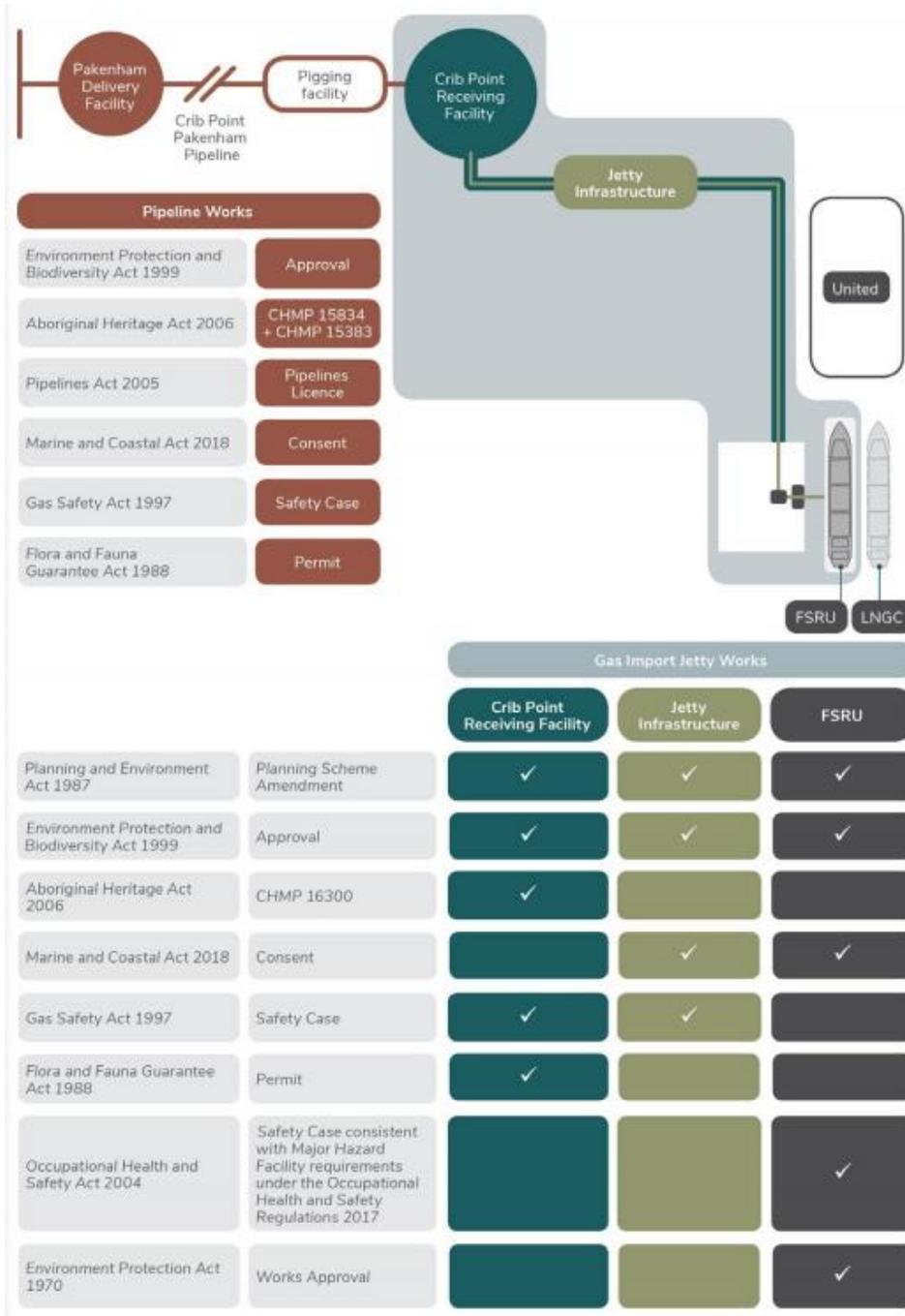
Figure 10 Environmental Effects Statement Assessment Framework <sup>18</sup>



The assessment framework was developed in the context of the EES scoping requirements issued by the Minister for Planning (discussed in Chapter 1.2.2) and by relevant legislation and policies. The scoping requirements informed the specialist studies that were undertaken and the matters that were investigated. The scope of these studies was informed by issues raised through stakeholder engagement before and during preparation of the EES and by issues identified as the Project design was refined. The outputs from the specialist studies were brought together in the completed EES, which seeks to inform decisions on the key approvals for the Project as outlined in Figure 11.

The key elements of the legislative and policy contexts are described in Appendix E.

Figure 11 Key Project approvals <sup>19</sup>



<sup>19</sup> EES Chapter 5, Figure 5-2

## 3 Project rationale and alternatives

### 3.1 Project rationale

#### 3.1.1 Introduction

The project rationale was discussed in EES Chapter 2. In summary, the rationale is that the Project would provide a secure, flexible supply of natural gas over a 20-year period that will augment future gas and energy needs in the industrial, commercial and residential sectors. It responds to projected natural gas supply limitations and cost increase issues and was noted to be consistent with Commonwealth and State policies that support natural gas as a transition fuel to a low carbon economy.

The relevant draft evaluation objective is:

**Energy efficiency, security and safety** – To provide for safe and cost-effective augmentation of Victoria’s natural gas supply in the medium to longer term.

Table 1 lists the relevant evidence that was provided.

**Table 1** Project rationale evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Bolt	Nous Group	Energy policy
Proponents	Mr Fahrer	ACIL Allen Consulting	Energy market
Proponents	Mr Kelp	ACIL Allen Consulting	Energy market
CEG	Mr Robertson	Institute for Energy Economics and Financial Analysis	Energy market
Ms King (S3272)	Mr Beinat	Ecomaster	Retrofit industry

#### 3.1.2 Key issues

The key issues are:

- The scope of matters relevant to the IAC’s consideration of the project rationale.
- The extent to which the Project is consistent with Commonwealth and Victorian energy policy.
- The extent to which the Project would be safe and cost effective.

#### 3.1.3 Evidence and submissions

The Proponents submitted the Project rationale was sound and *‘natural gas currently constitutes a critical component of the Victorian and national energy mix, and that both the State and Federal Governments recognise that it will continue to play an important role into the future’*<sup>20</sup>.

They submitted *‘it is not the role of the IAC to review or assess the merit of the State or Federal Government’s energy or climate policies. The IAC must instead assess the merits of the proposal pursuant to the policies that are presently in place’*<sup>21</sup>.

<sup>20</sup> D589

<sup>21</sup> D589

The Proponents relied on the energy related evidence of Mr Bolt, Mr Fahrer and Mr Kemp.

Mr Bolt provided an overview of relevant Commonwealth and State legislation and policy, including Australian Energy Market Operator (AEMO) forecasts. He noted that the possible importation of LNG was referenced in various policy documents, including the recent AEMO assessment that:

Committed annual gas supply forecasts provided to AEMO by Victorian gas producers have increased by approximately 10% for 2020-23 compared to the 2019 VGPR, due to some anticipated projects progressing into committed projects. Despite the near-term increase in forecasts, committed supply is forecast to reduce by 37% from 2022 to 2024 due to field decline. Without additional gas supply, removal of pipeline constraints, or a liquefied natural gas (LNG) import terminal, gas supply restrictions and curtailment may be necessary from 2024 <sup>22</sup>.

He gave evidence that the Project:

- Is consistent with Federal and State policies that support a more secure supply of natural gas and this will remain the case, even as the energy mix shifts to lower emission energy sources.
- Is flexible and its timeframe presents the '*least impediment*' to adopting more ambitious emission targets, compared to other gas supply options.
- Would reinforce electricity supply reliability and contribute to decarbonisation by supplying gas for flexible power plants to back up renewable power and enable the closure of coal-fired power stations.

Mr Bolt concluded:

Both the Australian and Victorian governments have policies to maintain reliable and affordable gas and electricity supplies, and to reduce carbon emissions to net zero. A gas import terminal utilising a FSRU and pipeline is consistent with those policies.

The modest scale of the development, and the likely critical role of gas in securing energy while decarbonising over coming decades, means that a decision by AGL and APA to proceed with this investment is unlikely to impede the adoption of more ambitious decarbonisation policies in future <sup>23</sup>.

Mr Fahrer gave evidence in relation to energy supply and cost that:

- The supply of gas from Bass Strait is declining and will need to be replaced given the projected consumption of gas in Victoria.
- The Project would contribute to replacing this supply, including peak demand in winter.
- Options for alternative gas supplies from Queensland are limited by contractual obligations and pipeline capacity limits, while the Port Kembla gas import project might not proceed and if it did would only make a small contribution to Victorian peak winter demand.
- Increased energy efficiency has already been factored into demand forecasts and is unlikely to close the increasing gap between gas supply and demand.
- The Project will reduce gas prices, compared to other supply sources and provide additional security for consumers, especially on peak demand days in winter.

Mr Fahrer relied on Mr Kelp's modelling of the Project's market implications which was based on the GasMark Global platform developed by ACIL Allen. That assessed the market

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<sup>22</sup> Victorian Gas Planning Report Update, March 2020, AEMO

<sup>23</sup> D66

implications over the 2020 – 2040 period, based on a range of reference case assumptions. The modelling concluded that:

- The Project will put downward pressure on Victorian gas prices over the projection period, although this will be dependent on a range of demand and supply developments.
- The Project will augment declining supplies, particularly from Bass Strait, and will enable Victoria to be self-sufficient for longer, although it will still be reliant on imported gas from interstate in peak winter months.
- If the Project does not proceed, Victorian gas consumption will marginally decrease because of the expected increase in wholesale prices.

The Proponents concluded that:

- (a) The Project's stated rationale in Chapter 2 of the EES is sound and robust;
- (b) The Project would deliver marked benefits to the operation of the East Coast Gas Market and would enhance the security, reliability and affordability of energy provision within Victoria; and
- (c) The Project is not inconsistent with and would not preclude the implementation of policies directed to achieving Victoria's commitment to achieve net zero greenhouse gas emissions by 2050 <sup>24</sup>.

Mornington Peninsula and Bass Coast (the Councils) made extensive submissions about climate change impacts, summarised as:

- a. Climate change is a real and current crisis that is already adversely affecting Australia and Victoria. In order to meet that crisis, Victoria has expressly adopted a goal of net zero by 2050.
- b. The Project will contribute to the occurrence of dangerous climate change by causing the consumption of additional natural gas over and above that which is predicted in the 'no project' scenario. This is expressly recognised in the evidence of Mr Kelp, who predicts that the Project will lead to the consumption of an additional 300 PJ of natural gas relative to a 'no project' scenario.
- c. To the extent the Project may offer some limited short-term benefits, these are substantially outweighed by the long-term contribution it will make to climate change occurring <sup>25</sup>.

The Councils submitted the key element of the policy framework the IAC should have regard to is the *Climate Change Act 2017*, including the long term target of net zero greenhouse gas emissions by 2050. They referred to the associated policy objectives and guiding principles and concluded that:

... a proper balancing of the modest and short term benefits associated with the proposal against the long term harms contributed to by the emissions associated with the Project leads to the conclusion that the Project should be refused on climate change grounds alone <sup>26</sup>.

Cardinia raised concerns about the project rationale, particularly in relation to climate change, and supported the submissions by Mornington Peninsula and Bass Coast.

Casey noted the scope for alternative energy solutions to reducing carbon emissions and recommended:

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<sup>24</sup> D589

<sup>25</sup> D426

<sup>26</sup> D426

That a 'no build' option is considered as part of the feasibility assessment for the project including a detailed analysis and comparison of environmental, social and economic impacts and benefits <sup>27</sup>.

The CEG submitted the project rationale does not justify the environmental effects and that:

- From an energy security and gas supply perspective, the Project is not '*indispensable*' and there are other alternatives to source gas and/or manage gas consumption.
- There is no guarantee that the Project will result in lower gas prices or that it will support energy transition.
- Recent developments in the energy market, including policies that will lower the demand for energy, question whether there is a convincing rationale for the Project in the context of energy security, efficiency and affordability.
- Projections provided on behalf of the Proponents overstate the demand for gas and do not adequately account for recent developments such as the Port Kembla proposal and the upgrade of the Eastern Gas Pipeline to create a bi-directional capacity, consequently, the Project is not required.
- The Project would '*prop up*' the use of a fossil fuel, particularly for the residential and commercial sectors which have the capacity to switch to electricity.

The CEG relied on the evidence of Mr Robertson that the Project and the importation of gas was a reflection that energy policy in eastern Australia had failed and that gas producers have fixed domestic prices above international prices. Mr Robertson added that:

- AEMO demand projections were unrealistically high, particularly in light of falling demand for gas-powered electricity and industry.
- Technological advances, including battery usage, had not been sufficiently reflected in gas demand forecasts.
- The residential use of gas will decline because it is now cheaper to heat houses with heat pumps and as other policy measures to replace gas use are introduced.
- Importing gas is highly inefficient and will add significantly to greenhouse gas emissions.
- A full lifecycle analysis of importing LNG shows that it is the highest greenhouse gas emitting fuel available in the market and will not assist the transition to a low carbon economy.
- Importing gas embeds the cost of liquefaction and shipping into the domestic price.

Mr Robertson concluded the Project was inconsistent with the Victorian Government's policy of net zero emissions by 2050 but should be rejected on economic grounds alone.

The CEG concluded:

... there is no credible rationale to proceed with the project on the grounds of energy security, efficiency and or affordability. There is limited evidence to demonstrate that the project will exert a beneficial influence on Victoria's energy security and costs, particularly in the context of established legislative and policy requirements to transition away from fossil fuels <sup>28</sup>.

Save Westernport supported the submission of the CEG in relation to the project rationale but added an inadequate site selection process contributed to the inadequacy of the its rationale.

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<sup>27</sup> D429

<sup>28</sup> D483

S3272 called evidence from Mr Beinat who discussed the scope for increased energy efficiency in existing housing stock. Many other submitters challenged the project rationale, particularly in terms of greenhouse gas emissions and climate change impacts.

### 3.1.4 Discussion

#### (i) Scope of the Committee's considerations

It was clear from many submissions there is widespread concern and dissatisfaction about the extent to which domestic energy policies are responding to greenhouse gas emissions and climate change impacts. The IAC acknowledges these concerns but agrees with the Proponents that its role is to assess the Project in the context of existing policy.

Related issues raised by submitters, such as greenhouse gas emissions attributable to the Project are discussed in Chapter 9.

#### (ii) Energy policy

The IAC acknowledges that Commonwealth and Victorian government policy responses to climate change and energy needs are evolving and this is likely to continue into the foreseeable future. As Mornington and Bass Coast noted, the Victorian Government's draft Infrastructure Policy was released during the Hearing and included various recommendations about energy efficiency and transition<sup>29</sup>. Similarly, the most recent report of the Victorian Gas Supply Program was released during the Hearing and reflects the role of gas as a transition fuel<sup>30</sup>. As noted, the IAC's role is to consider whether the Project is consistent with existing energy policies rather than to review those emerging policies or anticipate future policies.

In this context, the IAC recognises the policy support for moving away from fossil fuels but is satisfied that there remains support for the continuing use of gas, particularly as a transition fuel<sup>31</sup>. This is evident at the Commonwealth level and, as Mr Bolt noted, reflected by the Prime Minister's recent National Energy Address in which the Prime Minister indicated '*Gas is not only central to our industry plan, it's also central to our energy plan*' and that '*...there is no credible energy transition plan for an economy like Australia that does not involve the greater use of gas*'<sup>32</sup>.

The Commonwealth Technology Investment Roadmap highlights the ongoing role that existing energy sources, including gas, will play in the future energy mix<sup>33</sup>. These issues are the subject of continuing analysis by various national agencies, including the Australian Competition and Consumer Commission (ACCC) and AEMO which have highlighted gas supply, delivery and cost issues, including expected shortfalls<sup>34,35</sup>. They recognise the potential role of LNG importation, including the Crib Point Project.

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<sup>29</sup> Victoria's Draft 30 year Infrastructure Strategy, Infrastructure Victoria, December 2020

<sup>30</sup> Victorian Gas Program Progress Report No 5, Geological Survey of Victoria, December 2020

<sup>31</sup> Expressed in the Victorian context through the Climate Change Act 2017 and Victoria's Climate Change Framework 2016

<sup>32</sup> Prime Minister's National Energy Address, 15 September 2020

<sup>33</sup> Technology Investment Roadmap: First Low Emissions Technology Statement - 2020, Department of Industry, Science, Technology and Resources, September 2020

<sup>34</sup> Gas Inquiry 2017-2025 Interim Report, ACCC, July 2020

<sup>35</sup> Gas Planning Report Update, AEMO, March 2020 and Gas Statement of Opportunities, AEMO, March 2020

Victorian government support for the use of gas as a transition fuel was recently affirmed when legislation providing for recommencement of onshore gas exploration was approved<sup>36</sup>:

Gas will continue to play a role in supporting Victoria's transition to a cleaner energy future, in line with the Government's commitment to net zero emissions by 2050<sup>37</sup>.

This position is reflected in various Victorian government policy documents, including the Renewable Energy Action Plan that advocates for *'secure, reliable and fairly priced gas for renewable energy generation'* and the Victorian Gas Program Progress Report that noted<sup>38</sup>:

The government acknowledges that in the medium to longer term, emissions associated with natural gas usage need to be reduced to align to Victoria's net zero emissions future. With around two million Victorian customers currently dependent on gas for heating, cooking and industrial uses, it is also important Victoria has a secure and reliable supply of gas as the state transitions to renewable sources of energy<sup>39</sup>.

It is clear to the IAC that the continued use of gas, particularly as a transition fuel, is consistent with Commonwealth and Victorian government energy policies and reflected in various high level energy planning documents. It is also clear that importation of LNG is acknowledged as a potential source of that gas, including projects such as Crib Point.

For these reasons, the IAC accepts that the Project is broadly consistent with Commonwealth and Victorian energy policies and the importation of LNG to supply the Victorian gas market is acknowledged in policy as an option for augmenting future gas supplies.

### **(iii) Cost effectiveness**

The draft evaluation objective refers to the 'cost effectiveness' of the Project, an issue that was referred to in submissions and evidence, particularly the evidence of Mr Fahrer, Mr Kelp and Mr Robertson. Assessing cost effectiveness with any certainty is problematic given the range of variables that might affect the cost of delivering the Project, the future mix of energy alternatives, including other gas supply options, the evolving regulatory and policy environment, including incentives to reduce gas demand, and investment decisions by the Proponents and other energy suppliers. The complexity and interrelationships of these issues were reflected in relevant evidence.

If the Project is approved, the judgement of whether it is cost effective will ultimately be an investment decision by the Proponents, taking into account all these factors, as well as the conditions of approval and any costs or restrictions they might impose. This is consistent with the market-based approach that underpins much of Australian energy policy.

Many submitters noted other possible supply options, such as the approved Port Kembla facility and the Viva Energy importation proposal at Geelong, could potentially impact on the cost effectiveness of the Project. While this may be true, the IAC agrees with Mr Bolt's observation that having alternative gas supply options can increase market competition and help avoid future supply shortfalls with reduced cost and delay.

For these reasons, the IAC has not reached any definitive conclusions about whether the Project would be cost effective, other than to acknowledge that energy policies and supporting documents anticipate the potential role that imported LNG might have in augmenting gas supply, including the Crib Point Project.

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<sup>36</sup> Petroleum Legislation Amendment Act 2020

<sup>37</sup> Media release, the Hon Jaclyn Symes MLC, 16 June 2020

<sup>38</sup> Renewable Energy Action Plan, Victorian Government, July 2018

<sup>39</sup> Victorian Gas Program Progress Report No 5, Geological Survey of Victoria, December 2020.

#### **(iv) Other issues**

The draft evaluation objective refers to the Project's safety. EES Chapter 16 examined safety, hazard and risk, and noted the different approvals required for the different components of the Project, as well as the iterative nature of risk assessment. It concluded:

With the implementation of the identified mitigation measures and further risk assessments, potential hazardous risks during construction and operation to people, property and the environment would be reduced so far as is reasonably practicable.

Safety, hazard and risk issues are discussed in Chapter 14, where the IAC concludes that while some aspects of the initial safety assessment were lacking, the EES assessment is reasonable given the Project's stage of development.

Casey submitted the EES should address the 'no build' case as part of the feasibility assessment for the Project. The IAC is satisfied this issue has been adequately addressed in the Proponents submissions and evidence.

### **3.1.5 Findings**

The IAC finds:

- The Project rationale must be considered in the context of existing energy policies and it is not the role of the IAC to review those policies.
- Commonwealth and Victorian government energy policies support the continued use of gas, particularly as a transition fuel to renewable energy sources.
- The importation of LNG is one of the recognised options to augment the supply of gas within Victoria.
- The judgement about whether the Project is cost effective is an investment decision that would need to be made by the Proponents.
- The Project rationale is consistent with Commonwealth and Victorian government energy policies, subject to the Project specific assessment of greenhouse gas emissions.

## **3.2 Project alternatives**

### **3.2.1 Introduction**

In addition to setting out the Project rationale, the Scoping Requirements Report required the EES include:

- an explanation of the selection of the FSRU approach in preference to a land-based alternative
- an explanation of the rationale for selecting the proposed site for the FSRU
- an explanation of selection process for the proposed pipeline route.

Discussion of these issues was contained in EES Chapters 2 and 3. The assessment of design alternatives, mode of regassification, environmental considerations and short and long term advantages and disadvantages of the Project are discussed in EES Chapter 3 and under the relevant chapters dealing with environmental effects.

### **3.2.2 EES evaluation of alternatives**

Having concluded that LNG import was a viable policy option, EES Chapter 2 discussed a range of Project delivery alternatives.

**(i) Offshore or land-based regasification and storage facility**

Both offshore and land-based regasification and storage technologies were considered during the gas import options screening phase. Offshore facilities were assessed as preferable for several reasons:

Onshore development takes around three and a half to four years to construct and requires a large onshore footprint. In comparison, an FSRU is an LNG vessel that includes regasification equipment which can be moored at the end of a jetty, providing additional separation from nearby communities, with a small onshore facility situated near the end of the jetty. On conclusion of the Project the FSRU can be relocated elsewhere <sup>40</sup>.

Few submissions suggested a land-based facility was preferable at Crib Point.

**(ii) Selection of the FSRU site**

Eight sites were initially evaluated by AGL as potential locations to import LNG into south-eastern Australia, including Port of Newcastle, Port Botany and Port Kembla (New South Wales), Corio Quay Precinct, Port of Melbourne and Crib Point (Victoria), Port Adelaide (South Australia) and Bell Bay (Tasmania).

Initial screening of those locations was based on initial screening criteria and the following short-listed options were subjected to a more detailed assessment:

- Port Adelaide in South Australia
- Port Kembla in New South Wales
- Crib Point in Victoria.

The three sites were assessed against the following factors:

- access to key gas markets
- marine and port suitability
- land availability
- environmental effects
- economics
- synergies with other gas assets.

The evaluation of the three short-listed sites was set out in EES Chapter 2 <sup>41</sup>. In summary, Crib Point was chosen as the preferred site for the following reasons:

- Its proximity to the largest gas market in south-eastern Australia.
- The Port of Hastings is an existing international shipping port already handling LPG imports.
- The Crib Point Jetty is part of an existing industrialised area.
- The Project would be compatible with development and use of the Port under existing planning controls.
- The Jetty provides a large deep-water shipping port and a wide swing basin to enable the safe passage of vessels as well as exclusive access to a berth capable of accommodating vessels measuring up to 300 metres long, with separation from adjacent berths.

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<sup>40</sup> EES Chapter 2, page 2-24

<sup>41</sup> EES Chapter 2, pages 2-26 to 2-31

- Locating the Project on the eastern side of Melbourne was optimal as it provides access to the Longford-to-Melbourne pipeline, which is the main gas transmission pipeline supplying Melbourne.
- Other Port options lacked the required depth or infrastructure to accommodate a continuously moored FSRU.

### **(iii) Options for the pipeline route**

Chapter 2.6 of the EES provided an explanation of the selection process for the pipeline alignment.

APA commissioned reports by IDM Partners Pty Ltd in 2017 and 2018 to consider the possible pipeline alignment options. This process considered pipeline alignments from Crib Point to several different connection locations on the VTS and considered environmental, safety, social, constructability and cost constraints<sup>42</sup>.

Pipeline alignment identification and selection requirements are set out in Australian Standard AS2885. The Australian Pipelines and Gas Association Code of Environmental Practice: Onshore Pipelines provides industry accepted guidance on environmental management through the planning and acquisition, construction, operation and decommissioning phases of a pipeline's lifecycle.

The initial assessment of corridor options considered two broad corridors (Figure 12):

- A western corridor running direct from the Jetty through Hastings to APA's existing Dandenong South LNG Facility.
- An eastern corridor, which consisted of onshore and offshore options to the existing Dore Road MLV near Pakenham.

Eight alignment options were identified, two through the western corridor and six through the eastern corridor.

The eastern corridor connection point to the VTS was subsequently revised to be near the Pakenham East HCMT depot in response to the inclusion of the existing Dore Road MLV within the Pakenham East Precinct Structure Plan area.

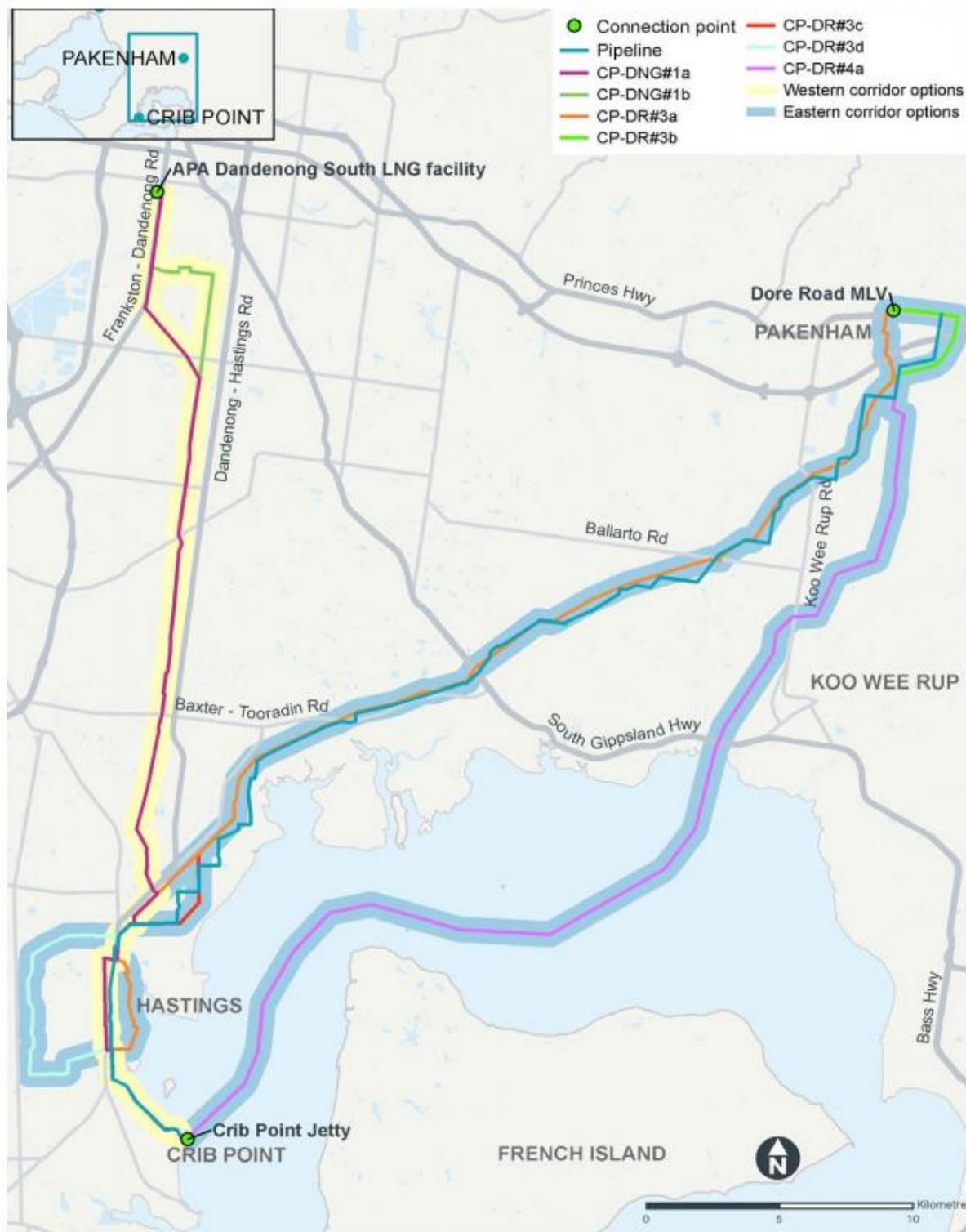
Investigation of the Dandenong South option identified this corridor as highly constrained, due to the pattern of development, urban growth and industrial subdivision in these areas. The social impacts associated with land use and tenure would have resulted in a high impact to these existing communities during construction.

Subsequent assessment discounted an offshore option due to potential impacts on the Western Port Ramsar site and significant costs associated with construction, operation and maintenance of offshore pipelines.

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<sup>42</sup> EES Section 2.6.3

Figure 12 Pipeline route options <sup>43</sup>



Pipeline alignment CP-DR#3b was ultimately identified as ‘the preferred pipeline alignment as it traverses mainly grazing land and uses existing pipeline corridors, while avoiding congested road reserves, rail yards and areas of high value intensive agriculture’ <sup>44</sup>. The EES noted this alignment minimised potential impacts on existing and future land use, including avoiding land

<sup>43</sup> EES Figure 2-21

<sup>44</sup> EES Chapter 2 page 2-36

within the Pakenham East Precinct Structure Plan (PSP) area and maximising co-location with existing infrastructure and transport corridors.

Several alignment issues are worthy of note:

- The pipeline route through Hastings was moved from the Frankston-Flinders Road corridor to the Stony Point rail corridor to significantly reduce potential business disruption and amenity impacts to the Hastings community during construction. VicTrack provided in principle support for the revised alignment <sup>45</sup>.
- The Tarago Water Supply Main pipe track reserve (Hastings to Pakenham South) was avoided due to the risk of impacts to water infrastructure during construction and potential impacts on landowners.
- Local and VicRoads managed roads were generally avoided as there is risk of damage to a pipeline in an area of high use where other services are located, and regular excavation can occur.

The majority of the pipeline alignments assessed by APA intersected the Western Port Ramsar site to varying degrees. Other options to avoid the Ramsar site, including an alignment west of Hastings, were considered but shown to have unacceptable outcomes. Alignments that intersect with the Ramsar site propose to use underground HDD methodology to avoid surface impacts, including at Warringine Park and Watson Creek.

The preferred alignment was subject to further assessment, refinement and design, with changes resulting from further investigations and engagement with relevant stakeholders. APA advised further refinement of detailed route options is ongoing.

APA refined the alignment through 11 design revisions summarised in EES Chapter 3, Table 3-5. Chapter 3 provided an account of the site selection process for the PDF and MLVs.

### **3.2.3 Key issues**

The key issues are:

- Whether a land-based regasification and storage facility should be considered.
- Whether alternative FSRU sites been properly assessed.
- Whether the pipeline route alternatives have been properly assessed.

### **3.2.4 Evidence and submissions**

#### **(i) Offshore or land-based regasification and storage**

Other than the work recorded in EES Chapter 3, the IAC was not presented with any evidence or submissions on this issue. The IAC is not aware of any support for a land-based regasification and storage facility at Crib Point.

#### **(ii) Selection of the FSRU site**

The Proponents submitted the proposed FSRU and CPRF are within the Port of Hastings which is strategically supported to serve commercial shipping, including the import and export of products such as crude oil, ethanol, LPG and steel. The Proponents submitted the GIJW are proposed to be developed and operated wholly on land and waters that form part of the Port. They submitted use of the land and further development as proposed is well supported in State and local planning policy.

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<sup>45</sup> D494

Mornington Peninsula submitted:

... the planning scheme does not prioritise the expansion of the Port over the achievement of other strategic planning objectives. Rather, the correct reading of the policy framework as it applies to the Port of Hastings is that policy support for the any material expansion of the Port is contingent on that expansion delivering acceptable environmental outcomes. As has been stated, MPSC does not consider the current proposal will do so <sup>46</sup>.

Mornington Peninsula submitted there is limited information on alternative sites such as Corio Bay and Port Kembla in the EES.

The CEG supported this position and added the permanent mooring of the FSRU goes well beyond the existing port and industrial purposes of Westernport.

Several submitters, including Save Westernport, asserted the use of Crib Point has declined in recent years, the Port is in the process of being de-industrialised and the proposed intensification of development on the site was not appropriate. Further, they submitted the site selection process was inadequate and safety matters should have been given greater weight at the site selection stage. They contended the IAC should seek further submissions about alternative project locations.

Several submitters raised concerns about the selection of Crib Point compared to other locations such as Port Kembla, Corio Bay and other locations in the Port of Hastings. Other submitters were concerned the environmental impacts of the Crib Point location had been understated in comparison to alternatives.

The Proponents submitted these contentions were based on a false premise and failed to recognise existing strategic documents, the long term vision for the Port, the current zoning of the Port and the historic and ongoing use of the Port.

The PHDA supported the Project based on its consistency with government policy, planning policies and the Port Development Strategy (PDS) <sup>47</sup>. It noted the site is recognised in both Plan Melbourne and Victoria's Industrial Land Use Strategy as a State Significant Transport Gateway. It submitted that recent strategic developments in relation to the role of the Port do not suggest that its long term future should or will be diminished. Nor it submitted, do recent and proposed port developments suggest that the Port is de-industrialising.

### **(iii) Options for the pipeline route**

The Department of Transport supported the alignment of the pipeline along the Stony Point rail corridor subject to a number of conditions to protect rail assets and to preserve future rail upgrade options.

Several submitters, including Cardinia raised concerns about the impact of the pipeline alignment on specific properties. Site specific pipeline route issues were raised by several submitters, and these are discussed in Chapter 20.

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<sup>46</sup> D564

<sup>47</sup> 2018 Port Development Strategy, PHDA

### **3.2.5 Discussion**

#### **(i) Offshore or land-based regasification and storage facility**

The IAC accepts the Proponents reasoning not to pursue a land-based regasification and storage facility at Crib Point.

#### **(ii) Selection of the FSRU site**

The IAC accepts that the assessment of options for the FSRU site used a sound methodology.

The IAC accepts that assessment of alternative sites presented in the EES, while not a detailed assessment of all aspects of all sites, is a reasonable preliminary assessment of the advantages and disadvantages of the alternatives. In the IAC's view, there are no omissions or flaws in the preliminary site assessment that would prevent the Project from being further assessed.

The IAC is aware the analysis of alternative FSRU locations could be a 'moving feast' as new alternatives and further details about other alternatives become known over time. This should not stop the Project from being assessed on its merits through this process.

The main site assessment criteria in dispute was the extent of strategic support for the Crib Point site. The IAC accepts submissions from the Proponents and the PHDA there is broad policy and strategic support for the Project within the Port of Hastings. The IAC accepts arguments this policy support is not over-riding and is subject to assessing the environmental and other impacts of the Project. This is discussed further in Chapter 15 in relation to the strategic role of the Port.

#### **(iii) Options for the pipeline route**

The pipeline alignment has gone through an extensive process over a four-year period. The IAC accepts the reasons why some alternative alignments have been discarded and agrees with the reasoning for recent refinements to the preferred alignment such as adoption of the Stony Point rail corridor. Any pipeline route will have impacts and the proposed route seeks to achieve a balance between environmental, economic and social impacts. The IAC notes APA's commitment to continual refinement of the route as required, in consultation with landowners and other stakeholders.

The IAC agrees with the rationale for the location of the CPRF, the PDF and other pipeline infrastructure.

More detailed site specific pipeline issues relating to the pipeline alignment are discussed in Chapter 20.

### **3.2.6 Findings**

The IAC finds:

- A land-based regasification and storage facility is not an option that has been assessed as part of the EES process.
- The EES assessment of alternative locations for the FSRU is acceptable, and the Crib Point site is a legitimate option that warrants more detailed assessment.
- The EES assessment of broad pipeline route alternatives is acceptable, and the proposed alignment is a legitimate option that warrants more detailed assessment.

## **PART B: ENVIRONMENTAL EFFECTS OF THE PROJECT**

## 4 Marine biodiversity

### 4.1 Introduction

Marine biodiversity effects are discussed in EES Chapter 6 and Technical Report A.

The relevant draft evaluation objectives are:

**Biodiversity** – To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

**Waste** - To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

The EES proposes 16 mitigation measures included in the EPRs to manage the impacts of the Project on marine biodiversity. These include:

- EPR-ME01: Design of intake, velocity and screening grilles
- EPR-ME02: Limit seawater regasification flows between September and February
- EPR-ME03: Use 6 port design to increase mixing
- EPR-ME04: High velocity discharge to increase dilution
- EPR-ME05: Port of Hastings Handbook
- EPR-ME06: Compliance with the environment management plan, regulations or policies
- EPR-ME07: No unauthorised cleaning
- EPR-ME08: Operation within dredged area
- EPR-ME09: Class and International Maritime Organization (IMO) standards
- EPR-ME10: FSRU mooring and LNG carriers pilotage
- EPR-ME11: Limiting lights to the number for safe operations
- EPR-ME12: Appropriate antifoul, cleaned and inspected in accordance with regulations
- EPR-ME13: Exclusion zone around FSRU
- EPR-ME14: Policing of exclusion zone
- EPR-ME15: Speed restrictions and Master watches for whales
- EPR-ME16: Monitoring program.

In response to the IAC's RFI, the Proponents provided the following TNs relating to potential impacts to the marine environment:

- TN06: Operation of the FSRU
- TN07: Chlorine and temperature discharge conditions
- TN15: Regasification when LNG tanker is present
- TN28: Seawater use
- TN32: Risk methodology – assessment of spills
- TN33: FSRU operation
- TN34: Seawater use
- TN35: Chlorine and temperature discharge conditions
- TN36: Consequence criterion Clarification of the risk register and methodologies

- TN53: FSRU chlorination discharge.

The IAC benefited from extensive submissions and wide-ranging evidence in its consideration of potential impacts to marine biodiversity.

Table 2 lists the marine biodiversity evidence that was provided.

Table 2 Marine biodiversity evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Chidgey	CEE Consulting	Marine ecology
Proponents	Dr Wallis	CEE Consulting	Hydrodynamics
Mornington Peninsula and Bass Coast	Dr Lincoln Smith	Cardno TGM	Marine ecology
Mornington Peninsula and Bass Coast	Dr Blount	Cardno TGM	Shorebird ecology
CEG	Dr Edmunds	Australian Marine Ecology	Marine ecology
CEG	Professor Baldock	University of Queensland	Hydrodynamics
CEG	Mr Waldrop	Safety, Environment and Emergency Response Associates	Marine science
CEG	Professor Cook	Monash University	Environmental Chemistry

Mr Chidgey and Dr Wallis both lodged supplementary evidence and responses to other evidence and matters raised during the Hearing (D163, D164, D395, D540 and D541). Dr Lincoln Smith and Dr Blount lodged supplementary evidence in reply (D158), Dr Edmunds lodged supplementary evidence with suggested changes to the EPRs (D491) and Professor Baldock responded to questions from the IAC (D521).

## 4.2 Key issues

The key issues are:

- The understanding of the marine environment and the adequacy of assessments conducted to predict the impact to the marine environment.
- Seawater discharge containing residual chlorine and cold water.
- Seawater intake and entrainment of biota.

## 4.3 Understanding the marine environment

### 4.3.1 Background

EES Chapter 6 and Technical Report A Section 5 describe the existing physical, biological and environmental features of Western Port Bay. The existing conditions reference a range of literature that published describing the characteristics of the marine environment. Technical Report A was supported by several Annexures that described the outcomes of assessments conducted in Western Port Bay, namely:

- Annexure A-A: Behaviour and regulation of chlorine in waters

- Annexure A-B: Phytoplankton sampling program
- Annexure A-C: Zooplankton sampling program
- Annexure A-D: Subtidal benthic habitats and biodiversity
- Annexure A-E: Water temperature - monitoring results
- Annexure A-F: Threatened ghost shrimp survey
- Annexure A-G: Ichthyoplankton sampling program
- Annexure A-H: Hydrodynamic modelling report
- Annexure A-I: Underwater noise impact assessment
- Annexure A-J: Underwater acoustic modelling.

Technical Report A focussed on a range of ecosystem components, particularly around Crib Point. The marine biodiversity assessments considered potential impacts at the GIJW, primarily from operations of the FSRU and mooring of the LNG carrier when offloading the LNG. Biological and physico-chemical monitoring was conducted which included sampling plankton populations, seabed surveys and water quality monitoring. Computer modelling was performed to understand the hydrodynamic conditions of the marine waters of Western Port Bay and the localised Crib Point environment. The hydrodynamic modelling of the marine environment was conducted to predict the path and dispersion of discharge plumes from the FSRU and the potential rate of particle entrainment including plankton and small biota.

The Proponents relied on the evidence of Mr Chidgey and Dr Wallis of CEE Pty Ltd who were the primary authors of Technical Report A. Mr Chidgey and Dr Wallis were supported by a range of other specialists who contributed to technical input into the twelve Annexures that supported EES Chapter 6 and Technical Report A.

The marine biodiversity assessment was independently peer reviewed by GHD Pty Ltd and presented as Technical Report A Annexure A-L. The scope of the peer review was to review the assessment conducted and determine if it adequately addressed the EES Scoping Requirements. The peer review surmised that generally *'the marine ecology assessment methodology is appropriate to the assessment required and the conclusions presented can be reasonably drawn from the methods used'*. GHD concluded the hydrodynamic modelling methodology adequately assessed the cool and warm water exchanges, the chlorine discharges on the seabed habitat, and the entrainment predictions of planktonic organisms in the water column into the FSRU over a number of scenarios.

The relevant near-field and far-field hydrodynamic modelling reports were independently reviewed by eCoast Marine Consulting and Research, New Zealand. The findings of the peer review were presented in Technical Report A Annexure A-K. The peer review concluded that the *'tools and methods used for the nearfield and regional modelling are appropriate and the results seem reasonable'*.

### **4.3.2 The Western Port Ramsar site**

#### **(i) Evidence and submissions**

In their opening submission, the Proponents asserted the Project is consistent with State and local planning policies that support the operation of the Port of Hastings, without undermining policies that seek to maintain and improve the overall ecological character of the Western Port Ramsar site. They submitted the operation of the FSRU at Crib Point compared favourably with existing industry within the Port (see Chapter 15).

The Proponents submitted the Western Port Ramsar Ecological Character Description and the ecosystem Components, Processes and Systems (CPS) can be protected during operation of the FSRU. They noted the information in Technical Report A was prepared by experienced experts, with input from other experts as necessary. They submitted the EES is highly conservative and assessed impact to Western Port Bay based on worst case operational scenarios. They presented the outcomes of the Project to marine biodiversity would be undetectable within the context of the entire Bay.

Mornington Peninsula and Bass Coast submitted that a balance needed to be struck between expanding the Port and protecting the Western Port environment. They submitted that balancing the different values and uses and applying the principles of ecologically sustainable development is key to development in Western Port.

The Councils submitted the Proponents only considered Crib Point's primary function as a working port and its impact assessments to inform the EES only considered the immediate area of impact within the Port.

The Councils raised the point on numerous occasions that Crib Point is dissimilar to other working Port environments such as Long Island Jetty. Mr Chidgey gave evidence that Crib Point will continue to be used as it was intended and impacts would be negligible in the context of the operating Port and across the broader environment of Western Port Bay.

In their closing submission, Mornington Peninsula and Bass Coast stated *'the Proponents have acknowledged the environmental and biodiversity significance of Western Port but have been unable to establish that those assets will be 'protected' let alone 'enhanced' or 'improved' as called for by State Planning Policies and Plan Melbourne'*<sup>48</sup>.

The Commonwealth Department of Agriculture, Water and Environment (DAWE) submitted it is not appropriate:

to link the potential impacts of the proposed action to the fact that the environment is a working Port, and that impacts of the action should be assessed relative to the critical components, processes and services of the Ramsar site.

The CEG stated in its opening submission:

... acceptable environmental effects and outcomes are those that provide for a protected environment, and that are consistent with 'a trajectory of improvement.

It added:

...effects and outcomes that allow for the environment to be further deteriorated by ongoing incremental losses and trajectories of decline are not acceptable<sup>49</sup>.

## **(ii) Discussion**

Western Port Bay was designated as a Ramsar listed wetland of international significance in 1982 (one of approximately 65 in Australia), and a UNESCO Biosphere Reserve in 2002 (only one in Victoria and one of nine in Australia). Both designations were made in the context of Western Port Bay being an existing operating Port.

The role and importance of the Port are discussed in Chapter 15, where the IAC notes that future land use decisions about the Port must balance potentially competing policies that support the use of the Port and environmental protection.

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<sup>48</sup> D564

<sup>49</sup> D155

Within the EES and throughout the Hearing, the Proponents submitted the Port has co-existed in Western Port Bay since the 1960s and has continued since the Ramsar designation in 1982. State and local policy seek co-existence and encouragement of the Port’s industrial activities, while ensuring appropriate environmental safeguards are maintained. The Proponents emphasised the Port is widely recognised within Western Port Bay and is a significant State economic asset with national importance.

The EES recognised the status of Western Port Bay as a Ramsar Wetland and stated:

The Ramsar Convention encourages signatory countries to designate wetland sites in order to conserve their ecological, botanical, zoological, limnological or hydrological importance. By listing a Ramsar site, countries agree to establish and oversee a management framework to conserve a wetland and ensure its wise use. Western Port All Ramsar sites are MNES under the EPBC Act <sup>50</sup>.

Western Port Bay is part of the Mornington Peninsula and Western Port Biosphere Reserve under the UNESCO ‘*Man and Biosphere*’ program. Its uniqueness is recognised as one of Victoria’s thirteen most significant environments that supports a number of endangered, vulnerable and threatened marine and avifauna species <sup>51</sup>.

At the national level, the *Environment Protection and Biodiversity Conservation Act* establishes the basis for managing Ramsar sites, which are recognised as a MNES under the Act. This significance is discussed in Chapter 21.

A number of submissions referred to the Shapiro study, the first study on the environment of Western Port Bay <sup>52</sup>. The IAC recognises the Shapiro report placed particular emphasis, some 46 years ago, on considering the Western Port Bay environment and the operations of the Port with balanced weighting.

Western Port Bay was variously described as vulnerable, unique, complex, delicate and compromised in submissions. Its social, economic, environmental and cultural heritage importance was raised throughout the Hearing. The designation of Western Port Bay under the Ramsar Convention was highlighted in many submissions as a distinctive characteristic that recognises the importance of the area. Designation of a wetland as a Ramsar site carries with it certain obligations, including managing the site to maintain its ‘*ecological character*’ and to have procedures in place to detect if any threatening processes are likely to, or have altered, the ‘*ecological character*’.

The Ramsar Convention defines ‘*ecological character*’ and ‘*change in ecological character*’ as:

Ecological character is the combination of the ecosystem components, processes and benefits/services [CPS] that characterise the wetlands at a given point in time.

Change in ecological character is defined as the human induced adverse alteration of any ecosystem component, process and or ecosystem benefit or service.

Changes to the ecological character of the wetland outside natural variations may signal that uses of the site or externally derived impacts on the site are unsustainable and may lead to the degradation of natural processes and thus the ultimate breakdown of the ecological, biological and hydrological functioning of the wetland <sup>53</sup>.

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<sup>50</sup> EES Technical report A page 203

<sup>51</sup> [https://www.melbournewater.com.au/sites/default/files/2018-02/Understanding\\_the\\_Western\\_Port\\_Environment\\_0.pdf](https://www.melbournewater.com.au/sites/default/files/2018-02/Understanding_the_Western_Port_Environment_0.pdf)

<sup>52</sup> Shapiro M.A. (ed.) (1975) Westernport Bay Environmental Study, 1973 -1974. Environmental Study Series No. 502. Ministry for Conservation, Victoria

<sup>53</sup> <https://www.environment.gov.au/system/files/resources/6d7408dc-2519-4294-9820-f7b2284816dd/files/module-2-framework.pdf>

The ecological character description identified the following critical components, processes and services (CPS) to the Ramsar site:

- wetland bathymetry
- geomorphology and sedimentation
- seagrass
- saltmarsh
- mangroves
- waterbirds
- invertebrates
- fish and threatened species.

The Proponents' marine experts noted the extent of knowledge of Western Port Ramsar and its critical CPS is limited. The intertidal mudflats, mangroves and seagrass beds support a diversity of local and migratory shorebirds, important commercial and recreational fish species and benthic biota. These habitats are critical as juvenile fish nurseries and are important for carbon capture and sequestration of atmospheric carbon. Western Port Bay is connected by tidal movement and provides critical foraging and roosting habitat for migratory shorebirds.

The IAC acknowledges existing activities within the Port have operated and will continue to operate in Western Port Bay with minimal adverse impacts to the ecological character of the Ramsar wetland. The EPA and PHDA indicated the number of environmental incidences in Western Port Bay is historically low <sup>54</sup>. On balance, the IAC considers existing activities have been effectively managed by Port users to protect the environmental values broadly recognised in these waters of high conservation value.

The IAC notes the primary objective of the updated Western Port Ramsar Site Management Plan:

To maintain, and where necessary improve, the ecological character of the Western Port Ramsar Site and promote wise and sustainable use <sup>55</sup>.

The IAC considers that future activities in Western Port Bay must align with the objectives of the Management Plan to maintain the ecological character and where possible improve the ecological values widely recognised in this Ramsar wetland.

### **(iii) Findings**

The IAC finds:

- The Port of Hastings and the Western Port Ramsar wetland have co-existed in relatively balanced manner.
- Existing Port related activity has been managed by its stakeholders to minimise adverse impacts to the ecological character of the Ramsar wetland.
- There are key policy and environmental imperatives to balance of the Port and the marine sensitivities of Western Port Bay in recognition that the Ramsar wetland is afforded a higher level of protection.

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<sup>54</sup> D498

<sup>55</sup> [https://www.water.vic.gov.au/\\_\\_data/assets/pdf\\_file/0029/66269/Western-Port-Ramsar-Site-Management-Plan-Summary.pdf](https://www.water.vic.gov.au/__data/assets/pdf_file/0029/66269/Western-Port-Ramsar-Site-Management-Plan-Summary.pdf)

### 4.3.3 Adequacy of environmental assessments

#### (i) Evidence and submissions

The Proponents submitted the EES was prepared in direct response to the targeted requirements of the Scoping Requirements, including the draft evaluation objectives. It was subject to a Technical Reference Group (TRG) process and determined by DELWP to be appropriate for public exhibition.

The Proponents submitted the EES was to include ‘*descriptions of the existing environment to the extent relevant to the assessment of potential effects*’. The Proponents noted Dr Blount and Dr Lincoln Smith agreed in cross-examination that determining what is and is not relevant in this respect, is a matter for professional judgement.

The Proponents closing submission responded:

The assessment approach has properly been informed by detailed assessments of the potential impacts of the Project, which in turn informed the scope and focus of the environmental effects assessments and the characterization of the existing environment. The EES accordingly did not seek to fully characterize the ecological values of Western Port. This was not its scope. It instead characterised those parts of the environment that would potentially be impacted by the construction or operation of the Project, and went on to document the various detailed and targeted environmental impact assessments completed in respect of the Project<sup>56</sup>.

Mr Chidgey and Dr Wallis gave evidence that the information on which the marine impact studies relied upon in the EES was comprehensive and fit for purpose. Their evidence was:

- The monitoring and sampling programs and physical modelling provided an understanding of the impact to Western Port Bay under a range of operating scenarios.
- The lack of direct and indirect impact outside the defined impact zone justified the sampling and analysis conducted to inform the EES.

Submitters raised concerns with the marine assessments used to predict potential impacts of the Project to marine biodiversity and argued the scope of the assessments were significantly lacking. Mornington Peninsula and Bass Coast submitted the onus was on the Proponents to demonstrate the Project’s impacts can be adequately managed. They submitted significant gaps exist in the EES and further emphasised the EES did not adequately describe the environment of Crib Point nor sufficiently assessed the potential impacts on marine biodiversity and waterbirds.

Many submitters noted a considerable amount of the EES relied on existing literature to define the ecosystems around Crib Point. Dr Lincoln Smith, Dr Blount and Dr Edmunds each gave evidence that assessment of marine habitats and biota at Crib Point was insufficient and the descriptions of the local environment and potential Project impacts were limited. Further, their evidence noted there was heavy reliance on the risk assessment to define the marine biodiversity assessments in the EES.

EES Attachment III reported the findings of the extensive risk assessment conducted across all elements of the Project. Evidence from Dr Wallis indicated:

The marine impact assessment includes an extensive combination of field studies, review of historical literature, hydrodynamic modelling and risk assessment in

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<sup>56</sup> D589

accordance with standard methods. A total of 53 potential risks are analysed and assessed, and 9 Ramsar Limits of Acceptable Change also are assessed<sup>57</sup>.

Of the 53 potential risks identified to marine biodiversity, all but one (*Contamination-spills from vessels*) was considered to have residual risks of very low to low following mitigation.

Dr Lincoln Smith and Dr Blount gave evidence that:

There are significant shortcomings evident in the marine ecology component of the risk analysis. These shortcomings fall into two broad categories: underestimation of the risk (either likelihood, consequence or both); and insufficient information available in the EES to make an appropriately informed assessment<sup>58</sup>.

Mr Chidgey and Dr Wallis generally agreed the extent of knowledge across ecosystems within Western Port Bay is limited. Mornington Peninsula and Bass Coast submitted a precautionary approach should be applied where there is potential for impact in a sensitive environment, such as Western Port Bay. The Councils submitted it is important to understand existing baseline conditions and extent of effects from existing activities, prior to attempting to understand impacts of additional activities within the Crib Point environment.

Mr Chidgey agreed that:

- an impact assessment was conducted to understand potential effects of a proposed activity on the receiving environment, prior to an action being undertaken
- it was important to identify the range of natural variability to understand impacts from future activities.

The Proponents submitted the independent reviews of the marine biodiversity assessment and the near-field and far-field hydrodynamic modelling reports concluded that the methods used to assess the Project were adequate.

Dr Lincoln Smith and Dr Blount identified the following key issues with the EES:

- data limitations to adequately predict impacts
- shortcomings in the approach to identify hazards, risk and impact
- cumulative impacts not well understood
- lack of alternative options, appropriate mitigation measures and poorly defined management options
- impacts to Ramsar and threatened/migratory shorebirds.

Dr Edmunds identified the following issues in relation to assessment of marine impacts:

- significance of ecological assets undervalued
- lack of consideration of ecosystem effects
- mitigation measures not tailored to predicted impacts
- cumulative impacts and larger scale ecosystem implications.

Mornington Peninsula and Bass Coast submitted that an improved understanding of potential for impact was required where impact may occur, which would assist with tailoring mitigation measures to reduce any potential impacts.

There was criticism from submitters that the marine assessments were not intrinsically linked. It was noted that understanding the intrinsic linkages within an environment is an effective way to adequately predict potential direct and indirect impact pathways.

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<sup>57</sup> Technical Report A Section 7.3

<sup>58</sup> D232

Dr Edmunds indicated in evidence that the EES lacked a holistic ecosystems assessment approach to understanding the potential impacts of the Project. He noted Western Port Bay contains a patchwork of communities that are interactive and tightly linked. He argued the systematic evaluation of all potential impact pathways across Crib Point, and more broadly, is required to adequately understand and predict the Project's impact pathways. The Proponents submitted it was not their responsibility to assess the entire marine environment within Western Port Bay, but rather to focus on the environment where direct and indirect impacts may be likely.

Dr Edmunds noted that FSRU vessels are operational worldwide and information specific to their activities and impacts could have been accessed to better inform the EES.

The DAWE submitted:

Fundamental issues such as potential impacts of increased shipping have not been satisfactorily assessed nor has the potential cumulative impacts of the project on the Ramsar CPS<sup>59</sup>.

The DAWE submitted the following issues were not covered adequately in the EES:

- Impacts from increased shipping, including:
  - ship wakes and sediment liberation
  - impacts to seagrass, saltmarsh and mangrove as a result of pollution/contaminants and ship wash
  - impacts of additional noise associated with increased frequency of shipping and operation of the FSRU on waterbirds (roosting and foraging)
  - noise, lighting, collisions from ships, boat wash on ghost shrimp, southern right whale, humpback whale, planktonic and pelagic marine species.
- Cumulative impacts of gas import works, noting:
  - risks and impacts have only been addressed for localised impacts of 20 hectare and 5 hectare plumes
  - a simplistic approach to conclude impacts to the Ramsar site would not be expected.
- the Marine Monitoring Program does not contain specific objectives or remedial actions to address the Ramsar CPS.

The DAWE submitted the statement in the EES that *'the likelihood of any effect from the GIJW and discharge of the FSRU on the subtidal reef or seagrass, estuarine areas, intertidal mudflats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low'* was too simplistic and did not address the cumulative impact of the additional Port activity and shipping movements on the Ramsar site.

In response to the DAWE submission, the IAC requested further information from the Proponents who provided TN30 that advised:

- An adequate baseline dataset was compiled from desktop databases and literature reviews and field surveys to predict the impacts of the Project on Ramsar wetland MNES.
- Cumulative impacts on CPS from increased shipping and Port related activities *'are properly categorised as impacts associated with the existing, ongoing, policy-supported use of the Port for port activities'*, noting any potential impacts are consistent with port related impacts elsewhere within Western Port<sup>60</sup>.

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<sup>59</sup> S2871

<sup>60</sup> D264

- Turbidity from tug wash would be localised and disturbed sediment would settle back to the seabed. The evidence of Dr Wallis was that *‘the resuspension by tugs of 640 t/yr is only 0.01 % of the amount of sediment naturally resuspended by tidal currents and waves’* within the Western Port Ramsar wetland <sup>61</sup>.
- Cumulative impacts of other shipping and Port related impacts, including marine pest introduction, seabed scouring, spills in transit and whale strike (if relevant to the IAC’s Terms of Reference) were deemed negligible.

The Proponents submitted that criticism of the impact assessment and the claim that it lacked robustness was a distraction for the IAC. They noted the methodology and approach to assess the potential environmental impacts was agreed by the TRG.

## **(ii) Discussion**

The IAC acknowledges that a significant number of submissions raised concerns the EES did not adequately characterise the Crib Point environment and the existing marine biodiversity that may be directly or indirectly impacted by the Project. The IAC notes the EES described the ecological character of Western Port Bay, placing a high reliance on a range of literature that described its marine biodiversity. The EES relied heavily on historic literature to describe the ecological character of the Ramsar site and its critical CPS. The EES relied on established Limits of Acceptable Change (LAC) for Western Port Bay to confirm the acceptability of potential change within the Crib Point environment and impacts of the Project.

As highlighted in Technical Report A, the Proponents assessed the Project’s risks against the relevant LAC for the entire environment of Western Port Bay. By comparing the Project impacts to the LAC, the Proponents concluded:

... the Project is acceptable on the basis that it does not cause a significant impact and is well within the limits of acceptable change <sup>62</sup>.

The IAC considers application of the broader Ramsar LAC to assess the impacts of the Project to the localised conditions at Crib Point is inappropriate. It presents an assessment that does not accurately assess the Project’s effects on the extent of marine biodiversity impacts on parts of the Ramsar site. Comparison to the LAC does not provide a reflection of the impacts to the CPS within this segment of Western Port Bay.

The IAC considers the EES would have been better informed if site specific assessments had been conducted at Crib Point to benchmark conditions of the CPS specific to Crib Point. The site specific benchmarked conditions could then be compared against the broader Western Port Bay LAC and used as a more appropriate measure of change to critical CPS at Crib Point.

The IAC agrees with the evidence of Drs Lincoln Smith, Blount and Edmunds that the Proponents appeared to use the risk assessment as a guide to define their assessments of biological impacts to Western Port Bay. The IAC agrees with evidence from Drs Lincoln Smith, Blount and Edmunds that the risk assessment is flawed because a significant number of risk pathways were inappropriately ranked and impacts in the localised environment were measured against the whole of Bay.

Of particular concern to the IAC were risks of chlorinated water deemed in the EES to have a negligible consequence to mangroves, saltmarsh, seagrass, subtidal invertebrate fauna, local

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<sup>61</sup> D70  
<sup>62</sup> D589

pelagic and demersal fish, listed protected species and accumulation in the food chain. The consequence of entrainment and cold seawater were generally considered negligible to minor. While the risks considered to the entire Western Port Bay may be low, the focus should have been on risks to the localised environment of Crib Point in the first instance, of which the consequence would be greater. The EES described impacts as certain, particularly to plankton, post larvae fish, the seabed and higher trophic species and this should have been correctly considered in the risk assessment.

The IAC notes the independent reviews of the marine biodiversity impact assessment and hydrodynamic modelling commissioned by the Proponents. The peer review of the marine biodiversity impact assessment appeared to only confirm the methodologies were correct, and the results drawn from the completed assessments were technically appropriate. The peer review did not confirm the extent of potential impacts of the Project, nor did it conclude on the acceptability or unacceptability of impacts to the marine environment.

The independent reviews of the near-field and far-field hydrodynamic modelling concluded the methodologies to model the chlorine, temperature and particle entrainment were sound and results were reasonable. This is in contrast to the evidence of Professor Baldock who queried the near-field inputs and the method for predicting particle entrainment (discussed further in Chapter 4.5.3). Dr Wallis countered the claims by Professor Baldock by advising particles were not added or removed within the model, and instead the modelling tracked particles in each zone to calculate:

- (1) the number that are flushed to Bass Strait;
- (2) the number that have moved to other zones due to tidal currents and dispersion;
- (3) the number that remain in the same zone; and
- (4) the number that are entrained in the intake of the FSRU <sup>63</sup>.

As described in Chapter 4.5.3, it appears the assumptions of plankton and fish larvae being replenished every seven to 21 days respectively raised concern about the predictions on replenishment particles modelled to predict the extent of entrainment.

### **(iii) Findings**

The IAC finds:

- The EES contains a substantial amount of information describing the characteristics of Western Port Bay which relies heavily on existing literature, most of which is historic in nature.
- The biological assessments were limited and only considered potential Project impacts on phytoplankton, zooplankton, ichthyoplankton, fish eggs and larvae. Impact to seabed was assessed as certain. The mapping of the seabed was patchy and disjointed, and species specific diversity and abundance of epibenthic and infauna assemblages that may be exposed to impacts from the FSRU were not described in any detail.
- The risk pathway modelling was flawed and considered consequence of most Project marine risks as negligible with varying likelihoods, yet the EES and supporting evidence acknowledged direct impacts are certain and will have an adverse impact to the Ramsar wetland on a localised scale.

- A more comprehensive understanding of the existing site specific conditions within Crib Point is required to predict potential impacts from the Project and better describe the baseline conditions.
- The lack of information in the EES on existing baseline conditions at Crib Point, within a segment of Western Port Bay creates uncertainty that potential direct and indirect impacts from the Project to marine biodiversity are measurable and can be acceptably managed.

#### 4.3.4 Assessed impacts to Western Port Bay

##### (i) Evidence and submissions

The Proponents acknowledged the operation of the FSRU will have an impact on the marine environment, and contended this impact is not unacceptable. The key impacts of the Project to the marine environment would be the seawater intake entraining and impinging marine biota, and the discharge plume of chlorine and cold water extending from the FSRU across the water column and seabed.

Technical Report A stated:

Operation of the proposed FSRU would result in shading caused by the two vessels, changed hydrodynamic conditions due to the presence of the vessels and local scour due to the discharges and tug-assisted berthing and departure of the LNG carriers as well as a zone of cooler seawater from the heat exchanger discharge.

The effects on seabed fauna would be due to the combined effects of these processes.

There would also be a minor increase in the quantity of non-living organic material from plankton damaged in the passage through the FSRU heat exchangers.

In giving evidence, Dr Wallis noted there would be:

- adverse impact to areas within the discharge plume envelope
- low impact outside the discharge plume
- negligible impact well outside the discharge plume.

Many submitters believed the Project would result in significant changes to the Crib Point marine environment. Submitters expressed concerns about the scale of potential impacts on the existing environmental values in Western Port Bay. The concern of most significance was the discharge of chlorine from the FSRU.

In evidence, Drs Lincoln Smith and Blount argued there was not an adequate baseline of existing conditions in Western Port Bay that could be used to assess potential changes. They indicated an improved monitoring program is required to better understand baseline conditions prior to commissioning the FSRU. They considered additional baseline information would assist with developing an adaptive management and monitoring framework necessary for the Project's operation beyond the proposed mitigation measures. Dr Lincoln Smith and Dr Blount believed triggers that initiate particular mitigation measures and remedial actions should be developed to manage potential operational impacts.

The potential impacts, either direct or indirect, from the GIJW to the primary productivity of Western Port Bay was questioned by Drs Edmunds, Lincoln Smith and Blount. Dr Edmunds' evidence was that the '*extensive sediment flats were likely to be the main primary production component of Western Port*'<sup>64</sup>. Dr Edmunds noted that microalgae forms a microfilm on

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<sup>64</sup> D108

unvegetated sediments and stands of intertidal seagrass and contributes to the nutrient cycling and productivity within the sediments. He added the microalgae was intrinsically linked with the secondary productivity of burrowing invertebrates (infauna), bacterial cycles and plankton and plays a critical role within the diet of migratory birds.

Drs Lincoln Smith and Blount expressed concern the intertidal and shallow subtidal habitats were not sampled to inform the EES<sup>65</sup>. They noted the decision by the Proponents not to sample was based on predictions of the hydrodynamic modelling that seawater discharged from the FSRU would not extend to the intertidal environment of Crib Point. During questioning by Mr Kane, Mr Chidgey gave evidence that microalgae is usually distinguishable on the seabed, but observations during seabed surveys to inform the EES did not identify the presence of microalgae.

The Proponents acknowledged that impacts from the FSRU are likely to occur to benthic seabed epibiota and infauna, and pelagic (free-swimming) organisms. The EES described the seabed and its benthic and infauna habitats as heterogenous, and stated:

The species present in the dredging-modified soft seabed habitat at Crib Point Jetty (Berth 2) are widely represented throughout the 36,000 ha of soft seabed in Lower North Arm, are likely to be distributed widely throughout the coastal environment of Victoria (e.g. Poore 2019).

The proportion of the species at any particular location is dependent on the natural characteristics of the seabed at that location, which is patchy at small spatial scales (metres to tens of metres) but relatively homogeneous at larger scales (hectares and kilometres)<sup>66</sup>.

Mr Chidgey gave evidence that the seabed at Crib Point is variable, containing a mosaic of benthic biota. The seabed was described as having variable sediment grain size, with undulating ripples, rubble and soft seabed communities. Technical Report A Section 8.3.4 stated:

In recognition of the importance of seabed character in determining epibiota and infauna characteristics, our major effort in documenting seabed epibiota and infauna in Lower North Arm focussed on mapping habitat in representative areas using towed video.

The IAC requested the underwater towed video footage. On review, the IAC noted the footage did not present a clear image of the seabed and it would be difficult to verify benthic species, distribution and abundance across the surveyed transects. The seabed was heterogenous and appeared consistent with the general descriptions of the Proponents' marine experts, though visibility was lacking.

The Proponents submitted throughout the EES and in evidence that during seabed surveys, Ghost shrimp were not identified, and Lamp shells were noted as present on deeper sediment. Dr Edmunds raised concern about potential impacts to Lamp shell communities that are present only at Crib Point and have not been identified anywhere else in Victoria.

Dr Wallis recognised there would be changes to seabed assemblages in the area around the FSRU. The Proponents submitted this would be acceptable as impact would be confined to waters within the Port area of the Jetty.

The marine experts for the Councils and CEG were concerned that spatial variability in benthic assemblages was not adequately addressed in the EES. The Councils and CEG submitted there

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<sup>65</sup> D232

<sup>66</sup> Technical Report A Section 7.7.12

was inconsistent sampling and inadequate description of benthic infauna, the diversity of benthic habitat was not well understood, and the extent of potential impact remained unknown.

Mornington Peninsula and Bass Coast submitted that according to the risk assessment, the Proponents considered annihilation of benthic habitats within nine hectares of the FSRU as a negligible consequence.

The EES stated that shading, particularly with the LNG carrier moored adjacent to the FSRU, would be a significant stress as it would *'reduce light in the water column and also reduce the biota in the water column occupied by the vessels'*<sup>67</sup>.

Many submitters expressed concern the Proponents did not adequately recognise the presence of a range of marine fauna species that frequent Crib Point and the North Arm. For example, higher trophic order fauna such as seabirds, seals, penguins, dolphins and whales were noted as frequently navigating the North Arm of Western Port Bay. (Whale strike is discussed in Chapter 14.)

EES Technical Report A noted the ichthyoplankton survey discovered:

Fish larvae came from 28 fish families, dominated by the Gobiidae (gobies) and to a lesser extent by the Syngnathidae (seahorses and pipefish) and Tetraogidae (scorpionfish and cobblers).

Larval fish from ten families were potentially of recreational and commercial fishing interest.

The Proponents noted flathead, King George Whiting, pipefish, seahorse, flounder, and an Australian Grayling were identified during the ichthyoplankton surveys. Submitters noted Western Port Bay provided important habitat for a range of recreational and commercial fish species and considered that information and potential impacts to fish was lacking in the EES.

Concerns were raised as larger, post larval pelagic and demersal fish had not been surveyed in any of the habitats surrounding Crib Point. A common theme in submissions was recreational and commercial fishers would experience less catch as a result of impacts from the Project to the important nursery habitats surrounding the Jetty. Submissions expressed concern the Project may compromise the quality of important recreational and commercial fish, questioning whether fish tissue may become damaged and tainted by the seawater discharge.

The CEG raised concern that continuous operation of the FSRU may cause barrier effects from underwater noise, vibration, lighting, chlorine plumes and colder water, impacting on the behaviour and movement of fauna.

Mornington Peninsula and Bass Coast raised concerns during cross examination of Mr Chidgey that Little Penguins inhabiting Barrallier Island were not surveyed to better inform the EES. Mr Chidgey indicated State government agencies preferred the presence of penguins north of Crib Point not be widely publicised. Mr Chidgey noted penguins may frequent the vicinity of Crib Point, but were not detected during unrelated surveys to inform Technical Report A.

Other issues commonly raised by submitters included the risk of introduced marine pests and invasive species, sediment disturbance by tugboat wash and oil spills. Mr Waldrop submitted:

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<sup>67</sup> Technical Report A Section 8.5.2

The EES has made little attempt to identify species that could be impacted by oil (either surface or subsurface oil) and does not provide a foundation for subsequent impact assessment. Consequently, the assessments of potential effects is limited and inadequate<sup>68</sup>.

The Proponents submitted *'risk of oil spills is a risk that exists where there is shipping'* and the EES had given ample consideration to oil spills deemed the greatest risk to marine biodiversity of Western Port Bay<sup>69</sup>. In closing, the Proponents concluded the EES had adequately considered the risk of routine and non-routine spills, noting there was no basis to suggest any special risk associated with the LNG tankers servicing the Project. They contended management plans would consider the prevention and management of non-routine spills from the GIJW.

Submitters, including Mornington Peninsula and Bass Coast, CEG and the local community, argued there was a lack of information that described potential risk of turbidity and seabed scouring that could occur from the four tugboats required to manoeuvre the LNG carrier in place. Drs Lincoln Smith and Blount indicated that additional sampling should be required during tugboat operations. They noted that tributyltin (TBT) is present in sediment at Berth 1, which warranted further consideration.

Technical Report A included a desktop assessment of introduced marine pests and invasive species in Western Port Bay. The Proponents relied on historic surveys conducted in 1997 and 2000 to describe the distribution of marine pests and invasive species in Western Port Bay and more specifically Crib Point. Dr Edmunds submitted that there was inadequate consideration of marine pests.

Several submitters suggested the marine biodiversity risk assessment was not transparent, it lacked quantitative scientific evidence and was subjective. Dr Edmunds questioned the process and outcomes of the risk assessment which the EES placed heavy emphasis on to predict environmental effects. He raised concerns the risk assessment had little supporting information on how and why each impact pathway was chosen or the logic for the likelihood and consequence ratings.

Drs Lincoln Smith and Blount noted the Project risk assessment was broadly based on the LAC which apply to determining impacts across the entire Western Port Ramsar site.

Mr Lane gave evidence that:

The components, processes and services approach to Ramsar site impact assessment is an Australia-wide, accepted framework for monitoring and assessing impacts on the ecological character of Ramsar sites. These have not been proposed by the authors of Technical Report B; rather they have been correctly adopted by them as the impact assessment framework for an Australian Ramsar site<sup>70</sup>.

The Proponents submitted in closing:

... when this [Australia-wide, accepted] framework is applied, the outcome is clear: the Project is acceptable on the basis that it does not cause a significant impact and is well within the limits of acceptable change<sup>71</sup>.

Drs Lincoln Smith and Blount noted the LAC has a Bay-wide application and was not appropriate to assess the impact on a local scale. They contended broad scale assessments performed in the risk assessment carried the risk that local scale impacts from the Project may

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<sup>68</sup> D107

<sup>69</sup> D589

<sup>70</sup> D210

<sup>71</sup> D589

be missed. Their evidence and that of Dr Edmunds was that consequence ratings did not directly relate to local scale impacts that may result from the Project.

## **(ii) Discussion**

Western Port Bay is listed under the Ramsar convention, protected by the *Environment Protection and Biodiversity Conservation Act* as a MNES and recognised by and recognised by State Environment Protection Policy SEPP (Waters) as an area of high conservation value. The Australian and New Zealand Water Quality Guidelines (WQ Guidelines) state:

For ecosystems highly valued for their unmodified state and outstanding natural and conservation values, there should typically be no change in biodiversity beyond natural variability. Where possible, there should also be no change in water/sediment chemical and physical properties, including toxicants<sup>72</sup>.

The Proponents acknowledged the Project will impact Western Port Bay, and the impact is predicted to occur within proximity to the FSRU and within designated Port waters. The EES relied on the outcomes of its marine biodiversity risk assessment to determine the focus of biological assessments.

Many submitters criticised the marine biodiversity risk assessment. The Proponents submitted the outcomes of the risk assessment were informed by the hydrodynamic modelling and biological assessments. The risk assessment identified 53 potential risks to the marine environment. The IAC agrees with submissions and the Mornington Peninsula and Bass Coast and CEG marine experts that several elements in the risk assessment were flawed.

The IAC questions the validity of findings that the marine biodiversity risks are generally considered low or very low in the Environmental Risk Report (EES Attachment III). The IAC agrees with evidence from Drs Lincoln Smith and Blount that the risk assessment appears to be unsupported by baseline condition surveys and environmental assessments.

Based on the evidence and submissions, the IAC considers there is:

- an underestimation of the likelihood, consequence or both of identified risks
- a lack of direct relationship between the consequence ratings and local scale impacts
- a disconnect between broad scale assessments and local scale impacts from the Project
- insufficient information available in the EES to conduct an appropriately informed risk assessment.

The IAC notes the varied criticisms of the EES, with Dr Edmunds asserting that the Proponents' predictions of physical impacts to the marine environment were used as surrogates for biological responses to marine biota. Similarly, it agrees with submissions opposing the Project that the EES did not discuss the ecological implications of the Project on the full range of direct and indirect biological impacts in sufficient detail. The IAC considers the biological monitoring and physical modelling focused on a limited range of potential impact pathways where direct impacts are certain.

The EES would have been assisted if the heterogeneity of the epibenthic invertebrates and infauna across each of the transects surveyed was characterised in more detail. The IAC notes the survey transects were lacked uniformity and information collected would not provide an

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<sup>72</sup> <https://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/level-of-protection#high-conservation-or-ecological-value-systems>.

adequate baseline for future assessments. It was suggested by Dr Edmunds that Lamp shell populations are only in the vicinity of Crib Point, and impact from the Project to the isolated population is unknown.

The Proponents submitted there would be no direct or indirect impact to the Crib Point intertidal environments where microalgae, infauna, mudflats, seagrass, mangrove and coastal saltmarsh exist. On balance, the IAC supports the assumption that the Project is unlikely to cause direct adverse effects to these sensitive CPS. However, the IAC considers indirect impact pathways are not properly understood and cannot be ruled out, particularly as intertidal environments are critically important for migratory shorebirds that inhabit the broader area.

During the Hearing, the IAC directed the Proponents to provide advice on alternative operational scenarios, including reducing chlorine produced oxidants (CPO) discharge from the high velocity discharge ports to 2 µg/L to minimise impacts to marine biodiversity (discussed in Chapter 4.4). A number of TNs were provided that considered various operational scenarios (TN033, TN34, TN35 and TN53). From these, the IAC was able to explore alternative options to achieve net improvements to environmental outcomes. The IAC welcomed the opportunity to understand the limitations in operating the FSRU, yet it considers further operation and design alterations to the FSRU would be required to maintain environmental values in Western Port Bay.

The IAC finds the EES has not adequately recognised the variety of marine fauna species likely to frequent the North Arm. The Proponents have not undertaken surveys of higher trophic order species known to frequent the area, a number of which are listed threatened and migratory species. It is difficult to qualify the risks to marine fauna as negligible or low without survey data to confirm or discount Crib Point as habitat for higher order marine species.

The IAC notes that recreational fishing is a popular past time with angling around Crib Point and North Arm, noted in the EES and a number of submissions. The IAC notes that commercial fishing is not practiced in North Arm but recognises number of important commercial fish species use the seagrass of Western Port Bay as important nursery habitats. The IAC considers more information is warranted on the distribution and importance of the Crib Point environment to the recreational and commercial fisheries.

Several submitters observed that modelling does not equate to fact. The modelling completed was based on a range of physical conditions and ecosystems at Crib Point. The impacts from the FSRU are within a sensitive and unique environment with recognised high conservation value and which is internationally recognised. There is an expectation that the modelled assumptions and the outcomes require a high degree of confidence. The IAC considers the information presented in the EES does not confidently demonstrate that the Project's impacts would result in an acceptable outcome.

The assessment of cumulative impacts from the Project to the marine environment is lacking. The IAC considers there would be combined stresses due to temperature change, CPO, shading and scour of sediments (periodically due to tugboats and locally due to the discharged seawater on the seabed), as well as entrainment resulting from seawater intake. The Proponents submitted:

There is a significant distance between the areas above the temperature and chlorine Guideline Values and the various habitat types recognised under the Ramsar Convention. Due to the distance, the likelihood of there being any effect from the

discharge on the subtidal reef or seagrass, estuarine areas, intertidal mud flats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low <sup>73</sup>.

The DAWE submitted:

This statement is too simplistic and does not address the cumulative impact of the additional port activity and shipping movements on the CPS Ramsar site <sup>74</sup>.

The IAC considers the Proponents have not given adequate consideration to qualify that exotic marine pests and invasive species do not exist at Crib Point. The IAC considers the Proponents should have conducted targeted surveys to assess the presence or otherwise of exotic marine organisms around the GIJW area in order to understand baseline conditions.

The criticism from a number of submitters regarding the lack of information on sediment dispersion from tug wash and impacts from oil spills is noted by the IAC, but it is not significant to the conclusions of the EES.

The IAC recognises the EES contributes to understanding the direct impacts of the Project, but considers some assessments were completed in isolation and linkages between ecosystems assemblages across Crib Point were not adequately described. The Proponents acknowledged impacts of the use of the Jetty for the FSRU are likely from chlorine, temperature, shading, lighting and tugboat scouring. Each in isolation may have minimal impact, but the combined or cumulative impacts are not well understood. In the context of impacts to the Western Port Ramsar site and recognition that critical CPS are intrinsically linked, but not well understood, the IAC concludes the EES is significantly lacking in its assessment of the Crib Point marine environment in the Western Port Ramsar site.

The IAC concludes EPR-ME16 should be revised to require further marine biodiversity assessments. Additional assessments would gather additional baseline data, prior to commissioning the GIJW, to benchmark existing conditions and contribute to an GIJW Operations Monitoring and Adaptive Management Plan, including triggers for remedial action.

### **(iii) Findings**

The IAC finds:

- Crib Point is located within Western Port Bay which is widely recognised as an area of high conservation value, a wetland listed under the Ramsar convention, and a wetland of international of international importance.
- An adequate baseline of conditions within Crib Point has not been established and future predictions of direct and indirect impacts from the Project are not certain.
- A number of potential impacts have not been adequately addressed, including:
  - species specific distribution and diversity of seabed and infauna assemblages
  - impact to commercial and recreational fisheries
  - extent of exotic pests
  - extent and distribution of listed species.
- Additional habitat mapping across the Crib Point seabed and Jetty would improve the baseline data against which ecological change can be better understood.
- The assessments and data that inform the EES are not adequate to predict that the direct and indirect, short and long term impacts on marine biota are acceptable.

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<sup>73</sup> EES Technical Report A Section 3.2.6

<sup>74</sup> S2871

- The cumulative impacts of the Project to marine biodiversity and the ecological character of Western Port Ramsar were not adequately addressed.

#### **4.3.5 Recommendation**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following change:**

- **Revised EPR-ME16 (Monitoring Program)**

This change is included at Appendix G.

### **4.4 Seawater discharge from the FSRU**

#### **4.4.1 Background**

The regasification of the FSRU would require the pumping of seawater from Western Port Bay, with a natural temperature range of approximately 11°C to 23°C, to heat the LNG from a temperature of minus 163°C to gas at ambient temperature. According to the EES, the FSRU can be operated using three regasification scenarios with differing seawater discharge characteristics as follows:

- Open loop regasification is proposed to occur for 90 per cent of the year. At peak production, open loop would involve the discharge of approximately 468,000 m<sup>3</sup> per day of seawater approximately 7°C colder than ambient.
- Closed loop regasification is an alternative to open loop. This process uses the FSRU's boilers as the source of heat, whereby ambient seawater is heated using steam from gas-fired boilers and recirculated through heat exchangers. At peak production, closed-loop regasification would discharge up to 187,000 m<sup>3</sup> per day of seawater approximately 5°C warmer than ambient. Closed loop is significantly more energy intensive than open loop.
- Combined loop regasification mode operates with similar seawater use as open loop. Seawater is continuously drawn into the FSRU through seawater inlets and the seawater is warmed by heat exchange with steam when the water temperature is close to 10 °C or below. This operational scenario is expected to operate no more than 30 days a year.

Additional discharges of seawater in minor concentrations would occur intermittently, including ballast water (which is taken in and released to maintain vessel stability), a water curtain and fire water testing.

Seawater would be treated by electrolysis to create chlorine, which would prevent growth of biota in the internal pipework and heat exchangers of the FSRU. An estimated concentration of 500 µg/L chlorine would be produced by electrolysis within the FSRU, which would rapidly degrade before discharge. According to the FSRU supplier, the seawater discharged from the six high velocity outlets would contain a residual concentration of 100 µg/L CPO.

In average open loop regasification operating scenarios, the EES reported that two of three regasification trains would discharge 312,000 m<sup>3</sup> per day from the FSRU. Peak regasification would result in a maximum seawater discharge from three trains of 468,000 m<sup>3</sup> per day. Hydrodynamic modelling simulated the dilution and transport of the open loop seawater

discharge at the peak production rate (six ports) and at a normal average production rate (four ports) over a typical year to predict the behaviour of the discharged seawater.

The complex hydrodynamic mixing and transport patterns in Western Port Bay were reproduced in near-field models of plume behaviour and development and use of 3-D regional models of dilution and transport. The hydrodynamic modelling indicated that during open loop operation, seawater containing residual chlorine would be discharged as plumes with colder water, which would be denser than the surrounding seawater. Under moderate to strong tidal currents, the plume is predicted to mix with the tidal flow 20 to 40 metres from the FSRU. During low currents, estimated in Western Port Bay during the turn of the tide, the denser discharge plumes would descend and form a pool or 'pancake' of cooler seawater on the seabed. As the current speeds increase, the model predicted the pancake layer thickness would decrease, due to tidal currents stripping the upper layer off the 'pancake', while the currents also push the residual pool along the seabed.

Dilution of the pancake was predicted to occur as the current speed increased. The pancake dilution of 20:1 was reported for the temperature pancake at 20 hectares during discharge when the FSRU and LNC carriers are together. The 20:1 dilution would still apply but the area where dilution would occur (the mixing zone) would be based on the strength of the currents, the nominated Guideline Value (GV) and the discharge concentration.

The GV adopted for temperature change was 0.5°C from ambient, which the EES reported was consistent with the short term variability in water temperature that local biota is currently accustomed to. During average open loop production, the discharge plume was predicted to be below 0.5°C ambient temperature over a potential impact area of 0.5 hectares under the FSRU. During closed loop, the area of seabed with a seawater anomaly of more than 0.5°C was reported as very small and approximately 50 metre diameter at the rear of the FSRU, corresponding to an area of about 0.3 hectares.

The FSRU would discharge 100 µg/L CPO from its six high velocity ports. The dilution of CPO from 100 µg/L was predicted to reduce to 5 µg/L at the end of the near-field plume. The end of the near-field plume was based on current speeds. At times of moderate to strong north/south tidal currents, the diluting plumes would entrain seawater in the tidal currents flowing across the path of the plumes. After a travel distance of about 40 metres, the plumes would be mixed vertically and be mixed into the tidal currents.

A default CPO GV for 99 per cent marine species protection was calculated by Commonwealth Scientific and Industrial Research Organisation (CSIRO) at 2.2 µg/L. This concentration of CPO was suggested to protect all but 1 per cent of exposed marine species in situations where the concentration is:

- relatively constant over time
- predominantly chlorine compounds.

The EES suggested a GV of 6 µg/L CPO as a TAC over a 12 hour tidal cycle in Western Port Bay. The tidal cycle includes six hours each for an incoming and outgoing tide, with an hour of slack water between.

Seawater discharged from the FSRU during peak operation while an LNG carrier is moored adjacent was identified as the worst case operating scenario. Under the worst case scenario, the discharge plume would extend five hectares from the FSRU before the GV of 6 µg/L CPO as a tidally averaged concentration was achieved. Colder water was modelled to extend for 20 hectares before the GV of 0.5°C was achieved. The Proponents committed to avoid

seawater discharge under the worst case scenarios when an LNG carrier is unloading LNG and during slack tides.

Irrespective of GV for temperature and chlorine, a mixing zone will be required where the defined GV or environmental quality objectives for CPO and temperature may be exceeded and beneficial uses may not be protected. Beyond the defined mixing zone, it is expected that environmental quality objectives will be achieved. A Works Approval is required for the FSRU, and a licence would be required prior to operations commencing. In accordance with SEPP (Waters), the EPA would be responsible for approving the extent of the mixing zone.

#### 4.4.2 Chlorine

##### (i) Evidence and submissions

The Proponents submitted the FSRU supplier recommended electrolysis to achieve a chlorine dose of 500 µg/L and prevent biofouling of heat exchangers and the pipe network in the FSRU. The FSRU suppliers indicated that, following treatment, a residual chlorine concentration of 100 µg/L would be discharged from the FSRU. As stated in the EES, the electrolysis process converts the chloride ions (Cl<sup>-</sup>) in seawater to hypochlorite ion and hypochlorous acid, which further react rapidly with bromine in seawater to form hypobromite ion and hypobromic acid, known as CPO.

The majority of submissions raised chlorine discharge into Western Port Bay as the most significant issue associated with the marine impacts of the Project. The CEG and others submitted the impacts from the FSRU are environmentally unacceptable due to the discharge under peak regasification of 468,000 m<sup>3</sup> per day of chlorinated and cooled seawater. They raised concerns the Project would have substantial adverse effects on biodiversity and the overall functions, values and beneficial uses of Western Port Bay. The CEG submitted the *'seawater would impact a range of flora and fauna that inhabit the area, compromising the intertidal mudflats, seabeds, the water column, and the air'*<sup>75</sup>.

The evidence of Mr Chidgey was that CPO are short lived and the strong tidal currents would effectively dilute the CPO within close proximity to the FSRU. Using internationally recognised methods to derive default GV, CSIRO undertook work to derive short term default GV's for CPO of 2.0 µg/L and 7.3 µg/L for 99 per cent and 95 per cent marine species protection respectively. The outcome of this work was provided in Annexure A-A to Technical Report A, which stated the GV's can be applied *'at and beyond the boundary of a mixing zone in situations where the concentration at the boundary is relatively consistent over time'*.

In Annexure A-A, CSIRO noted:

A 99% species protection short-term GV of 6.0 µg/L should apply to CPO concentration at and beyond the boundary of a mixing zone where concentration at the boundary of a mixing zone is intermittent or variable over time such as North Arm of Western Port.

The Proponents presented 6 µg/L as the time averaged concentration (TAC) and the site specific GV for 99 per cent species protection in Western Port.

The CEG cross examined the marine experts for the Proponents regarding the acceptability of a GV of 6 µg/L for Western Port Bay and its application as a TAC over a 12 hour tidal cycle. The CEG expressed concern with the interpretation and application of the GV for the purpose of extrapolating discharge impacts from the FSRU and the extent of the mixing zone. Dr Wallis

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<sup>75</sup> D155

confirmed the hydrodynamic model predicted instantaneous concentrations in the field every 10 minutes and then averaged the concentrations over a 12 hour period. This was then compared to CSIRO's GV of 6 µg/L to determine the extent of the dispersed seawater plume.

The CEG submitted that 6 µg/L should be considered as an instantaneous peak value, which it claimed changed the basis on which the Proponents marine experts formed their views. The CEG tabled an email to Professor Cook, containing advice from one of the CSIRO authors, Dr Batley, which indicated that *'the value of 6 µg/L refers to an instantaneous concentration on the assumption that where there is intermittent exposure, a time averaged concentration will be nearer to 2 µg/L'*<sup>76</sup>. The CEG submitted it was not appropriate to use a TAC of 6 µg/L as a GV. Mr Chidgey agreed, that based on this advice, the TAC should instead be 2 µg/L instead of 6 µg/L. Dr Wallis acknowledged that if the 2 µg/L GV is to be applied, the chlorine impact zone is extended.

Dr Wallis submitted additional advice from Dr Batley that the derived default GV was 2.2 µg/L for 99 per cent species protection, and from a regulatory perspective should be applied at the edge of a mixing zone<sup>77</sup>.

Dr Batley noted the default GV was based on exposure of test organisms to a relatively constant chlorine concentration. He indicated the derived default GV was conservative and did not consider the rapid degradation that would occur in the field and diluting effects to other products such as chloramine and brominated compounds (e.g. bromoform, which he noted has a lower toxicity). He further described that *'application of a TAC-based GV would require validation based on sampling and analysis, eg. every 2 h and calculation of a TAC to characterise the concentrations that may result in biological effects'*<sup>78</sup>.

Submitters raised concerns with the GV as the CPO discharge from the FSRU would be continual and the marine water quality guidelines outlined by CSIRO were derived using test species exposed over a short term, generally three to seven days<sup>79</sup>. There was criticism the default GV was based on marine species endemic to the northern hemisphere. It was submitted by a number of parties the default GV are concentrations assumed to protect species under short term, acute pulse doses.

The CEG cross examined Mr Chidgey and Dr Wallis on the interpretation of acute compared with chronic exposure. Dr Wallis confirmed the hydrodynamic model predicted that exposure to the seabed above 1 µg/L CPO under the FSRU could be experienced for approximately 50 per cent of the time every 24 hours, continuously over the 28 day modelled period.

Mr Chidgey accepted that chronic toxicity is defined as an effect that occurs following exposure to an organism for a considerable proportion of its lifespan, according to Warne et al and a substantial portion of an organism's life span is typically greater than 10 per cent<sup>80</sup>. Mr Chidgey noted that as CPO is short lived and non-persistent, chronic GV were deemed irrelevant.

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<sup>76</sup> D280

<sup>77</sup> D395

<sup>78</sup> D395 Annexure

<sup>79</sup> Technical Report A Annexure A-A

<sup>80</sup> Warne MStJ, Batley GE, van Dam RA, Chapman JC, Fox DR, Hickey CW and Stauber JL 2018. Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants – update of 2015 version. Prepared for the revision of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, 48 pp.

Dr Batley noted during his work to derive the default GV for CPO (Annexure A-A): *'many of the test data sets had endpoints derived over durations >96 hours, this is expected to provide suitable protection from longer-term chronic effects lasting a significant portion of an organism's life span'* <sup>81</sup>.

The CEG highlighted Annexure A-A that referenced unrelated studies in which chronic GV's were suggested concentrations for 95 per cent species protection and 99 per cent species protection of 0.9 µg/L CPO and 0.03 µg/L CPO, respectively. Mr Chidgey accepted that chronic GV are expected to be lower than acute GV and gave evidence that if a toxicant is not accumulative, then chronic toxicity may not be displayed at lower concentrations deemed acutely effective.

Professor Cook gave evidence the GV is based on chronic toxicity. He stated the derivation of a GV is usually a default standard that is a starting point without considering site specific conditions. He advised the derived GV is appropriate for determining acute toxicity following short term exposure or pulse dosing. He noted that given there is a constant supply of CPOs from the FSRU, the exposure regime of the Project should be considered chronic. His evidence was that a zone would exist where sedentary organisms would experience a variable but continuous exposure to CPO for the life of the Project. He concluded exposure should be considered chronic to sedentary organisms within the discharge plume.

The Proponents predicted that for the open loop operation at full production, there would be no zones with a tidally averaged concentration exceeding 2.0 µg/L. The highest tidally averaged concentration contour on the seabed for open loop operation at full production was reported at 1 µg/L CPO <sup>82</sup>.

Dr Wallis and Mr Chidgey indicated the total area of the chlorine impact zone for a minimised mixing zone is three hectares (including open and closed loop operations) considering a GV of 2 µg/L. This was reported as smaller than the five hectare 'chlorine impact zone' originally presented in the EES. Dr Wallis added:

As the CPO in the pancake is mostly bromoform and bromine compounds, a GV for CPO based on chlorine tests has a large margin of safety <sup>83</sup>.

He noted the assessment of biodiversity risks for different habitats had regard to the impact zone defined using a 24-hour average GV for CPO of 6 µg/L and that it matched the definition of 'short term' as advised by CSIRO.

The marine experts and the Proponents indicated CPO will have an impact within the mixing zone. Dr Wallis and Mr Chidgey concluded that *'whether a tidally-averaged GV of 2 µg/L or 6 µg/L is used, the chlorine impact zone for the project will be within the port zone and well away from seagrass, intertidal zones, mangroves, reefs and saltmarsh'* <sup>84</sup>.

Dr Wallis agreed there will be an adverse effect on infauna within the chlorine impact envelope, possibly out to the extent of the temperature impact envelope. He indicated he did not expect a measurable impact beyond the plume envelope. The degree of impact remains unconfirmed. Technical Report A (Section 6.2.1) notes that chlorine will stress infauna communities resulting in composition changes, similar to changes noted on the Bass Strait seabed at the Wonthaggi desalination plant's brine discharge location.

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<sup>81</sup> D395

<sup>82</sup> D395

<sup>83</sup> D395

<sup>84</sup> D395

## (ii) Discussion

The modelling of the FSRU seawater discharge was undertaken on the basis that the concentration of chlorine or CPO within the seawater at the point of discharge would be 100 µg/L. The Proponents contended an instantaneous exposure to CPO levels up to 100 µg/L would have a negligible impact.

The IAC accepts that reductions in chlorine concentrations would be driven by the discharge velocity from the designated discharge ports and the effect of tidal currents which would result in a mixing zone extending three hectares from the FSRU, where species protection would not be guaranteed.

There was debate between the experts on the efficacy of whether 2 µg/L or 6µg/L should be deemed the more appropriate GV for Western Port Bay. The IAC acknowledges the Mornington Peninsula and Bass Coast submission that a precautionary approach should be applied where there is potential for impact in a sensitive environment such as Western Port Bay. As such, the IAC considers that a TAC of 2 µg/L CPO is more appropriate than 6 µg/L.

The Proponents submitted a time averaged chlorine concentration over the 12 hour tidal cycle is applicable: *'plumes are episodic, resulting from the diluting pancakes of seawater discharge being carried away from the FSRU by the flood and ebb tidal currents, respectively'*<sup>85</sup>.

The Proponents described at length the discharge results in short term acute exposure, which is a short lived pulse dosing scenario influenced by the strong tide and currents diluting chlorine in the vicinity of the FSRU. Discharge of chlorine at 100 µg/L would result in plumes of CPO extending a distance from the FSRU, either over the seafloor or through the water column. The Proponents submitted that plumes are episodic, resulting from the diluting 'pancakes' of seawater discharge being carried away from the FSRU by the flood and ebb tidal currents. The IAC notes the average rate of regasification occurs for about 90 per cent of the year.

The FSRU would discharge a continuous concentration of chlorine into the marine waters resulting in benthic biota within the plume being consistently exposed every other 6 hours for the life of the Project. The IAC considers this to be more akin to chronic exposure, rather than acute exposure.

The IAC recognises the extent of work completed by the Proponents' marine experts to describe the behaviour of CPO once it is discharged from the FSRU. They described that while the chlorine concentration at the seabed would vary throughout the tidal cycle, the tidally averaged concentration at all locations on the seabed was predicted to be below that identified as achieving species protection.

Annexure A-A referenced Batley et al that reported<sup>86</sup>:

Acute toxicity tests usually (but not necessarily) measure lethality and are appropriate in cases of a spill event, or pulse exposures as can occur with pesticides in rivers, or where contaminants are short-lived and non-persistent due to dispersion, volatilisation or degradation. The minimum exposure period is generally 96 hours, but there might be circumstances where a lesser exposure time is relevant.

There was general consensus amongst the marine experts that chronic toxicity occurs at lower concentrations than acute toxicity. Longer exposure results in greater toxicity at lower

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<sup>85</sup> Technical Report A Section 6.5.5

<sup>86</sup> Batley, G.E., van Dam, R.A., Warne, M.St.J., Chapman, J.C., Fox, D.R., Hickey C.W. and Stauber, J.L. (2018)

concentrations. Chlorine discharged from the FSRU is short lived but continuously discharged. This was referred to in evidence as a press dose (chronic, continuous) contrasted with pulse dose (short term, intermittent). Chronic toxicity is usually based on a 10 per cent effect concentration, referred to as EC10. The IAC is concerned the permanent cyclical exposure to benthic biota in the vicinity of the FSRU for the life of the Project reflects a press dose consistent with chronic exposure, rather than a pulse dose.

The IAC notes Annexure A-A reported that sea urchin early life stages were the most sensitive test species to CPO (Annexure A-A) with acute toxicity reported at 6 µg/L. The IAC notes in Annexure A-A, Batley and Simpson observed chronic toxicity to sea urchin larvae would be likely after more than one hour exposure. The IAC is concerned about this, as sea urchins are endemic to Crib Point and important within the marine ecosystem, early life stages could be directly impacted by chlorine at concentrations discharged by the FSRU.

It was noted by the Proponents that Crib Point is within Port waters and within a slightly to moderately disturbed ecosystem. The Proponents suggested a 95 per cent species protection GV could be considered relevant as the area within the impact zone has been historically disturbed by Port related activities including dredging and seabed levelling.

The IAC considers this argument may be applicable if the proposed site was within a port environment that was not within a Ramsar wetland. As Crib Point is within a significant Ramsar conservation area, a level of 99 per cent species protection should prevail in accordance with the WQ Guidelines<sup>87</sup>. The WQ Guidelines note highly valued ecosystems in their unmodified state with outstanding natural and conservation values, should typically have no change in biodiversity beyond natural variability. Where possible, the aim should be no change in water/sediment chemical and physical properties, including toxicants.

The suggested default GV for CPO was derived for inclusion in the WQ Guidelines. At the time of the IAC's report, the devised default GV had yet to be adopted as the default CPO GV for marine waters.

The IAC believes that to understand the implications of the continuous discharge of CPO from the FSRU, tailored ecotoxicity tests should be conducted with marine species endemic to Western Port Bay. Ecotoxicity testing should be performed whereby test species are exposed to CPO for periods of seven days or more, to understand chronic exposure responses.

The IAC concludes that the following changes to the EPRs are necessary:

- EPR-ME02 should be amended to require a maximum discharge concentration of 2 µg/L CPO from the FSRU, a maximum mixing zone extending 10 metres from the FSRU's high velocity discharge ports, avoid discharge for one hour either side of slack tide and discharge no more than a 7°C variation in temperature compared to in situ conditions.
- EPR-ME04 should be amended to specify discharge from the FSRU discharge ports is prohibited when an LNG carrier is moored adjacent the GIJW and one hour before and after slack tide.
- EPR-ME16 should be amended to require ecotoxicity testing under chronic exposure conditions.

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<sup>87</sup> <https://www.waterquality.gov.au/guidelines/anz-fresh-marine>

### (iii) Findings

The IAC finds:

- The extent of the chlorine plume and its dilution efficacy have not been adequately demonstrated, and the extent and persistence of residual chlorine or chlorine by-products are unknown.
- Indirect impacts of CPO to the marine environment are not well understood and although it readily disperses in seawater, evidence indicates that the spatial and temporal extent of CPO and its derivatives can persist within the marine environment well after discharge.
- The discharge of chlorine from the FSRU, a recognised toxicant, will result in an unacceptable impact to marine biodiversity.
- Direct impacts of discharge are expected to be localised to waters immediately around the vessel.
- The default CPO GV has been derived using widely recognised methods which provide a sound understanding of likely CPO toxicity to a range of marine species in conditions of short term, acute exposure.
- The long term discharge for the life of the Project should be considered as chronic exposure instead of pulse dose, of which impacts are usually expressed at lower concentrations than acute toxicity responses.
- The long term impacts of CPO and continuous discharges have not been adequately predicted.

#### 4.4.3 Chlorine Produced Oxidants and by-products

##### (i) Evidence and submissions

Evidence from the Proponents' marine experts described the highly reactive behaviour of CPO and brominated oxidants in seawater. Dr Wallis submitted that following discharge:

*... in the North Arm of Western Port, the modelled concentration is not constant, as it varies with the speed of the tidal current and with the path of the diluting plume, which changes direction through the tidal cycle*<sup>88</sup>.

The Proponents marine experts were confident that residual chlorine or CPO would quickly convert through a series of reactions back to the natural seawater salts, chloride and sodium.

The Proponents submitted that bromine products would be created in the discharge and convert back to the natural seawater salt bromide, and there would be no long term accumulation of chlorine or related products. Bromine products were reported in the EES as much less toxic than chlorines and naturally distributed in the marine environment. The Proponents suggested background bromine concentrations in the marine waters of Western Port Bay were assumed to be 1-3 µg/L<sup>89</sup>.

Professor Cook gave evidence that in the presence of bromine and organic matter brominated organic compounds (BOC) are created. BOC are found in chlorine treated water, which are dominated by concentrations of bromoform and other brominated compounds including tribromomethane, dibromoacetic and tribromophenol. Professor Cook noted the risk of acute toxicity of BOC in chlorinated heat exchanger outlets was low.

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<sup>88</sup> D395

<sup>89</sup> Technical Report A Section 7.8.25

Mr Chidgey's evidence in reply to Professor Cook was that BOC, including tribromomethane, dibromoacetic and tribromophenol, were much less toxic than CPOs<sup>90</sup>. Mr Chidgey indicated the background concentrations of BOC in Western Port is expected to be 0.2 µg/L, and naturally occurring in the marine environment. He suggested the Transplanted Mussel Monitoring in EPR ME16 would provide a measure of the CPO and BOC accumulation potential during operation of the FSRU and *'monitoring HPBs would be an important and interesting component of a monitoring program'*.

During cross examination of Mr Chidgey and Dr Wallis, the EPA referenced Boudjellaba et al which reported that CPO were elevated in seawater and fish within an industrialised bay in France housed multiple chlorinated discharges, including two FSRUs, a position also referenced by the CEG.

Professor Cook suggested sediment accumulation could be a chronic exposure pathway of TBH. During cross examination of Professor Cook, Mr Townshend questioned his assumptions that accumulation of TBP would be an issue in sediment exposed to discharges from the FSRU. The Proponents submitted that sediment results at Crib Point Berth 2 indicated low total organic carbon (TOC) concentrations and bioaccumulation potential of CPO TBP in sediment could be considered negligible.

## **(ii) Discussion**

The IAC recognises the effects of CPO to the Ramsar site are not well understood. Professor Cook's evidence indicated there could be a wide spectrum of halogenated organic compounds produced in the event chlorine discharged from the FSRU reacts with organic matter in seawater. The IAC considers their potential occurrence in the marine environment and potential impacts have not been adequately studied for the purpose of the EES.

The IAC notes Dr Wallis stated in evidence there will be some bioaccumulation of brominated contaminants in the food chain and there would be an expectation of some uptake by local infauna, which will pass on to starfish, crabs, prawns and small fish that eat infauna.

Annexure A-A noted there have been few studies that examined the toxicity of chlorine reactive products, including bromoform and chloroform. The toxicity of chloroform and bromoform produced by reactions with organics was described in Annexure A-A as *'moderate to high'*.

Evidence indicated that residual chlorine is likely to extend much further than a defined mixing zone. Bromoform was measured at concentrations higher than background concentrations of 1-3 µg/L reported in the EES. The IAC acknowledges the site in France (referenced by the EPA to Boudjellaba) appears more industrialised than Western Port Bay and a number of CPO sources exist, however, this study indicated CPO has the capacity to be persistent.

The EES described that naturally elevated CPO derivatives, such as bromides occur in the marine environment, which the Proponents asserted to be naturally produced by marine biota. The EES suggested background bromine concentrations in marine waters of Western Port Bay was assumed to be 1-3 µg/L, although there was no evidence to confirm this.

The IAC notes the EES does not consider in detail that naturally occurring bromine derivatives are produced by marine biota in minute concentrations (less than residual concentrations discharged from the FSRU) and these compounds are produced as a defence to protect

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<sup>90</sup> D164

organisms from natural biofouling. The IAC considers the EES would have benefited from reporting the background concentrations of CPO and derivatives within Western Port Bay.

Professor Cook's evidence indicated there to be a wide spectrum of halogenated organic compounds (HOC) produced when chlorine reacts with organic matter in seawater. The IAC agrees their potential occurrence in the marine environment and potential impacts are poorly understood. Mr Chidgey attempted to provide context about their occurrence by citing scientific literature indicating low to very risk of chronic toxicity, but the IAC considers the risks of HOCs to Western Port Ramsar wetland from the FSRU is not immaterial.

The FSRU is located within proximity to intertidal mudflats and seagrass, and the threat of residual chlorine to Western Port Bay sediment and water was not well explored. The risk was deemed negligible without sufficient supporting evidence. Dr Wallis recognised there may be accumulation in sediment, but this was not explored further. The IAC acknowledges that marine sediment sampled to understand potential contamination at Berth 1 and 2 (EES Technical Report E) indicated heterogeneity in TOC which varied between 600 mg/kg to 6800 mg/kg across the twenty sediment samples taken at Berth 2. Bioaccumulation potential of TBP in sediment at Crib Point is not well understood and should be explored further.

The IAC concludes the impacts to Crib Point from continual discharge of CPO from the FSRU is not adequately understood, particularly the background concentrations in Western Port Bay, and the bioaccumulation potential in sediment and tissue of exposed biota. The monitoring program in EPR-ME16 should be amended to improve the transported mussel monitoring program, increasing the frequency of tissue analysis and to monitor CPO, including brominated and chlorinated organics in the analytical suite.

### **(iii) Findings**

The IAC finds:

- Though it might occur naturally, evidence indicates the spatial and temporal extent of bromine as a derivative of CPO can persist in marine waters and tissue of biota in areas with chlorinated discharges.
- Indirect impacts of CPO and its reactive by-products to the marine environment have not been adequately explored in the EES. In particular, TBH is known to accumulate in sediment and tissue and long term impacts at Crib Point are unknown.
- The discharge of CPO will result in an unacceptable impact to marine biodiversity of the Western Port Ramsar site.

The IAC recommends:

#### **Environmental Performance Requirements**

**Include the following change:**

- **Revised EPR ME16 (Monitoring Program)**

This change is included at Appendix G.

#### **4.4.4 Water temperature**

##### **(i) Evidence and submissions**

The Proponents submitted that during open loop operation, the FSRU would discharge seawater through the six high velocity discharge ports 7°C below ambient seawater temperature. They advised that when ambient temperatures are at 10°C or lower, the FSRU

must operate in combined or closed loop mode. As a consequence, discharged seawater would be around 5°C warmer than ambient water temperatures during closed loop operation. The original worst case scenario modelled temperature changes extending 20 hectares during discharge with an LNG carrier moored adjacent. The Proponents committed to avoiding discharge from the six high velocity ports when the LNG carrier is moored adjacent to the FSRU and during slack tide. They submitted this will significantly reduce the extent of the plume and mixing zone.

The option supported by Dr Wallis to locate two of the six discharge ports on the west side of the FSRU and discharging to the west was considered to improve dispersion when an LNG carrier was moored adjacent. The option of amending the discharge port design was later disregarded by the Proponents.

The Proponents submitted the cold discharge plume would descend rapidly through the water column, slowing as it mixes with ambient seawater. Plumes would be rapidly mixed at times of medium to strong tidal currents. They submitted that temperature changes would vary between 0.5 – 1.0 degrees below ambient levels under open loop which will operate 90 per cent of the year. Dr Wallis gave evidence that *'the temperature limit (Guideline Value) has an averaging time of 30 minutes (short-term average concentration > 0.5 °C)'*<sup>91</sup>.

Submissions raised concerns there was lack of understanding of seabed benthic biota impacts from temperature changes. The discharged plumes of cooler seawater were reported as denser than adjacent seawater and would descend to the seabed (TN07). The Proponents acknowledged that temperature changes would extend over the seabed over a greater area than the chlorine plume but contact with the seabed would be more pronounced during low currents and periods around slack tide.

The Proponents argued that impact would be localised to less than 1 per cent of the channel seabed habitat in the Lower Arm and 0.11 per cent of channel subtidal habitat in Western Port.

During cross examination of the Proponents' marine experts, the EPA referenced Boudjellaba et al and elaborated the paper indicated colder water as a surface layer may act as a thermal barrier, reducing the volatilisation potential of CPO<sup>92</sup>. Influences on temperature to CPO degradation was also recognised by Batley and Simpson (2019)<sup>93</sup>.

Mr Chidgey acknowledged that colder waters in Western Port may reduce the volatilisation potential of CPO in deeper waters. He agreed it may be possible that the colder waters in Western Port may cause bromoform to persist longer than the approximate 28 hours reported in Boudjellaba. He further indicated the assessment of the risks of bromoform and other brominated compounds in Western Port may require further consideration if the derived GV had not considered toxicity under colder temperatures.

The Proponents submitted risks to sensitive environs from temperature changes were low to very low as impacts are localised and during medium to strong currents, the colder water would dissipate rapidly. Risks to mangroves, seagrass, saltmarsh and intertidal mudflats were presented as negligible as these habitats are one kilometre from the FSRU. Intertidal mudflats

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<sup>91</sup> D70

<sup>92</sup> Zeng, J., Jiang, Z., Chen, Q., Zheng, P. and Huang, Y. (2009). The decay kinetics of residual chlorine in cooling seawater simulation experiments. *Acta Oceanologica Sinica*, 28, 54-59.

<sup>93</sup> Batley, G.E and Simpson, S.L (2019). Short term Guideline Values for Chlorine in Marine Waters. *Environmental Toxicology and Chemistry*, Vol.39 No.4 pp.754-764

are approximately 500 metres west of the FSRU. Temperature changes were likely to be expected on the seabed within the immediate vicinity of the plume.

Modelling to inform the EES indicated the temperature plume extended most dramatically when the LNG carrier is moored adjacent to the FSRU and when the FSRU is operating at maximum capacity. Under this operating scenario, a maximum seabed area of approximately 20 hectares would be impacted by reduced temperature, with the plume being more pronounced around slack tide. The Proponents advised the FSRU would cease discharge when the LNG carrier was moored alongside.

The Proponents acknowledged that formation of a pancake of cooler seawater on the seabed would have an impact on seabed epibiota and infauna during periods of reduced currents and slack tide. The extent of impact has not been quantified as the heterogeneity of the seabed assemblages were yet to be assessed. Species specific tolerances to temperature changes are not understood for benthic biota of Western Port Bay.

The Proponents committed to avoiding discharge from the FSRU during periods of slack tide and this was included as an amendment to EPR-ME02.

## **(ii) Discussion**

The IAC considers Technical Report A Annexure A-A and Boudjellaba confirmed the risk of CPO appeared to be elevated within colder waters. This information suggested that chlorine volatilisation is contingent on temperature, with colder waters reducing the decomposition potential of CPO. Technical Report A Annexure A-A notes *'the higher the water temperature, the faster the reactions and the reduction in chlorine concentration'*.

Annexure A-A reported Zeng et al that *'noted that in summer, the CPO had fully decayed before discharge, whereas in winter, the CPO decomposition was slower and might be incomplete'*<sup>94</sup>.

The EES reported that Western Port Bay has a wide water temperature ranging from 10° C to 24° C. The seasonal influence on CPO degradation in Western Port Bay was not considered in the hydrodynamic modelling that simulated the dispersion of the plumes. The IAC considers information about the behaviour of chlorine under varying water temperatures is lacking in the EES.

Water temperature is critical to the reproduction of marine biota. A number of marine species use temperature cues to initiate reproduction, with elevated temperatures during spring and summer starting mass spawning and increased reproductivity. This is consistent with the elevated plankton concentrations reported in the EES during spring and summer. Discharge from the FSRU when an LNG carrier is moored adjacent was reported to create colder water across an area of 20 hectares during maximum production. The IAC supports the commitment from the Proponents to cease seawater discharge when the LNG carrier is present and during periods of slack tide.

The EES reported large heterogeneity of seabed biota and sensitivity of species exposed to temperature variation, particularly during periods of fertility, was unknown. Temperature can alter the reproductive capacity of a number of species if the plume extended to the seabed. This is a particular concern for the Lamp shell which was described in evidence from Dr Edmunds to exist only in the Crib Point area, with increased abundance around Berth 2. He

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<sup>94</sup> Zeng, J., Jiang, Z., Chen, Q., Zheng, P. and Huang, Y. (2009)

indicated that Lamp shells do not exist anywhere else but Western Port Bay. The sensitivity of Lamp shells to chlorine and colder water is not well understood.

The effects of the cooler seawater discharge was reported in the EES as confined to the marine ecosystem components around the Jetty, with negligible consequences to roosting and feeding habitats of waterbirds and wading birds, intertidal mudflat, seagrass, mangrove and saltmarsh habitat and associated communities. The IAC accepts that it is unlikely that colder water will extend to intersect with the more sensitive intertidal habitats at Crib Point.

Even though closed loop mode is estimated to be used no more than 30 days a year, the impact of increased temperature during winter months should have been further considered in the EES.

The IAC agrees that Jetty and seabed epibiota and infauna assemblages would be most exposed to CPO and colder waters discharged from the FSRU but is not satisfied that species specific sensitivity was adequately quantified. The IAC believes the EES should have considered the combined effects of chronic exposure to CPO and the effect of cooler waters to a range of species under conditions of continual pulse dosing for periods greater than seven days. Test species should be consistent with epibiota and infauna species endemic to Crib Point. This is lacking and creates additional uncertainty.

The IAC concludes the following changes to the EPRs are necessary:

- EPR-ME02 be amended to require a maximum discharge concentration of 2 µg/L CPO from the FSRU, a maximum mixing zone extending 10 metres from the FSRU's high velocity discharge ports, avoid discharge for one hour either side of slack tide and discharge no more than a 7°C variation in temperature compared to in situ conditions.
- EPR-ME16 be amended to require regular monitoring and recording of water flow rate and temperature discharge from the FSRU and monitoring at the edge of the mixing zone.

### **(iii) Findings**

The IAC finds:

- Avoiding discharge from the FSRU when the LNG carrier is unloading and during periods of slack tide will avoid the plume extending at distances across the seafloor.
- Cold water dilution is more efficient during moderate to strong currents.
- The influence of colder waters on CPO has not been adequately explored in the EES and warrants further analysis.
- The continual discharge of cooler water for the life of the Project, coupled with CPO discharge, would result in an unacceptable impact to Western Port Bay.
- In isolation, the cold water discharged from the FSRU is unlikely to result in an unacceptable impact to the marine biodiversity, if discharges avoid periods of low currents and slack tides.

### **(iv) Recommendations**

The IAC recommends:

#### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-ME02 (Seawater discharge)**

- **Revised EPR-ME04 (Use 6 port design to increase mixing)**
- **Revised EPR-ME16 (Monitoring program)**

These changes are included at Appendix G.

#### **4.4.5 Alternative chlorine discharge concentrations**

##### **(i) Evidence and submissions**

The IAC directed the Proponents to provide advice on whether a CPO discharge concentration of 2 µg/L was feasible. This concentration reflected the default GV of 2.0 CPO mg/L derived by CSIRO for 99 per cent species protection. The Proponents responded in TN53, which described options to discharge 20 µg/L CPO from the FSRU instead of the proposed 100 mg/L. TN53 described options to manage seawater and discharge of 20 µg/L CPO from the FSRU.

The Proponents claimed it would be technically feasible to reduce the chlorine discharge, but it was not practicable at all times when the FSRU is operating. TN53 suggested that limitations exist precluding the efficacy of alternative chlorine treatment and discharge regimes. TN53 stated *'a reduction in chlorine discharge to 20 µg/L is technically feasible and has consequences for maintenance and operation'*.

Mr Chidgey and Dr Wallis agreed that mechanical cleaning would benefit the marine environment by reducing the chlorine dosage requirements.

TN53 did not consider a chlorine discharge concentration from the FSRU less than 20 µg/L. In response to the IAC's direction to consider a discharge concentration of 2 µg/L, the Proponents asserted that it was not feasible to operate the FSRU under this condition. The IAC questioned the ability to dechlorinate prior to seawater discharge. The Proponents advised it was not an option due to the large volumes of seawater requiring treatment prior to discharge.

TN53 presented two options for chlorine discharge considered by the Proponents to be practicable for the operation of the FSRU. They were included in EPR ME02:

##### **Option 1 – Varying chlorination rate at point of discharge**

Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must:

- have a chlorine residual concentration of up to 0.1mg/L other than at Slack Tide
- have a chlorine residual concentration of 0mg/L during Slack Tide
- not exceed a tidally averaged chlorine residual concentration of 0.0022mg/L beyond a distance of 100 metres from the FSRU
- not exceed a temperature variation of 7°C from ambient

Note: The time of Slack Tide is half an hour either side of high tide or low tide at Crib Point. High tide and low tide at Crib Point are to be calculated by reference to the BOM Victorian Tide Tables or other source to the satisfaction of the EPA.

##### **Option 2 – Constant chlorination rate at point of discharge**

Except as approved or required by the EPA, the OEMP must include requirements that seawater discharges from the regasification system must:

- a. have a chlorine residual concentration of 0.02 µg/L
- b. not exceed a tidally averaged chlorine residual concentration of 0.0022 µg/L beyond a distance of 100 metres from the FSRU;
- c. not exceed a temperature variation of 7°C from ambient.

The Proponents submitted they had consistently recognised their obligation to minimise any area of impact to the extent practicable, and to implement mitigation measures to this effect. They advised that eliminating chlorine at and around slack tide was considered superior to the constant chlorination option, given the extent to which tidal currents influence dispersion. They submitted either option demonstrated their willingness to implement measures to minimise potential impacts beyond objective tests of acceptability.

In cross examination of the Proponents' marine experts, the EPA noted the FSRU approved in Port Kembla was granted an Infrastructure Approval in accordance with the NSW *Environment and Planning Assessment Act 1979* to discharge 20 µg/L Total Residual Chlorine 'under the full range of operating conditions and during all seasons'. The EPA referred to a FSRU in Croatia that had been configured to apply mechanical cleaning as an alternative to chlorine.

## **(ii) Discussion**

During the Hearing, alternative seawater discharge conditions were presented by the Proponents. The worst case operating scenario for the FSRU was predicted during seawater discharge from the six ports to the east when the LNG carrier was moored adjacent and the FSRU was operating at peak regasification. The Proponents confirmed seawater would not be discharged from the FSRU high velocity ports during periods when an LNG is moored adjacent, and as a consequence they claimed the impact zone is considerably reduced by avoiding discharge at these times.

It was noted during evidence that a number of FSRUs are in operation across international waters. Details of these vessels were not presented to the IAC. The Proponents' marine experts advised they were aware of alternative FSRUs but were unable to elaborate on alternative options as their scope of work did not require investigating alternatives to chlorine.

The IAC requested the Proponents consider whether it is technically feasible to operate the proposed FSRU to achieve a zero chlorine discharge rate, or an absolute maximum of 0.002 mg/L (2 µg/L), at the point of discharge. The Proponents submitted there were constraints in the use of alternative technologies to electrolysis for biofouling prevention<sup>95</sup>. The Proponents advised they were not aware of any operating FSRU or comparable land-based facility using seawater that is operated to achieve a chlorine discharge of 0 µg/L.

The IAC is cognisant there are alternatives to discharging 100 µg/L CPO from the FSRU, such as mechanical cleaning as proposed in the FSRU at Krk Island, Croatia and the maximum discharge of 20 µg/L TRC approved for the Port Kembla FSRU. The IAC considers an FSRU within Western Port Bay needs to adopt best practice and avoid CPO discharge. It is evident from FSRU's operating elsewhere that discharge of 100 µg/L CPO cannot be considered best practice.

While the IAC considers the amendments to EPR-ME02 are superior to the original Day 1 version, it considers a maximum concentration of 0.002 mg/L or 2 µg/L of CPO should be discharged from the FSRU. The concentration of 2 µg/L is based on the derived GV of 2 µg/L to protect 99 per cent of marine species.

## **(iii) Findings**

The IAC finds:

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<sup>95</sup> D535

- Discharge of chlorine into Western Port Bay will result in an unacceptable impact.
- Avoiding or reducing the discharge of chlorine to a maximum concentration of 2 µg/L CPO would appropriately protect the receiving environment.
- Some FSRU's proposed in marine waters within Australia and Croatia propose lower or no chlorine discharges, indicating the FSRU proposed for Western Port Bay should be optimised to avoid chlorine entering the Ramsar wetland.

#### **(iv) Recommendation**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR- ME02 (Seawater discharge)**

This change is included at Appendix G.

#### **4.4.6 Compliance with SEPP (Waters)**

##### **(i) Evidence and submissions**

Submitters expressed concern the discharge from the FSRU does not comply with the requirements of SEPP (Waters), particularly Clause 22(3). The Proponents, in introducing the marine evidence, said *'the impacts are reasonable in the context of the environmental objectives of SEPP (Waters)'*<sup>96</sup>.

Clause 23 (2) of SEPP (Waters) states:

The Authority must not approve a mixing zone which, according to tests approved by the Authority, will result in any of the following –

- (a) acute lethality at the point of discharge;
- (b) chronic toxicity outside the mixing zone;
- (c) risks to beneficial uses at the boundary of the mixing zone;
- (d) harm to humans;
- (e) harm to plants or animals;
- (f) loss of aesthetic enjoyment;
- (g) objectionable odour.

Clause 22(3) of SEPP (Waters) states:

The Authority must not approve an application for a new wastewater discharge to surface waters in the following areas unless the Authority is satisfied that the wastewater discharge will be consistent with the requirements of clause 25 –

- (a) aquatic reserves;
- (b) waters of high conservation value as set out in Schedule 5;
- (c) wetlands or estuaries segments.

Clause 25 states:

The Authority may approve an application to discharge wastewater to surface waters to provide water for the environment or other uses, if –

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<sup>96</sup> D269

- (a) the Authority is satisfied that the wastewater can be treated and managed to a level to protect beneficial uses, and
- (b) the waterway manager (if applicable) is satisfied that the discharge is consistent with environmental flow requirements.

SEPP (Waters) allows discharge into areas of high conservation value if discharge provides a net benefit to the receiving environment. During cross examination by the EPA, the Proponents' marine experts agreed there is sufficient seawater in Western Port Bay and there is no need to supplement supply with additional water. Mr Chidgey acknowledged the seawater discharge does not provide a net benefit to the environment or waters at Crib Point.

In closing, the Proponents concluded impacts on the marine environment will be minimised to the extent practicable and in accordance with best practice and with SEPP (Waters).

## **(ii) Discussion**

The IAC recognises an objective of SEPP (Waters) is to achieve water quality that is suitable to achieve a nominated level of environmental quality required to protect the beneficial uses of waters. The beneficial uses most relevant to the Project are '*Water dependent ecosystems and species, Human consumption of aquatic foods (natural populations – commercial and recreational catch), Water-based recreation, and Navigation and shipping*'. SEPP (Waters) requires the objective for toxicants in Western Port's Entrances and North Arm achieves a 99 per cent marine species level of protection.

CPO impact is assumed by the Proponents to be localised and minimal impact is expected outside the 2 or 6µg/L CPO mixing zone. A mixing zone is allowed by the EPA to manage seawater discharges into an aquatic environment. The IAC notes that SEPP (Waters) Clause 23 regulates the approval of a mixing zone to manage seawater discharges.

Mixing zones are designed to accommodate the residual impact on the environment from a discharge. The application of a mixing zone regulated by the EPA allows for a defined area where specified GV or environmental quality objectives do not apply within the defined zone. Environmental impact is accepted within a mixing zone, yet the mixing zone is to be reduced to the maximum extent practicable. In principle, the specified water quality criteria or GV is met at and beyond the boundary of a mixing zone. Within the mixing zone of the FSRU and where the plume of CPO or temperature cannot achieve environmental quality objectives or the nominated GVs, it can be generally accepted that some biota within the mixing cannot be protected.

As indicated in SEPP (Waters), a mixing zone identifies an area of the environment that will be compromised, and SEPP (Waters) recognises that some or all of the environmental quality objectives for surface waters set out in SEPP (Waters) are not required to be achieved. Within the mixing zone of the FSRU and where the plume of CPO or temperature cannot achieve environmental quality objectives or the nominated GVs, it is expected some species may not be protected.

Based upon the evidence presented at the Hearing, the IAC considers the Project may not meet the requirements of Clause 23(2) (a) and (b). It is likely that a discharge of 100 µg/L CPO would result in acute toxicity to some species at the point of discharge. The likelihood of chronic toxicity from the continual discharge of CPO into Western Port waters in the vicinity of Crib Point is unconfirmed.

SEPP (Waters) allows new wastewater discharges into areas of high conservation value if it can be demonstrated the discharge will provide water for the environment and the

wastewater can be treated to protect beneficial uses. Mr Chidgey acknowledged the seawater discharge does not provide water for the environment or other uses, described in Clause 25.

In making its assessment, the IAC considers that discharge of 100 µg/L CPO is unlikely to protect the beneficial uses of water dependent ecosystems at the point of discharge, it is not necessary for the net benefit of the environment of Western Port Bay and could result in acute lethality in the immediate vicinity of the FSRU. The final decision of the Project's compliance with SEPP (Waters) is a matter for the EPA.

### **(iii) Findings**

The IAC finds:

- Based on the evidence presented to the IAC, the Project does not, at a minimum, comply with the requirements of SEPP Waters Clause 23(2) (a) and Clause 22(3).
- The seawater discharged from the FSRU is considered a new wastewater discharge into an area of high conservation value.
- Discharge from the FSRU would not provide water for the environment and discharge concentration of 100 µg/L CPO may impact water quality, compromising the beneficial uses of water dependent ecosystems and species.

## **4.5 Seawater intake and entrainment**

### **4.5.1 Background**

The EES assessed the potential rate of entrainment of plankton and other biota into the FSRU. Normal operations of the FSRU would involve open loop regasification, with ambient seawater taken in through sea chests on the sides of the FSRU, circulated through three heat exchange units and discharged through six high velocity ports on the east side of the FSRU. The FSRU would draw seawater from Western Port Bay and discharge an average volume of 468,000 m<sup>3</sup> per day of seawater.

The seawater intake has been designed with a low, horizontal velocity that would draw seawater at a rate of 0.15m/sec to minimise the possibility of fish impingement. Intake screens will be sized 100 x 100 millimetres to prevent larger biota such as penguins and large fish from entering the intake and becoming trapped, injured or killed.

### **4.5.2 Evidence and submissions**

The Proponents submitted the potential adverse effect of seawater intake is entrainment of smaller marine organisms (small fish, zooplankton and phytoplankton, drifting eggs and larvae) in the central part of the water column adjacent to the intake. The Proponents advised the FSRU was designed to reduce the impact of seawater intake and discharge and will have minimal impact because of the distance from the shoreline and the significant size of Western Port Bay with its strong tidal currents<sup>97</sup>.

The Proponents relied on evidence from Dr Wallis that plankton would be entrained by the intake at a rate that is insignificant when compared to the whole of Western Port Bay. Dr Wallis was responsible for the hydrodynamic dispersion and entrainment model. That model predicted the rate of particle entrainment whereby the release of neutrally buoyant particles

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<sup>97</sup> D269

into a range of zones within Western Port Bay was simulated for 28 days (assuming peak open loop operations every day).

Dr Wallis submitted that data published for plankton life cycles indicated the period for assessing entrainment for phytoplankton should be seven days (phytoplankton have a life cycle of a few days) and 21 days for zooplankton and fish larvae. His evidence concluded that:

... entrainment rate depends on the duration of the simulation (which is determined from the life cycle of plankton) and the volume of water from which the plankton are sourced (which can include all of Western Port and part of Bass Strait). Because of this large volume, the percentage entrainment is very small in relation to other processes (growth, predation, exchange with Bass Strait) that affect phytoplankton and zooplankton <sup>98</sup>.

The peer review of the hydrodynamic modelling concluded *'the methodologies were sound and modelling approaches were deemed to be suitable for assessing behaviour of the plume in the marine environment'* <sup>99</sup>.

Professor Baldock's evidence generally accepted the hydrodynamic model was well used for Western Port conditions, but he raised concerns about the validity of the modelled conditions to estimate the rate of plankton entrainment. He expressed concern the particles appeared to decrease over the 28 day simulation period.

In his response, Dr Wallis contended that Professor Baldock appeared to misinterpret the particle distribution calculated using the 3-D particle transport and dispersion model, hence his concerns were incorrect <sup>100</sup>. Dr Wallis gave further evidence that the alternative modelling methods suggested by Professor Baldock would predict similar entrainment rates to those predicted in the EES.

Dr Wallis advised the plankton entrainment modelling using the 3-D particle transport and dispersion model took the conservative approach in that all biota entrained into the seawater intake would die <sup>101</sup>. He stated it was likely that entrained biota could survive chlorine and cold water treatment in the heat exchangers, suggesting that 50 per cent of entrained biota may survive. The risk assessment assumed zero percent survival rate.

Dr Lincoln Smith and Dr Blount questioned the assumptions of the EES that entrained biota would survive the exposure to electrolysis, chlorine, and temperature changes during entrainment. Their evidence was that the combination of effects would cause mortality and moribundity and would likely increase predation at the discharge.

Dr Wallis recommended that monitoring be undertaken once the FSRU is commissioned so plankton survivorship could be established. He indicated the monitoring proposed in EPR-ME16 would be sufficient. The Proponents submitted the objective of EPR-ME16 was to determine percentage survival of zooplankton and fish larvae, so that the Project's effect on primary productivity could be quantified. Dr Lincoln Smith and Dr Blount questioned how impacts to phytoplankton and chlorophyll, which are the measure of primary productivity, could be assessed by sampling zooplankton and fish larvae.

Mornington Peninsula and Bass Coast submitted the phytoplankton, zooplankton and ichthyoplankton sampling monthly for a 13-month period was not representative of spatial and temporal variability in plankton that may be entrained. They submitted a single sample

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<sup>98</sup> D540  
<sup>99</sup> Technical Report A Annexure A-K  
<sup>100</sup> D540  
<sup>101</sup> D70

at a point in time is not representative of the heterogeneity that is likely at a nominated site at the time of sampling. The Councils commented that more intensive sampling was required to understand site specific variability. They expressed further concern as replicate sampling was not conducted at each site to provide statistical robustness to the results.

Dr Edmunds gave evidence that survey methods for plankton were not well designed for impact assessment, given the assessment made many assumptions about stratified depth distributions and the monitoring integrated sampling across the whole water column. Assumptions that plankton are evenly distributed throughout the water column were questioned by Drs Lincoln Smith and Blount as work referenced in the EES indicated this may not be the case. The EES noted variability may exist in plankton behaviour:

Most plankton are weak swimmers and are carried horizontally by ambient water currents. Some plankton move vertically through the water column in response to time of day, this is known as diurnal migration. Others maintain themselves at a certain depth range in waters that are stratified by temperature or salinity layers. Still others may be associated with certain seabed habitats, such as seagrass or mudflats in shallow water and have strategies to maintain their position on, in or close to those habitats <sup>102</sup>.

In response to cross examination, Mr Chidgey agreed the consequence of entrainment on the Ramsar as a whole, is accepted as low. He acknowledged that if the focus on rate of entrainment was concentrated more locally, the consequence would be greater. The risk assessment considered the potential for fish larvae and eggs to be entrained during peak open loop degasification was likely. The EES recognised that eggs and larvae of a number of recreational and commercial fish species exist in the North Arm of Western Port Bay and Western Port serves as a nursery for a range of species.

Mornington Peninsula and Bass Coast questioned the division of Western Port Bay into zones for the purpose of modelling the entrainment rate across the North Arm, and the ecological considerations used to define the zones. They argued there did not seem to be any basis for the separation.

The CEG expressed concern there would be short and long term impacts on marine biota due to either entrainment of organisms in seawater or discharge of cooled seawater after use for degasification.

The Proponents submitted the seawater intake was designed to minimise the entrainment and impingement of marine biota. EPR ME01 outlined the structure of the intake, velocity and screening grilles.

The Proponents submitted that fish and other mobile biota would avoid entrainment by detecting the intake flows and swim away from the intake, which would be 14.5 metres long by 2.5 metres high. Drs Lincoln Smith and Blount were critical of this and noted a number of fish are cryptic and attracted to dark places. In evidence, they referred to the intake as a '*really big cave*' and raised concern that '*the proposed screen grid (100 x 100 mm) could admit virtually all plankton, but also many biota of moderate (e.g. jellyfish, eels, pipefishes, blennies, gobies juvenile and adult forms) size*' <sup>103</sup>. They noted there was a lack of information within the EES on local fish assemblages and species biology and behaviour. This created uncertainty in the predictions of what fish larvae and eggs could be entrained and the impact on local populations.

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<sup>102</sup> Technical Report A Section 5.8

<sup>103</sup> D403

The Proponents submitted EPR-ME03 limits seawater regasification flows to minimise potential entrainment impacts. In questioning of Mr Chidgey and Dr Wallis, the EPA raised concern about entrainment of fish eggs by the FSRU during the peak periods when fish eggs were recorded as most abundant. The EPA recommended that operation of the FSRU be restricted between August and February inclusive when fish eggs and larvae were reportedly more abundant, noting that peak periods of egg abundance commenced in August. The Proponents amended EPR-ME03 to reflect the EPA's suggestion.

#### **4.5.3 Discussion**

The EES reported the intake would entrain a range of biota into the pipe network and heat exchangers. Two mitigation measures (EPR-ME01 and EPR-ME03) were proposed to reduce the impact of entrainment. The mitigation measures appear acceptable to the IAC and will contribute to minimising entrainment and impingement. However, the plankton monitoring in EPR-ME16 is lacking in detail and the IAC considers that a better understanding of the inter diurnal variability in plankton density and entrainment between months is required to better predict variability in plankton numbers and entrainment rates. The IAC recommends improvements to this program, reflected in revised EPR-ME16 at Appendix G.

The IAC notes the amendment to EPR-ME03 suggested by EPA to limit seawater regasification and subsequent seawater intake between August and September to minimise entrainment impacts. It remains unconfirmed if a reduction in seawater intake would reduce the entrainment rate. Plankton is more abundant in spring and summer, with fecundity of a number of species increasing with warmer water and air temperatures. There is the potential that EPR-ME03 would be ineffective at reducing the rate of entrainment if plankton numbers are more concentrated during these warmer periods.

EES Technical Report A stated:

Phytoplankton and zooplankton (holoplankton) reproduce in the water column, with different rates of reproduction or turnover between species, seasons and years. The characteristics and duration of the life stages of meroplanktonic invertebrates are highly variable between species.

The IAC recognises that a significant number of parties emphasised the complex system in Western Port is not well understood. The IAC further acknowledges that early life stages of marine biota are highly complex which determine the population abundance and diversity of species. Larval recruitment is critical to success of many important ecological community components, including commercial fishery species and is contingent on a range of contributing factors. The seagrass meadows, mangroves and saltmarsh communities are important nursery habitats for a range of important fish species and little attention was given in the EES to understand the variability that may exist.

The IAC accepts there is significant movement of plankton around North Arm and a high degree of particles are flushed to Bass Strait. The Proponents submitted that plankton entrainment by the FSRU will be inconsequential within the broader Western Port Bay environment. The likelihood of plankton entrainment is certain. The IAC considers the Project is likely to have an impact on plankton and another biota entrained by the FSRU, with the extent of impact unknown.

The IAC considers the 3-D particle transport used to calculate the entrainment rate is adequate, but it remains concerned with the modelled rate of particle entrainment and the assumptions of particle densities in the 28 day simulation. The IAC acknowledges the short life cycles of plankton and fish larvae and eggs but recognises that larvae populations are

continuously replenished during fecund periods, with inter diurnal variability in plankton density and abundance between months, particularly during warmer periods.

The IAC is concerned the modelling conducted of peak FSRU production appears to predict that particles originating within a particular zone are not replenished by particles (e.g. larvae in zone 2) within that zone, but instead particles are replaced by a particle entering from an adjacent zone. Dr Wallis' evidence does not appear to predict phytoplankton particles being replenished within a particular zone more frequently than every seven days, and fish larvae and zooplankton being replenished every 21 days<sup>104</sup>. Dr Wallis gave evidence that '*based on data for published plankton life cycles, the period for assessing entrainment for phytoplankton should be 7 days (phytoplankton have a life cycle of a few days) and 21 days for zooplankton and fish larvae*'<sup>105</sup>.

The plankton sampling methodology was criticised by a number of submitters. The IAC agrees the monthly sampling and analysis of plankton over 13 months may not adequately characterise the intra-month and inter-annual variation in plankton, particularly as the life cycle of plankton was reported by the Proponents to be between seven and 21 days. An increased frequency in the plankton sampling would provide a better understanding of the variability in plankton and provide a more comprehensive understanding of entrainment rates.

The Proponents submitted that fish and other biota will swim away from the intake but there was little evidence to support the assertion that biota will not be attracted to the intake. The commitment in EPR-ME01 to design the intake, velocity and screening grilles goes some way to mitigate entrainment and impingement. The IAC accepts evidence from Mr Chidgey and Dr Wallis that further refinements to the intake design would compromise the efficiency of the FSRU. The IAC considers entrainment of plankton and biota sized to at least 100mm is likely and unavoidable.

The EES considered that entrainment would contribute an additional '*supply of food to the infauna under the discharge ports*' which the EES purports would enable filter feeders and their predators to flourish<sup>106</sup>. According to the Proponents, there would be no loss or addition of organic carbon or nutrients. The Proponents indicated the composition of the infauna community could be compromised, and the IAC acknowledges this is contingent on the size and extent of the seawater plume dispersion.

Consideration of impingement risks to the variety of marine biota potentially impacted was lacking in the EES. The IAC considers the long term impacts of recruitment and viability was not adequately considered for the range of species within North Arm that may be impacted by the seawater intake.

The IAC acknowledges plankton entrainment was modelled during peak open loop regasification which is not expected to occur between August and February and entrainment numbers were predicted under worst case scenarios. Based on evidence from Professor Baldock and the assumptions applied by Dr Wallis to the hydrodynamic entrainment model of plankton distribution and rate of replenishment within each modelled zone, the IAC is unclear on the magnitude of entrainment and impingement, and consequential impacts on a local scale.

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<sup>104</sup> D540

<sup>105</sup> D540

<sup>106</sup> Technical Report A section 8.5.2

The IAC concludes that EPR-ME16 should require additional baseline plankton surveys for 13 months prior to commissioning the GIJW and subsequent monthly sampling from the FSRU and nominated distances from the GIJW.

#### 4.5.4 Findings

The IAC finds:

- The EES plankton monitoring and hydrodynamic entrainment modelling provides an understanding of the likely rate of entrainment by the FSRU seawater intake.
- Irrespective of the configuration of the FSRU seawater intake, biota will be entrained up to a minimum size of 100mm, and this is an unacceptable impact to ecology of Crib Point.
- The entrainment and impingement of marine biota may be acceptable in the context of the entire marine environment of Western Port Bay, but on a local scale at Crib Point, the impacts are considered to be greater.
- Entrainment of biota will continue for the life of the Project, and it is not possible to determine if the continual entrainment will create an unacceptable impact to the North Arm and Western Port Bay.
- A more comprehensive understanding of intra-month plankton diversity is required to better inform the rate of entrainment and variation, particularly during spring and summer and improve the statistical validity of results measured for each month and locations sampled.
- The risk of impingement was not adequately considered in the EES for the range of species within North Arm and further consideration of species likely to be impinged is necessary.

#### 4.5.5 Recommendation

The IAC recommends:

##### Environmental Performance Requirements

**Include the following change:**

- **Revised EPR-ME16 (Monitoring program)**

This change is included at Appendix G.

#### 4.6 Overall conclusions on marine biodiversity

- The likely marine biodiversity impacts do not achieve the relevant draft evaluation objective.
- An adequate baseline of conditions within Crib Point has not been established and future predictions of direct and indirect impacts from the Project are not certain.
- The 20 year life of the Project will result in continued exposure to adverse environmental impacts.
- The marine discharges into Western Port Bay are inconsistent with the legislative, policy and guideline requirements and commitments to conserve, maintain and enhance the wetland as a consequence of its recognition as:
  - a listed wetland under the Ramsar Convention
  - a MNES under the EPBC Act
  - an area of high conservation value by SEPP (Waters)

- an ecosystem highly valued for its unmodified state and outstanding natural and conservation value.
- Discharge from the FSRU is expected to result in an adverse impact proximal to the Jetty, including impacts to the seabed habitat and changes to epibiota and infauna assemblages.
- The aggregate direct impacts from chlorine and coldwater discharges, entrainment of biota sized to at least 10 centimetres, impingement of pelagic biota and indirect impacts of CPO are potentially threatening processes to the ecological character of Western Port Ramsar site.
- Marine biodiversity impacts cannot be acceptably managed through the recommended mitigation measures.
- For these reasons, the IAC concludes the Project will result in unacceptable impacts on the marine environment. If the Project is approved, the recommended Environmental Performance Requirements in Report No. 2 should be adopted.

## 5 Terrestrial and freshwater biodiversity

### 5.1 Introduction

Terrestrial and freshwater biodiversity effects are discussed in EES Chapter 7 and Technical Report B. Additional material was provided in TN01, TN17, TN21, TN27, TN41, TN44 and TN46.

The Study Area for terrestrial and freshwater biodiversity includes the pipeline ROW, the PDF, EOLSS, MLVs, pipe stringing areas, vehicle access tracks and land-based area required for the GIJW. It includes the adjacent exposed intertidal and coastal habitats at Crib Point with respect to impacts on shorebirds.

The relevant draft evaluation objectives are:

**Biodiversity** – To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

Table 3 lists the terrestrial and freshwater biodiversity evidence that was provided. Mr Lane lodged supplementary evidence and responses (D210, D330, D346, D530 and D567). Dr Lorimer, Mr Urlus and Dr Cole lodged supplementary reports (D427, D441 and D486).

**Table 3** Terrestrial and freshwater biodiversity evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Lane	Nature Advisory	Terrestrial Biodiversity
Proponents	Mr Cook	AECOM	Lighting
Mornington Peninsula Bass Coast	Dr Lincoln Smith and Dr Blount	Cardno (NSW/ACT) Pty Ltd	Shorebird Ecology
Mornington Peninsula and Bass Coast	Dr Lorimer	Biosphere Pty Ltd	Orchids
Mornington Peninsula and Bass Coast	Mr Urlus	Tactecol Consulting	Terrestrial Fauna Ecology
Western Port and Peninsula Protection Council Inc	Dr Cole	Agpath Pty Ltd	Plant Pathology
CEG	Dr Edmunds	Australian Marine Ecology	Shorebird Ecology
S3272	Ms Thomas	Animalia Wildlife Shelter	Wildlife Handling

The following EPRs apply to terrestrial biodiversity associated with the CPRF:

- C07 – Operation waste management (requirement ‘e’ relates to lidded waste containers to mitigate fauna access)
- FF01 – Unplanned vegetation loss
- FF02 – Invasive weeds, pests, pathogens and waste
- FF03 – Contractor awareness

- FF04 – Topsoil management
- FF05 – Injury and/or disturbance to fauna
- FF06 – Migratory birds
- FF07 – Surface water sedimentation and runoff
- FF08 – Surface water contamination
- FF09 – Lighting impacts to fauna
- FF10 – Dust impacts to flora/fauna.

The following POS environmental controls in the CEMP Appendix J apply directly or indirectly to terrestrial and freshwater biodiversity:

- B1 to B14 relating to Biodiversity including native vegetation and threatened species
- S1 to S6 relating to Biosecurity
- R12 to R15 relating to reinstatement works.

## 5.2 Key issues

The key issues are:

- Native vegetation loss, including large scattered trees.
- Threatened species habitat loss, fragmentation and disturbance including migratory shorebirds.
- Biosecurity risks with pathogens.
- The impacts of lighting on wildlife.

## 5.3 Native vegetation loss, including large scattered trees

### 5.3.1 Background

The EES assessed potential impacts of the Project on land-based and freshwater aquatic flora and fauna values. In relation to native vegetation, the assessment involved the GIJW area which is restricted to the area of the proposed CPRF on land currently owned by the PHDA and the Pipeline Works alignment.

According to the EES, the total area of native vegetation proposed to be removed is 16.955 hectares comprising:

- 1.603 hectares for the CPRF, which includes 1.573 hectares of Heathy Woodland (EVC48), 0.030 hectares of Swamp Scrub (EVC53) and the loss of two large patch trees (trees located within a patch of native vegetation and not identified as a scattered tree). Most of the native vegetation within the CPRF area was removed by the PHDA in early 2020 to manage bushfire risk<sup>107</sup>.
- 15.352 hectares for the Pipeline Works, including 12.3 hectares associated with the removal of habitat patches of native vegetation, 48 large patch trees, 29 large scattered trees and 50 small scattered trees.

The removal of native vegetation is proposed within the pipeline impact area which includes not only the pipeline ROW, but pipe stringing areas associated with HDD and access tracks for

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<sup>107</sup> The IAC is aware this removal raised community concern and is subject to ongoing investigation by Mornington Peninsula Shire Council.

construction machinery that will either upgrade and use existing access tracks or construct new ones for pipeline construction.

### 5.3.2 Evidence and submissions

The GIJW would be located within an environment that has been substantially modified with past vegetation clearing associated with development of the former BP refinery, the existing land-based infrastructure associated with the Jetty and the recently cleared area of the proposed CPRF site. In his presentation to the IAC, S2912 provided an excellent historic image of the Crib Point Jetty and former BP refinery in the 1960s that showed the extent of vegetation at that time, much of which has now been removed <sup>108</sup>.

Some submitters were concerned the clearing of the CPRF site reflected poorly on the assessment process. The Proponents submitted removal of native vegetation at the CPRF site was included in the EES assessment with a commitment to offset this vegetation loss.

In relation to the pipeline, the Proponents submitted it runs through a heavily modified landscape which includes co-location with existing pipeline infrastructure (approximately 19 kilometres), areas of cleared and fragmented vegetation including areas of regrowth, farmland, and urban areas (Hastings) <sup>109</sup>.

The Proponents considered that through the process of pipeline alignment selection and review, significant effort was made to avoid the extent of native vegetation removal where practicable. They submitted this work was supported by design elements such as narrowing the pipeline construction footprint within the ROW in sensitive areas to minimise the extent of vegetation removal.

The Proponents submitted that, although there will be native vegetation removal, offsets are proposed for this in conjunction with promoting natural regeneration of vegetation removed along those sections of the pipeline alignment where open trench construction is proposed.

Mr Lane provided evidence that mapping of native vegetation followed the *Guidelines for the removal, destruction or lopping of native vegetation*, DELWP 2007 (Guidelines) as required by the EES Scoping Requirements, with all four key categories of native vegetation (native vegetation, large trees in patches, scattered trees and mapped wetlands) assessed. Mr Lane identified native vegetation mapping by Biosis and Monarc Environmental in the EES was incomplete in some instances. He provided a peer review report attached to his evidence which included an update on the extent of native vegetation removal for the Project. That report responded to:

- unidentified and inaccurate mapping of areas of native vegetation
- assignment of an inappropriate EVC
- unidentified scattered trees and large trees in patches.

Generally, Mr Lane considered the assessment in Technical Report B was appropriate and condition (habitat) scores of mapped native vegetation were accurate.

His report found the Project would remove an additional 0.988 hectares of native vegetation and an additional 15 large trees, culminating in a total loss of 17.953 hectares of native vegetation and a total of 94 large trees, comprised of 31 large scattered trees and 63 large patch trees. Mr Lane identified the removal of 54 small scattered trees.

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<sup>108</sup> DR1-42

<sup>109</sup> Attachment IX – Pipeline Licence Application page 9.

Generally, submitters, such as the Western Port and Peninsula Protection Council (WPPC) (3194), and the Southern Peninsula Indigenous Flora and Fauna Association (SPIFFA) (S1694), were concerned about the extent of loss of native vegetation, including the loss of large trees. Large trees identified through benchmarks under relevant EVCs include long lived specimens, many of which are hollow bearing or contain spouts that can offer habitat value. The IAC notes these trees are difficult to replace due to their age and condition and the time required for the development of such hollows and spouts.

Fragmentation of vegetation and associated habitat values, and edge effects and loss of connectivity with other vegetation areas were raised by many submitters.

The WPPC highlighted that damage may occur from vegetation removal through the disturbance of soils resulting in the loss of soil structure, the soil microbiome and soil mycorrhiza that can provide connectivity amongst trees and other vegetation in heathland areas.

Casey submitted that land use impacts have reduced the pre-settlement biodiversity of that municipality to about seven per cent of its former extent. It considered the management of remnant vegetation and fauna throughout the City is important to achieve a net gain in the extent and quality of native vegetation and to protect and conserve biodiversity including biolink corridors. Although Casey acknowledged the extent of clearing within its municipal boundaries was small and the quality of the vegetation degraded, it maintained that due to the proximity of the Western Port Ramsar wetland, there remains a connection with vegetation by virtue of direct habitat contiguity, connectivity and shared characteristics. Casey considered much of this vegetation could be considered an extension of the Ramsar site.

Casey submitted the impacts to native vegetation at South Boundary Road East, Pearcedale (KP20.1) were unacceptable and that vegetation in this location is of high conservation significance due to:

- The presence of the ecological community Subtropical and Temperate Coastal Saltmarsh listed under the *Environment Protection and Biodiversity Conservation Act* as Vulnerable.
- The vegetation at this location (Estuarine Scrub EVC 953) being identified as habitat for Southern Brown Bandicoots.
- The proximity and direct habitat contiguity to the Western Port Ramsar site and its links with and contribution to the ecological character of the wetlands.
- The area identified in the Casey Planning Scheme under Schedule 1 to Clause 42.01 – Environmental Significance Overlay relating to Coastal Environs (ESO1), which seeks to conserve and enhance the ecological values of environmentally sensitive land fringing Western Port and to maintain and enhance the rural character of areas fringing Western Port.

Consequently, Casey submitted all vegetation in this location should be retained and HDD be considered.

Based on EVC bioregional conservation status, Mr Lane's evidence was that approximately 50 per cent of the native vegetation proposed to be removed by the Project is listed as an Endangered EVC within the Gippsland Plain Bioregion (approximately 8.905 hectares), with

much of the vegetation being Swamp Scrub (EVC 53) <sup>110</sup>. Most of the vegetation loss occurs in the southern portion of the pipeline alignment. Mr Lane considered this extent of removal to not be significant given the pipeline alignment attempts to follow existing pipeline alignments in areas where Swamp Scrub vegetation has experienced past disturbance. He considered these past disturbances have tended to result in regrowth of patches dominated almost exclusively by Swamp Paperbark (*Melaleuca ericifolia*), which out-competes other species and therefore results in poor quality vegetation lacking native ground cover elements. He stated this situation was observed in the vast majority of this mapped EVC, with relatively low condition scores representative of low quality, modified vegetation.

Mr Lane gave evidence that almost 8.2 kilometres, or almost 15 per cent of the Project area, has been subject to deliberate changes in construction methods to avoid impacts on remnant areas of native vegetation. A further 1.75 kilometres (three per cent) of the Project area has been subject to such modifications to avoid impacts on habitat for threatened fauna that is not native vegetation. These changes to the Project represent avoiding and minimising impacts in most areas where the Project potentially directly affects biodiversity. Mr Lane considered such a strategy to be consistent with the avoid and minimise requirements of the Guidelines and would significantly reduce the potential direct impacts on native vegetation and the biodiversity that it supports.

The Proponents referred to TN01, which included a draft offset strategy. This sought to demonstrate that a strategic approach for any required offsets for both general and species specific purposes can be provided. Mr Lane provided an update on offset requirements in his peer review report and an explanation for variations in offsets based on the combination of vegetation loss for the CPRF and the pipeline alignment (D567).

The Proponents submitted the extent of work conducted in preparing the EES with respect to terrestrial and freshwater biodiversity including Technical Report B prepared by Biosis and the peer review report prepared by WPS Australia Pty Ltd in 2020 were adequate and sound.

The Proponents submitted that through pipeline alignment and realignment, reductions in the construction footprint at sensitive locations, and use of trenchless construction techniques such as HDD to avoid native vegetation, there were no further practicable avoidance or mitigation measures of any significance available. A modification to the alignment was suggested by the Proponents at KP5 in the northern end of Warringine Park/Reid Parade, Hastings (Pipeline alignment option BJ-11) <sup>111</sup>. This option replaces open trenching of the pipeline with HDD and the need to remove native vegetation in an area of the Park that is covered by a conservation covenant. It involves construction within land parcels on the north side of Reid Parade that were not previously impacted. There are some native trees on these parcels, but there is expected to be a net reduction in native vegetation impacted. HDD rigging would be required closer to residences on the north side of Reid Parade.

With respect to South Boundary Road (KP20) and the *Environment Protection and Biodiversity Conservation Act* listed vulnerable coastal saltmarsh ecological community, the Proponents indicated that HDD is not suitable for avoiding the habitat at this location due to the angle of the alignment. The location of HDD equipment, particularly the location of the welded pipeline drill string prior to pull in, would create further impacts to land use, including properties not otherwise impacted, and/or other areas of sensitive vegetation.

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<sup>110</sup> Approximately 5.425 hectares.

<sup>111</sup> D326, information bulletin (D130) and TN17.

This response was reiterated by Mr Lane who gave evidence that the coastal saltmarsh in this location occurs in a highly modified nature. It occurs within a drainage line and extends into a low depression in the corner of a paddock. These areas are subject to sea water inundation at extreme high tides flowing through a culvert under a road which segments this area from an extensive coastal saltmarsh area. He considered the area is not directly continuous with the Ramsar wetland and provides limited contribution to its ecological character. Although considered to be the *Environment Protection and Biodiversity Conservation Act* listed ecological community, Subtropical and Temperate Coastal Saltmarsh, it only meets the condition thresholds due to the area's proximity to an extensive area of intact coastal saltmarsh. As this community is listed as Vulnerable under that Act, it is not considered a MNES for the purposes of referral under the Act.

### 5.3.3 Discussion

#### (i) Native vegetation condition and policy

The IAC considered the following sources of information to identify areas of native vegetation and some large scattered trees worthy of further investigation by the Proponents to further avoid native vegetation removal:

- APA's GIS mapping tool, including the native vegetation patch and large scattered tree data.
- Information provided in TN41 and TN44.
- Site inspections.
- Information about Habitat Zone Condition Scores provided in the appendices to EES Technical Report B, in Mr Lane's peer review evidence and the Flora and Fauna Assessment prepared by Monarc Environmental in 2018 <sup>112</sup>.
- Information cross referenced to the endangered status of EVCs.

The IAC acknowledges the Proponents efforts in demonstrating consistency with the Guidelines' avoid, minimise, or offset policy with respect to native vegetation removal. However, the IAC considers the environment around Western Port Bay is a sensitive location that retains a strong environmental character. It includes areas of connected native vegetation close to the Western Port Ramsar site such as Warringine Park and the North Western Port Nature Conservation Reserve. This is despite the area including Port related activity, industrial development and land zoned for such purposes.

The IAC's considers native vegetation close to Western Port is of environmental importance due to its connection between the land and the coast. This view is consistent with State planning policy under Clause 12.01-1S (Protection of biodiversity) and its objective '*To assist the protection and conservation of Victoria's biodiversity*'. Strategies supporting this objective relevantly include '*Use biodiversity information to identify important areas of biodiversity, including key habitat for rare or threatened species and communities, and strategically valuable biodiversity sites*'. This includes sites listed as Ramsar wetlands. In addition, the policy includes the strategy:

Ensure that decision making takes into account the impacts of land use and development on Victoria's biodiversity, including consideration of:

- Cumulative impacts.
- Fragmentation of habitat.

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<sup>112</sup> For the purposes of the Guidelines the condition score is the Habitat Score.

- The spread of pest plants, animals and pathogens into natural ecosystems.

The policy includes the strategy '*Avoid impacts of land use and development on important areas of biodiversity*'. Parts of the pipeline alignment affect areas of important biodiversity such as Warringine Park, vegetation around the Tyabb Resource Recovery Centre (former Tyabb landfill site), Watsons Creek and other areas with close association with the Western Port Ramsar site and its associated mangrove and coastal saltmarsh vegetation communities.

The IAC considers this policy, combined with the locational attributes of the Project study area strengthens the focus on avoidance as an important measure for managing impacts on terrestrial and freshwater biodiversity.

## **(ii) Additional mitigation of vegetation loss**

The IAC considers there are opportunities to further reduce the extent of native vegetation loss. There are Habitat Zone patches of EVCs with an endangered bioregional conservation status that have condition (habitat) scores greater than half their mature natural state. These warrant revisiting for avoidance of removal. In addition, large scattered trees that contain hollows or spouts warrant avoidance from removal.

In relation to the open trenched sections of the pipeline alignment in Warringine Park, the IAC notes the response has generally been that the pipeline follows existing pipeline easements (TN41). This forms part of the Proponents response to minimise impacts to surrounding land use where much of the vegetation proposed to be removed is within or between existing pipeline easements. These easements have previously been disturbed or cleared and are subject to ongoing vegetation management by the pipeline operator. Despite this, it is stated in TN44 that maintenance of the pipeline easement in areas above HDD locations is unlikely to require vegetation removal. This was confirmed in the evidence of Mr Lane. This presents a contradiction to the IAC with respect to the difference with easement maintenance between areas trenched and those where HDD is applied. To the IAC, it highlights the need for additional avoidance of native vegetation removal in Warringine Park through the extension of HDD.

The Proponents submitted that within Warringine Park, the width of the construction ROW has been reduced to 20 metres (from 30 metres) to reduce vegetation impacts. The pipeline is proposed to be installed between existing pipelines, limiting alignment flexibility, and the native vegetation is assessed as occurring across almost the full width of the reduced construction ROW. The Proponents stated that as a result, it is not possible to further avoid the vegetation through pipeline micro-siting. The IAC considers this response further reinforces the benefit of avoidance given the constraints on micro-siting – a minimisation measure rather than one of avoidance.

The identification of trees includes those associated with EVCs that have a Bioregional Conservation rating of endangered and which have been identified with the presence of hollows and spouts – good habitat values. As large scattered trees are usually old trees, the presence of habitat values makes them valuable, as is recognised in the Guidelines that place greater emphasis on their biodiversity value. The value of large scattered trees is further heightened in cleared landscapes, such as those in the northern portion of the pipeline alignment, where they take on a more prominent role regarding habitat connectivity. The IAC considers greater effort is required to avoid the loss of such trees. The IAC considers this could be achieved either through changes to the pipeline alignment or HDD and has made recommendations for retaining identified trees accordingly.

The IAC agrees with Casey regarding the coastal saltmarsh area at KP20 at South Boundary Road. The IAC does not accept the arguments of the Proponents concerning the constraints on applying HDD in this area to avoid the coastal saltmarsh, wet areas and the potential habitat for Southern Brown Bandicoots offered by the Estuarine Scrub in this location. It appears the physical reasons for not entertaining any change can be overcome, most likely through angled crossing of some private land rather than trying to follow boundaries. The area of coastal saltmarsh was accepted by Mr Lane as having a tidal connection with the broader Ramsar coastal saltmarsh. This connection, together with the vegetation community's status as vulnerable, highlights a need to ensure that coastal saltmarsh is avoided and not merely dismissed, due to it not triggering a referral action under the *Environment Protection and Biodiversity Conservation Act* and failing to provide appropriate consideration of its values as a wetland system. The IAC considers it appropriate to recommend the coastal saltmarsh community at KP20 be avoided from removal through HDD.

### **(iii) Pipeline changes, offsets and soil effects**

The pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings is supported by the IAC and would assist in ensuring that open trenching within the whole of Warringine Park is avoided. The IAC considers it appropriate to accept and support the alignment change.

Regarding offsets, the IAC is generally satisfied the provision of the draft offset strategy in TN01 provides surety that these can be locally provided, and that quantum of species specific offsets provided in Mr Lane's further calculations (D567) can be satisfied.

Other than these matters, the IAC is satisfied that impacts from removal of native vegetation along the pipeline alignment to soils, the soil microbiome and soil mycorrhiza will not be significant given the narrow width of the ROW and the narrow extent of construction for a 600mm diameter pipeline structure. The POS for reinstatement of soil profiles provided by the Proponents should provide suitable safeguards.

The IAC concludes that with respect to terrestrial and freshwater biodiversity, impacts from the proposed loss of native vegetation, will generally be acceptable subject to reducing the extent of loss of endangered of EVCs and large scattered trees as set out in the IAC's recommendations. The relatively defined, narrow and lineal nature of the pipeline construction and its operation means the extent of environmental impact should not be significant.

The IAC notes that POS B3 in Appendix J to the CEMP provides for the retention of native vegetation that is identified to be retained in Attachment G – *Environmental Line List* to the CEMP. Accordingly, the IAC recommends that the Environmental Line List in Attachment G to the CEMP be amended to include those sites identified by the IAC for avoidance from removal and additional retention.

### **5.3.4 Findings**

The IAC finds:

- Impacts from the loss of native vegetation are acceptable subject to additional native vegetation sites and large patch and scattered trees being retained.
- Offsets requirements have been demonstrated in the draft offset strategy to be capable of being provided.

### 5.3.5 Recommendation

The IAC recommends:

#### Construction Environment Management Plan in Attachment G (Environmental Line List)

**Include the following sites where the removal of native vegetation and large scattered trees is to be avoided:**

- a) Pipeline alignment option BJ-11 located at KP5 in the northern end of Warringine Park/Reid Parade, Hastings with Horizontal Directional Drilling.
- b) Tree #1 Manna Gum (*Eucalyptus viminalis*) a large scattered tree containing hollows and spouts located at the proposed access track entry off Stony Point Road just south and over the railway crossing and intersection with Frankston-Flinders Road through either a change to the track entry location or use of an alternative access point.
- c) Habitat Zone ID KOJH23 (EVC175 Grassy Woodland) located at the entry to access track off Frankston-Flinders Road that leads to KP4.5 and small scattered Tree #655 Swamp Gum (*Eucalyptus ovata*) located approximately 140 metres along the proposed access track through access entry design and changes to the track alignment.
- d) Tree #662 Manna Gum (*Eucalyptus viminalis*) a large patch tree at KP2.23 containing hollows through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.
- e) Between KP3.6 to KP4 Habitat Zone IDs KOJH13 and KOJH14 (EVC53 Swamp Scrub) close to the Ramsar wetland and Warringine Park through Horizontal Directional Drilling.
- f) From KP4.3 to the revised BJ-11 alignment at KP5 near Railway Crescent, Hastings associated with Habitat Zone IDs KOJH15 (EVC53 Swamp Scrub), KOJH16 (EVC83 Swampy Riparian Woodland) and KOJH21 (EVC175 Grassy Woodland) through Horizontal Directional Drilling.
- g) KP6.9 Habitat Zone ID HZ24 (EVC821 Tall Marsh) and wetland area through Horizontal Directional Drilling.
- h) Between KP13.7 to KP14.4 adjacent to the former Tyabb landfill area at Habitat Zone IDs JHCC56 and JHCC57 or Brett Lane's Peer Review report Habitat Zone ID NA8 - EVC83 avoiding fragmentation with adjoining vegetation areas and potential Southern Brown Bandicoot habitat through Horizontal Directional Drilling without impacting vegetation for pipe stringing.
- i) KP17.3 Tree #333 Manna Gum (*Eucalyptus viminalis*) a small scattered tree with hollows and Tree #337 a stag inside the proposed footprint containing hollows through changes to the pipeline alignment or Horizontal Directional Drilling.
- j) Between KP18.5 to KP18.7 large patch of EVC 48 vegetation with numerous large trees to prevent fragmentation of habitat in close proximity south of Watsons Creek through Horizontal Directional Drilling.
- k) Between KP20 to KP20.3 coastal saltmarsh, Estuarine Scrub and potential Southern Brown Bandicoot habitat in close proximity to Ramsar wetland by eliminating right

angle changes in direction and through diagonal crossing of private land and avoiding impacts from access which could be achieved from following the alignment of the pipeline from the south through Horizontal Directional Drilling.

- l) KP22.1 large scattered trees Tree #260 and 262 both Manna Gums (*Eucalyptus viminalis* subsp *pryoriana*) that contain spouts through changes to the pipeline alignment or Horizontal Directional Drilling.
- m) KP26.1 Tree #36 containing hollows and nesting material through reducing the width of the pipeline Right of Way, changes to the pipeline alignment or Horizontal Directional Drilling.

## 5.4 Threatened species habitat loss and fragmentation

### 5.4.1 Background

Construction and operation of the proposed GIJW and pipeline has the potential to impact through direct and indirect loss of habitat for, or on, flora and fauna species listed as threatened or migratory under the *Environment Protection and Biodiversity Conservation Act*, *Flora and Fauna Guarantee Act* and/or DELWP advisory lists.

For the GIJW, species potentially impacted include various migratory and shorebird species. The primary impacts relate to disturbance from construction and operational activities such as lighting, noise, dust and increased human activity.

For the pipeline alignment, there is a range of threatened species potentially affected by construction works and operation/maintenance of the pipeline easement. The EES identified the Project has the potential to result in short term loss and fragmentation of habitat for the Southern Brown Bandicoot, the loss of potential habitat for the Southern Toadlet and removal of habitat for the Swamp Skink.

The pipeline crosses several waterways which has the potential to impact on aquatic fauna and fish species such as the Growling Grass Frog, Dwarf Galaxias and Australian Grayling.

The proposed use of HDD raised some concerns in relation to ‘frac outs’ and ground subsidence affecting various species of orchids including Merran’s Sun-orchid.

There were also concerns regarding direct impacts from construction works on wildlife.

The EES was informed by targeted surveys focussing on species such as the Southern Brown Bandicoot, River Swamp Wallaby-grass, Growling Grass Frog, Swamp Skink, Southern Toadlet, Dwarf Galaxias, orchid species between KPs 1.13 and 1.7 and for shorebirds around the GIJW study area.

### 5.4.2 Evidence and submissions

The EPA and many submitters considered the EES terrestrial and freshwater biodiversity assessment lacked rigour. Mr Lane’s evidence refuted such criticism and indicated that Technical Report B was prepared with methodological rigour and had undertaken assessments in accordance with relevant Commonwealth and State assessment criteria and guidelines, as applicable at the time of assessment.

Many submitters, including the Victorian National Parks Association (S3004), Mornington Environment Association (S2724), Mornington Peninsula and Western Port Biosphere Reserve Foundation Ltd (S2768) and S2827 expressed concern the Project would result in the direct

loss of habitat for threatened species such as the Southern Brown Bandicoot, leading to further local extinction of the species.

Ms Thomas provided evidence suggesting that vegetation clearance for pipeline construction would compromise wildlife corridors and cause significant harm to wildlife where salvage and relocation of wildlife is proposed.

Mr Lane's response in reply was that such impacts would be acceptable through a combination of avoidance, minimisation of vegetation removal and appropriate wildlife handling and management arrangements under the *Wildlife Act*.

The evidence from Mr Lane and Mr Urlus generally identified that Southern Brown Bandicoot prefer habitat with a dense cover between 0.2 -1 metre in height, regardless of whether the vegetation is native or introduced. The EES and Mr Lane's evidence was that suitable habitat for this species is extensive between the South Gippsland Highway (KP 30) and the EOLSS. In this area, most roads and creeks crossed by the pipeline contain dense weedy vegetation that provides suitable habitat for the species. Other suitable habitats are varied, ranging from relatively intact Heathy Woodland, to degraded Swamp Scrub as well as exclusively exotic vegetation.

The Proponents submitted the species utilised long linear habitats within the pipeline alignment for foraging, shelter and movement/dispersal. It is of note that the species' use of weedy environments presents a dilemma in that these areas are targeted for removal under obligations established by the *Catchment and Land Protection Act*. Thus, actions that attempt to improve the environmental condition can create a risk to the species.

Submissions from the Proponents and evidence from Mr Lane was that, although the southern half of the pipeline alignment (generally south of KP20) contained extensive low lying areas of vegetation compared to the more cleared farming areas in the northern half, Southern Brown Bandicoots had likely disappeared from that part of the alignment. This was disputed in evidence of Mr Urlus who considered the species may still be present and was not detected because of the limited survey effort.

Mr Urlus gave evidence that the presence of relatively good quality and generally well-connected habitat along the Western Port coast, the sizeable population of Southern Brown Bandicoots at Quail Island and the presence of several records within the last 15 years from the Crib Point and Hastings area, suggested the species might be present in the Mornington Peninsula. He suggested places like Warringine Park and the area around the Tyabb Resource Recovery Centre offered potential habitat for the species. He considered that even if the species were absent, recolonisation of the area was possible given the species' ability to disperse in a landscape with suitable habitat that is linked.

Mr Lane recommended that the Project acknowledge the broader planning context for Southern Brown Bandicoot and consider including all 35 areas identified by Monarc Environmental (2018) as potential habitat for the species. All of these areas should be subject to rapid revegetation to suitable habitat, except where HDD is proposed, and direct impacts are avoided. This was later qualified to reflect rapid revegetation of those habitat areas in the northern half of the alignment where Southern Brown Bandicoots had been recorded from survey work to be undertaken, while other habitat areas proposed to be removed where the species had not been recorded would be allowed to regenerate naturally (POS R13).

Although the Proponents considered this would be consistent with the Sub-Regional Species Strategy for the Southern Brown Bandicoot, it was not supported by Mr Urlus. He continued

to support the concept of rapid revegetation (specified in POS R14 in Appendix J to the CEMP) being undertaken in all potential Southern Brown Bandicoot habitat throughout the entire pipeline alignment, and not be limited to the portion north of KP20. He considered this aligned with the original recommendation made by Mr Lane in his evidence.

Mr Urlus and many submitters expressed concern the linear nature of pipeline construction and removal of vegetation including habitat for species like the Southern Brown Bandicoot, would have the potential to facilitate the movement and/or predation success of introduced predators, particularly foxes, which are a major threatening process for the species.

The Proponents and Mr Lane considered that such predators were most likely already present in the study area given the presence of existing pipeline infrastructure along much of the proposed alignment and the Project would not make a significant difference.

The Proponents considered that, although the Project would result in the short term loss and fragmentation of some habitat for Southern Brown Bandicoots and other threatened species, the impacts would not be significant. Proposed POS' would ensure that risks to terrestrial and freshwater ecology are appropriately managed and impacts acceptable.

Generally, the Proponents submissions and the evidence of Mr Lane were that the pipeline construction impacts on fauna species would be short term and temporary. Mr Urlus referred to the construction period of 18-24 months, which might impact over multiple breeding seasons for the Southern Brown Bandicoot. However, Mr Lane's evidence in reply referred to works at any one site consisting of 6-8 weeks, after which the first stage of site reinstatement would be completed, which would alleviate effects on breeding.

Once completed, the alignment will be rehabilitated and allowed to naturally recover, apart from those areas identified for active revegetation.

Temporary impacts on ground-dwelling fauna populations such as Swamp Skinks are expected during construction of the pipeline where removal of native vegetation is unavoidable. The extent of the area of terrestrial habitat affected has been minimised through the adoption of modified construction methods, including HDD and narrowed construction width, no greater than 27 metres, that meet the 'avoid and minimise' principles of the Guidelines. Mr Lane considered populations of affected species in the Project Area would be expected to recolonise the temporary disturbance area once site revegetation occurs.

Other critical species would have the benefit of tailored POS requirements to minimise impacts (B10 – Swamp Skink and B13 – Growling Grass Frog).

For aquatic species such as Dwarf Galaxias and Australian Grayling, Mr Lane's evidence was those waterways potentially supporting these species are not proposed to be open trenched. There are four ephemeral waterways (Craigs Lane, Western Outfall, Tooradin Inlet and Hagelthorn Drain) proposed to be open trenched, however, to avoid impacts on these species, they will only be trenched during dry conditions with no water flow.

Mr Urlus acknowledged in responding to mitigation measures that in reviewing the nature of the Project and the potential risks it poses to matters of terrestrial ecology, he did not consider these risks to be unacceptable subject to additional mitigation measures being included relating to:

- Rapid revegetation along the whole of the pipeline alignment for Southern Brown Bandicoot habitat loss.

- Provision of refuge shelters at regular points along the pipeline alignment for Southern Brown Bandicoots.
- Contributions to predator management.
- Development of a clearing and revegetation protocol for Swamp Skink.
- Avoidance of works in Southern Toadlet habitat or where HDD works could not be undertaken to avoid breeding and larval periods (approximately March to November).

The IAC heard evidence from Dr Lorimer concerning potential impacts on threatened orchid species, including land subsidence and frac outs from HDD activity<sup>113</sup>.

The Proponents and Mr Lane's evidence suggested that Merran's Sun-orchid (along with other co-located orchids) is unlikely to be impacted at all, by virtue of the use of HDD under the orchids and a series of POS' designed to ensure safe HDD.

Questioning of Dr Lorimer and Mr Lane confirmed that appropriate mitigation measures can be applied to ensure impacts from smothering of orchids associated with a frac out of material from HDD works can be monitored and managed, and that ground subsidence is unlikely due to the geology of the area at Crib Point.

Many submitters such as Mornington Peninsula, Birdlife Australia, Save Westernport expressed concern over impacts on shorebirds from disturbance associated with human activity, noise, vibration and lighting.

The submission from DAWE stated:

Western Port Bay is important habitat for migratory shorebirds and utilise the site regularly and predictably each year. The site is particularly important habitat post- and pre-migration. Western Port is in an area known for its declining number of shorebirds. Loss or degradation of habitat should be avoided, particularly altering water quality, nutrient cycles or hydrology. Human disturbance, including light and noise, of roost sites and feeding areas should be avoided.

DAWE suggested that further consideration of impacts to migratory species is required, including development of appropriate mitigation measures to minimise the risk of adverse impacts.

Mr Lane gave evidence that intertidal environs at the Jetty and within 200 metres either side do not support significant numbers of shorebirds. He considered this is supported by the findings of decades of detailed monitoring of shorebirds in Western Port since 1973. Mr Lane considered monitoring is highly unlikely to discern any statistically meaningful changes in bird activity in the affected areas as very few of these birds use these areas. Areas such as Hastings Bight were considered by Mr Lane to be more actively used as foraging habitat due to the more extensive mudflats found in that area. Hastings Bight was sufficiently distant from the Project to not be significantly affected by lighting, noise and vibration effects.

Mr Lane gave evidence that impacts on Orange-bellied Parrots would be unlikely to be impacted as no coastal saltmarsh habitats favoured by the species are proposed to be impacted by the Project.

The Proponents and Mr Lane considered the risk of either a significant impact on migratory birds, including waders and waterbirds, or a significant impact on the Ramsar site, would be very low during both construction and operational phases of both components of the Project.

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<sup>113</sup> The fluid from HDD work is under pressure and if it bursts can reach the ground surface and smother vegetation.

They submitted the reality is that key sites for these birds are too distant from the GIJW for the birds to be impacted, and there is no reason to expect the use of closer, secondary foraging habitat would be impacted. The Proponents accepted that additional baseline monitoring and adaptive management responses of birds at Crib Point would be required.

Dr Lincoln Smith and Dr Blount gave evidence there was insufficient baseline information on the extent of wading birds and shorebirds using Crib Point which limited the assessment of Project impacts to birds. They further observed that the spatial scale of waterbird impact assessments was inappropriate. Mr Lane responded that the impact assessment utilised the Australia-wide accepted framework of assessing the Project against the Bay-wide critical CPS and LAC <sup>114</sup>.

Dr Blount and Dr Lincoln Smith suggested monitoring for a period of 24 months between August and February would provide valuable baseline information that would assist with predicting impacts from the Project.

In response to questions from the IAC, Mr Lane advised that four monitoring events between November and February for one or two years would provide a sound baseline of waterbirds at Crib Point prior to commissioning the FSRU. He noted monitoring for a minimum of two seasons before operation would be ideal.

Dr Edmunds gave evidence that the assessment of migratory birds failed to apply appropriate criteria to assess impacts. Mr Lane responded:

Technical Report B provides a thorough assessment of the status, distribution and abundance of these birds in and near the Project Area based on the extensive long-term data sets on waterbirds in Western Port. Impacts are then assessed in Section 7.1.3.1 against the significant impact criteria published by the Commonwealth Government to inform assessments of impacts under the EPBC Act. Dr Edmond's assertion is therefore incorrect<sup>115</sup>.

Mr Lane further advised that the prediction of impacts of the Project to waterbirds is thorough and fit for purpose, and *'usage by ecosystems in Western Port by waterbirds was extensively documented'*.

### **5.4.3 Discussion**

#### **(i) Impacts on threatened species and wildlife**

There was conjecture by opposing evidence and many submitters over the adequacy of survey effort for the presence or otherwise of threatened species within both components of the Project. The IAC considers any shortcomings are overcome by the application of relevant guidelines and protocols for the assessment, the conservative approach of assuming the presence of habitat values suitable for threatened species irrespective of their presence and in applying suitable mitigating measures to manage residual effects to acceptable levels.

The fact remains that irrespective of whether a threatened species or quantum of species are present within the Project's impact area, the extent to habitat impact remains.

The IAC heard evidence from Ms Thomas that with respect to translocation of wildlife that may be within the pipeline ROW, DELWP generally does not approve translocation of non-threatened wildlife. She considered this leads to a misapprehension that all wildlife can be

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<sup>114</sup> D210

<sup>115</sup> D210

captured and translocated when this is not necessarily true. Helpfully, she directed the IAC to DELWP's website on wildlife, which explained that translocation of non-threatened wildlife is not possible because there may be limits on the availability of food and shelter, territorial issues with other members of the species, and stress and exposure to predation in finding a new home.

With respect to translocation of threatened wildlife, DELWP is generally more supportive as it considers it an important conservation technique offering the only method for some species to prevent extinction or to establish new populations. A good example of this referred to in the EES was the release of captive bred, Orange-bellied Parrots into the wild at Western Port Bay.

The IAC acknowledges the concerns of submitters and in evidence, about impacts from the Project on threatened species. However, it takes solace in the fact that unlike Ms Thomas' reference to the extent of impact on wildlife from projects like Peninsula Link, this Project has a confined footprint with respect to terrestrial and freshwater biodiversity, comprising the CPRF site and the 30 metre ROW for pipeline construction that is much narrower than the width of a two-way dual carriageway arterial road.

In addition, the IAC notes the extent of impacts from pipeline construction can be reduced so that it may not be necessary for the full 30 metre ROW width to be impacted. The IAC has also recommended the retention of additional native vegetation areas proposed for removal.

Construction of underground pipelines is not new and has occurred previously in the area. The IAC acknowledges the Proponents intend to construct the pipeline along easements of existing pipelines and other infrastructure such as roads, property boundaries and internal paddock boundaries. These approaches are encouraged through the Mornington Peninsula submissions, subject to the caveat of environmental considerations.

Underground pipelines, whether constructed through open trenching, HDD or boring is tried and tested. The length of construction is limited and short term, and the timing of construction can be controlled. This enables the avoidance of sensitive times of the year when breeding cycles are prevalent, or during wetter times when open trenching and waterway crossings can have higher risks of greater impacts, or when species may be more active with movement. It is a form of construction that can be planned and managed to avoid or at least minimise such effects.

What particularly comforts the IAC is that once pipeline construction is completed, significant impacts cease (apart from routine maintenance of a small scale). In accordance with pulse impact theory, this allows the environment to recover as occurs following bushfire or flood events.

The IAC acknowledges that there will be impacts to species' habitats. It finds the extent and level of impacts to terrestrial biodiversity are acceptable, given the opportunity to apply the principles of avoid, minimise and offset, supported by mitigation measures that will facilitate recovery of the environment and habitat values for threatened species and any direct losses of species from the proposed works.

The IAC finds the evidence of Mr Lane useful, however, it was somewhat dismissive of the value of habitat for threatened species. This was exemplified for the issue of rapid revegetation of Southern Brown Bandicoot habitat areas and where the species was recorded/not recorded. Similarly, the IAC found the evidence of Mr Urlus useful and helpful given his preparedness to concede on matters based on objective analysis.

The IAC considers the impacts on threatened species to be acceptable subject to the amended POS (Day 4 version). However, there are some outstanding matters to be addressed.

## **(ii) Impacts on shorebirds**

In relation to impacts on shorebirds, the IAC reviewed the construction and operational effects of both components of the Project regarding noise, dust, vibration, and human activity, all of which are associated with disturbance of birds foraging on the exposed mudflats at low tide. These effects are not considered by the IAC to be unacceptable <sup>116</sup>.

The IAC makes this finding on the basis that it accepts the intertidal mudflats around the Jetty are not primary foraging habitats and do not include roosting sites. It is clear to the IAC that these mudflats are much narrower and less extensive compared to areas elsewhere in Western Port Bay (such as Hastings Bight, the north-east part of the Bay or eastern arm of the Bay). This reflects the bathymetry of the western arm of the Bay, the proximity of a naturally deep channel and the scouring effect of high tidal currents.

The mudflats around Crib Point Jetty provide foraging habit for shorebirds but the numbers or extent of use of the area are not as high as other parts of Western Port Bay.

The IAC accepts that impacts to birds from noise, vibration and dust will be minimal. The effects from construction will be limited and operation impacts would likely generate habituation (unless there are periodic sudden loud noises which may frighten birds). Human activity or an increase in such activity runs a greater risk of disturbance. Increased disturbance of shorebirds risks reducing their ability to forage on mudflats that are only available at low tidal periods and can compromise the ability of migratory species to add weight in preparation of migration.

In this regard, the IAC considers the distances to primary foraging areas and roosting sites are such that physical effects from the Project are acceptable.

The IAC acknowledges the evidence that questioned the adequacy of the shorebird and waterbird survey data and assessments of the extent of birds using Crib Point. The Proponents considered assessment against the bay-wide LAC as appropriate to determine the distribution and abundance of birds at Crib Point, identified as a secondary foraging habitat and less utilised than other locations further north of Crib Point. The lack of baseline data specific to Crib Point was noted by several submitters. The IAC considers additional monitoring for two years before operation commences would provide an adequate baseline understanding of birds at and around Crib Point and addresses this issue in Chapter 5.6.

## **(iii) Mitigation measures**

In relation to mitigation measures, the IAC notes the change in position of Mr Lane who in his primary evidence recommended:

A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times frames and monitoring for rapidly re-establishing habitat which is impacted upon. This will ensure that potential impacts to SBB will remain negligible.

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<sup>116</sup> The effects from lighting are addressed in Chapter 5.6.

Any suitable SBB habitat throughout the entire Project Area that is impacted should be revegetated as per the SBB mitigation measures MM-FF09c, d & e to provide additional habitat. Where this occurs on private land, landowners must be consulted<sup>117</sup>.

In his evidence in reply to Mr Urlus, Mr Lane changed his opinion having regard to the likelihood that Southern Brown Bandicoot no longer occurs in areas south of KP20 <sup>118</sup>. He concurred that allowing natural regeneration of vegetation would be sufficient and unlikely to lead to impacts on the species as it is likely to be absent.

The IAC supports the recommendation from Mr Urlus to retain rapid revegetation along the length of the pipeline alignment for the Southern Brown Bandicoot. The IAC does not accept the Proponents' position that the absence of records of the species in the southern portion of the pipeline alignment means '*that there is no rush to re-establish potential habitat – it is sufficient to allow it to re-establish over a longer timeframe*'. The IAC considers it acceptable to require rapid revegetation for all potential habitat along the alignment, including a Southern Brown Bandicoot-specific revegetation plan with timeframes and monitoring. In addition to the IAC's recommendations about retaining additional native vegetation, this will ensure the effects from pipeline works are further minimised and contribute to habitat embellishment useful for other species. For these reasons, the IAC supports amending POS R14 to require rapid revegetation along the pipeline alignment where Southern Brown Bandicoot habitat is removed from areas where the species is known or has the potential to be present.

Regarding a contribution towards predator management programs, the IAC considers this is appropriate. It is not dis-proportionate to effects, considering predator risks may already be present and the Project is undertaking works within the area where such risks occur. The IAC notes the evidence of Mr Urlus that fox predation is currently a key factor influencing the Southern Brown Bandicoot in the region. The Project poses a risk of facilitating the movement of foxes to and through potential habitat of the Southern Brown Bandicoot as well as potentially increasing predation risk through reducing the availability of shelter and refuge from habitat loss.

Mr Urlus considered a contribution to the long term management of introduced predators along and adjoining the pipeline alignment would be appropriate. He noted it could include supporting existing introduced predator control programs for Southern Brown Bandicoots and be based on principles of strategic and integrated control of foxes, rabbits and domestic and feral cats and dogs. He considered any such predator control contribution should occur for at least a ten year period, which would cover the construction and revegetation periods where vegetation structure would suitably re-establish.

The IAC considers it appropriate to include a recommendation relating to a contribution to predator control management along the pipeline alignment to be developed in consultation with appropriate land managers and authorities. This is included in a new CEMP POS.

Regarding the Swamp Skink, the IAC notes the EES included MM-FF08, which referred to a specific protocol for management of Swamp Skinks during clearing works. The Proponents considered the protocols were incorporated into the relevant POS (POS B10). However, Mr Urlus considered POS B10 focused on salvage and relocation measures and that reference to key protocols such as avoidance of the planting or spread of trees or overstorey shrubs in

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<sup>117</sup> D76.

<sup>118</sup> D330.

Swamp Skink habitat and revegetation with a high cover of grasses and sedges remained overlooked. Mr Urlus preferred retention of MM-FF08 as contained in the EES, which includes reference to consultation with Mornington Peninsula and aligning with the *Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula* (Robertson and Clemann 2015).

The IAC notes there may need to be some integration with the type of revegetation between the Swamp Skink with that of other species such as the Southern Brown Bandicoot where they may co-exist to ensure each species habitat requirements are considered.

The IAC supports collaboration in developing a protocol for Swamp Skink as set out in MM-FF08 and considers POS B10 should be amended to reflect what was originally exhibited in the EES. The IAC acknowledges the commentary on Southern Toadlet and considers that HDD should appropriately minimise impacts on this species. It notes that if open trenching is to occur in Southern Toadlet habitat, efforts to avoid breeding periods should be undertaken where practicable.

The IAC is satisfied the proposed management of frac out potential and the avoidance of impacts on orchids is satisfactory. Further, that wildlife handling arrangements are appropriately addressed in the proposed mitigation measures.

The IAC concludes that impacts on threatened species from habitat loss and fragmentation, including on migratory shorebirds from land-based effects, will generally be acceptable. The relatively defined, narrow and lineal nature of the pipeline construction and operation means the extent of environmental impact should not be significant. Efforts to avoid, minimise and offset, including revegetation establishes a process whereby impacts are of a short duration and limited in extent.

#### **5.4.4 Findings**

The IAC finds:

- The terrestrial and freshwater biodiversity assessment documented in the EES Technical Report B provides a sound basis to assess the impacts on threatened species.
- Impacts on threatened species have been appropriately avoided and minimised, will not be significant and can readily be managed to within acceptable limits.
- The proposed mitigation measures should be implemented subject to modifications relating to rapid revegetation for Southern Brown Bandicoot habitat along the length of the pipeline alignment and an appropriate protocol for managing clearing of Swamp Skink habitat.
- The Proponents should consider making a contribution to predator control management along the pipeline.

#### **5.4.5 Recommendations**

The IAC recommends:

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **New B14 (Predator control management):**

**Consider the opportunity for a contribution to predator control management along the pipeline alignment that would be developed in consultation with appropriate land managers and authorities.**

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **Revised R14:**

**The following measures will be implemented to reinstate area of Southern Brown Bandicoot habitat:**

- **A clear and appropriate Southern Brown Bandicoot-specific revegetation plan should be incorporated in the relevant CEMP that explicitly states times frames and monitoring for rapidly re-establishing habitat which is impacted upon.**
- **Dense cover of suitable native shrubs or vegetation of similar structure will be reinstated, other than directly above the pipeline and a narrow track as identified in the Environmental Line List (Attachment G) to allow ground access for surveillance patrols. Easement agreements with landholders will require that this vegetation be reinstated and protected.**
- **Rapid re-establishment of dense ground cover will be achieved at any of the sites of known or assumed presence for the Southern Brown Bandicoot impacted by the construction footprint, but not subject to HDD, by planting of semi-mature native shrubs, or fast-growing tubestock, at an appropriate density during rehabilitation. The aim is to re-establish dense understory vegetation in the 0.2-1 metre height range.**

- **Revised B10:**

**Swamp Skink**

**Implement the following measures where areas of Swamp Skink habitat are identified in the Environmental Line List (Attachment G), to reduce impacts:**

- **Clear and grade activities will occur preferentially in warmer months (late Spring to early Autumn) when skinks are more active and better able to avoid activities.**
- **A suitably qualified and authorised fauna handler will complete an inspection of the habitat area immediately prior to any vegetation removal (including ground cover).**
- **If clear and grade occurs during cooler months, when skinks may be in burrows (April to September or as determined by a fauna ecologist), a suitably qualified and authorised fauna handler will be present during topsoil stripping to monitor the area and inspect stripped material.**
- **A suitably qualified and authorised fauna handler will complete an inspection of topsoil and vegetation stockpiles prior to respreading.**
- **Erosion and sediment controls and temporary fencing will be inspected for sheltering skinks prior to removal.**
- **Relocate any individuals that are captured during the inspections described above to the nearest adjacent habitat away from the construction area.**
- **A specific protocol will be developed for clearing Swamp Skink and Glossy Grass Skink habitat, in consultation with Mornington Peninsula Shire Council,**

which will refer to the *Guidelines for Management Activities in Swamp Skink Habitat on the Mornington Peninsula* by Robertson and Clemann (2015).

## **5.5 Biosecurity risks and pathogens**

### **5.5.1 Background**

Biosecurity risks associated with soil and fungus pathogens were highlighted in the EES. They have potential for spreading due to construction works and through human activity.

Biosecurity risks *Phytophthora cinnamoni* (PC) and *Batrachochytrium dendrobatidis* (BC) are specifically addressed by proposed POS (B13 – Growling Grass Frog and S13 – Cinnamon Fungus).

### **5.5.2 Evidence and submissions**

The IAC heard evidence from Dr Cole on PC and BC. PC is already present in the soil and cannot be removed. It is spread through construction works. BC is solely related to transportation by human activity and, for example, can be transmitted by human handling of frogs.

Dr Cole was concerned these pathogens could be spread due the Project, impacting on native vegetation and frogs, and on croplands including asparagus crops.

The Proponents submitted that asparagus growing areas have been avoided by the Project.

Dr Cole considered the locations where pathogens are present needed to be identified and that because the EES had not done this, it would be difficult to manage. Her evidence recognised the importance of managing runoff from ground disturbance in order to contain sediment within work site boundaries.

Dr Cole acknowledged the benefit of avoiding works during winter or wet periods to minimise the risk of runoff.

The Proponents and the evidence of Mr Lane considered mitigation measures POS B13 and S1 to S6 would appropriately address biosecurity and pathogen risk, including appropriate hygiene associated with vehicle washdown facilities.

### **5.5.3 Discussion**

The IAC acknowledges the evidence of Dr Cole and is satisfied the EES and the response of the Proponents, including the amended POS, will appropriately address biosecurity risks.

### **5.5.4 Findings**

The IAC finds:

- Biosecurity risk can be appropriately managed.

## **5.6 Lighting**

### **5.6.1 Background**

The EES assessed the impacts of ‘light spill’ associated with the GIJW on fauna, particularly shorebirds and noted that the increase in illuminated area is very small, in the broader context of Western Port Bay. It found the potential effects in the small area around Crib Point would be minor and concluded the risk rating was low.

Similarly, the EES assessed the lighting impacts on terrestrial fauna and shorebirds and concluded possible impacts would be minor. It recommended a construction related mitigation measure that has been translated into EPR-FF09 (Lighting impacts to fauna) and the preparation of an *'artificial light management plan'* for migratory birds (EPR-FF06). It concluded that the operational lighting associated with the Project would not constitute *'a measurable impact on terrestrial fauna or waterbirds'*. It concluded the Project was consistent with the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds, Commonwealth of Australia 2020* (National Light Pollution Guidelines) and relevant lighting impacts would be further addressed through EPR-FF09 and EPR-FF06.

### 5.6.2 Evidence and submissions

The DAWE noted the potential for light impacts from the Project to *Environment Protection and Biodiversity Act* listed threatened and migratory species. It submitted the EES did not adequately refer to the National Light Pollution Guidelines. The submission noted the *'Guidelines are relevant for all migratory and other species that may be impacted by artificial light including Southern Brown Bandicoot and Growling Grass Frog'*.

Other submitters were concerned there had been inadequate consideration of the National Light Pollution Guidelines and that the EES had not considered the spatial extent of sky glow and broader impacts particularly to migratory shorebirds. Mr Cook advised he had not assessed the lighting and skyglow impacts to the ecology around the GIJW.

The Proponents noted the EES assessment of lighting and review of information on impacts of light to fauna found:

The construction phase of the Project is unlikely to disrupt or displace wildlife from important habitat, nor is it likely to prevent wildlife from undertaking critical behaviours including foraging, reproduction and dispersal <sup>119</sup>.

The Proponents concluded that with appropriate management of lighting during the operation of GIJW, wildlife is unlikely to be disrupted or displaced from important habitat. They committed to integrating an adaptive management framework into the OEMP *'to detect and respond to any documented impacts of artificial light on migratory birds and/or Ecological Character of the Ramsar site'*.

### 5.6.3 Discussion

The IAC agrees with the Proponents' submission that the permanent lighting associated with the FSRU and CPRF, in combination with the existing lighting across intertidal areas and over areas of Western Port, is unlikely to cause a measurable impact on threatened and migratory species, nor impact on the foraging success of birds. The IAC accepts that lighting and skyglow during the operation of GIJW, may temporarily alter the behaviour of wildlife but it is unlikely species would be disrupted or displaced from important habitat, nor prevented from undertaking critical behaviours such as foraging, reproduction and dispersal.

The IAC supports the proposed EPRs and has recommended (in Chapter 12.6 the Incorporated Document include a requirement that the lighting plan for the GIJW *'Configure the number, intensity and direction of lights, and the reflectivity of surfaces on the FSRU in order to minimise its landscape and visual impact'*. Although this is focussed on landscape and visual impacts, it will also assist in minimising any wildlife impacts.

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<sup>119</sup> Technical Report B Section 7.1.1.5

Regarding EPR FF06 and EPR FF09 concerning lighting and shorebirds, the IAC notes the evidence of Mr Lane, his responses to questions from the IAC and the Proponents and TN46 relating to the timing for shorebird monitoring around the Crib Point Jetty of one to two years before and two years after the FSRU commences operating. The IAC accepts the suggested changes, however, considers a more conservative approach is necessary given the uncertainty of effects and recommends EPR FF06 require monitoring from November to February for two years before and four years after the FSRU commences operations. This will ensure the establishment of an adequate baseline and assist with identifying any changes with shorebird activity and lighting effects from the operation of the GIJW.

#### **5.6.4 Findings**

The IAC finds:

- Lighting impacts on wildlife will not be significant and can be appropriately managed.

#### **5.6.5 Recommendation**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-FF06 (Migratory birds).**
- **Revised EPR-FF09 (Lighting impacts to fauna).**

This change is included at Appendix G.

### **5.7 Terrestrial and freshwater biodiversity conclusions**

The IAC concludes that:

- The terrestrial and freshwater biodiversity impacts are consistent with the draft evaluation objective.
- Terrestrial and freshwater biodiversity impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no terrestrial and freshwater biodiversity impacts that preclude the Project being approved.

## 6 Surface water

### 6.1 Introduction

Surface water effects was discussed in EES Chapter 8 and Technical Report C. Additional material was provided in TN12, TN21 and TN22.

The relevant draft evaluation objective is:

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

The review of surface water is closely aligned with the IAC’s review of groundwater (Chapter 7) and contamination and acid sulphate soils (Chapter 8).

Table 4 lists the surface water evidence that was provided.

**Table 4** Surface water evidence

Party	Expert	Firm	Area of expertise
Proponents	Dr McCowan	Water Technology Pty Ltd	Surface Water

### 6.2 Key issues

The key issues are:

- Impacts of the Project on surface waters, including Western Port Bay and waterways.
- Sea level rise risks on Project infrastructure.

### 6.3 Impacts on surface waters

#### 6.3.1 Background

The location of the CPRF and pipeline potentially affects waterways within five sub-catchments that flow towards Western Port Bay <sup>120</sup>.

Part of the area through which the pipeline traverses includes low lying land that was substantially altered in the 1800s when creeks were enlarged, and large open drains excavated to drain the Koo Wee Rup Swamp, known as the Koo Wee Rup-Longwarry Flood Protection District. Approximately 19 kilometres of the proposed pipeline alignment is within this floodplain, between Pearcedale and Pakenham.

The proposed CPRF site is close to the shoreline, north of the Jetty. Both its construction and operational risks would potentially impact on the quality of the waters of Western Port Bay from stormwater runoff, flooding, sedimentation and pollutants from spillages.

The pipeline passes through low lying flat areas which are subject to flooding, and several waterways where flooding occurs during large rainfall events. The pipeline crosses 64 declared waterways and more informal drainage depressions and drains. Risks from its

<sup>120</sup> Refer to Figure 5-1 in Technical Report C

construction include stormwater runoff, sedimentation, pollution from spillages and disruption to water flows.

The EES recognises that many of the waterways experience poor or reduced water quality, mainly due to changes in land use in the catchment.

The waters of Western Port Bay already experience high sediment loads that affect light penetration and seagrass growth. The EES acknowledges that sediment from the catchment is a significant contributor to this and that maintaining low sediment volumes is important in sustaining the Western Port Ramsar values.

The following EPRs relate to surface water:

- EPR-SW01 Managing runoff
- EPR-SW02 Fuel and chemical storage
- EPR-SW03 Spills prevention and management
- EPR-SW04 Refuelling of mobile machinery
- EPR-SW05 Facilities design
- EPR-SW06 Water Sensitive Urban Design treatments.

Other EPRs that relate indirectly to surface water include EPR-C05 – Fuel and chemical leaks/spills and EPR-C06 – Construction waste management.

The following POS environmental controls in the CEMP Attachment J directly apply to surface water:

- WC1 Waterways managed by the Catchment Management Authority
- WC2 Waterways managed by Melbourne Water
- WC3 Watercourse trenchless crossing
- WC4 Watercourse trenching
- WC5 Above ground blasting
- WC6 Soil stockpiles.

Other controls in the CEMP relate indirectly to surface water such as C7 - Managing soil stockpiles; C10 - Sediment pollution control; T4 to T7 relating to Trenching and de-watering; T12 - Contaminated groundwater/trench water and D1 to D11 relating to HDD.

### **6.3.2 Evidence and submissions**

Surface water issues were not prominent in submissions to the IAC. The IAC notes there were no submissions from either Melbourne Water or the Port Phillip and Westernport Catchment Management Authority, both of whom have responsibilities for surface waters. No evidence was called to contest that of Dr McCowan. The Proponents noted there was little questioning of Dr McCowan and submitted his conclusions should be accepted.

The EES and Dr McCowan's evidence concluded it was unlikely the Project would cause significant impacts to surface water. The Proponents position was that surface water impacts have been comprehensively assessed, can be managed through mitigation measures, and are acceptable.

TN22 provided information relating to stormwater management at the CPRF. Existing overland flow paths are proposed to be maintained, with stormwater at the CPRF designed to avoid the risk of localised flooding. Overland stormwater flows are derived from local rainfall which runs into Western Port Bay. The CPRF is not affected by flooding from any waterways (see Chapter 6.4).

Dr McCowan gave evidence that stormwater management at both the CPRF and the PDF can be appropriately designed with overland flows managed to avoid increasing upstream flood levels. More specifically, Dr McCowan's evidence concluded that:

- Most of the waterways are small, with 60 per cent around 2 metres in width and 30 per cent less than 1 metre in width.
- The majority are ephemeral and only flow after rain or prolonged periods of wet weather.
- Upstream catchments of the pipeline alignment are predominantly rural and used for grazing and cropping with little or no buffer zones.
- The pipeline alignment crosses four main 'carrier drains' (drains built as part of the Koo Wee Rup drainage scheme and managed by Melbourne Water) that convey flows from upstream catchments directly to Western Port Bay (Cardinia Creek, Gum Scrub Creek, Toomuc Creek and Deep Creek).
- Most of the waterways are proposed to be crossed using HDD, effectively eliminating key risks associated with sedimentation and reduced water quality.
- Those proposed to be trenched will be done during no flow conditions where practicable and reinstated as soon as possible.
- Gaps in stockpiles will be used to avoid diversion of passage of flood waters.
- Any dewatering will be tested to ensure it is appropriate for disposal, otherwise it will be collected and disposed to an appropriately licensed landfill facility.

Dr McCowan considered appropriate mitigation measures to include:

- Avoidance of pipeline construction during the wetter months of the year, after periods of flooding or periods of prolonged wet weather.
- Avoidance of pipeline exposure due to bank erosion by providing a minimum depth of cover of 2 metres to the invert of any waterway or drain and greater than 2 metres depth of cover over HDD crossings of major waterways.

Dr McCowan considered risks related to construction can be appropriately managed by mitigation measures addressing:

- sediment and erosion control
- diversion of stormwater flows around work sites
- avoidance of concentrated flows
- diversion of stormwater flows around stockpiles
- minimisation of the area to be cleared for pipeline works
- provision of vegetation buffers to filter flows.

For operational matters, he considered risks can be appropriately managed by applying Water Sensitive Urban Design principles and vegetation buffers. In addition, he considered pollution risks from spillages of fuels, lubricants and chemicals could be satisfactorily managed through appropriate storage, bunding and containment, and spill management.

Dr McCowan recommended a further requirement be added to SW01 Managing runoff to divert stormwater around construction activities. This was adopted by the Proponents and included as item 'c' in SW01.

### **6.3.3 Discussion**

The IAC accepts the evidence of Dr McCowan and considers the impacts on surface water from construction and operation of the Project will not be significant and can be managed to an acceptable level.

His evidence provided an objective and balanced consideration of the Project's effects on surface waters.

The EPA sought a change to POS WC4 to require waterway crossings to occur only when there is no flow. The Proponents suggested trenched crossings of ephemeral watercourses must only be constructed during no or low flow conditions. They considered this represented a proportional response to risk of sedimentation which in low flow conditions would likely see any mobilised sediments settling out long before there was any chance of these reaching Western Port Bay.

The IAC accepts the position of the Proponents and considers the risk of sedimentation from crossing ephemeral waterways low.

#### **6.3.4 Findings**

The IAC finds:

- The impacts on surface waters are not significant and subject to the recommended EPRs and CEMP, is acceptable, noting there was general agreement between the parties regarding this issue.

### **6.4 Sea level rise risks**

#### **6.4.1 Background**

The CPRF is located close to Western Port Bay, a large tidal embayment and potentially subject to the effects of predicted sea level rise on the infrastructure.

#### **6.4.2 Evidence and submissions**

Dr McCowan provided evidence that the eastern part of the CPRF site may become vulnerable to inundation during a 1 per cent Annual Exceedance Probability (AEP) storm tide event by 2100. The expected life of the CPRF is 20 years and Dr McCowan advised at the level of the 1 per cent AEP storm tide, elevation by 2040 is expected to be 2.6 metre Australian Height Datum. Under these conditions, he considered only a narrow band of land along the inside of the eastern boundary of the CPRF site would be expected to be affected by storm tide inundation over the life of the CPRF. Dr McCowan considered the effects of sea level rise could be mitigated by:

- Modifying the layout of the Receiving Facility to only take up land outside the LSIO;
- Filling the eastern part of the site to an appropriate level; or
- Monitoring sea level rise and protecting the site by a sea wall, if and when it became necessary.

He advised any works required would need to be carried out to the satisfaction of Melbourne Water.

#### **6.4.3 Discussion**

The IAC accepts Dr McCowan's evidence and considers that over the 20 year timeframe of the Project, there will be opportunity to monitor, re-assess and respond to any risks from the effects of sea level rise as necessary.

#### **6.4.4 Findings**

The IAC finds:

- The risk of impact from sea level rise on the CPRF is acceptable and can be monitored over the 20 year life of the Project.

## **6.5 Surface water conclusions**

The IAC concludes that:

- The surface water impacts are consistent with the draft evaluation objective.
- Surface water impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no surface water impacts that preclude the Project being approved.

## 7 Groundwater

### 7.1 Introduction

Groundwater effects were discussed in EES Chapter 9 and Technical Report D. Additional material was provided in TN09, TN10, TN11, TN13, TN27 and TN39.

The relevant draft evaluation objective is:

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

The review of groundwater is closely aligned with the IAC’s review of surface water (Chapter 6) and contamination and acid sulphate soils (Chapter 8).

Table 4 lists the groundwater evidence that was provided.

**Table 5** Groundwater evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Medd	Golder Associates Pty Ltd	Groundwater
Mornington Peninsula and Cardinia	Mr Smitt	EHS Support Pty Ltd	Groundwater

Mr Medd provided supplementary evidence (D166).

One EPR is proposed relating directly to groundwater – EPR-HG01 – Suitably qualified contractors. Another proposed control EPR-C03 – Contaminated groundwater is relevant with regard to the CPRF.

The following POS environmental controls in the CEMP Appendix J apply directly or indirectly to groundwater:

- WC1 to WC6 relating to Watercourse crossing
- D1 to D11 relating to HDD and thrust boring.

### 7.2 Key issues

The key issues are:

- The impacts on groundwater levels, flows and quality.
- The risks to loss of groundwater bores and water supply.
- The impacts on Groundwater Dependent Ecosystems (GDE).

### 7.3 Groundwater levels, flows and quality

#### 7.3.1 Background

The Project involves sub-surface works associated with the construction of structural piles required for the nitrogen tank at the CPRF and the construction of the pipeline. Both the construction and operation of these components of the Project have the potential to interact with groundwater.

The EES described the geology of the Project study area as mostly fine-grained clay, silts and sand with occasional gravels with a low permeability.

The central and northern portion of the proposed pipeline alignment falls within the Koo Wee Rup Water Supply Protection Area <sup>121</sup>. The Protection Area is managed by Southern Rural Water through a Groundwater Management Plan which documents all local management rules, including trade, groundwater monitoring and licenses <sup>122</sup>.

Historical groundwater levels at the CPRF site have been recorded at six to eight metres below the ground surface where it is proposed to construct up to 100 piles up to 20 metres in depth for the nitrogen tank.

Groundwater levels along the pipeline alignment are described at less than four metres below the ground surface. Fluctuation of groundwater levels can vary between 0.5 metres to two metres with shallowest levels occurring in winter/early spring and deeper levels in summer/early autumn.

The maximum depth of trench excavation for the pipeline is approximately two metres but can be up to three metres. The depth for thrust bore holes are around four metres.

### **7.3.2 Evidence and submissions**

Many submitters, including S2912, S3105 and S3129, expressed concern that groundwater flows would be impacted by construction of the pipeline, given that it passes through large areas of low lying land, much of which was previously the former Koo Wee Rup Swamp, an area prone to flooding, with groundwater levels close to the surface. Submissions from others such as S1479 were concerned the pipeline would risk damage to groundwater aquifers.

The general themes from submissions were:

- The depth of excavation for the pipeline would intersect with groundwater requiring trench dewatering which could result in a drawdown of groundwater levels to the detriment of the groundwater system.
- The placement and operation of the pipeline would potentially provide a preferential flow path for groundwater movement along the alignment or disrupt groundwater flows across the trench alignment.
- The quality of groundwater would degrade from:
  - use of drilling muds with HDD
  - soil disturbance with open pipeline trench construction that would allow stormwater runoff entering the open trenches and sedimentation
  - disturbance of contaminated soils
  - creation of acid sulphate soils.

The piling for the CPRF nitrogen tank was a concern to S2947 and the IAC in relation to interaction with groundwater and restrictions on flows or intersection between aquifers.

The Proponents submitted the assessment undertaken in the EES adopted a conservative, 'worst case' approach in considering potential risks with respect to groundwater. The EES assumed groundwater would be present close to the surface even though this was unlikely to be the case. The Proponents submitted the proposed mitigation measures appropriately address these worst case conditions and mitigate groundwater impacts to an acceptable level.

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<sup>121</sup> Refer to Figure 9-1 in Chapter 9, Volume 2 of the EES.

<sup>122</sup> A Permissible Consumptive Volume of 12,915 megalitres per year currently applies and if groundwater is required for construction of the Project, a temporary entitlement may need to be purchased from an existing licence holder as the area is fully allocated.

The evidence from Mr Smitt initially raised concern whether adequate seasonal groundwater monitoring had been undertaken as part of the EES. This was clarified by the Proponents in TN39 and through the evidence of Mr Medd. Groundwater levels were monitored in summer and winter to corroborate predictions of groundwater conditions and behaviour.

Mr Smitt gave evidence questioning errors and uncertainties in the EES relating to groundwater quality modelling and currency of information and findings. Many of these issues were responded to in Mr Medd's evidence in reply (D166).

Mr Medd gave evidence that soils in the pipeline alignment were generally of low permeability, which meant it would be unlikely dewatering of any groundwater encountered in the trenches would affect overall groundwater levels. His view was reinforced by:

- The typical two metre construction depth for the pipeline trench not intersecting groundwater levels were generally greater than 1.5 metres below ground surface levels in summer when it is proposed to undertake construction.
- The short duration of any dewatering of encountered groundwater which would typically be limited to no more than 100 metre section lengths of the trench for one to two days and up to 10 days for thrust bore holes.

Mr Medd considered such a short period of time associated with any dewatering of the trenching would not be long enough to cause any discernible impacts from drawdown on groundwater levels. In recognition of the possibility of longer dewatering timeframes, Mr Medd recommended a dewatering plan be prepared to evaluate risks and implement appropriate contingency measures. This was included in POS T14 in Appendix J to the CEMP.

Mr Medd considered changes caused by the pipeline to groundwater flow paths, would not be significant as:

- It would be unlikely for the backfilled trench to prevent all groundwater passing across it, particularly given the relatively shallow depth of pipeline excavation.
- Preferential groundwater flow along the pipeline alignment would be unlikely on the basis that the trench is to be backfilled with the same in situ material.

In relation to the effect from piling for the CPRF nitrogen tank, TN10 advised any intercepting flows between aquifers would be of short duration, limited to the time taken for drilling and pumping of concrete slurry. Upon completion of this work and once the piles were sealed, impacts on groundwater flows should cease.

In relation to groundwater quality, Mr Medd's evidence was that any potential for HDD works to intersect aquifers and for drilling muds to escape and contaminate groundwater would be unlikely, given the construction method includes maintaining bentonite-based drilling muds within the borehole. These should provide sufficient pressure to balance groundwater inflow and create a low permeability lining on the borehole walls. When the pipeline is drawn back through the borehole, this mud would remain to fill the small area between the pipe and the borehole wall. This would provide resistance to groundwater flow such that the risk of interconnection between aquifers is low. Mr Medd recommended drilling muds used in HDD should be non-toxic and where possible biodegradable (POS D7 of Appendix J of the CEMP).

The pipeline alignment is proposed to travel through areas adjoining industrial development in Hastings (KP7.3 to KP7.5) and the former Tyabb Landfill (KP13 to KP16). These locations have the potential to contain contaminants that may be disturbed by pipeline construction and with dewatering, could be mixed and mobilised with groundwater flow movement. Mr Medd gave evidence the shallow depths of excavation and short duration of dewatering mean

that, although some temporal change in distribution might occur, the scale of this change would be minor. He noted it would be expected that over time, groundwater quality would re-establish to the condition prior to the disturbance. He found the quality of trench backfill material will be important to ensure potential for any contaminant movement is controlled. He recommended mitigation measure CEMP Attachment J, C04 include reference to using backfill material of a similar hydraulic conductivity to that of the surrounding soils. TN11 also refers to soil re-profiling and placement to avoid cross contamination.

Mr Medd considered any dewatering that encountered or had the potential to lead to acid sulphate soils should be carefully managed in accordance with the *National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soil in shallow groundwater environments*.

### 7.3.3 Discussion

The IAC acknowledges the concerns from submitters regarding groundwater and understands their significance. It acknowledges the evidence of Mr Medd and Mr Smitt in consideration of issues and effects. The IAC appreciates the willingness of both witnesses to provide objective responses to, and preparedness to concede, on issues.

The IAC notes the evidence of Mr Medd and Mr Smitt generally supported the conclusion in the EES that it was unlikely the Project would cause significant impact to groundwater. Mr Smitt had residual concerns about potential GDE.

Overall, the IAC accepts the findings of the EES and the evidence that impacts on groundwater levels, flows and quality will not be significant. The IAC agrees:

- The short duration and shallow construction of pipeline trenches that avoids the wetter months and wet conditions, and limits the extent and time of any dewatering, should avoid significant impacts on groundwater levels.
- The shallow form of trench construction and use of appropriate backfill material of similar hydraulic conductivity to that of the surrounding soil should avoid significant impacts on groundwater flows.
- Use of HDD with appropriate drilling muds should mitigate against intersecting between aquifers and avoid significant impacts on groundwater quality.
- Construction of piling for the CPRF nitrogen tank and sealing with concrete should mitigate aquifer intersection and avoid significant impacts on groundwater quality.

The IAC generally considers the temporary nature of construction means impacts on groundwater will be short, temporary, and designed to minimise changes to groundwater levels, flows and quality. This will be important, particularly with respect to contaminant disturbance and acid sulphate soils to ensure impacts from these effects do not materialise. The timing of construction will be important to ensure the EES predictions eventuate.

Similarly, the IAC does not consider the operation of the CPRF or pipeline will significantly impact groundwater levels, flows and quality, subject to appropriate backfilling with in situ material and appropriate use of HDD drilling muds and concrete sealing of piles that prevents ongoing groundwater aquifer leakage.

The IAC agrees with the changes to EPRs and CEMP recommended by Mr Medd and notes these were incorporated into the final versions of the EPRs and CEMP where relevant.

### **7.3.4 Findings**

The IAC finds:

- The impacts on groundwater levels, flows and quality are not significant and subject to the recommended EPRs and CEMP, are acceptable.

## **7.4 Groundwater bores and water supply**

### **7.4.1 Background**

Groundwater provides for beneficial uses including water supply and is provided using groundwater bores. The EES identified 69 registered groundwater bores within 200 metres of the pipeline ROW used for stock, domestic and irrigation purposes. Five bores were within 30 metres of the pipeline:

- One at Devon Meadows, KP28.7, that is used as an observation bore and with a depth of 114.3 metres.
- Two at the former BP Crib Point refinery, with depths of 8.1 metres and 12.7 metres.
- Two at Somerville, KP16.5, used for irrigation with depths of 42.6 metres and 47.5 metres.

The southern portion of the pipeline alignment travels through vegetated areas and the urban area of Hastings. The northern portion of the pipeline alignment travels through farming areas, including part of the Koo Wee Rup Water Supply Protection Area.

### **7.4.2 Evidence and submissions**

Several submitters raised concerns that pipeline construction would impact on groundwater bores. Further, trench dewatering would result in drawdown of groundwater levels, resulting in reduced availability or loss of water supply from groundwater bores affecting farming and domestic use. For example, S1479 was concerned over loss of water supply from groundwater sources for the wine industry.

Mr Medd gave evidence that in a worst case scenario of a high-water table being drawn down by two days of trench dewatering, the magnitude of water level reduction away from the excavation may extend up to 25 metres from the trenched pipeline sections and around 60 metres from the thrust bore holes. The EES demonstrated there were no groundwater bores within these distances. Mr Medd generally considered any impacts would be minimal because construction is expected to occur in the drier months of the year and will be a short duration that allows for groundwater recovery.

In relation to the two groundwater bores used for irrigation purposes at Somerville close to the pipeline alignment, Mr Medd considered that due to the depth from which they extract groundwater, water supply is unlikely to be affected by the pipeline trench. This is because it is proposed to be installed approximately two metres below the ground surface level. Mitigation measures were provided for identifying and protecting surface infrastructure of groundwater bores near the construction areas.

### **7.4.3 Discussion**

The IAC agrees with the EES assessment and the evidence of Mr Medd with respect to groundwater bores and water supply.

There are no groundwater bores that are close enough to the proposed pipeline alignment that would be affected by the construction and operation of the pipeline.

The limited extent and duration of trench dewatering of any intercepted groundwater should not have a discernible impact on groundwater supply due to the short duration and temporary nature of construction.

#### **7.4.4 Findings**

The IAC finds:

- Based on the evidence presented, there should be no impacts on groundwater bores.
- Impacts on groundwater supply will not be significant, and subject to the EPRs and CEMP, are acceptable.

### **7.5 Groundwater Dependent Ecosystems**

#### **7.5.1 Background**

GDE are ecosystems that require access to groundwater to meet all or some of their water requirements to maintain the communities of plants and animals and ecological processes they support, and ecosystem services they provide. These can include vegetation with roots that access groundwater.

The EES identified there are numerous moderate to high potential terrestrial GDE crossed by the pipeline alignment, particularly in the southern portion as well as adjacent to the CPRF site. Potential GDE include woodland, coastal saltmarsh, swamp scrub and salt meadows.

The EES described that shallow groundwater is likely to discharge to waterways, and potentially to Western Port, particularly in wet seasons. Streams and drains may provide groundwater recharge in dry seasons. Aquatic ecosystems may be associated with freshwater waterways, saltwater marine environments (including the Western Port Ramsar site) and intertidal areas. Ecosystems that rely on groundwater discharge are referred to as aquatic GDE (waterways). Eleven potential aquatic GDE were identified within or near to the Project area and nine of these are to be bypassed by proposed HDD.

#### **7.5.2 Evidence and submissions**

Submitters such as Mornington Peninsula and Cardinia, together with S3149 and S1479 were concerned about potential damage to GDE.

Mr Medd's evidence was that impacts on any GDE would not be significant. He considered excavation works required to install the pipeline are shallow and impacts are of a temporary nature, i.e. days of dewatering. It would be reasonable to expect that groundwater levels would return to levels reasonably close to those prior to excavation over a similar number of days based on the shallow excavation depths and dewatering durations.

Mr Lane provided a response to GDE (D530). The two waterways proposed to be open trenched (Olivers Creek at KP9.6 and the Western Outfall Drain at KP31.5) described in the EES as cleared areas, with minimal existing vegetation and with minor flows.

Mr Lane confirmed vegetation along the pipeline corridor, including areas that may depend on groundwater, were mapped and indicated that most of the larger areas such as Warringine Park were bypassed by HDD. As groundwater levels naturally vary seasonally and on longer

time scales, temporary changes in groundwater levels due to dewatering of excavations are not likely to affect terrestrial GDE.

Cardinia and the evidence of Mr Smitt expressed concern that groundwater monitoring was not undertaken for an area of basalt geology near the PDF and pipeline (KP 55). They both contended this may have missed a potential GDE associated with perched water tables that might be impacted.

Cardinia raised concerns about the possibility of perched aquifers in proximity to moderate and high potential GDE <sup>123</sup>. It noted Mr Smitt suggested there is a need for an ecological survey to determine the presence of GDE, along with a qualitative estimate of the degree of groundwater dependence. Cardinia noted that, depending on outcomes of further ecological survey, Mr Smitt suggested a watering management plan may be required at certain points.

Mr Lane's response was that this area has been highly altered due to past agricultural development, with planted shelter belt vegetation comprising non-indigenous and exotic trees. His view was that further assessment for GDE was not warranted.

### 7.5.3 Discussion

The IAC notes that although there was general agreement between the witnesses, Mr Smitt had residual concerns about potential GDE and impacts from the Project. Mr Smitt considered an ecological survey is required to determine the presence of GDE, along with a qualitative estimate on the degree of groundwater dependence. He considered that where they occur, mitigation measures should be implemented to manage dewatering and acid sulphate soil risks, as well as including a watering management plan in case activities dewater the perched systems.

The IAC agrees with the evidence of Mr Medd and the information provided by Mr Lane with respect to waterways and vegetation that:

- The two waterways (Olivers Creek and Western Outfall Creek) proposed to be trenched do not have intact vegetation and GDE are absent.
- Given the limited extent and, in particular, the short duration of groundwater drawdown, it is unlikely that aquatic fauna in these waterways will be affected as the temporary minor impact on creek flows will not be outside the natural range of flow variation to which this fauna is adapted.
- Impacts on vegetation at Warringine Park will now be avoided through the use of HDD as recommended by the IAC in Chapter 5.3.
- At around KP55, an ecological assessment of potential GDE prior to construction is not necessary given the nature of the planted vegetation and the conclusion of Mr Lane that there are no GDE in this location.

Generally, the IAC accepts Mr Lane's evidence that the short duration of any groundwater drawdown and changes in the availability of groundwater in the root zones of vegetation will be within the range of natural variability. Impacts on GDE from the Project will not be significant and can be appropriately managed to an acceptable level.

### 7.5.4 Findings

The IAC finds:

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<sup>123</sup> D442 paragraphs 15-19

- Impacts on Groundwater Dependent Ecosystems will not be significant and that subject to the CEMP, are acceptable.

## **7.6 Groundwater conclusions**

The IAC concludes that:

- The groundwater impacts are consistent with the draft evaluation objective.
- Groundwater impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no groundwater impacts that preclude the Project being approved.

## 8 Contamination and acid sulfate soils

### 8.1 Introduction

Contamination and acid sulfate soils effects was discussed in EES Chapter 10 and Technical Report E. Additional material was provided in TN10, TN11 and TN13.

The relevant draft evaluation objectives are:

**Water and catchment values** – To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.

**Waste** - To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

The review of contamination and acid sulfate soils is closely aligned with the IAC’s review of surface water and groundwater.

Table 6 lists the contamination and acid sulfate soils evidence that was provided.

**Table 6 Contamination and acid sulfate soils evidence**

Party	Expert	Firm	Area of expertise
Proponents	Mr Davidson	AECOM Australia Pty Ltd	Contamination and Acid Sulfate Soils
Proponents	Mr Medd	Golder Associates Pty Ltd	Groundwater and Contamination
Mornington Peninsula and Cardinia	Mr Smitt	EHS Support Pty Ltd	Groundwater
CEG	Associate Professor Wong	Monash University	Acid Sulfate Soils

Mr Davidson provided supplementary evidence (D168).

The following EPRs apply to contamination and acid sulfate soils associated with the Project:

- C01 – Contaminated soils
- C02 – Acid Sulfate Soil Management Plan
- C03 – Contaminated groundwater
- C04 – Unknown contamination
- C05 – Fuel and chemical leaks/spills
- C06 – Construction waste management
- C07 – Operation waste management.

The following POS environmental controls in the CEMP Attachment J apply directly or indirectly to contamination and acid sulfate soils:

- F1 to F12 relating to Fuels and chemicals
- W1 to W10 relating to Waste
- T11 and T12 related to Contaminated soils and trench water
- T13 for Acid Sulfate Soils Management Protocol.

Acid sulfate soils are proposed to be specifically addressed under the Acid Sulfate Soils Management Protocol in Attachment K to the CEMP. The following EPRs apply to contamination and acid sulfate soils associated with the Project:

- C01 – Contaminated soils
- C02 – Acid Sulfate Soil Management Plan
- C03 – Contaminated groundwater
- C04 – Unknown contamination
- C05 – Fuel and chemical leaks/spills
- C06 – Construction waste management
- C07 – Operation waste management
- C08 – Fuel and chemical leaks/spills
- C09 – Construction waste management.

The following POS environmental controls in CEMP Attachment J apply directly or indirectly to contamination and acid sulfate soils:

- F1 to F12 relating to Fuels and chemicals
- W1 to W10 relating to Waste
- T11 and T12 related to Contaminated soils and trench water
- T13 for Acid Sulfate Soils Management Protocol.

The following TNs were submitted by the Proponents:

- TN10 related to CPRF piling
- TN11 relating to Soil profiles and trench reinstatement
- TN13 relating to Mornington Peninsula and Bass Coast submissions.

## **8.2 Key issues**

The key issues are:

- Disturbance of contaminated soils and groundwater during construction and marine sediments during operation.
- Impacts from disturbance of potential and actual acid sulfate soils.

## **8.3 Disturbance of contaminated soils, groundwater and marine sediments**

### **8.3.1 Background**

The potential impacts of the Project to human health and the environment from activities that may disturb or create contaminated soils, groundwater and marine sediment are discussed in Technical Report E. The assessment of existing conditions for contamination was based on desktop reviews of available information and intrusive field sampling.

The soil and groundwater investigations focussed on impact from construction. Investigations were concentrated along the pipeline ROW including alignment alternatives and a buffer area of 50 metres either side of the ROW, the PDF, EOLSS, and the landside component of the GIJW.

The assessment indicated that with the exceptions of a few locations, the majority of existing land uses were considered to have a relatively low potential for soil and groundwater contamination. Intrusive soil assessments identified contamination at the proposed CPRF, adjacent to the former BP refinery, and within the rail corridor in Hastings. Groundwater contamination was described as limited in extent, with contamination only encountered adjacent to the former Tyabb landfill and adjacent to the metal recycling yard in Hastings.

The marine sediment assessment included sampling of sediments from the seabed surrounding the Jetty. The study area included Berth 1 and 2, and a buffer area of approximately 200 metres east of the berths. Four reference samples were collected from locations approximately 500 metres north of Berth 1 and south of Berth 2.

The marine sediment investigation indicated contamination exceeding adopted GV were not identified at Berth 2. Contamination from historical and/or existing activities at the Jetty was limited to Berth 1 only, with arsenic, polyaromatic hydrocarbons (PAH) and Tributyltin (TBT) reported as exceeding adopted GV. The EES concluded the existing beneficial use of protecting water dependent ecosystems and species at Berth 1 and 2 should be protected.

Assessment of risks to beneficial uses of land, surface water and groundwater (as specified in the SEPP (Prevention and Management of Contamination of Land) (SEPP (PMCL)) and the SEPP (Waters)) from construction and operation of the Project in accordance with Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk Management Process, was undertaken using information obtained through desktop and limited field investigation.

### **8.3.2 Evidence and submissions**

The Proponents submitted contamination impacts to soil and groundwater were only likely during construction. In its closing submission, the Proponent stated:

That it was unlikely that the Project would cause or be impacted by contamination. Hot spots of contamination and potential contamination will readily be dealt with by the proposed controls, which are standard practice and now incorporate several clarifications and additions in response to matters raised in submissions on the EES and in evidence <sup>124</sup>.

#### **(i) Soil contamination**

The Proponents submitted the intrusive contaminated soil investigations indicated soil contamination is limited in extent and can be managed appropriately by applying relevant mitigation measures during construction. Contaminated soils were identified at:

- The proposed CPRF site (impacted by zinc and benzo(a)pyrene).
- The Esplanade adjacent to the former BP refinery (KP0.2 And KP0.3 impacted by benzo(a)pyrene).
- Railway corridor in Hastings between High Street and Cool Store Road (KP6.0 impacted by benzo(a)pyrene).

Submitters raised concerns contaminated soils would be inappropriately disposed, particularly soils containing Per- and polyfluoroalkyl Substances (PFAS) disturbed during construction of the CPRF. Mr Medd gave evidence that mitigation measures EPR-C01 and EPR-C07 satisfactorily address potential risks of encountered contaminated soils.

Casey raised the following concerns with potential soil and groundwater contamination:

- Additional investigations should be conducted if suspected soil or groundwater contamination is observed or encountered during excavation or backfilling.
- The EES proposed that risk and impact assessment is to be an iterative process and procedures and mechanisms should be in place to adequately manage potential risks.

- The CEMP and risk assessment should be an iterative process, with regular reviews required.

Submissions raised concerns that an area adjacent to a metal scrap yard (KP7.3 to KP7.9) had not been sampled and analysed due to heavy cover in the area. The Proponents committed to conducting further intrusive works prior to pipeline construction, now included in POS T11. A number of submissions expressed concern that construction activities would cause contamination. Mr Medd gave evidence that risks from spills from machinery, fuel and chemical storage and landfill gas at the former Tyabb landfill were low and could be effectively managed during construction with the nominated EPRs and POS.

## **(ii) Groundwater**

The Proponents submitted groundwater assessments identified limited sources of groundwater contamination. Contamination was detected adjacent to the former Tyabb landfill (KP13 to KP16), with trace concentrations of PFAS. Elevated nickel was encountered adjacent to the metal recycling yard in Hastings (KP7.3 to KP7.5).

Mr Medd gave evidence he was satisfied contaminated groundwater could be effectively managed, noting:

Contamination impact assessment focusses on disposal of contaminated groundwater, should it be encountered during the pipeline works. The assessment does not directly address the potential for dewatering activities to result in migration of contaminated groundwater <sup>125</sup>.

Mr Medd added the potential for migration of groundwater contamination during trenching was not well covered in the EES. Based on the proposed shallow excavations and short durations of groundwater dewatering during trenching, the scale of temporal changes in potential contamination would be minor. Any impacts would be re-established back to existing conditions relatively quickly. He found the low rate of groundwater drawdown would not result in the slow movement of contaminated groundwater, in the event migration was to occur.

Casey submitted construction may increase risk of cross contamination between interconnected groundwater aquifers. It suggested monitoring and/or investigation should be carried out and plans updated to reflect this.

The IAC directed the Proponents provide additional information regarding the risk of intersection and potential cross contamination of groundwater at the CPRF. They responded in TN10 which noted:

The risk of interconnecting aquifers and impacting groundwater quality such that beneficial uses and/or groundwater users are affected in one or more aquifers is low.

Mr Smitt expressed concern the persistence and widespread use of PFAS warranted further consideration in groundwater at additional hotspots, particularly KP13 to KP16. He noted ambiguity in the groundwater results at the former Tyabb landfill and recommended additional sampling to verify PFAS results. His evidence suggested additional groundwater investigations adjacent to the meat packer facility should include PFAS as he considered this a potential hot spot.

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<sup>125</sup> D84

Mr Davidson gave evidence that groundwater, which is at an adequate depth below the CPRF, would preclude intersection during the construction works on site. The only intersection will be via pile driving, which he confirmed adequately justified the lack of analysis at this location.

At the direction of the IAC, the Proponent provided TN11 which described the proposed methods that would be employed to separate, stockpile and reinstate soils during trench works.

### **(iii) Marine contamination**

In response to concerns by submitters that marine sediments would be disposed inappropriately, Mr Medd's evidence asserted marine sediments would not require removal as part of the Project. Submissions raised concerns that sampling and analysis of marine sediments in the EES was limited.

The Proponents submitted that PFAS was detected in marine sediment above the laboratory limit of reporting (LOR) at three locations within Berth 2. Arsenic, PAH's and TBT were identified in sediment above the Interim Sediment Quality Guidelines at Berth 1. A number of submitters expressed concern that contaminated sediment would be disturbed during commissioning of the FSRU and high velocity discharge ports and during tug wash scouring of the seabed each time an LNG carrier was moored adjacent to the FSRU.

Further submitter concerns related to the management of wastes from the FSRU. The Proponents submitted that wastes from various processes within the vessel would be removed by licensed contractors and disposed of to appropriate disposal facilities.

### **8.3.3 Discussion**

The IAC acknowledges the submitter's concerns regarding soil, groundwater and sediment contamination and understands their significance. It acknowledges the evidence of Mr Davidson, Mr Medd and Mr Smitt in consideration of issues and effects. The IAC appreciates the willingness of each witness to provide objective responses to, and preparedness to concede, on issues.

The IAC notes the evidence of Mr Davidson and Mr Medd supported the EES conclusions that the Project would unlikely result in unacceptable environmental impacts from contamination of soil, groundwater and marine sediment. Mr Medd and Mr Smitt generally agreed groundwater impacts are likely to be minimal and managed effectively by applying the relevant mitigation measures.

The IAC notes the soil and groundwater assessments focussed attention on the land-based components of the Project, stretching from the CPRF to the EOLSS. The pipeline assessment considered soils every one kilometre, with more targeted sampling at locations where prominent change in land uses could potentially contaminate land. This is generally accepted by the IAC as appropriate.

Mr Davidson, Mr Medd and Mr Smitt recommended a number of amendments to the EPRs and CEMP POS and the IAC notes that these were largely adopted by the Proponents.

There were submissions that raised general concerns about the possible cross contamination of groundwater and soils during construction works within discrete locations, particularly around the CPRF, BP refinery and former Tyabb landfill. The IAC recommends that EPR-C04 is amended to require soil and groundwater be assessed in accordance with EPA Publications IWRG 702 and IWRG 621 in the event unknown contamination is encountered.

The IAC concurs with evidence from Mr Medd that in the event contaminated groundwater was intersected, the risks were considered low as trenches would be relatively shallow and potential contaminant movement would be reduced by trench backfilling with excavated soils. Mr Medd suggested mitigation measures included backfilling with materials that have a similar or lower hydraulic conductivity than surrounding soils. The Proponents adopted this suggestion in EPR-C03. TN11 described the proposed approach to soil reinstatement presented as a method to reduce potential migration of groundwater. The IAC recommends revision of EPR-C03 to require containment of contaminated groundwater prior to treatment and or disposal.

The IAC notes elevated Total Dissolved Solids was reported in the EES at a number of locations. This precludes the use of groundwater for a number of beneficial uses. The IAC considers groundwater dewatering and discharge to land and receiving surface waters should be restricted where suspected soil and groundwater contamination is assumed. The POS and EPR do not currently preclude groundwater reuse at identified hotspots. The IAC has suggested amendments to EPR-C03 that groundwater not be dewatered and discharged to the environment unless groundwater is deemed uncontaminated.

The former Tyabb landfill is a priority site along the pipeline alignment. The EES reported an environmental audit under s53V under the *Environment Protection Act* had been undertaken for the former Tyabb landfill owned by Mornington Peninsula. The audit identified a medium risk of groundwater leachate impacting on the groundwater beneficial use of 'Stock Watering' and impacts of sub-surface landfill gas migration and accumulation to on the health of workers undertaking works in underground mains or trenches.

Mr Davidson advised he supported the assumptions in the audit that indicated risks of landfill gas generation and methane concentrations were considered low to very low, respectively. He noted risks to workers should be managed by inclusion of a mitigation measure to protect workers during pipe works adjacent to the former landfill. POS T12 was amended in response to Mr Davidson's evidence to require landfill gas monitoring as part of pre-start checks and prior to any hot works commencing during open excavations adjacent to the former landfill site.

Submitters identified the lack of intrusive soil and groundwater investigations between KP7.3 and KP7.9 due to site inaccessibility. They questioned the procedures to ensure that additional investigations would be conducted once vegetation was cleared. The Proponents included a requirement in POS T11 to ensure such an intrusive investigation occurs. The IAC recommends a further amendment, requiring soil sampling and analysis in accordance with EPA IWRGs to understand the potential contamination prior to excavation commencing.

During the soil contamination assessments, benzo(a)pyrene was detected in soils at the CPRF site, The Esplanade adjacent to the former BP refinery and in the rail corridor at Hastings. This organic compound is a carcinogen and formed as a result of incomplete fuel combustion. The EES noted the compound had negligible leaching potential and was unlikely to present risks to offsite receptors.

The IAC agrees with the evidence of Mr Smitt that PFAS are highly persistent in the environment and wide-spread use of PFAS related products warrants further intrusive sampling between KP7.3 to 7.6 to confirm the extent of groundwater contamination. This is reflected in POS T11 which the IAC recommends is amended to include further groundwater sampling at both locations in accordance with EPA IWRG 621 and 702.

Although not raised at the Hearing, the IAC acknowledges disposal of soils contaminated with PFAS has been problematic for recent projects within Victoria. The IAC recommends the Proponents assess the volume of likely PFAS contaminated soil and develop a strategy outlining how and where soils will be disposed of prior to soil disturbance. The IAC recommends revising POS W3 to require the Proponent to develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated by PFAS.

The IAC considers the marine sediment assessment was consistent with relevant guidelines for assessing and categorising contamination and supported by Mr Davidson in his evidence. The IAC acknowledges that marine sediment sampling indicated sediments were either below the laboratory LOR or below the adopted sediment quality guideline values (SQGV) at Berth 2. PFAS was detected in marine sediment sampled from three locations at Berth 2 close to laboratory detection limits or LOR. An Australian SQGV for PFAS to maintain ecosystem health has not yet been established. As indicated in the EES and supported by Mr Davidson, risks to the beneficial use of protecting water dependent ecosystems and species was deemed low. On balance, the IAC considers this conclusion adequate.

The EES reported results collected from marine sediment at Berth 1 in 2018 by Jacobs. Concentrations of arsenic, PAH anthracene, fluoranthene, phenanthrene, pyrene and TBT were detected above the ISQG trigger values. The IAC accepts the assertion in the EES that exceedances are generally low and do not preclude the existing use of the Jetty.

The Project does not involve dredging marine sediments at Crib Point, and the IAC considers the only disturbance to marine sediment is likely to be minor levelling of the seabed and infrequent disturbance by the tugboats. As indicated in Chapter 4, the risk of tugboats dispersing sediment, particularly at Berth 2 when mooring the LNG carrier, was raised by several submitters. Similarly, the disturbance of sediment containing elevated TBT displacing from Berth 1 to Berth 2 during tugboat operations was raised as a concern.

A number of submitters and the marine experts for Mornington Peninsula and Bass Coast and the CEG submitted dispersion of contaminated sediment is likely during commissioning of the FSRU's discharge ports and during tugboat operations. The IAC acknowledges the evidence presented by Mr Chidgey and Dr Wallis that confirmed risk to the beneficial use of protecting water dependent ecosystems and species was low.

The Proponents concluded that as marine sediment contamination was not expected to impact beneficial uses, contaminated marine sediments were not addressed in the risk assessment. The IAC supports this conclusion as significant disturbance by the Project to marine sediment is unlikely.

The IAC considers the recommended mitigation measures should adequately manage any contaminated soils and groundwater disturbed within the Project area, including unknown contamination.

#### **8.3.4 Findings**

The IAC finds:

- Contamination of soil and groundwater was identified at a number of locations along the pipeline alignment and at the CPRF.
- Soil and groundwater contamination impacts can be adequately managed by the recommended mitigation measures.
- Contamination of marine sediments at Berth 1 exceeded adopted criteria and was attributed to historic activities. PFAS was measured marginally above laboratory

limits of reporting at Berth 2 and the beneficial use of protecting water dependent ecosystems and species will be maintained.

- Based on the evidence presented at the Hearing, marine contamination at Crib Point is not expected to adversely impact Western Port Bay.

### 8.3.5 Recommendations

The IAC recommends:

#### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-C03 (Contaminated groundwater)**
- **Revised EPR-C04 (Unknown contamination)**

These changes are included at Appendix G.

#### Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **Revised POS T11: (Contaminated Soils), add the following dot point:**
  - **intrusive soil contamination sampling at KP7.3 to KP7.6 in accordance with EPA IWRG 621 and IWRG 702, prior to excavation to confirm the presence or absence of contaminated soils.**
- **Revised POS W3:**
  - **Develop a strategy in consultation with EPA which outlines the methods for disturbing and disposing soils contaminated with PFAS.**

## 8.4 Acid sulfate soils

### 8.4.1 Background

Acid sulfate soils (ASS) are soils affected by iron sulphide minerals, predominantly pyrite. They occur naturally along many parts of Victoria's coastal zone including estuarine systems, mangroves, saltmarsh ASS and in floodplain areas. ASS can be categorised as either:

- Potential Acid Sulfate Soils (PASS) are soils containing unoxidized metal sulfides in oxygen-less or waterlogged conditions. If left undisturbed, they are largely benign. However, if disturbed, such as when excavated and exposed to air, they can react with oxygen and produce sulfuric acid.
- Actual Acid Sulfate Soils are soils that have been exposed to oxygen and are already acidic.

ASS can be detrimental to the environment with impacts that include acidification of water and soil, de-oxygenation of water, poor water quality, dissolution of soil, rock and concrete, and corrosion of metals. Sometimes impacts can be extreme, resulting in fish kills and a risk to human health.

The Project involves the disturbance of over 90,000 cubic metres of soil from construction excavations. The EES described that, although national mapping indicated 16 kilometres of the pipeline alignment has a high probability of ASS, it has assumed that ASS would be present along the length of the pipeline as well as at the CPRF site due to its location on the Crib Point Jetty foreshore.

The EES identified that soil disturbance activities undertaken during construction of the Project such as excavation, trenching, HDD and thrust boring have the potential to encounter ASS and oxidise PASS. The preferred management options are to prevent oxidation of ASS by staging soil excavations to minimise the amount of time soil is exposed to oxygen. Where soils are to be stockpiled for a longer timeframe and acidic leachate runoff poses a risk to the surrounding environment, they would be neutralised via addition of lime.

#### 8.4.2 Evidence and submissions

Many submitters expressed concern over the disturbance of ASS and the effectiveness of mitigation measures. These related to:

- The frequency of sampling along the pipeline alignment that failed to comply with the 100 metre length intervals outlined in EPA Information Bulletin Publication 655.1 related to *Acid Sulfate Soil and Rock* to gauge the extent of ASS or PASS. As a result, an inaccurate understanding would occur about the extent of soil condition (including texture) and acidification risk and impact (S2912 and S2947), an issue noted in the evidence of Associate Professor Wong.
- The ability of the Acid Sulfate Soil Management Protocol to adequately address ASS risks and the management of contaminated slurry from HDD works (S1059).
- The potential for generation of acid leachate from soils excavated from open trenching that may be exposed to oxygen far longer than planned due to unforeseen circumstances or delays such as water flows in waterways (S2768 and Casey).
- The risks around the Project and ASS were inadequately assessed, the technical description was inaccurate, and control measures will not be effective (S2465 and Casey).

Generally, the concern of submitters was that liming and re-burial is a reactive response to a problem that could be avoided by the Project not proceeding or locating clear of ASS risk. Actions such as liming and burial merely change the nature of the contamination and delays migration of contaminants unless anoxic conditions can be recreated. Generation of ASS cannot be reversed and is difficult to treat when dealing with the proposed quantity of soil volume.

The Proponents' position regarding ASS was that the evidence demonstrated that potential impacts from ASS have been well assessed. Field investigations were subsequently reported in the EES and the Proponents submitted the sampling frequency was '*considered sufficient to provide an indication of presence or absence of ASS in the study area*'<sup>124</sup>. The EES reported:

Net acidity exceeding the 'Action Criteria' of 0.03 %S for disturbance exceeding 1,000 tonnes (BPMG, 2010) was exceeded in 78 samples of a total 180 samples. Therefore, soils must be managed in accordance with the EPA Victoria Publication IWRG655.1<sup>126</sup>.

A highly conservative, 'worst case' approach was adopted in considering the most significant potential risks associated with ASS. The EES assumed that all soils were ASS. The proposed controls included mitigation measures appropriate for worst case conditions, including the preparation of an Acid Sulfate Soils Management Plan (ASSMP) for the CPRF and including a draft ASSMP for the proposed pipeline in the CEMP.

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<sup>126</sup> Technical Report E Part 2 of 3 Appendix A

Key mitigation measures outlined in the EES and in evidence to prevent and manage ASS included:

- Crossing most waterways and minimising significant soil disturbance and excavation using HDD.
- Not undertaking works across waterways when they are flowing or have low flows.
- Not leaving soil exposed for too long and then reburying them.

The Proponents submitted soils stockpiled for more than 10 days may require management to prevent oxidation and generation of ASS. Treatment with lime may be required to neutralise the drop in salinity and then re-burial.

The Proponents considered any acid leachate generation during the construction of waterway crossings using the open trenching method was considered unlikely due to the ephemeral nature of the waterways. The likelihood was further reduced with construction only being undertaken during no or low flow conditions.

The EES concluded the proposed construction methodology, including trenching timeframes, neutralisation with lime and avoidance of wet waterway crossings, was unlikely to result in generation and loss of acidic leachate to the surrounding environment and eventual discharge into Western Port Bay. Soils impacted during pipeline construction were considered by the Proponents to have a low risk of impacting human health and the environment.

Significant uncertainty was emphasised in the evidence of Associate Professor Wong who submitted the lack of soil sampling meant the evaluation objective was not satisfied because adverse effects associated with ASS from the Project could not be determined. She considered the default position of the Proponents to test as works commenced and assess liming rates, meant the presence and risk from ASS could not be quantified. This was particularly so with regards to acidic contaminant mobilisation, which could extend impacts beyond the construction zone of the pipeline.

In contrast, Mr Davidson's evidence was the sampling undertaken in the EES assessment was sufficient and any concerns over a shortfall in soil sampling was overridden by assuming the presence of ASS along the pipeline alignment.

Associate Professor Wong considered the EES did not adequately assess impacts other than associated with the generation of acidity including 'soil ripening' or irreversible changes to soil structure that may occur from collapse of soil micropores leading to soil subsidence.

She reiterated that many effects associated with oxidation of ASS are irreversible. Oxidation of sulfidic materials can not only occur during the construction phase, but also during the operations phase to generate chronic discharges of acidity. Once the sub-surface ASS soils are oxidised, it can take many years for pH to recover in shallow groundwaters. She contended the timescales for remediation to reform reduced iron and sulfide minerals in the absence of oxygen is much longer than the time taken for oxidation.

Mr Davidson gave evidence the short duration of works, the short timeframe for dewatering (at less than 7 days) and the small areas affected (around 30 metres radius), were within the thresholds outlined in the *National Acid Sulfate Soil Guidelines*.

In its closing submission, the EPA considered evidence from Associate Professor Wong reinforced the EPA's position that POS T13 should be amended to require that soil sampling for ASS and that texture be conducted every 100 metres along the pipeline alignment, consistent with relevant guidance. The EPA supported Associate Professor Wong's advice that

in situ sampling would better inform understanding of the variability of soil texture and concentration of acidity to inform the degree of liming during construction activities and stockpiling.

The Proponents intend to utilise HDD techniques extensively, including across active waterways and most ephemeral water courses (minimising disturbance), undertake excavations and stockpiling within the recommended timeframes (prevent oxidation), and treat or neutralise soils as required as a last resort.

### 8.4.3 Discussion

Construction of the CPRF and pipeline involves excavation considered under the EPA's Best Practice Management Guidelines 2010 CASS (BPMG) 2010 as high risk activities.

The IAC acknowledges the Proponents adopted a conservative approach about the presence of ASS across the entire Project area and application of an ASSMP was sufficient to ensure risks can be managed as an early priority. This recognises the potential brevity of ASS impacts and a strong commitment to avoid and manage risks. The Proponents proposed to develop and apply an ASS management plan for the GIJW, including the CPRF site and an ASSMP for the pipeline, which was drafted and presented as Attachment K to the Pipeline Licence Application CEMP.

In this regard, the IAC notes Associate Professor Wong was generally satisfied with the ASSMP. Her evidence highlighted there could be serious potential impacts if ASS was not identified early and subsequently, managed properly. These include irreversible change to soil condition and contaminants that could be lethal to flora and fauna, damaging to farming productivity and dangerous to human health.

Associate Professor Wong was concerned consideration of environmental impacts in the EES did not address impacts in a cumulative sense or with regard to how changes to one part of the environment will affect another. For example, how oxidation and acidification would impact on terrestrial and freshwater biodiversity. Associate Professor Wong noted ASS frequently co-occurs with coastal wetlands and swampy scrublands and woodlands, and effects of acidic runoff on these and marine environments were not considered in detail.

The IAC considers these impacts are important and relevant to managing ASS because of their irreversibility and difficulty in preventing the veracity of detrimental effects on the environment.

The IAC notes State policy under Clause 12.02-1S relates to *Protection of coastal areas* to recognise, conserve and enhance coastal areas and ensure sustainable use of natural resources and to coordinate land use and planning to avoid disturbance of coastal ASS.

The Proponents relied on the short term exposure of soil to air anticipated by the construction works, and the generally short term dewatering expected to occur. They referred to the nature of pipeline construction in trenched sections, each open for a day or two and dewatering for a maximum of a day to argue that works would not generate acidification. On this basis, they considered the risk of ASS and its impacts were low.

The IAC considers the hierarchy approach to management of ASS follows a structured path with the starting point that, although soils will be excavated, the intent is to minimise the length of exposure to air to avoid triggering acidification processes. Concerns were expressed by submitters regarding the length of time proposed for stockpiling soils, and the EES suggested trenches may be open for several weeks before the pipe is installed and backfilled.

The IAC notes Table 7-1 in Technical Report E Part 1 of 3 is an extract from the CASS BPMG (2010) (Table 4) which recommended stockpiling of soils between 18 and 140 hours, before treatment is necessary and/or required. The EES assumed this period for the minimum time of stockpiling is allowed before treatment occurs does not align with the IAC's interpretation of Table 4. The IAC considers stockpiles of PASS should be exposed to oxygen for the minimum amount of time possible to limit oxidation of the sulfide minerals and ideally stockpiles should not be exposed for more than 140 hours.

Despite the IAC's concerns regarding the risks of ASS, it is aware of existing pipelines in the area and notes that no party or witness made submissions or gave evidence of any known impacts associated with ASS from the works involved with these pipelines.

The IAC notes Associate Professor Wong's acknowledgement that the proposed use of the ASS management plan and ASSMP represents best practice, with her caveats relating to:

- The frequency of sampling being increased in accordance with the EPA Information Bulletin Publication 655.1 and BPM CASS (2010) to enable variation in soil condition to be adequately detected for a linear pipeline and to determine whether liming was necessary and how much liming may be required.
- How trench water is appropriately disposed of to avoid damage to land and its productivity.

The IAC acknowledges the Proponents' views that changes to the testing regime are not necessary and mitigation measures should be proportionate to risk. The IAC is cognisant that in closing, the EPA requested soil sampling at 100 metre intervals across the Project area consistent with BPM CASS (2010).

The IAC considers that requiring testing for PASS every 100 metres along the whole length of the pipeline alignment would be excessive. The IAC considers it appropriate to test at selected and identified locations along the pipeline alignment considered to be medium to high risk of PASS. This should be done in consultation with EPA to confirm such locations that may require additional assessment for PASS prior to construction commencing. The IAC recommends amending POS T13 to read:

Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.

The IAC supports the Proponents' changes to the mitigation measures that provide for monitoring and discharge arrangement of trench water to minimise impacts on vegetation and have regard to water quantity and quality.

#### **8.4.4 Findings**

The IAC finds:

- Impacts from acid sulfate soils can be managed effectively in accordance with the Acid Sulfate Soils Management Plan and Acid Sulfate Soils Management Protocol, in consultation with EPA.
- Additional acid sulfate soil sampling should be conducted in areas of medium to high risk in consultation with the EPA.

#### **8.4.5 Recommendations**

The IAC recommends:

### Environmental Performance Requirements

**Include the following change:**

- **Revised EPR-C02 (Acid Sulfate Soil Management Plan)**

This change is included at Appendix G.

### Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **Revised POS T13:**

**Manage all soils in accordance with the Acid Sulfate Soils Management Protocol (Attachment K). The Acid Sulfate Soils Management Protocol will be finalised in consultation with EPA and following additional soil investigations in locations considered by EPA as medium to high risk of PASS.**

## **8.5 Contamination and acid sulfate soil conclusions**

The IAC concludes that:

- Contamination and acid sulfate soil impacts are consistent with the draft evaluation objective.
- Contamination and acid sulfate soil impacts can be acceptably managed through the recommended mitigation measures.
- There are no contamination or acid sulfate soil impacts that preclude the Project being approved.

## 9 Greenhouse gas

### 9.1 Introduction

Greenhouse gas (GHG) effects was discussed in EES Chapter 11 and Technical Report F. Additional material was provided in TN04, TN13 and TN40.

The relevant draft evaluation objective is:

**Waste** - To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

Table 7 lists the greenhouse gas evidence that was provided.

**Table 7** Greenhouse gas evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Sichlau	Point Advisory	Greenhouse Gas Emissions
Mornington Peninsula and Bass Coast	Mr Smith	Northmore Gordon	Greenhouse Gas Emissions

Mr Sichlau lodged supplementary evidence in reply (D209 and D425).

The following EPRs apply to greenhouse gas:

- GG01 – Equipment specification – fuel efficiency
- GG02 – Source local materials
- GG03 – Low embodied energy materials
- GG04 – Managing the quality of materials
- GG05 – Sustainable resource management practices
- GG06 – Implementation of the PEM (Protocol for Environmental Management (GHG emissions and energy efficiency in industry)).

The following POS environmental controls in the CEMP Appendix J apply directly to greenhouse gas:

- SG1 to SG3 relating to Sustainability and greenhouse gas.

### 9.2 Key issues

The key issues are:

- The accounting of greenhouse gas emissions and its consistency with policy.
- The provision of greenhouse gas emissions offsets.

### 9.3 Greenhouse gas emissions accounting and consistency with policy

#### 9.3.1 Background

GHG emissions associated with the Project are required to be considered in accordance with the EPA's *Protocol for Environmental Management (PEM): Greenhouse Gas Emissions and Energy Efficiency in Industry* and the *State Environment Protection Policy (Air Quality Management)* (SEPP (AQM)) under the *Environment Protection Act*.

A works approval is required for the FSRU, and a licence would be required prior to operations commencing.

The *Climate Change Act* has set a target for Victoria of net zero emissions by 2050. This legislation requires the EPA to consider the potential impacts of climate change, and the potential contribution to Victoria's GHG emissions when deciding about a works approval application.

Project activities that would cause the release of GHG into the atmosphere include:

- burning fossil fuels in vehicles, plant, and equipment
- the production of electricity from burning fossil fuels (such as coal or natural gas)
- manufacturing processes (for steel or cement, for example)
- vegetation clearance.

The EES recognised that direct and indirect GHG emissions are split into three categories, known as 'Scopes'. Scope 1, Scope 2 and Scope 3 are defined by the *Greenhouse Gas Protocol (GHG Protocol)*, the World Business Council for Sustainable Development and the World Resources Institute as:

- Scope 1 – Direct emissions of greenhouse gas from sources that are owned or operated by a reporting organisation (examples include combustion of diesel in company-owned vehicles or used in on-site plant and equipment)
- Scope 2 – Indirect emissions associated with the import of energy from another source (examples include import of electricity from the grid, or heat)
- Scope 3 – Other indirect emissions, other than energy imports (above) which are a direct result of the operations of the organisation, but from sources not owned or operated by them and due to upstream or downstream activities (examples include indirect upstream emissions associated with the extraction, production and transport of purchased construction materials; and business travel (by ship, air or rail).

The operational elements of the Project included in the EES assessment of GHG emissions are:

- the LNG tanker delivering LNG to Crib Point
- the FSRU for regasification
- the CPRF for processing of the imported natural gas
- the pipeline for transport of the imported natural gas
- the PDF for connection with the VTS.

Upstream Scope 3 activities not accounted for in the GHG emissions assessment included the gas field source and extraction of natural gas, the liquefaction plant and process, and the LNG storage tanks. Scope 3 downstream activities included the VTS distribution pipeline and natural gas consumption.

The EES identified that with the proposed open and closed loop scenarios, the assumed supply of natural gas would be around 387 million standard cubic feet per day (mmscf/d) for 213 days, 500 mmscf/d for 122 days per year and 750 mmscf/d for 30 days per year, based on delivering a total of 40 cargoes of LNG into the VTS. This variation of gas supply was based on seasonal demand and equated to 160 petajoules (PJ) of natural gas proposed to be delivered per annum by the Project.

The EES noted that a combined loop regasification process would potentially be used when ambient seawater temperature in Western Port Bay became too low for open loop regasification to operate effectively. The EES assumed this would be around 30 days a year.

In Victoria, annual Scope 1 and 2 GHG emissions at 2017 levels (D315) are 110,200 kilotonnes of carbon dioxide equivalent (Kt CO<sub>2</sub>-e)<sup>127</sup>. The EES used these levels for comparison against the Scope 1 and 2 GHG emissions proposed to be produced by the Project.

Scope 1 and 2 annual GHG emissions from the operation of both components of the Project in closed loop mode is 249.9 Kt CO<sub>2</sub>-e. For open loop mode it is 69.3 Kt CO<sub>2</sub>-e. Scope 1 and 2 GHG emissions from construction of both components of the Project are 26.4 Kt CO<sub>2</sub>-e.

With respect to the legitimate indirect upstream Scope 3 GHG emissions of the Project mainly linked with transport of LNG to Crib Point, the levels are around 390.4 Kt CO<sub>2</sub>-e and for construction around 33.9 Kt CO<sub>2</sub>-e.

Adding these Scope 3 figures to the closed loop mode, operational Scope 1 and 2 GHG emissions of the Project amount to 640.4 Kt CO<sub>2</sub>-e. For open loop mode, they amount to 459.8 Kt CO<sub>2</sub>-e.

Annual GHG emissions associated with upstream Scope 3 production of 160 PJ of imported LNG (extraction and liquefaction processes) were estimated by the EES to be around 1,300 Kt CO<sub>2</sub>-e. For annual downstream Scope 3 GHG emissions associated with commercial and residential consumption of natural gas, the levels are estimated to be around 8,000 Kt CO<sub>2</sub>-e.

GHG emissions arising from the extraction and liquefaction and storage of natural gas at source would represent Scope 1 emissions for the operator that undertakes the production activities. Similarly, GHG emissions arising from Scope 3 downstream consumption of natural gas would represent Scope 1 emissions for the entity that consumes the gas. The EES identified that including these in the GHG emissions inventory would lead to double counting of these emissions.

The EES identified that:

- The Project's estimated Scope 1 and Scope 2 construction emissions are estimated to contribute the equivalent of 0.02 per cent of Victoria's annual GHG emissions.
- For operation, the Project would contribute the equivalent of 0.23 per cent of Victoria's annual Scope 1 and Scope 2 emissions under a closed loop scenario or 0.06 per cent under an open loop scenario.

Operating in closed loop mode clearly produces higher levels of GHG emissions and would make a greater contribution to Victoria's annual GHG emissions. Under the closed loop scenario, the Project would trigger requirements under the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Safeguard Mechanism) including keeping annual GHG emissions below its set baseline<sup>128</sup>.

### 9.3.2 Evidence and submissions

There was generally no dispute amongst the parties concerning the quantum of GHG emissions described in the EES.

The Proponents advised the assessment of GHG emissions followed legislative requirements such as the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and *National Greenhouse and Energy Reporting (Measurement) Determination 2008* and accepted methodologies and GHG Protocol. The Proponents advised EES Technical Report F was independently peer reviewed by GHD and found to be acceptable.

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<sup>127</sup> 1 Kilotonne (Kt) equals 1,000 Tonnes (t).

<sup>128</sup> This relates to direct (Scope 1) annual operational GHG emissions greater than 100,000 t CO<sub>2</sub>-e.

Many submitters including Mornington Peninsula, Bass Coast, and the CEG expressed concern the Project would contribute to additional GHG emissions, which was inconsistent with the objective under the *Climate Change Act* for Victoria to achieve net zero GHG emissions by 2050.

The Proponents submitted these concerns were not supported by evidence and did not consider, in an integrated manner, policy concerning energy security, reliability, and affordability, which the IAC discussed in Chapter 3. The Proponents submitted the Project offered flexibility with the ability for the FSRU to cease operations and leave Crib Point if demand for natural gas declined without the risk of a stranded asset associated with more permanent fixed infrastructure. They further submitted the Project would precipitate transition away from coal as a source of electricity generation using natural gas and would support the continued development of renewable energy sources. They argued the Project would not preclude or materially impede the capacity for policies and other measures to be developed and implemented to achieve GHG emission reduction targets.

The matter of Scope 3 upstream and downstream GHG emissions associated extraction, liquefaction, storage, and consumption of imported natural gas and their inclusion in GHG emissions accounting was more vigorously contested between parties. The Proponents acknowledged the EES, the independent peer review and the evidence from both Mr Sichlau and Mr Smith had regard to these forms of direct and indirect GHG emissions.

The IAC notes there was general agreement between the experts with respect to the carbon accounting of GHG emissions and that relevant accounting methodologies had been appropriately followed. The exception was in relation to the variation of emissions that could be derived from the different sources of the imported natural gas (upstream Scope 3 sources). Mr Smith gave evidence the carbon accounting provided in the EES had used a superseded standard which excluded Scope 3 GHG emissions from the emissions inventory <sup>129</sup>. Mr Sichlau's evidence refuted this. The IAC notes that, although Technical Report F did not include the full suite of Scope 3 GHG emissions in the inventory, they were included in the text of the report.

The IAC notes the EES acknowledges that although Scope 3 GHG emissions have been calculated, emissions associated with downstream consumption of natural gas were not included in the assessment. This was because it would effectively represent double counting of GHG emissions as these would be separately accounted for in emissions reporting.

Mr Sichlau gave evidence that it would be anticipated over the life of the Project, natural gas and electricity related GHG emissions in Victoria will fall, irrespective of whether the Project proceeds. He noted Scope 1 GHG emissions would be approximately 3.5 times higher when the FSRU is operating in closed loop mode compared to operating in open loop mode. His evidence was the overall Scope 1 and 2 GHG emissions would be imperceptible when compared against Victoria's annual Scope 1 and 2 GHG emissions. This was acknowledged by Mr Smith as being relatively low.

However, Mr Smith gave evidence the decarbonisation benefits of the Project are potentially overstated due to exclusion of liquefaction emissions (upstream Scope 3 emissions) from the inventory.

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<sup>129</sup> A 2006 version instead of ISO 14064-1:2018 *Greenhouse gases – Part 1: Specification with guidance at the organisation level for the quantification and reporting of greenhouse gas emissions and removals*.

Mr Sichlau's evidence suggested that even when annual Scope 3 GHG emissions are considered, they will remain relatively constant in Victoria and nationally with or without the Project. By 2025 with the Project, they will be marginally lower at around 0.12 per cent and by 2040 marginally higher by around 0.19 per cent. The difference is most likely to be a reflection of modelled changes in GHG emissions generation towards 2050.

With respect to the Project contributing to additional GHG emissions, Mr Sichlau's evidence was that if the Project did not proceed, another source of natural gas would most likely take its place, given the demand for natural gas in Victoria. This could be from a source elsewhere in the State or from interstate. GHG emissions would most likely not vary with or without the Project as the demand for natural gas in Victoria would remain relatively steady, at least in the short to medium term when other circumstances or policy changes might occur.

The CEG and many other submitters expressed concerns that natural gas contributes fugitive emissions in the form of methane leakage with rates of around 3.2 per cent, resulting in natural gas being around 2.3 to 2.8 times more emissions intensive than coal. Methane has a longer residency time in the atmosphere, causing greater effect regarding climate change processes.

The Proponents relied on the evidence of Mr Sichlau who discounted the effects of the Project in contributing significant amounts of fugitive emissions. Mr Sichlau's findings were based on direct comparisons between electricity generated by coal and natural gas in Victoria and how levels of fugitive emissions can be compared between the situation in Victoria with that of findings relied upon by submitters in the USA, which has a much larger operating footprint. He estimated leakage rate tipping points would be in the order of 7.4 per cent, which is much higher than the estimate of 3.2 per cent from submitters, unlikely to be reached in Victoria.

Mr Sichlau was not confident that natural gas had greater emissions intensity than coal and found this proposition was not supported by clear evidence.

The Proponents indicated the pipeline would be designed not to leak. Measures are proposed by APA to ensure any leaks detected are repaired in accordance with relevant standards and statutory requirements regarding safety.

### **9.3.3 Discussion**

The IAC acknowledges concerns expressed by parties regarding the effect from additional GHG emissions contributed by the Project. Climate change is a significant concern. The Victorian Government has taken action to mitigate contributions to climate change effects with the *Climate Change Act* to establish a zero net GHG emissions target by 2050 and interim targets beforehand. There is no doubt this Project will contribute additional GHG emissions.

The IAC acknowledges the EES has assessed, accounted, and provided actions to minimise direct and indirect GHG emissions associated with and generated from the Project directly under the control of the Proponents (Scope 1 and 2 emissions).

Appropriately, and in accordance with national legislative requirements, the Project has accounted for annual operating Scope 1 and 2 GHG emissions which, when compared to those at the State level, are relatively low. The IAC acknowledges these levels of GHG emissions are acceptable, subject to the consideration of emission offsets.

The IAC does not agree the GHG emissions produced from the Project will run the risk of undermining or preventing the development, implementation, or achievement of net zero reduction of GHG emissions by 2050. It sees no issue with how the Project can flexibly adapt

to any Government policy in relation to future emissions reduction targets. The FSRU can adjust its gas outputs depending on policy and/or consumer demand or it can relocate elsewhere if the facility is no longer required.

Similarly, the IAC does not consider the aspirations of Councils, such as Mornington Peninsula regarding the setting or achievement of local net zero emissions reductions to be at risk from the Project. The Project represents flexibility in responding to future market demand for natural gas and how that may change in response to future policy requirements. The IAC agrees with Mr Smith that offsets are a relevant tool to assist with mitigating the effect of GHG emissions.

Regarding Scope 3 GHG emissions associated with transport of LNG, these can be legitimately included in accounting calculations. Including these results in significantly higher total GHG emissions from the Project under either open or closed loop operating scenarios.

Including those Scope 3 GHG emissions associated with upstream gas source extraction and downstream gas consumption would further significantly increase overall emissions.

The IAC notes the request from various submitters that all Scope 3 GHG emissions be included in the overall emission accounting calculations.

The IAC does not agree with including all upstream Scope 3 GHG emission associated with the extraction and processing of imported natural gas in the Project's GHG emissions calculations. These sources of GHG emissions should be accounted for by the source entity. Similarly, for downstream gas consumption, GHG emissions should not be included in the Project's accounting. These emissions would most likely occur whether the Project proceeded or not. Demand for natural gas will likely remain in the short term and supply would likely be provided, until such time as renewable energy sources begin to carry the greater load for securing energy supply. Hence, emissions from the consumption of natural gas should remain a matter that is reported and accounted for separately.

The accounting and reporting of GHG emissions is guided by the *National Greenhouse and Energy Reporting Act* and it only requires Scope 1 and 2 GHG emissions to be included in such requirements. Under this scenario, the Project's annual operating Scope 1 and 2 GHG emissions in open loop mode are relatively low compared to Victoria's levels, but in closed loop operating mode, the emissions would be much higher such that obligations under the *National Greenhouse and Energy Reporting Act* Safeguard Mechanism would be required. This highlights the dilemma where the Project, operating in closed loop mode creates less impact on the marine environment, yet has a greater impact on climate change processes compared to open loop mode.

Further, this dilemma presents a challenging problem for the Project. If legitimate Scope 3 GHG emissions from LNG transport to Crib Point are considered, noting that TN40 identified that the Project's Scope 3 emissions are 0.35 per cent of Victoria's annual total of Scope 1 and 2 emissions, then GHG emissions associated with open loop mode would probably warrant some consideration regarding offsets.

The IAC is satisfied the Project is generally consistent with policy relating to energy provision and it will provide for a secure and flexible source of energy for commercial and domestic consumption. Likewise, the IAC finds those GHG emissions produced by the Project (including Scope 1, 2 and transport related Scope 3) are acceptable and consistent with the policy framework around energy. The IAC acknowledges the Project will contribute additional GHG emissions. However, the IAC believes these emissions may vary over its 20 year life and

potentially reduce as renewable energy sources continue to develop under the aim of carbon emission reduction into the future.

### 9.3.4 Findings

The IAC finds:

- The reporting and assessment of the Project’s GHG emissions is in accordance with relevant legislative requirements and protocols.
- The assessment of the Project’s annual operating Scope 1 and 2 GHG emissions, although additional to what is produced in Victoria, is reasonable and acceptable.
- The Project’s annual operating GHG emissions in open loop mode are sufficiently low to avoid obligations under the *National Greenhouse and Energy Reporting Act* and Safeguard Mechanism compared to operating in closed loop mode.
- The consideration of Scope 3 GHG emissions associated with upstream transport of LNG to Crib Point is relevant and significantly increases the Project’s GHG emissions.
- Other Scope 3 GHG emissions associated with upstream LNG extraction and processing, and downstream gas consumption should not be included in the Project’s accounting and reporting.

## 9.4 Greenhouse gas emissions offsets

### 9.4.1 Background

The EES describes that:

Offsetting emissions associated with the Project could be pursued using a number of approved pathways in line with the Australian Government’s National Carbon Offset Standard (NCOS).

The NCOS provides a list of eligible offset units that have been assessed as meeting the Standard’s offsets integrity principles. These principles are designed to ensure that eligible offset units represent genuine and credible emission reductions. Offset options described by NCOS include:

- GreenPower®
- Australian Carbon Credit Units (ACCUs)
- Certified Emissions Reduction (CER) under Kyoto Clean Development Mechanism (CDM)
- Verified Emissions Reductions (VERs) issued by the Gold Standard
- Verified Carbon Units (VCUs) issued by the Verified Carbon Standard <sup>130</sup>.

EES Technical Report F recommended the following mitigation measure:

#### **Certified carbon offsets**

The Project should consider purchasing certified carbon offsets to compensate for the long-term impacts of the Project’s greenhouse gas emissions <sup>131</sup>.

That mitigation measure was not included in the EPRs.

### 9.4.2 Evidence and submissions

In relation to GHG emissions offsets, the Proponents submitted they were not included as a formal requirement because such commitments are not statutorily required under Victorian

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<sup>130</sup> Refer to section 8.1 of Technical Report F.

<sup>131</sup> MM-GG09

legislation. They noted these are only triggered under the *National Greenhouse and Energy Reporting Act* if the Project's Scope 1 and 2 GHG emissions are sufficiently high to reach baseline levels. Offsets are calculated on emissions above a baseline. The Proponents submitted any offsets provided would be voluntary.

Mr Sichlau gave evidence that the use of offsets does not minimise the generation of GHG emissions. Rather, they offset the impact of GHG once they have been emitted. He believed GHG emissions offsets can certainly provide benefits, however, he considered the draft evaluation objective does not call for the consideration of GHG emissions offsets.

Mornington Peninsula, Bass Coast and the CEG called for a mandatory offset requirement to be included in the EPRs. The CEG submission went further, suggesting any such obligation should extend to the full range of Scope 3 GHG emissions.

The Proponents submitted there is no support in the evidence or from legislation for such an obligation. Mr Sichlau specifically rejected the notion that any offset obligation (were one to apply to the Project) extend to the full range of Scope 3 emissions. So too did Mr Smith who gave evidence that any offset requirement would be voluntary and provided in respect of direct emissions associated with the Project.

The Proponents considered imposing an obligation in this respect would be to require the Project to offset emissions associated with the combustion of natural gas in homes, industry, and in electricity generation within Victoria, as well as emissions associated with extraction and processing of that gas. They submitted this would be wholly unreasonable and without precedent.

The Proponents submitted (including what is described in TN40) that AGL is acting responsibly to reduce GHG emissions within its portfolio while providing customers with secure and affordable energy. TN40 outlined AGL was developing renewable energy projects and it committed to closing down existing coal fired power stations.

The Proponents opposed the inclusion of any provision for GHG emissions offsets in the absence of any statutory basis upon which an offset could properly be required.

### **9.4.3 Discussion**

The IAC has noted the impacts operating in open loop compared to closed loop modes on the marine environment and climate change.

The IAC believes voluntary provision of GHG emissions offsets would be a positive outcome of the Project, should it be approved. This is particularly so because the Project would continue to contribute an increase in GHG emissions over a relatively long period of time (up to 20 years). The IAC notes the EES originally recommended a voluntary offset mitigation measure, which was not carried over into the final draft EPRs. The IAC considers there would be merit in including this EPR and it should be a consideration in approval of the Project. This should include Scope 1 and 2 GHG emissions, and the legitimate Scope 3 emissions that would include transporting the imported LNG to Crib Point.

In this regard, the IAC considers the mitigation measure included in Technical Report F at MM-GG09 (that the Project should consider purchasing certified carbon offsets to compensate for the long term impacts of its GHG emissions) should be included in the EPRs.

The IAC further considers an additional option is to consider the recognised blue carbon value of coastal saltmarshes, mangroves and seagrasses in Western Port Bay as suggested by S940.

The IAC considers this would be relevant and beneficial given the location of the Project in Western Port Bay.

#### **9.4.4 Findings**

The IAC finds:

- The Project would increase GHG emissions and would benefit from the voluntary offset of Scope 1 and 2 and legitimate Scope 3 GHG emissions generated or associated with the Project.
- The mitigation measure included in Technical Report F at MM-GG09 that the Project should consider purchasing certified carbon offsets to compensate for the long term impacts of the Project's GHG gas emissions, should be included as an EPR.
- The Proponents should consider enhancement of blue carbon as a form of GHG emissions offset for the Project, given its location in Western Port Bay.

#### **9.4.5 Recommendations**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following change:**

- **New EPR-GG07 (Certified carbon offsets)**

This change is included at Appendix G.

#### **9.5 Greenhouse gas conclusions**

The IAC concludes that:

- The greenhouse gas impacts are consistent with the draft evaluation objective.
- Greenhouse gas impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no greenhouse gas impacts that preclude the Project being approved, although the Proponents should consider voluntary carbon offsets.

## 10 Air Quality

### 10.1 Introduction

Air quality impacts was discussed in EES Chapter 12 and Technical Report G. TN42 relates to air quality and the IAC engaged Mr McIntosh to provide expert assistance on air quality.

The relevant draft EES evaluation objectives for air quality are:

**Social, economic, amenity and land use** – To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

**Waste management** – To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.

The Air Quality Assessment (Technical Report G) covered the potential direct, indirect, on site and off site impacts to air quality from construction and operation of the Project.

Relevant standards and guidance are included in State Environment Protection Policy (Air Quality Management) (SEPP (AQM)) and State Environment Protection Policy (Ambient Air Quality) (SEPP (AAQ)).

The EES proposed the following mitigation measures to manage air quality during construction and operation of the Project:

- EPR-AQ01 Dust suppression
- EPR-AQ02 Restricted vehicle movements
- EPR-AQ03 Covering vehicle loads
- EPR-AQ04 Weather monitoring
- EPR-AQ05 Dust monitoring
- EPR-AQ06 Odorous soils management
- EPR-AQ07 Equipment maintenance
- EPR-AQ08 Maintenance of the FSRU burners
- EPR-AQ09 Monitoring FSRU air emissions.

The operational Air Quality Assessment focussed on air emissions likely from the FSRU during a range of operational conditions that would trigger the need for an EPA works approval and discharge licence.

The following CEMP POS relate to air quality:

- E1 Speed restrictions
- E2 Dust monitoring and control
- E3 Suspension of dust emitting activities
- E4 Maintenance of plant.

Table 9 lists the air quality evidence that was provided.

**Table 8 Air quality evidence**

Party	Expert	Firm	Area of expertise
Proponents	Dr Ross	CAMM	Air quality specialist
Proponents	Dr Drew	Drew Toxicology Consulting	Human health and ecotoxicology

## 10.2 Key issues

The key issues are:

- Air quality impacts during construction.
- Air emissions during operation of the FSRU.

## 10.3 Air quality impacts during construction

### 10.3.1 Background

Technical Report G reported that air emission generated from the Project construction will primarily be related to vehicle movements, earthworks and materials handling, in particular for the Pipeline Works. Emissions from plant and equipment during construction CPRF are likely but expected to a lesser extent than the Pipeline Works. Emissions during construction works on the Jetty are not expected as these works are over water.

The construction impact assessment method was described in Section 4.3 of Technical Report G. Air quality impacts during construction were assessed '*semi-quantitatively*' using methodologies provided in the UK Institute of Air Quality Management (IAQM) document, *Guidance on the assessment of dust from demolition and construction* and through consideration of industry standard practice.

Dust impacts from the Pipeline Works were assessed with a focus on sensitive receptors located within 350 metres of the boundary of the pipeline works.

The outcome of the air quality risk assessment showed the unmitigated air emissions from the construction works pose a low risk for dust soiling from demolition and construction, and a medium risk for earthworks and tracking of vehicles in and out of the Project area (trackout). Human health impacts from construction presented a negligible risk for demolition and construction, and a low risk for earthworks and trackout. The proposed EPRs and POS are expected to ensure the residual risk of construction resulting in adverse effects on air quality would be '*Very Low*' or '*Low*'.

To mitigate potential construction impacts to air quality, the EES proposed seven construction EPRs:

- EPR-AQ01 Dust suppression
- EPR-AQ02 Restricted vehicle movements
- EPR-AQ03 Covering vehicle loads
- EPR-AQ04 Weather monitoring
- EPR-AQ05 Dust monitoring
- EPR-AQ06 Odorous soils management
- EPR-AQ07 Equipment maintenance.

Additional EPRs related to manage air emissions included:

- EPR-FF10 Dust impacts to flora/fauna.

The CEMP Attachment J included the POS environmental controls E1 to E4 to manage potential direct and indirect construction impacts to air quality. POS A9, C12, T10 and T13 indirectly relate to air quality.

### 10.3.2 Evidence and submissions

In opening remarks for air quality, the Proponents submitted:

The air quality impacts associated with the construction of the Project would be primarily attributable to the generation of dust and would be relatively short-lived. The application of conventional dust suppression techniques will be required pursuant to the applicable controls and will ensure that impacts of this type are limited to within acceptable parameters<sup>132</sup>.

The peer review of the EES conducted by Dr Ross of the reported air quality impacts from construction indicated:

- Adoption of the IAQM methodology appeared appropriate, particularly given the absence of any Australian-based guidance and its apparent acceptance for other projects in Australia.
- A quantitative air dispersion modelling assessment was not deemed necessary.
- Unmitigated emission of dust during construction may cause:
  - a transient low risk for dust soiling from demolition and constructions, and a medium risk from earthworks and trackout
  - a negligible risk of potential health impacts from construction, and a low risk for earthworks and trackout.
- With the proposed mitigation measures, potential impacts from construction could be appropriately managed to ensure that the residual risk is either '*low*' or '*very low*'.

Dr Ross recommended dust monitoring during construction be extended to include monitoring of fine particulates to assess potential health impacts, which was accepted in EPR-AQ05. Similarly, POS E2 was amended to insert:

Observational monitoring of dust will be undertaken along the construction right of way (ROW) where adjacent to sensitive receptors, including monitoring of fine particulates.

S2912 made several suggestions for changes to the EPRs relating to dust suppression, weather monitoring and dust monitoring, which the Proponents claimed had already been addressed.

### **10.3.3 Discussion**

Based on submissions of the Proponents and evidence from expert witnesses, the IAC accepts impacts from construction on air quality will be relatively localised and short lived. Dust generated during pipeline construction may have a localised adverse environmental effect, but should be capably managed through normal construction techniques and adoption of the CEMP POS.

### **10.3.4 Findings**

- The EPRs and POS (as modified) are adequate to manage potential air emission impacts predicted during construction.

## **10.4 Air emissions during operation**

### **10.4.1 Background**

EES Chapter 12 and Technical Report G included the assessment of FSRU air emissions. The assessment excluded the CPRF, PDF, pipeline and LNG carrier for reasons set out in Section 4.4.2 of Technical Report G.

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<sup>132</sup> D312

A description of the operational impact assessment methodology was set out in Section 4.4 of Technical Report G, including a description of the pollutants of interest.

The assessment completed by AECOM identified potential air emissions during operation of the FSRU and dispersion modelling of likely emissions under a range of worst case operating scenarios.

The key sources of identified air emissions were the four dual-fuel reciprocating engines and either two or three 60 megawatt (MW) boilers on the FSRU. The modelled sources were the FSRU engine stacks or funnels, or 'point' sources. AECOM modelled four operating scenarios to predict worst case emissions from the FSRU.

The pollutants emitted from the FSRU during operation were projected to be nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulphur dioxide (SO<sub>2</sub>) and volatile organic compounds (VOCs). Common VOCs likely to be emitted included benzene, formaldehyde and polycyclic aromatic hydrocarbons (PAHs).

The assessment concluded the modelled ground level concentrations under four worst case operating scenarios from the FSRU adopted a number of conservative assumptions. The air emissions modelled under worst case dispersion scenarios were well below SEPP (AQM) design criteria at sensitive uses such as schools, hospitals and residences in the broader area.

The SEPP design criteria for formaldehyde and nitrous oxide were modelled as exceeded over water and a portion of the Crib Point foreshore. The EES reported:

NO<sub>2</sub> concentrations exceed the design criteria of 190ug/m<sup>3</sup> (when combined with 54.7ug/m<sup>3</sup> background) within approximately 50 metres of the FSRU.

Formaldehyde concentrations exceed the design criteria of 40ug/m<sup>3</sup> within approximately 200 metres of the FSRU, at a number of areas over water to the south and east of the FSRU and a small area of the Crib Point foreshore.

To mitigate potential impacts from air emissions during operation, the EES proposed the following EPRs relating to the FSRU:

- EPR-AQ08 Maintenance of the FSRU burners
- EPR-AQ09 Monitoring FSRU air emissions.

## **10.4.2 Evidence and submissions**

### **(i) General concerns**

The Proponents submitted air emissions during operation of the GIJW would not cause adverse environment impacts as air quality exceedances would be confined over water and a small area along the Crib Point foreshore. Air emissions were not likely to result in adverse health impacts as exposure to the SEPP (AQM) design criteria would be over water and limited due to the mostly transient nature of boating activities and an exclusion zone applied around the Jetty.

The independent peer review of the EES was conducted by Dr Ross and Dr Drew. Their evidence concentrated primarily on validating air quality impacts to sensitive uses.

The Proponents noted:

- The EES adequately modelled air emissions during operation of the FSRU under worst case scenarios.

- The worst case emissions scenario was estimated to be during continuous operation of the FSRU at peak capacity when operating in closed loop or open loop at 100 per cent load.
- Operation at peak capacity would occur for 10 per cent of the time.
- Emissions from the FSRU may exceed the EPA’s Scheduled premises threshold for NO<sub>2</sub>, CO and VOC during gas fuelled open and gas fuelled closed loop, with two of three boilers operating.
- All modelled scenarios indicated the concentration of pollutants NO<sub>2</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and VOCs would not exceed SEPP (AQM) design criteria at any of the identified sensitive uses.
- Exceedances of the SEPP (AQM) design criteria would occur over water within approximately 50 metres of the FSRU for NO<sub>2</sub> (all scenarios).
- Concentration of particulates were modelled as exceeded during gas fuelled closed loop with three boilers operating.

The Proponents submitted air emissions during average and worst case operating scenarios would not have an adverse impact on sensitive uses in the broader Crib Point area. The Proponents advised use of the proposed FSRU *‘for the Project is considered best practice from an air quality emissions perspective’*. They contended it was likely no further major benefits in air quality could be gained by choosing different plant or power source technology<sup>133</sup>.

A number of submitters (including S102, S685 S2445 and S2912) expressed concern about emissions from the Project, particularly from the FSRU and CPRF. Some submitters noted the assumptions by the Proponents that the worst case operating scenarios occurring 10 per cent of the time or 36 days should be regarded as a significant time frame for air pollutants to be produced.

The IAC questioned the impact of potential air emissions to sensitive uses, including the Victorian Maritime Centre, and on aquatic and terrestrial flora and fauna. The Proponents responded in TN42 that modelled dispersal plumes for assessed air pollutants did not intersect with the Victorian Maritime Centre.

The Proponents deemed the Victorian Maritime Centre and recreational uses of the waters around Crib Point and Woolleys Beach were not sensitive uses as defined by SEPP (AQM). Several submitters countered these areas should be considered sensitive uses, with S2912 noting:

Air quality impacts over water could affect local recreational fishing and boating activities downwind of the FSRU. Fishing boats are often immobile and located in fixed positions on water and could be subject to air emissions dispersed by the operations of the FSRU vessel<sup>134</sup>.

Submitters questioned the likelihood of adverse health impacts, odour and noxious gases. They were concerned with air emissions extending along the Crib Point foreshore and beyond, and potential impacts to residential homes around Crib Point from odorant (mercaptan) to be used at the CPRF (S2912).

The EPA proposed that odorant should not be detectable outside the CPRF property boundary. S2912 expressed concern the injection of mercaptan into the pipeline to give the odourless natural gas a strong and offensive smell could be sensed by people. The Proponents submitted in the risk assessment (EES Attachment III Environmental Risk Report) the

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<sup>133</sup> Technical Report G Section 3.5

<sup>134</sup> S2912

accidental release of gas or spill resulting in emissions of odour (mercaptan) would be avoided as the CPRF would be ‘... *designed in accordance with relevant Australian standards and emergency spill response procedures developed as per EES Technical Report K: Safety, hazard and risk assessments*’.

During the Hearing, the EPA sought clarification and additional information about the assessment of air quality and later advised these were addressed to its satisfaction by the additional information provided in the evidence of Drs Drew and Ross.

## **(ii) Review of modelling**

Dr Ross reviewed the methodology used to assess air emissions impact and noted a number of issues that required clarification and further information to be rectified before the EES was finalised. He advised that the methodology was considered appropriate because:

- the selection of the AERMOD atmospheric dispersion modelling system, meteorological data and input files
- suite of modelling files to predict air emissions from the four worst case operating scenarios at the GIJW.

Inputs into the dispersion model were questioned by a number of submitters. On behalf of the IAC, Mr McIntosh questioned the information presented in the dispersion modelling, including use of a 100 metre grid spacing. The Proponents submitted that a grid spacing of 50 a metre or 100 metre resolution had no impact on results at sensitive receptors locations and would not alter the predicted extent of air emissions, a position supported by Dr Ross.

Submitters expressed concern the elevated background data would be used as a benchmark for background air quality for Crib Point (S2912). Dr Ross responded that the background concentrations were regarded as conservative and over predicted the emissions during worst case operations.

Dr Ross noted the EES excluded air quality assessments for the CPRF, PDF, the pipeline construction, Crib Point Jetty Berth 1 and LNG carrier emissions. It was suggested by submitters that all emissions from the operation should be assessed, including fugitive emissions. In his peer review, Dr Ross advised exclusion of emissions from the CPRF, PDS, the pipeline construction and Crib Point Jetty Berth 1 as additional sources was justified. He noted there was ‘*insufficient detailed information with which to make an informed comment*’ on the emissions from additional sources<sup>135</sup>.

## **(iii) Review of worst case emissions**

In his evidence statement, Dr Ross said:

Emissions to air from the FSRU for the four operational scenarios assessed will:

- Comply with the SEPP (AQM) design criteria at all sensitive receptor locations considered.
- Produce exceedances of the design criteria within approximately:
  - 50 metres of the FSRU for NO<sub>2</sub> for all scenarios.
  - 200 metres of the FSRU, within a number of over-water areas to the south and east of the FSRU, and a small area of the Crib Point foreshore, for Formaldehyde for the gas-fuelled scenarios.<sup>136</sup>

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<sup>135</sup> D72

<sup>136</sup> D72

Dr Ross further concluded that impacts of exceedances of NO<sub>2</sub> were negligible as the design criteria was confined to areas over water. He advised predicted exceedances for NO<sub>2</sub> would be reduced significantly if a '*less ultra-conservative background concentration*' was adopted.

TN42 outlined in relation to flora and fauna impacts of nitrogen oxide (NO<sub>x</sub>):

- Deposition rates for NO<sub>x</sub> is expected to be negligible, and uptake via soil pore water has not been considered a complete exposure pathway.
- NO<sub>x</sub> is broken down rapidly in the atmosphere and in water.
- NO<sub>x</sub> does not accumulate in the food chain.
- Nitrogen is a macronutrient; therefore, the addition of nitrogen can result in a physiological response such as the stimulation of growth.
- The lowest adverse phytotoxic effect reported is more than two orders of magnitude greater than the 1-hour maximum NO<sub>2</sub> concentration predicted overland for the Project.
- NO<sub>2</sub> reacts immediately with water and can change composition effectively.
- NO<sub>x</sub> does not bioaccumulate in the food chain.

Dr Ross noted a human health risk assessment (HHRA) was required for formaldehyde as the SEPP (AQM) design criteria was exceeded in a small area of Crib Point foreshore. He concluded in his witness statement:

Application of the Tier 1 screening approach indicates that the predicted formaldehyde concentrations are almost an order-of-magnitude less than the screening criterion, and as such, there will be no adverse health impacts expected for workers or receptors in the vicinity of the FSRU.

Dr Drew was requested by the Proponents to review the air quality impact assessment and HHRA, and comment on human health implications of possible emissions from the proposed FSRU operations. He noted the EES reported on a Tier 1 HHRA assessment which he deemed inappropriate as the criteria used in the EES was developed for dealing with emergencies.

Dr Drew considered the extension of formaldehyde onto sections of the Woolleys Beach foreshore. He advised formaldehyde concentrations would be between 1.5 - 10 times lower than the relevant health assessment criterion and therefore persons who may be exposed to modelled concentrations would not experience adverse health effects<sup>137</sup>. Dr Drew concluded there was very little likelihood of a person at Crib Point experiencing an effect from exposure.

Dr Drew further noted in evidence the EES did not deal with carcinogenic risks, particularly from PAHs and benzene. Based on worst case emission predictions modelled from the FSRU and cancer potency from the World Health Organisation, Dr Drew concluded a negligible risk of cancer occurring as a result of exposure to emissions. He opined that workers on the FSRU would be the most likely to be exposed to air emissions from the Project. The HHRA indicated risks of chronic human health effects at concentrations likely to be emitted were low.

Dr Drew advised the predicted worst case modelled ground level concentrations easily met the air quality objectives proposed in the draft Environment Reference Standard which is part of the new *Environment Protection Act*.

In his advice to the IAC, Mr McIntosh questioned the operation and potential for a +/- 20 per cent fluctuation in formaldehyde emissions during worst case operations<sup>138</sup>. The Proponents

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<sup>137</sup> D73

<sup>138</sup> D24

responded in TN42 that tolerances in formaldehyde emissions were considered during the air quality impact assessment <sup>139</sup>.

The Proponents submitted in TN42 that if the FSRU operated continuously at peak capacity (750 mmscf/d) for the entire year, formaldehyde concentrations would be below the SEPP (AQM) design criterion for at least 99 per cent of the time at locations greater than 60 metres from the FSRU. TN42 described the more realistic scenario of operation at 500 mmscf/d formaldehyde concentrations would be below the criteria at locations greater than 150 metres from the FSRU, 100 per cent of the time.

The EPA recommended EPR-AQ09, specific to monitoring FSRU air emissions be adjusted to include additional monitoring of formaldehyde from the FSRU. Dr Ross supported this recommendation and the Proponents amended EPR-AQ09 (previously AQ11) to require monitoring of the FSRU for 12 months, and in accordance with any works approval issued. Review of monitoring results would determine compliance with design specifications and any future monitoring requirements in the event results became unacceptable.

Impact of formaldehyde to biodiversity was addressed in TN42:

- Atmospheric formaldehyde is not persistent and modelled maximum concentrations would be likely to remain in the atmosphere for a short period of time, limiting potential exposure to vegetation.
- Plants are known to absorb and metabolise gaseous formaldehyde with literature indicating that plants show no visible signs of injury following exposure to higher concentrations than predicted from the FSRU.
- Atmospheric formaldehyde efficiently transfers into surface water due to formaldehyde's high solubility.
- Formaldehyde is not expected to significantly sorb to suspended solids and sediments in the water column, and therefore exposure to benthic species is considered unlikely.
- The bioaccumulation potential of formaldehyde is negligible.

The Proponents submitted that operational air emissions were not expected to impact aquatic and terrestrial ecosystems in the vicinity of the FSRU. Dr Drew gave evidence that birds would be most at risk from air-borne emissions and formaldehyde the pollutant of most concern. He noted scientific literature indicated formaldehyde would not kill birds or affect hatchability of eggs or viability of embryos.

### **10.4.3 Discussion**

The IAC accepts the conclusions in the EES that that SO<sub>2</sub>, CO<sub>2</sub>, and particulate emissions from the FSRU would comply with SEPP (AQM) design criteria. Evidence from Dr Ross supported the EES that NO<sub>2</sub> and formaldehyde are the air pollutants likely to exceed SEPP (AQM) design criteria.

The EES reported that sensitive receptors were allocated at 38 locations surrounding the FSRU location with the nearest approximately 1.2 kilometres from the FSRU. The IAC accepts that, based on dispersion modelling of four worst case scenarios, estimated by the Proponents to occur no more than 10 per cent of the year, emissions from the FSRU are not likely to impact this nearest residence.

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<sup>139</sup> D332

The Proponents did not consider the Victorian Maritime Centre as a sensitive use despite a contrary opinion by many submitters. The Proponents demonstrated in the worst case dispersion modelling; potential air pollutants would unlikely intersect with the Victorian Maritime Centre. The IAC accepts that assessment.

The EES considered the accidental release of gas or spill of mercaptan during operation would be effectively managed through the original mitigation measure MM-AQ09. The IAC notes that in the Day 4 version of the EPRs, this mitigation measure has been removed. The IAC recommends an additional EPR is included as EPR-AQ10 requiring that odour is not detectable outside the CPRF property boundary.

The IAC accepts the Proponents have verified the modelling adequately predicts air quality impacts from the FSRU. The inputs into the models are viewed by the IAC as valid, based on the evidence presented by Dr Ross and Dr Drew, and the advice from Mr McIntosh. The IAC recognises larger than expected background concentrations have been modelled to predict air emissions from the FSRU. These have resulted in predicted air emissions being overly conservative and background modelled emissions are somewhat greater than resulting air quality at Crib Point. The air shed of Crib Point is far less urbanised than metropolitan Melbourne where background data from EPA monitoring stations has been extracted, *'and therefore actual background concentrations at the Project site may be lower than the adopted concentrations'*<sup>140</sup>.

The IAC acknowledges operation of the FSRU under a range of peak conditions will result in design criteria exceedances for NO<sub>2</sub> and formaldehyde over water. Formaldehyde is expected to exceed criteria over a small portion of the Crib Point foreshore. The IAC recognises the likely exceedances are not within areas deemed sensitive uses according to SEPP (AQM) including schools, residents and hospitals.

The IAC accepts the conclusions of the HHRA that chronic exposure concentrations of formaldehyde and nitrogen oxide are significantly greater than worst case emissions predicted from the FSRU. The IAC is comforted by evidence in the HHRA completed by Dr Drew indicates that formaldehyde and nitrogen oxide emissions from the FSRU would be at significantly lower concentrations than concentrations that cause adverse human health impacts.

The IAC is satisfied that air emissions under worst case scenarios are considerably lower than widely recognised criteria for human health protection. The IAC is reassured by the evidence of Dr Drew and the outcomes of his additional HHRA which concluded health effects are unlikely. The assessment considered the potential carcinogenic substances emitted by the FSRU, notably VOC's including formaldehyde, benzene and VOCs, are not expected at concentrations that would result in chronic impacts to human health.

The IAC considers formaldehyde and nitrogen oxide are unlikely to adversely impact aquatic environments and vegetation. Evidence demonstrates that exposure to significantly higher concentrations of formaldehyde at Crib Point are required before impact to birds or eggs are likely. The IAC accepts the Crib Point intertidal environment is a secondary foraging habitat and eggs and newly hatched chicks of migratory shorebirds are unlikely to be present.

The EPA submitted additional monitoring of formaldehyde is recommended to confirm that emitted concentrations comply with design criteria and do not result in SEPP (AQM) exceedances beyond those predicted in the dispersion model. The requirement for additional

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<sup>140</sup> Technical Report G Section 4.7

monitoring during the first 12 months of FSRU commissioning is supported by the IAC as are the amendments to EPA-AQ09 included in the final version of the EPRs. The IAC considers they align with requirements of the EPA and recommendations by the Proponents' air experts.

The FSRU requires a Works Approval and environmental licence as a result of its general air emissions. The Works Approval and Licence will prescribe limits requiring compliance with the general emissions to air. The additional formaldehyde monitoring suggested by the EPA can be a condition of any Project approval by the EPA. It is expected any Project approvals granted by EPA will need to align with its new Act.

The SEPP (AQM) aims to safeguard the environmental values and human activities (beneficial uses) that require protection in Victoria from the effect of air pollution and waste. The IAC appreciates Dr Drew's evidence that modelled air emissions would comply with the new Environment Quality Standards that will accompany the amended *Environment Protection Act* to be introduced in 2021.

There were submissions that nominated air emission monitoring should continue for the life of the Project. The IAC considers the EPA, within its relevant approvals, should be responsible for determining ongoing air monitoring requirements, particularly if results collected over the initial 12 months are deemed unacceptable.

The IAC notes concern raised by submitters that not all emissions associated with the Project have been modelled. Submitters contended cumulative impacts of the FSRU, LNG carrier and four tugboats could have been modelled for completeness of the Air Quality Assessment. On balance, the IAC considers the additional emissions from the LNG carrier and tug boats are intermittent and would not significantly increase emissions predicted in the EES.

#### **10.4.4 Findings**

The IAC finds:

- The EES predictions of possible air emissions from the FSRU are acceptable, based on the completed dispersion modelling presented in EES Technical Report G.
- Dispersion modelling presented in the EES can be considered conservative as:
  - Modelled emissions are based on maximum predictions for emissions assuming worst case operating scenarios and peak operating capacity operating every day of the year. These scenarios are estimated to occur for 10 per cent of the year.
  - The dispersion modelling has applied higher than expected background concentrations and SEPP AQM design criteria is predicted to be achieved at all identified sensitive uses around Crib Point, including the nearest resident 1.2 kilometres from the FSRU.
- Under worst case operating scenarios formaldehyde and NO<sub>2</sub> were both modelled to exceed SEPP (AQM) design criteria over water. Formaldehyde was modelled exceeding SEPP (AQM) design criteria over a small area of Crib Point foreshore. Exceedances are not expected to result in adverse impacts to human health and do not affect sensitive receptors.
- Modelled air emissions will not exceed SEPP (AQM) design criteria at Woolleys Beach and the Victorian Maritime Centre.
- Additional evidence from the Proponents indicates aquatic and terrestrial flora and fauna, including birds, are not expected to be adversely affected by predicted air emissions.

- Emissions modelled during worst case scenarios are predicted to comply with the new *Environment Protection Act* and draft Environment Reference Standards.
- EPRs AQ08 and AQ09 are considered appropriate for operation of the FSRU and should be consistent with EPA approvals.
- Inclusion of a new EPR-AQ10 is recommended requiring that mercaptan odour is undetectable beyond the boundary of the CPRF.
- Amendments to EPR's may be required to comply with Environment Reference Standards of the new *Environment Protection Act* and other relevant EPA requirements.

#### Environmental Performance Requirements

##### **Include the following changes:**

- **Insert EPR-AQ10 (Managing mercaptan odour)**

### **10.5 Air quality conclusion**

The IAC concludes that:

- Air quality impacts are consistent with the draft evaluation objectives.
- Air quality impacts can be acceptably managed through the recommended mitigation measures.
- Based on the evidence presented at the Hearing, there are no air quality impacts that preclude the Project being approved.

## 11 Noise and vibration

### 11.1 Introduction

Noise and vibration effects were discussed in EES Chapter 13 and Technical Report H. Underwater noise and vibration impacts were discussed in EES Chapter 6 and Technical Report A, Annexures A-I and Annexures A-J. Section 10 of the WAA discussed surface noise.

Terrestrial acoustic impacts from the Project was discussed in EES Chapter 7 and Technical Report B.

Additional material was provided by the Proponents within TN03, TN26 and TN43.

The relevant draft evaluation objectives are:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

**Biodiversity** - To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.

Table 10 lists the noise and vibration evidence that was provided.

**Table 9** Noise and vibration evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Marks	Marshall Day	Acoustics
Proponents	Mr McPherson	Jasco Applied Sciences	Underwater acoustics
Proponents	Mr Lane	Nature Advisory	Underwater acoustics
Mornington Peninsula and Bass Coast	Mr Antonopoulos	SLR Consulting Australia Pty Ltd	Terrestrial Biodiversity
Mornington Peninsula and Bass Coast	Dr Lincoln Smith and Dr Blount	Cardno TGM	Marine and Shorebird Ecology
CEG	Dr Edmunds	Australian Marine Ecology	Marine and Shorebird Ecology

Mr Marks and Mr McPherson lodged supplementary evidence and responses on behalf of the Proponents (D83 and D165). Mr Antonopoulos lodged a supplementary report (D119) on behalf of Mornington Peninsula and Bass Coast. Ms Hui provided technical advice to the IAC (D22, D148 and D565).

The Proponent submitted the following TNs:

- TN03: Background noise levels
- TN26: Background noise levels and mitigation measures
- TN43: Underwater acoustic modelling and underwater noise impact assessment.

### 11.2 Key issues

The key issues are:

- Operational noise and vibration.
- Underwater noise.
- Construction noise.

## 11.3 Operational noise and vibration

### 11.3.1 Background

EES Chapter 13 and Technical Report H provided details regarding surface noise and vibration impacts and management during operation. Noise and vibration impact assessments were conducted for a range of operational scenarios. Technical Report H focussed on noise and vibration impacts at the Jetty and PDF and considered the potential for cumulative impacts.

The FSRU operating at peak regasification was assumed as the worst case scenario at the Jetty. Noise modelling was conducted on five operating scenarios under peak regasification with an LNG carrier unloading LNG. The modelling included potential noise produced by nitrogen injections. The modelled scenarios included continuous operation of each facility for 24 hours each day, seven days per week.

The modelled scenario for the PDF captured the worst case operational mode with all site equipment operating continuously.

Noise and vibration impact to fauna and the underwater environment were assessed in EES Technical Reports A and B.

The following EPRs apply to operational noise:

- EPR-NV06 Managing cumulative noise impacts
- EPR-NV09 Operations Noise Management Plan
- EPR-NV10 Operational noise controls
- EPR-NV10A Recreational noise control
- EPR-NV11 Operational noise cumulative control
- EPR-NV12 Notification for mooring LNG carriers
- EPR-NV13 Post-commissioning measurements.

### 11.3.2 Evidence and submissions

The Proponents submitted Technical Report H provided a detailed assessment of operational industrial noise and vibration impacts at the PDF and GIJW, being the two new above ground infrastructure installations. The Proponents submitted noise levels at sensitive receptors closest to the PDF were predicted to exceed the Recommended Maximum Levels for the night period, but mitigation could be effectively applied to achieve compliance<sup>141</sup>.

The Proponents submitted the FSRU operating at peak regasification (three trains) with the LNG carrier berthed alongside was the worst case scenario for the GIJW. Modelling suggested noise at the GIJW under worst case scenarios would achieve compliance with applicable Recommended Maximum Levels specified in EPA Publication 1411 *Noise from industry in regional Victoria* (NIRV) at the closest sensitive uses.

Mr Marks gave evidence that Technical Report H addressed operational and construction noise and vibration impacts. He considered continuous operational and short term construction noise and vibration could be properly managed and impacts could be suitably addressed through the Project's mitigation measures.

Concerns were expressed by many submitters about potential noise impacts during operation, including:

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<sup>141</sup> Noise from industry in regional Victoria: Recommended Maximum Levels from commerce, industry and trade premises in regional Victoria (NIRV; EPA publication 1411)

- The ISO 9613-2 method for calculating the attenuation of sound from industrial sources, and the potential that noise levels were underpredicted due to limitations in assessing noise propagation over large distances, over water bodies, and elevated noise sources <sup>142</sup>.
- Compliance with NIRV Recommended Maximum Levels, particularly at the nearest sensitive receptor at 103 The Esplanade Crib Point.
- Cumulative noise impacts, particularly with Berth 1 and Berth 2 operations occurring simultaneously.
- Amenity impacts to Woolleys Beach and HMAS Otama Lookout, where operational noise is predicted to reach 45-52 dBA.
- Reliance on assumed noise attenuators in both the LNG carriers and the FSRU.

### **(i) Issues with noise modelling**

The EES noise modelling completed by AECOM applied the ISO 9613 modelling method. This was accepted by Mr Marks but critiqued by Mr Antonopoulos.

Mr Antonopoulos questioned the suitability of ISO 9613 method for modelling noise from the GIJW. His evidence was that the ISO 9613 algorithm might underpredict noise levels from elevated sources, it had limitations over water surfaces, and its accuracy beyond one kilometre was undetermined <sup>143</sup>. In their opening submission, Mornington Peninsula and Bass Coast submitted the ISO 9613 algorithm failed to make allowance for noise from existing industrial operations <sup>144</sup>. In evidence, Mr Antonopoulos noted his request to access the AECOM noise model had been unsuccessful. Consequently, he had been unable to validate the results of the noise modelling against his own model that *'provided concerningly variable results'*.

The Proponents submitted that adopting the ISO 9613 method and modelling software was acceptable and the modelling approach was routinely utilised within Victoria for the purposes of similar planning and environmental assessments. They advised the modelling adequately predicted noise from worst case operational noise emitted.

### **(ii) Noise from the GIJW**

The Proponents submitted the modelling demonstrated the capacity for operations at the GIJW to achieve compliance with applicable Recommended Maximum Levels specified in the NIRV in all worst case scenarios.

In her review of the EES and Technical Report, Ms Hui identified that details of background operational noise levels used for determining the NIRV Recommended Maximum Levels for operation at the nearest receivers were missing in the EES. Following a request from the IAC, background noise levels were provided by the Proponents in TN03.

The EPA submitted a number of the EPRs and POS should be amended to better adhere to noise criteria and manage out of hours activities to avoid excessive noise. The Proponents amended most mitigation measures during the course of the Hearing to align with the EPA's suggestions, and those of other submitters.

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<sup>142</sup> ISO 9613-2: 1996 'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'

<sup>143</sup> D119

<sup>144</sup> D160

The Proponents considered the recommendations by the EPA and Ms Hui to amend a number of EPR and POS to require appointment of an independent environmental auditor, particularly to approve night time works, was not necessary, rather a qualified environmental assessor was sufficient.

Cumulative noise at Crib Point with operations occurring concurrently at Berth 1 and Berth 2 was noted by a number of submitters as the most significant operational noise issue. This was supported by the EES that the existing operations at Berth 1 have the capacity to produce noise within close range to the night time NIRV Recommended Maximum Levels when vessels are offloading petroleum.

To inform the EES, one attended noise measurement at 103 The Esplanade, the nearest dwelling, was taken while a United Petroleum vessel was moored at Berth 1. In his evidence, Mr Marks noted the overall LAeq sound pressure level audible from the Jetty was approximately 40 dBA at the dwelling. This was higher than the night time Recommended Maximum Level of 35 dBA LAeq,30min specified in NIRV. Weather conditions at the time of monitoring were reported as still and overcast<sup>145</sup>. Mr Marks noted that levels could increase if the wind came from the south south-west and especially as a prevailing wind direction<sup>146</sup>.

Several submitters expressed concern that compliance with relevant night time operational noise limits may not be achieved, especially if an LNG carrier arrived during the night when the FSRU and United Petroleum were both operating. Cumulative noise during night time operations was identified as a higher risk than day time operations. Ms Hui advised the IAC that cumulative noise impact assessments were not based on a comprehensive assessment of existing noise from operations at Berth 1 and suggested EPR-NV13 include a requirement to assess cumulative noise levels<sup>147</sup>.

Mr Marks gave evidence that noise levels that meet the EPA NIRV guideline usually provided a satisfactory level of amenity for affected residents. Mr Marks recommended NIRV recommended levels be included in the EPRs so that compliance with the noise targets would be enforceable. The EPA suggested amendments to EPR-NV10 and NV13 to better align with the requirements of NIRV and measures for managing cumulative noise. The EPA noted achieving the intent of the NIRV included implementing best practice noise control measures, considering noise from multiple premises, and considering the effect of noise on quiet rural areas.

Mr Antonopoulos gave evidence the LNG carriers are a significant noise source and the Proponents had modelled noise from those vessels fitted with high performance exhaust stack silencers. He advised the LNG carrier is the loudest and most critical noise source associated with the proposed operations and appeared to be the source the Proponents would likely have least control over.

Mornington Peninsula and Bass Coast submitted:

... that the FSRU might be built “to spec” to incorporate the assumed attenuation, it remains concerned about the possibility that LNG carriers delivering to the FSRU which are not owned or operated by the project Proponent might not incorporate the same attenuation. Additionally, it remains unconvinced that an appropriate allowance was made to the noise model having regard to its known limitations stated above<sup>148</sup>.

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<sup>145</sup> Technical Report H Section 5.2.2.1

<sup>146</sup> D83

<sup>147</sup> D148

<sup>148</sup> D564

The Proponents submitted noise sources not in their direct control (such as the LNG carrier and Berth 1 operations) could effectively be ameliorated by implementing the EPRs. They noted there is scope to implement further noise amelioration to achieve compliance with Recommended Maximum Levels in the event this may be required.

The Proponents advised EPR-NV11 was intended to manage cumulative noise from the Project and existing activities at Berth 1. The Proponents submitted in the event noise from the United Petroleum pumps, FSRU, or the combination of both, exceeded the NIRV targets, then EPR-NV11 would require *'appropriate noise amelioration measures'*. The Proponents suggested offsite noise mitigation might be considered.

EPR-NV11 would require the establishment of a working group to include the PHDA, commercial operators at the Crib Point Berths 1, 2 and 3, and a community representative within a 1.5 kilometre radius of the Jetty to manage noise.

### **(iii) Sensitive uses**

Submitters expressed concern the Project would have a detrimental effect on the amenity of the Crib Point foreshore, including Woolleys Beach south of the Jetty and Jacks Beach to the north. The EES found that changes in ambient noise level were expected to be noticeable at Woolleys Beach and at the Victorian Maritime Centre. Mr Antonopoulos gave evidence that operational noise from Berth 2 would be audible for significant periods at Woolleys Beach due to its different character from existing noise sources. He added predicted noise from the GIJW would *'be well above'* typical background noise levels at Woolleys Beach and HMAS Otama lookout.

Mornington Peninsula and Bass Coast submitted *'these beaches provide a valuable recreational asset for the community, not least because of their peaceful natural environment'*<sup>149</sup>. They submitted the Project should incorporate, where practicable, operational noise limits for open spaces such as Woolleys and Jacks beaches.

Under cross examination by Mornington Peninsula and Bass Coast, Mr Marks accepted that Woolleys Beach and the HMAS Otama lookout should be considered noise sensitive sites. He agreed that:

... operational noise from the Project would be both audible at these locations for potentially 4-6 hours per day if the FSRU was operating continuously over that period and different in character to the existing ambient sources excluding the United Energy operations (which are currently relatively limited in duration over the year)<sup>150</sup>.

Ms Hui suggested an assessment of operational noise to recreational areas be considered<sup>151</sup>.

### **(iv) Terrestrial biodiversity**

The Proponents submitted that operational noise and vibration at the GIJW under the worst case combining the FSRU, the LNG carrier berthed and nitrogen offloading (closed loop) would represent the worst case for fauna, but impacts are unlikely as this operational scenario. The EES considered predicted noise extending from the GIJW to secondary foraging habitats at Crib Point in the range of 40 to 50 dB  $L_{eq(15min)}$  are unlikely to interfere with bird behaviour.

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<sup>149</sup> D564

<sup>150</sup> D564

<sup>151</sup> D565

Mr Marks gave evidence that birds were relatively unperturbed by moderate levels of impulsive or continuous noise, consistent with noise generated by the GIJW. The Proponents submitted concerns raised by submitters about impacts on shorebirds and wetland birds were:

... largely expressed in terms of “uncertainty” about impacts rather than actual or likely impacts. They indicated that criticism is ‘largely made without any reference to the applicable standard of acceptability of impacts’<sup>152</sup>.

Mr Lane gave evidence that impacts of noise on birds and other wildlife were adequately assessed in the EES and ‘... *predicted noise levels in primary foraging habitats for significant bird populations are the same as or less than current ambient noise levels in these habitats*’<sup>153</sup>. He advised significant impacts on birds from noise were not anticipated and noted a review of existing information on impacts of noise and artificial lighting on wildlife had been undertaken in accordance with relevant guidelines.

The EES predicted noise levels extending into foraging areas would be consistent with noise experienced by birds in other industrialised locations in Western Port, including Long Island.

The DAWE submitted that ‘*it cannot be assumed that existing operational noise levels at these primary habitats is not adversely affecting the birds*’<sup>154</sup>. They noted further analysis may be required on potential impacts on waterbirds (roosting and foraging), resulting from additional noise associated with increased frequency of shipping and operation of the FSRU. It expressed concern that modelling of worst case scenarios ‘*predicts noise levels reaching 45 DBA at closest shorebird habitat, Woolleys beach (secondary foraging habitat) to the FSRU*’<sup>155</sup>.

A number of submitters similarly expressed concerns about operational noise emissions adversely impacting terrestrial biodiversity. Further, they contended the EES assessment of noise impacts on wildlife was lacking.

The evidence from Drs Lincoln Smith and Blount was that, as a minimum, the EES should have considered the cumulative and interactive effects of noise, boat wash and other disturbances on shorebirds from the Project’s vessels and other vessels/operations at the Jetty<sup>156</sup>. In cross examination, Drs Lincoln Smith and Blount agreed that noise levels predicted at Crib Point were quite low and impacts to shorebirds would be unlikely.

### 11.3.3 Discussion

The IAC notes the EES noise and vibration assessment considered a number of Project related noise sources and modelled worst case operational scenarios. Air-borne noise and vibration impacts were considered two kilometres out from the proposed pipeline alignment, which encompassed the pipeline construction ROW, proposed operational facilities as well as works on and adjacent to the Jetty. Operational noise generated was reported to include continuous noise from the PDF and the GIJW. The IAC notes that with amelioration, operational noise at the PDF will achieve Recommended Maximum Levels.

The worst case noise generating scenario was deemed to be the GIJW operating at peak regasification with an LNG carrier moored alongside. The IAC notes the criticism of Mr

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<sup>152</sup> D589

<sup>153</sup> D76

<sup>154</sup> S2871

<sup>155</sup> S2871

Antonopoulos who doubted the noise modelling and inputs used to predict operational noise, noting the modelling results were unverified. The IAC acknowledges there is value in independent validation of the noise modelling, but on balance, it considers the noise modelling provides a relatively sound understanding of the likely noise emissions and sources at the Jetty.

The IAC acknowledges the robust discussions about the noise sources and potential exceedances from operations at Berth 1 and 2, both in isolation and combined. It accepts that individual operations proposed at Berth 2 are likely to meet the NIRV Recommended Maximum Levels during gas import operations. However, the combined operations at Berth 1 and 2 are likely to result in exceedances of Recommended Maximum Levels at the nearest residence at 103 The Esplanade, particularly when the landside pump is offloading petroleum from a vessel docked at Berth 1.

The IAC considers the most sensitive noise receptor is 103 The Esplanade. The single noise assessment completed at that location does not conclusively predict the noise from the existing Crib Point operation. One measured event does not consider variability in meteorological conditions that could influence the dispersion of noise. Based on evidence from Mr Marks, the IAC considers compliance measurements at the nearest sensitive receptor should be undertaken over an extended period to provide a representation of prevailing conditions at the site. This will assist in developing targeted noise amelioration measures to minimise cumulative noise exceedances likely to occur at night during concurrent operations at Berths 1 and 2.

The Proponents submitted a three-decibel reduction would be applied to the Recommended Maximum Levels for the GIJW, in accordance with EPA Publication 1413 (Guidelines on applying NIRV). The IAC considers this is an important contribution to managing cumulative noise and achieving the Recommended Maximum Levels for each of the GIJW noise sources during concurrent activities at Berths 1 and 2.

The IAC notes proactive responsiveness by the Proponents and third parties to ameliorate noise would be critical to the success of EPR-NV11 which outlines operational noise cumulative control measures. The IAC recommends the working group proposed in EPR-NV11 include a representative from the residents located within 1.5 kilometres of the Jetty.

Noise from the LNG carriers was noted as a potential noise source beyond the control of the Proponents, and the IAC considers this warrants further consideration by the Proponents to determine how noise from combined sources, particularly during night time can be managed to ensure compliance with Recommended Maximum Levels. The IAC recommends amendments to EPR-NV13 to strengthen the program of noise monitoring post-commissioning, whereby noise is measured fortnightly for the first 12 months of commissioning the GIJW. Post-commissioning measurements will provide valuable information to assist with mitigating cumulative noise sources at Crib Point.

The IAC considers the amenity of the Woolleys Beach Reserve is important and noise impacts should be further assessed. The IAC recommends an addition to EPR-NV09 (Operations Noise Management Plan) to include *'the identification and assessment of noise sensitive receptors, including habitat for listed threatened fauna, likely to be impacted by the project'* include reference to 'the Woolleys Beach Reserve'. The IAC considers the Operations Noise Management Plan should be approved by an independent environmental auditor rather than an assessor before approval by EPA.

Impacts from operational noise to terrestrial biodiversity, particularly to migratory shorebirds utilising the intertidal habitats at Crib Point are considered low and not dissimilar to noise experienced at other industrialised jetties in Western Port Bay.

#### 11.3.4 Findings

The IAC finds:

- The noise generated from the GIJW will likely achieve the NIRV Recommended Maximum Levels at the nearest sensitive receptor under worst case operational scenarios.
- Cumulative noise generated during combined operations at Crib Point is expected to exceed night time NIRV Recommended Maximum Levels and will require careful management by individual operators contributing to the operational noise to achieve compliance.
- The opportunity to attenuate noise from LNG carriers and United Petroleum vessels may prove difficult as these noise sources are not controlled by the Proponents.
- The amenity of the Crib Point foreshore is considered valuable to a range of users and potential noise impacts from the GIJW warrant further assessment.
- Impacts to terrestrial fauna species, particularly birds, are expected to be negligible and consistent with other locations in Western Port Bay.

#### 11.3.5 Recommendations

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-NV06 (Managing cumulative noise impacts)**
- **Revised EPR-NV09 (Operations Noise Management Plan)**
- **Revised EPR-NV11 (Operational noise cumulative controls)**
- **Revised EPR-NV13 (Post-commissioning measurements)**

These changes are included at Appendix G.

### 11.4 Underwater noise

#### 11.4.1 Background

EES Technical Report A Annexure A-I and Annexure A-J detailed the underwater noise impact assessment and underwater acoustic modelling, respectively, which assessed the potential impacts of underwater sound on four marine fauna taxa – marine mammals, fish, invertebrates and diving birds. The assessment was based on model predicted sound levels with special consideration given to species listed as threatened or vulnerable under the *Environment Protection Biodiversity Conservation Act* and species listed under the *Flora and Fauna Guarantee Act*.

The underwater acoustic modelling utilised acoustic models to estimate the underwater sound emissions during four operational scenarios involving the FSRU, LNG carrier and the existing offload operations of liquid petroleum at Berth 1. The report indicated limited data was available to determine monopole source levels (MSL) for berthed FSRU, LNG and petroleum carriers. The modelling considered Floating Production Storage and Offload (FPSO)

facilities as a conservative proxy to derive sound pressure levels (SPL) and accumulated sound exposure levels (SEL). The predicted extent of underwater sound propagation was assessed against marine mammal criteria used to predict temporary and permanent effects from underwater sound.

The underwater acoustic modelling indicated an SEL causing a permanent threshold shift (PTS) in cetaceans and seals would extend a maximum distance of 80 metres from the combined operations of the FSRU, LNG carrier offloading and petroleum carrier offloading. The marine mammal behavioural response criterion of 120 dB re 1  $\mu$ Pa<sub>1</sub> (SPL) or temporary threshold shift (TTS) would extend up to 2.09 kilometres from Crib Point during combined operations of the FSRU and the LNG and petroleum carriers during offloading.

An independent peer review of the underwater noise assessment by GHD concluded *'the underwater noise assessment methodology is appropriate for the assessment required and the conclusions presented can be reasonably drawn from the methods used'*.

The following EPRs apply to underwater noise:

- EPR-NV14 Underwater Noise: Detailed Design
- EPR-NV15 Underwater Noise: Ambient Noise Study
- EPR-NV16 Underwater Noise: Post-Construction Monitoring and Assessment.

#### **11.4.2 Evidence and submissions**

The Proponents noted the underwater noise assessment reported in Annexure A-I that *'planned operations at the Gas Import Jetty will contribute to the soundscape in this harbour area but not change the ecological character or reduce the biodiversity of this environment'*. Annexure A-I noted the GIJW is located at an operating port jetty and *'it is assumed that the existing harbour operations create a noise field that already alters the natural sound field and impacts the marine receptors in the surrounding area'*.

The Proponents acknowledged operations at the Jetty, including the FSRU, LNG carrier and petroleum tanker would generate underwater noise. Noise from tugboats would be sporadic, limited in duration and not expected to be major noise sources.

The Proponents advised suitable underwater noise data was unavailable to determine the sound emitted by the GIJW. They instead relied on noise measurements from a FPSO unit as a proxy to predict underwater noise. The modelling reported in Annexure A-J assumed the FSRU, LNG carrier and petroleum tanker emitted the same MSL of 174 dB.

Mr Marks conducted a peer review of the Underwater Noise Assessment and Underwater Noise Modelling reports prepared by Jasco Applied Sciences (Annexure A-I and Annexure A-J). His evidence was that:

- The underwater noise assessment was conservative, with the four operational scenarios considered for the noise modelling all showing a limited impact zone.
- The assessment considered continuous sounds only, which is appropriate given the noise sources considered in the assessment.
- The criteria for marine impact were absolute averaged and weighted sound levels, assessed over a nominated duration (e.g. 24 hours).
- Underwater construction would be minimal, and the impact would not be material

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Mr Marks noted the following limitations to the underwater noise modelling and assessment:

- A comprehensive description of a wide general range of species and their response to noise was provided but the impact on the specific subset of marine life normally found in Western Port Bay was not discussed in detail.
- An ambient noise survey would have provided clarity of existing conditions, including details of ambient levels and the impact of existing marine traffic.
- Some commentary and assessment of how added vessel movements could change the acoustic environment in Western Port Bay and Crib Point specifically would have been beneficial.

The Proponents made Mr McPherson available to assist Mr Marks address any issues raised regarding underwater noise. Consequently, Mr McPherson gave evidence to the IAC and was cross examined by a number of submitters. He advised that underwater noise was modelled using underwater noise measured from a FPSO vessel, a similar vessel to the FSRU.

There was criticism by the CEG and other submitters that the substituted underwater noise source was lacking high velocity discharge ports, which were anticipated would create more intense underwater noise at the Jetty. Submitters considered this to be a deficiency in the underwater noise assessment. During cross examination, the CEG criticised the modelling of the FPSO as a proxy for the FSRU. It noted the FPSO was dissimilar to the FSRU as the FPSO did not discharge water through high velocity discharge ports.

The FSRU, LNG carrier and petroleum tanker vessel noise were all assumed to produce the same MSL spectrum, being 174 dB MSL. Mr Marks noted it was *'unlikely in reality that all vessels will create the same noise, and he considered the FSRU is likely to be noisier than the other two vessels'* <sup>158</sup>. He further noted that Jasco advised no comparative data was available to warrant any changes to the model and assumptions based on the FPSO. Mr McPherson indicated that LNG carrier noise levels have been reported to range from 150-186 dB MSL depending on vessel size. In evidence, Mr Marks advised the FSRU noise data was not quantified, but tests obtained by him on other FSRUs indicated levels used in the underwater modelling report were conservative. He further noted detailed information on actual FSRU noise was difficult to obtain or validate, and subsequently recommended that testing be carried out in situ.

S1715 submitted the underwater acoustic modelling was below industry standard as it lacked ambient underwater acoustic data, did not consider the benthic substrate nor the water depth profiles. She added the modelling and assessment did not factor in the various acoustic frequency ranges marine mammals respond to.

Mr Marks recommended commissioning measurements to verify that FSRU source levels were consistent with the MSL values referenced in the Jasco assessment.

### **(i) Impacts to marine biodiversity**

The Proponents advised the Underwater Impact Assessment (Annexure A-I) considered four taxonomic groups: marine mammals (whales, seals), fishes (finfish, sharks, rays), avifauna (penguins, cormorants, swans, waterfowl) and invertebrates. They submitted underwater noise modelling indicated severe impacts on cetaceans and seals (such as PTS) was predicted to occur within 80 metres or less of vessels, and usually exposed mammals will swim away.

The TTS zone for cetaceans, equivalent to the 120 dB MSL contour, was reported to vary in distances of 1.42 to 2.09 kilometres, depending on operating scenarios.

The Proponents advised underwater noise emitted during operation of the GIJW was modelled on results measured from a similar operation, and:

... the assessment of likelihood and consequence of impact shows that individual animals can be at a medium or high risk of being impacted by the sound while on population level the impact risk is low or very low for all species and species groups considered <sup>159</sup>.

The EES concluded there would be negligible risk for direct loss of fauna species listed as threatened under the *Flora and Fauna Guarantee Act* or *Environment Protection and Biodiversity Conservation Act*. Annexure A-I reported:

The assessment of likelihood and consequence of impact shows that individual animals can be at a medium or high risk of being impacted by the sound while on population level the impact risk is low or very low for all species and species groups considered

Various submissions noted the EES inadequately described the potential impacts of underwater noise from the GIJW to marine biota. Mr Edmunds gave evidence that underwater acoustic modelling of the FSRU and LNG carrier indicated behavioural impact thresholds would be exceeded across the width of North Arm <sup>160</sup>. Submitters expressed concern that underwater noise from the GIJW would result in behavioural effects, such as avoidance, and create faunal movement barriers in North Arm. Mr Edmunds suggested the FSRU could alter behaviour and restrict movement of fauna groups, including impact on mobile squid, sharks and fish that traverse back and forth through the North Arm.

The Proponents provided TN43 in response to the IAC's RFI, which described potential impacts on marine fauna within Western Port Bay, and indicated:

... behavioural responses, which are not necessarily equivalent to disturbance, in marine mammals could occur between 1.42 and 2.09 km, depending upon the scenario. Because of the attenuating effect of bathymetry, the maximum ranges to thresholds, were predicted to occur within the deeper waters of the channel to the southeast and northeast of the Crib Point Jetty.

Evidence from the Proponents further indicated data had not been gathered to quantify temporal and spatial distribution of marine mammals proximal to GIJW, species specific sensitivities to underwater noise is not easily predicted from existing literature, and additional effects from underwater noise may result in '*... reduction in prey availability as prey responds to anthropogenic sound and is displaced from a feeding area*'.

The Proponents submitted that marine mammals may deflect their swimming path to avoid higher noise levels in closer proximity to the sound source. It was noted in TN43 that Western Port Bay is already a '*disturbed environment with its existing port activities and marine mammals are likely to be accustomed to human-made noise*'. TN43 noted the noise induced impacts of temporary or permanent impairment of the animals hearing was extremely unlikely to occur as these thresholds assume an animal remains in proximity to the noise source for more than 24 hours.

The underwater noise impact assessment indicated it was possible that fish species would likely detect the operational noise and exhibit behavioural responses, avoiding the area. Annexure A-I indicated:

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<sup>159</sup> Annexure A-I

<sup>160</sup> D108

Sound produced by the vessels in the considered scenarios could cause physiological effects, and recoverable injury, to some fish species, but only if the animals are in very close proximity to the sound sources—within a maximum planar distance of 50 metres for 48 hours.

The Proponents relied on Mr McPherson and the modelling by Jasco to assert that underwater noise was not anticipated to materially impact on the colony of Little Penguins known to inhabit Barrallier Island. Similarly, the Proponents indicated the noise would unlikely impact shorebirds utilising Crib Point as a secondary foraging habitat.

## **(ii) Underwater ambient noise levels**

Technical Report A Annexure A-I noted:

The existing underwater ambient sound field at the Gas Import Jetty has not been measured and cannot be approximated from measurements other locations.

It further noted the lack in information on ambient noise levels created difficulties in quantitatively assessing likely impact of exceedances to the range of audibility and behavioural responses of cetaceans and pinnipeds.

A number of submitters expressed concern that the existing underwater noise environment was not assessed. Ms Hui noted the existing underwater ambient sound field at the Jetty had not been measured and predicted sound levels were based on data derived from a similar FPSO <sup>161</sup>. Ms Hui advised the IAC that EPR-ME16 should be amended to require a baseline study of underwater noise in the Crib Point area <sup>162</sup>.

Mr Marks said in his witness statement:

Although not material, some baseline line monitoring would have better informed the community in relation to the existing noise environment, including from current shipping, and would have helped to quantify the changes or impacts arising from the predicted Facility underwater levels <sup>163</sup>.

The Proponents responded that ambient underwater noise would be assessed prior to commissioning, and indicated ambient assessments were included as a requirement in EPR-NV15.

Submitters expressed concern that post-construction monitoring and assessment of underwater noise were not addressed in the EES. Subsequent amendments to the EPR-NV16 resulted in refinement of the post-construction monitoring program to measure underwater noise during the GIJW operations.

### **11.4.3 Discussion**

FSRU's are in operation worldwide and it would have been valuable to monitor and subsequently simulate the underwater noise emissions from a similar vessel in operation with the conditions that exist at Crib Point. The IAC considers the modelled predictions applying the FPSO MSL as a proxy highlights that underwater noise generated during the GIJW and Berth 1 operating together could alter the behaviour of marine fauna within a two kilometre radius of the Jetty. The IAC accepts the underwater noise may cause acoustic masking and stress to marine mammals, with mammals likely to avoid the area where the TTS is exceeded during different operational scenarios.

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<sup>161</sup> D22

<sup>162</sup> D22

<sup>163</sup> D83

The IAC considers modelled underwater noise predictions should apply real time FSRU noise emission data to predict underwater noise more accurately, particularly as Mr Marks noted underwater acoustic data or MSL would be available from other vessels operating in international waters. The IAC recommends revisions to EPR-NV14 to ensure design of the FSRU applies best practice operational requirements to reduce underwater noise, particularly from the high velocity discharge ports. There is the opportunity to integrate information from existing FSRU operations in other ports to optimise the design of any FSRU proposed in Western Port Bay.

The Proponents acknowledged the existing soundscape in Western Port Bay has not been measured. The IAC considers it worthwhile to conduct additional underwater noise modelling applying real time MSL data. Underwater MSL could be measured during operation of the United Petroleum vessels at Berth 1 and modelled with real time acoustic measurements during unloading of LNG carriers and FSRU operating in other ports. The IAC considers an ambient underwater noise assessment is critical to understanding existing acoustic conditions in and around Crib Point, and the lack of ambient acoustic information is acknowledged by the Proponents as a limitation to comprehensively understanding impacts to marine mammals. The IAC recommends amending EPR-NV15 to require ambient noise conditions be measured continuously for six months at a number of locations around Crib Point and North Arm prior to commissioning the FSRU to provide a benchmark for further assessments post-commissioning.

The peer review by GHD considered the methods used during the underwater noise modelling and assessment. The IAC is of the view the review did not appear to consider whether the underwater noise assessment and modelling sufficiently determined the extent of noise impacts to the receiving environment and potentially exposed biota.

There was a general theme in submissions that the combination of noise, vibration, odour and light from the GIJW could deter marine species from the North Arm and potentially, alter migration routes. The IAC considers the extent of impacts to species has not been adequately quantified. Evidence suggested marine mammals and fish are likely to be most affected as they have the greatest sensitivity to sound at the frequencies likely to be generated by the combined activities at the Jetty.

The IAC considers the most likely scenario is marine fauna would experience acoustic masking and behavioural changes as a consequence of underwater noise exceeding the sound level 120 dB re 1  $\mu\text{Pa}^1$  MSL. There is a risk marine mammals may avoid the area around the GIJW where the sound levels exceed the behavioural threshold of 120 dB re 1  $\mu\text{Pa}^1$  SPL. The IAC accepts the assumption in TN43 that large cetaceans are unlikely to remain in proximity of the FSRU for extended periods and permanent impacts are considered as highly unlikely.

The IAC considers that the underwater soundscape across the North Arm is likely to alter, with potential barrier effects created during combined operations at Crib Point. With the exception of penguins, the species specific sensitivities to noise predicted during operations at GIJW and Berth 1 were not thoroughly considered by the Proponents. This was agreed by both Mr Marks and Mr McPherson. The IAC notes penguins readily co-exist close to shipping areas such as ports and harbours in Victoria, and the population at Barrallier Island, north of Crib Point is unlikely to be adversely impacted by the GIJW.

The IAC noted that the EES generally considered impacts from underwater noise to marine mammals and fish and noted qualitative information was lacking to fully characterise the sensitivities to the marine mammals and fish known to use the North Arm. The IAC considers

EPR-NV15 should require further assessment to better understand underwater noise sensitivities of the range of marine species known to use the Lower North Arm.

#### **11.4.4 Findings**

The IAC finds:

- Underwater noise generated under various GIJW operational scenarios is predicted to extend 1.42 to 2.09 kilometres at SPL known to result in behavioural changes to marine fauna. Marine fauna will experience temporary behavioural changes such as acoustic masking and stress, and a barrier effect could deter marine fauna movement within the Lower North Arm.
- The PTS is predicted to occur a maximum distance of 80 metres from the GIJW, but permanent damage is unexpected as marine mammals and fish are unlikely to stay at this distance over a period of 24 hours.
- Impacts of underwater noise to marine fauna have been simplified to consider impacts more generally across marine fauna. There is a lack in understanding species specific sensitivities of underwater noise to species known to exist in the North Arm where barrier effects are likely.
- The underwater noise assessment is deficient as it has not adequately considered the ambient noise levels in the vicinity of Crib Point. This creates uncertainty in the EES predictions as the actual extent of underwater noise generated during various operational scenarios of the GIJW and their impacts to marine fauna cannot be confirmed.
- Modelled underwater noise predictions would have benefitted from real time FSRU noise emission data to provide a greater understanding and certainty about impacts.

#### **11.4.5 Recommendations**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-NV14 (Underwater Noise: Detailed Design)**
- **Revised EPR-NV15 (Underwater Noise: Ambient Noise Study)**
- **Revised EPR-NV16 (Underwater Noise: Post-Construction Monitoring and Assessment).**

These changes are included at Appendix G.

### **11.5 Construction noise**

#### **11.5.1 Background**

The following EPRs apply to noise management during construction of the GIJW:

- EPR-NV01 Construction Noise and Vibration Management Plan
- EPR-NV02 Managing noise and vibration from construction activities
- EPR-NV03 Construction noise criteria.

The following POS in the CEMP Attachment J apply directly or indirectly to construction noise and vibration:

- E6 Managing noise from construction activities

- E7 Offsite noise management measures
- E8 Scheduling out of hours work
- E9 Vibration safe working distances
- E10 Noise and vibration monitoring
- D9 HDD noise control
- H10 Cleaning, hydrostatic testing.

### 11.5.2 Evidence and submissions

The Proponents recognised construction activities would create temporary disruption and inconvenience, that would vary over time and be dependent on the nature of the construction activities along the alignment. The Proponents submitted noise and vibration impacts during construction will be limited in duration in any given location and materially less than for other major infrastructure projects.

The Proponents submitted it was common ground between Mr Marks and Mr Antonopoulos there was scope for construction noise to be acceptably managed subject to the adoption of standard noise amelioration techniques and adherence to established protocols. This view was shared by Ms Hui.

Impacts of noise and vibration during construction of the pipeline was highlighted by submitters as having the greatest potential to impact amenity of residents. The Proponents amended several EPRs and POS following suggested changes by Mr Antonopoulos, Mornington Peninsula and Bass Coast and the EPA, which were reflected in the Day 4 version of CEMP Attachment J.

Mr Marks recommended site specific CNVMP be required for critical works through townships or other sensitive regions affected by the pipeline works, including Hastings. Mr Antonopoulos, and to some degree the EPA, supported site specific CNVMP to protect residential amenity during the construction period. Ms Hui suggested the CNVMP should include, but not be limited to, details of agreed noise targets/triggers and mitigation measures<sup>164</sup>.

The Proponents submitted noise could be managed by adopting on site best practice measures as well as off site management measures such as respite and relocation. EPR-NV04 included reference to a Project relocation policy. Ms Hui noted details describing the respite and relocation mitigation measures are required within the CEMP and EPRs<sup>165</sup>.

The Proponents submitted that adoption of mitigation measures during unavoidable works and the opportunity for respite or relocation would ameliorate adverse impacts of out of hours work. The generation of noise and vibration during out of hours works was raised by several submitters, particularly based on the Proponents intention to continuously construct the pipeline over 24 hours. The EPA expressed concern regarding the efficacy of the proposed night time target detailed in EPR-NV02 to meet the inaudibility criteria of EPA Publication 1254 during the Jetty works.

In closing, Mornington Peninsula and Bass Coast submitted the proposed mitigation measures had not responded appropriately to the quiet rural environment in which the construction will take place. The EPA, Mr Antonopoulos and Ms Hui considered the NSW noise guidelines

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<sup>164</sup> D148

<sup>165</sup> D148

should be adopted. They would provide a more intensive and conservative management approach, more reflective of the rural environment associated with the Crib Point/Hastings area.

Ms Hui advised the IAC that defined noise criteria and trigger levels should be based on background noise levels representative of the area and time of day when construction works may be occurring<sup>166</sup>.

S2912 suggested a number of changes to the noise and vibration EPRs for the GIJW.

### **11.5.3 Discussion**

In order to minimise construction impacts, the Proponents proposed various mitigation measures. Submitters proposed various amendments to a number of the EPRs and CEMP POS. The Proponents accepted some of the suggested changes during the course of the Hearing. With the additional changes recommended by the IAC, it is generally satisfied the mitigation measures would ameliorate noise and vibration impacts.

The IAC accepts the Proponents' assessment of the potential for noise and vibration to be generated during construction of the entire Project. Noise and vibration impacts during construction are expected to be greatest during construction of the pipeline, rather than the Jetty works and PDF, given the geographic extent of the pipeline works. Night time noise was a concern to a number of submitters.

Construction of the pipeline will create the greatest noise impacts, particularly where the route is in close proximity to commercial and urban areas, such as in and around Hastings. Mr Marks' evidence noted Technical Report H did not fully address the risk of adverse impact from construction activities in Hastings. He recommended further assessments once details of the nominated equipment, daily construction rate variations and actual processes to be used by the successful construction contractors are known. This is supported by the IAC.

The IAC considers site specific CNVMP should be developed for locations where the Project is in close proximity to sensitive uses. Further, these should be approved by an independent environmental auditor and include a targeted stakeholder communication strategy and be supported by background monitoring and site specific risk assessments prior to works proceeding. The CNVMP will be particularly valuable during pipeline construction within corridors close to townships, including Hastings. The requirement for the site specific CNVMP has been included in EPR-NV01.

The EPRs and CEMP include management measures and mitigations to reduce adverse impact of noise and vibration during construction. Witnesses indicated Victorian noise guidelines are not as robust as the NSW Construction Noise and Vibration Guideline (CNVG). The EPRs and CEMP should incorporate the requirements of the NSW CNVG. The IAC recommends establishing criteria and trigger levels based on background noise levels representative of the area and time of day when construction works may be occurring, as recommended by Ms Hui<sup>167</sup>.

The adoption of work practices to minimise noise and impacts is critical. The IAC supports the EPA's recommendation that all reasonably practicable actions to minimise construction noise and impacts should be taken from the outset of the Project, rather than being conditional

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<sup>166</sup> D148

<sup>167</sup> D148

upon exceedances. This should apply to regular works, night time works, and unavoidable works. The IAC recommends EPR-NV03 and CEMP E7 be amended to reflect no noisy activities before 7.00am.

#### 11.5.4 Findings

The IAC finds:

- Construction of the GIJW is unlikely to create unreasonable noise and vibration impacts. Any impacts can be appropriately managed.
- Construction activities for the Pipeline are localised, and with the adoption of relevant construction mitigation measures and noise criteria, are not expected to result in unacceptable noise and vibration impacts.
- Site specific CNVMP should be prepared, informed by a more detailed risk assessment and baseline monitoring to identify areas where adverse impact to amenity will be greatest.
- The appointment of an independent auditor is appropriate to review procedures, noise management plans and mitigation measures, and to verify construction activities are consistent with EPR and CEMP requirements.

#### 11.5.5 Recommendations

The IAC recommends the following amendments to:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR-NV01 (Construction noise and vibration management plan)**
- **Revised EPR-NV02 (Managing noise and vibration from construction activities)**
- **Revised EPR-NV03 (Construction noise criteria)**
- **Revised EPR-NV05 (Noise and vibration monitoring).**

These changes are included at Appendix G.

##### Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **Revised POS E5**
  - **Remove reference to the independent and qualified environmental assessor. Approval of out of hours work is required by an independent environmental auditor.**
- **Revised POS E6: Managing noise from construction activities**
  - **Revise to require site specific Construction Noise and Vibration Management Plans (CNVMP) which will include specific noise targets/triggers and mitigation measures for locations where critical works through townships or other sensitive regions are proposed. Each CNVMP is to be approved by an independent environmental auditor.**
- **Revised POS E7: Offsite noise management measures**
  - **Revise EPA Normal working hours to allow works on Monday to Friday between 7.00am and 6.00pm, Saturday 7.00am to 1.00pm, EPA Night hours and unavoidable hours 10.00pm to 7.00am.**

- **Remove reference to the independent and qualified environmental assessor. An independent environmental auditor is required to approve night time works during the hours of 10.00pm and 7.00am.**

## **11.6 Noise and vibration conclusions**

The IAC concludes that:

- Noise and vibration impacts from construction are consistent with the draft evaluation objectives.
- Noise and vibration impacts from construction can be acceptably managed through the recommended mitigation measures.
- Surface noise and vibration impacts from the operation of the GIJW can be acceptably managed through the recommended mitigation measures.
- The underwater noise assessment and modelling is deficient and as such, it is not possible to confirm if the impacts from the operation of the GIJW to the underwater soundscape are acceptable. Gaps exist in the underwater acoustic modelling and assessment and additional operational assessments are required to assess underwater ambient noise in North Arm and species sensitivity of endemic in Western Port Bay to underwater noise.

## 12 Landscape and visual

### 12.1 Introduction

Landscape and visual effects were discussed in EES Chapter 14 and Technical Report I. Additional material was provided in TN14, TN24 and TN37.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

The landscape and visual impact assessments were conducted by Ethos Urban and peer reviewed by William James.

The Proponents recommended various mitigation measures in order to address landscape and visual impacts.

Table 10 lists the landscape and visual evidence that was provided.

**Table 10** Landscape and visual evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Burge	Jacobs	Visual impact
Proponents	Mr Cook	AECOM	Lighting
Proponents	Mr Biacsi	Contour	Town planning
Ms King (3272)	Mr Hanson	Frank Hanson Urban Design	Urban design

Mr Burge and Mr Cook lodged supplementary reports that further addressed night time lighting impacts following their inspections of the Crib Point area <sup>168</sup>.

The following EPRs apply to landscape and visual issues:

- EPR-LV01 Landscape screening
- EPR-LV02 Materials and finishes
- EPR-LV03 Preventative maintenance
- EPR-LV04 Reflective surfaces
- EPR-LV05 Design of lighting for land-based works
- EPR-LV06 Vegetation outside construction footprint.

The following CEMP Attachment J controls relate to landscape and visual:

- A2 Access track planting and screening vegetation
- A12 Landscape screening
- A13 Materials and finishes
- A14 Reflective surfaces.

### 12.2 Key issues

The key issues are:

- The adequacy of the landscape and visual impact methodologies.
- The landscape and visual impacts of the pipeline and associated infrastructure.

<sup>168</sup> D537 and D538

- The landscape and visual impacts of the FSRU and LNG carriers.
- The landscape and visual impacts of the CPRF.
- The visual impacts of night time lighting particularly associated with the FSRU and CPRF.

## 12.3 Landscape and visual impact methodology

### 12.3.1 Background

EES Chapter 14 and Technical Report I provide the landscape and visual impact assessments including:

- an overview of relevant legislation and policies
- a description of landscape character areas
- a description of landscape significance and susceptibility to change
- an assessment of visual impacts, including the pipeline and associated works, the GIJW and light spill.

The EES recommended a range of mitigation measures, including EPRs and CEMP controls.

### 12.3.2 Evidence and submissions

The Proponents submitted the methodology that underpinned the landscape and visual impact assessment in the EES was sound and noted it was supported in the peer review undertaken by Mr Williams. The methodology was based on the Guidelines for Landscape and Visual Impact Assessment 2013<sup>169</sup>.

The Proponents relied on the evidence of Mr Burge who undertook his own review based on the methodology outlined in his evidence report. He used this as a basis for comparison with the methodology and findings of the EES assessment. He noted his methodology has been applied in other significant projects in Australia and overseas, and peer reviews considered it to be *'best practice'*. A key element of the methodology is assessment of impacts in terms of:

- visibility
- distance
- landscape character and sensitivity
- viewer numbers<sup>170</sup>.

The assessment of these criteria included reference to the time or duration of the effect and was ranked on an impact scale that included nil, negligible, low, medium/moderate, high or unacceptable visual impacts, as well as positive impacts.

Although many submissions raised concerns about visual impacts or took issue with various findings in the visual impact assessments, there were few substantive submissions and no evidence that challenged the underlying methodologies used in the Ethos Urban assessment or Mr Burge's evidence. Mr Hanson's evidence for example, noted that *'the landscape and visual impact assessment for the project has been undertaken according to prevailing industry standards'*. Mr Hanson's concerns were primarily focussed on the extent to which overshadowing from the FSRU might have marine impacts.

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<sup>169</sup> Guidelines for Landscape and Visual Impact Assessment 2013, Third edition, published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (UK)

<sup>170</sup> D77, paragraph 65

Some submitters such as Save Westernport, raised issues about application of the methodologies and resultant conclusions, including the extent to which some of the impact analysis was subjective. S3296 noted that *‘the differing and unique sensitivities of people to the visual landscape’* had not been addressed in either the visual and landscape assessment or the social impact assessment (where Mr Burge suggested it might occur). Save Westernport expressed similar concerns.

Other submitters took issue with the reliance and accuracy of the various photo montages and other representations of existing and future views. They submitted these did not provide a sound basis on which to assess visual impacts. The IACs attention was drawn to some of the potentially misleading wireframe images in the EES report. Figures 64 and 66 in Technical Report I (see Figure 13) for example, gave the appearance the CPRF was proposed to be located on the foreshore at Woolleys Beach. It was apparent from some of the submissions received that some people had interpreted it that way.

**Figure 13** Wireframe positioning (eastern boundary) of the Receiving Facility from Viewpoint 7(a), Woolleys Beach North Facing North <sup>171</sup>



### 12.3.3 Discussion

The IAC accepts the landscape and visual impact assessment methodologies relied on by Ethos Urban and Mr Burge were appropriate and provide a sound basis for assessing the Project’s impacts. While some elements of these methodologies and how they were applied rely on varying degrees of subjectivity, this is unavoidable given the nature of the issues being assessed and the varying perceptions of the landscape, including what might constitute acceptable and unacceptable change.

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<sup>171</sup> EES Technical Report I Figure 66

The IAC agrees that some of the visual images in the EES were misleading and it is unfortunate this appears to have led to unnecessary alarm about the location of some elements of the Project.

The IAC undertook extensive inspections of various views referred to in the EES, evidence and submissions. It has reached its own conclusions about the issues raised by submitters, including the accuracy of the impact assessments and the veracity of any subjective judgements that informed those assessments. Where relevant, these issues are discussed further with regard to specific visual impacts.

### **12.3.4 Findings**

The IAC finds:

- The visual impact assessment methodologies in the Ethos Urban EES assessment and Mr Burge's evidence provide an appropriate framework for assessing landscape and visual impacts.

## **12.4 Pipeline and associated infrastructure**

### **12.4.1 Background**

The EES assessed visual impacts by landscape character type and impact significance. In relation to the Pipeline Works, it concluded the mitigated impact significance (post-construction) would be either '*negligible*' or '*minor*', depending on the landscape character type, its sensitivity and the nature of the works. Impact significance during construction would range from '*minor*' to '*moderate*', although would be limited to within the construction phase.

In relation to associated infrastructure, the EES concluded the mitigated impact significance would be:

- '*minor*' for the two MLVs and the PDF
- '*negligible*' for the EOLSS.

The EES included a proposed a mitigation measure relating to reinstating the ground surface within the construction footprint (addressed in various CEMP controls).

### **12.4.2 Evidence and submissions**

The Proponents submitted landscape and visual impacts from the pipeline element of the Project will be primarily related to construction, which will be temporary and of short duration.

Mr Burge agreed pipeline impacts would be mainly confined to the construction phase, particularly where open cut-trenching is used. The only noticeable visual change after construction would be signage associated with the easement and the temporary loss of vegetation. He noted the construction impacts would be more limited in areas where HDD is used and concluded visual impacts would be '*negligible*' or '*low*', depending on the landscape character area.

In relation to other pipeline infrastructure, Mr Burge concluded the visual impacts would be:

- '*nil*', '*negligible*' or '*low*' for the MLVs, depending on the landscape character area
- '*nil*' or '*negligible*' for the PDF and EOLSS, depending on the landscape character area.

He did not consider any additional mitigation measures, beyond those required as part of the pipeline CEMP, were necessary.

Submitters raised concerns about the visual impacts during pipeline construction, including vegetation and ground surface clearing.

### **12.4.3 Discussion**

The IAC agrees landscape and visual impacts of the pipeline will be most prevalent during the construction phase, particularly where open cut trenching is used. This is unavoidable given the nature of the works, although the various mitigation measures, including extensive POS that relate to construction and reinstatement works, will assist in mitigating those impacts. Similarly, the EOLSS is an underground facility that will have minimal visual impact once constructed.

The two MLVs and PDF are above ground facilities and will be visible during construction and operation. The MLVs are relatively small structures located in remote rural areas where their impacts will be limited. The PDF would be a larger, more visible facility, but its impacts need to be assessed within the context of the adjacent Pakenham East Train Maintenance Facility, limited access to and visibility of the site, and the scope for landscape screening. These facilities would be subject to various POS related to landscape screening, materials and finishes, and reflective surfaces. In combination, these mitigation measures will provide an acceptable framework for managing landscape and visual impacts.

### **12.4.4 Findings**

The IAC finds:

- The landscape and visual impacts of the pipeline and associated works will mainly be confined to the construction phase of the Project, while the impacts associated with its operation will be negligible.
- Visual impacts of the pipeline and associated works can be managed through the recommended mitigation measures and are acceptable.

## **12.5 The Crib Point Receiving Facility**

### **12.5.1 Background**

The EES assessed visual impacts by landscape character areas and impact significance. In relation to the CPRF, it concluded impacts would be '*minor*' although lighting impacts (see Chapter 12.7) would be '*moderate*' for some receptors. It proposed various mitigation measures relating to:

- landscape screening (EPR-LV01)
- materials and finishes (EPR-LV02)
- preventative maintenance (EPR-LV03)
- reflective surfaces (EPR-LV04)
- vegetation outside the construction footprint (EPR-LV06).

A lighting mitigation measure for land-based works was included in EPR-LV05.

### 12.5.2 Evidence and submissions

The Proponents submitted visibility of the CPRF from surrounding land is limited by its location and surrounding vegetation, while visual impacts from Phillip Island and French Island would be mitigated by distance. They relied on the evidence of Mr Burge and Mr Biacsi.

Mr Burge noted the main land-based view of the CPRF will be from a small section of The Esplanade that runs along the western boundary of the Jetty area. He gave evidence that vegetation will screen or filter views from other public areas, including Woolleys Beach Reserve, although the upper edge of the nitrogen tank will be visible from the north. Views from within Western Port Bay and French Island will be partly screened by the Jetty and FSRU and will sit within a backdrop of the Victorian Maritime Centre and the oil tanks on the former BP site to the west.

Mr Burge concluded visual impacts of the CPRF would be ‘low’ or ‘negligible’, although he noted additional planting along The Esplanade and retention of existing vegetation around the site would be beneficial.

Mr Biacsi concluded built form changes associated with the GIJW are unlikely to generate unreasonable visual or related amenity impacts.

Some submitters raised concerns about the visual impact of the CPRF, including lighting, although more were concerned about the impact of the FSRU. Some raised concerns about the visual impacts of additional truck traffic servicing the CPRF, particularly the estimated 900 truck movements per annum that would deliver nitrogen to the CPRF.

### 12.5.3 Discussion

The IAC agrees with the EES visual impact assessment and Mr Burge’s evidence that the visual impacts of the CPRF will be minimal given its location and siting, together with the topography and the extent of existing vegetation that screens much of the site. From a visual impact perspective, it is satisfied this type of facility is appropriate within the Port Zone (and the part of the site being rezoned to the Port Zone) in light of policy support for its port related development and use. For these reasons, port related industrial development is to be expected on the site, as are some off site amenity impacts, including landscape and visual impacts.

Nevertheless, there is scope to minimise visual impacts through detailed design of the facility, including the retention and addition of screening vegetation. This would be addressed through the Incorporated Document that will require the approval of a Development Plan that addresses relevant landscape and visual EPRs. These include landscape screening, materials and finishes, preventative maintenance, reflective surfaces, design of lighting and vegetation. While the IAC supports these EPRs, it believes that EP-LV01 should be expanded and clarified to ensure that landscape screening is used to the maximum extent possible.

The following revised EPR-LV01 is included in the recommended EPRs at Appendix G:

#### **Landscape Screening**

Retain and introduce, to the maximum practicable extent, appropriate indigenous vegetation to screen facilities within the viewshed of roads (such as the Esplanade), other public places (such as the Victorian Maritime Centre and the Woolleys Beach reserve) and residences (if requested by affected landholders).

In terms of additional truck traffic, the IAC accepts there will be some visual impact in the Crib Point area during peak nitrogen delivery periods, but this is not inconsistent with the role of

the Port or the use of existing road infrastructure. Road capacity and safety issues are discussed in Chapters 13 and 14.

#### 12.5.4 Findings

The IAC finds:

- The CPRF is consistent with the zoning and policy intent for the site.
- The CPRF will have minimal visual impact.
- The recommended EPRs will provide an acceptable framework for managing the visual impacts of the CPRF.

#### 12.5.5 Recommendations

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR LV01 (Landscape screening)**

This change is included at Appendix G.

### 12.6 The Floating Storage and Gasification Unit and LNG carriers

#### 12.6.1 Background

EES Chapter 14 and Technical Report I provided the assessment of visual impacts associated with the FSRU and LNG carriers.

The EES assessed visual impacts by landscape character areas and impact significance. It concluded visual impacts of the FSRU and moored LNG carriers would be '*minor*'. It noted lighting impacts (see Chapter 12.7) would be '*moderate*' for some nearby receptors but did not believe this warranted a change to the overall assessment rating.

The EES did not specifically assess visual impacts associated with movement of LNG carriers through Western Port Bay and its approaches, although it noted movement of large ships is in character with the area and consistent with the operation of the Port.

#### 12.6.2 Evidence and submissions

The Proponents submitted the permanent presence of the FSRU, and increased shipping activity should be considered within the context of the existing Port and the use of the Jetty. Relying on the evidence of Mr Burge and Mr Biacsi, they submitted visual impacts from Phillip Island and French Island would be mitigated by distance.

Mr Burge generally supported the EES assessment but undertook his own assessment in order to test the EES findings. This involved identifying key viewpoints, assessing their potential sensitivity and rating the extent of any visual impact. He concluded visual impacts caused by the FSRU and additional shipping would for the most part be '*low*' or '*negligible*', while for some viewpoints there would be '*nil*' impact. These conclusions reflected his assessment that the number and extent of direct viewpoints was limited by vegetation and topography, the significant distance of many viewpoints from the Jetty would ameliorate visual impacts and the number of people who might view the FSRU were typically '*low*' to '*moderate*'.

In relation to additional shipping movements, including tugboats, Mr Burge noted this would be consistent with the nature of an active port and was anticipated in various State and local policy documents, including the PDS.

Mr Biacsi gave evidence that built form changes associated with the GIJW, coupled with the increased presence of vessels moored at the Jetty, were unlikely to generate unreasonable visual or related amenity impacts.

The visual impact of most concern to many submitters was the permanent mooring of the FSRU and to a lesser extent the mooring and movement of the LNG carriers. This was highlighted by the CEG which dismissed the Proponent's proposition that the FSRU was consistent with the Port's function and the current use of the Crib Point Jetty for the delivery of petroleum. The CEG submitted it was unreasonable to compare the fortnightly mooring of a petroleum tanker (typically 180 metres long and 35 metres wide) with the permanent mooring of the FSRU (approximately 300 metres long, 50 metres wide and with an air draft of approximately 50 metres). The CEG was concerned about night time impacts associated with FSRU lighting. Many submitters likened the FSRU to a '*permanent floating factory*', which in their view, was a change of use to the existing operations of the Port.

Other submitters raised similar concerns about the FSRU, while the additional shipping was seen by many as part of an '*undesirable industrialisation of Western Port Bay*', including many submitters from French and Phillip Islands.

### 12.6.3 Discussion

The IAC agrees with the CEG and others that the visual impacts of infrequent mooring of petroleum tankers at the Crib Point Jetty does not equate with the permanent mooring of the much larger FSRU and the associated LNG carriers. The IAC's views on this were assisted by inspecting the area when petroleum tankers were present at Berth 1, during daylight and night time hours, and comparing this with the anticipated visual impacts of the much larger FSRU and LNG carriers. It is clear from those inspections and the IAC's analysis, that the FSRU will have a more prominent visual presence than the petroleum tankers, and this will be exacerbated by being permanently moored at the Jetty.

However, the IAC must have regard to the context of the site within a State significant port and the possibility that more and/or larger ships might use the Jetty in the future without any additional approvals being required. In this context, the IAC believes that the visual impacts of additional shipping are neither unreasonable nor unacceptable.

Having reviewed the Project against the four assessment criteria used by Mr Burge, the IAC concludes the visual impact of the FSRU from some viewpoints will not be as significant as many submitters fear, particularly long distance views from Phillip Island and French Island.

This is certainly the case in relation to Phillip Island given that its northern most areas, including Cowes, are over 10 kilometres from the Jetty. To the limited extent that the FSRU would be visible, it would be within a broader viewshed that includes Stony Point, Long Island and ships that are anchored off Cowes<sup>172</sup>. For these reasons, the IAC is satisfied the visual impacts of the FSRU from Phillip Island would be negligible.

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<sup>172</sup> The PHDA advised that in the two year period between July 2018 and June 2020 over 56 ships (including support vessels) were anchored off Cowes (D350)

The western shoreline of French Island (approximately four kilometres from the Jetty at its closest point) and the elevated viewing points such as the Pinnacles lookout (approximately seven kilometres from the Jetty), would be closer to the FSRU, but views would still be distant and sit within a broader viewshed that includes existing Port facilities and shipping at Crib Point, Stony Point and Long Island, as well as the Hastings waterfront and urban area. Some views would sit within the Jetty's immediate visual backdrop that includes the higher topography and petrol tanks on the former BP refinery site. For these reasons, the FSRU will be one of several competing elements in various views from French Island and its overall impact will not be as significant as some submitters suggested. The IAC is satisfied these limited impacts would be acceptable given the Port's role and what might be reasonably expected to occur at Crib Point in the future.

The FSRU will have a more prominent presence when viewed from recreational boats within Western Port Bay, but the extent of the impacts will depend on the view context and background (as is the case for French Island) and the distance from which the FSRU is viewed. Observer numbers from within the Bay will be limited and the IAC does not believe these impacts are a significant consideration.

The IAC agrees with Mr Burge the scope for short distance views to the FSRU will be limited given the topography and vegetation in the area, although it agrees with many submitters that in some views, such as from areas of the Woolleys Beach Reserve (to the immediate north and south of the Jetty), the FSRU will be visually prominent<sup>173</sup>. It will be visible from the Victorian Maritime Centre and The Esplanade opposite the Jetty, although that view will be somewhat obscured by the CPRF and potential for some additional landscape screening.

The IAC notes Mr Burge's observation that for some people and in some contexts, views of ships can be a positive experience, but recognises for many others, this is unlikely to be the case, particularly in relation to the permanently moored FSRU.

Some submitters expressed concerns about the visual impact of the LNG carriers being moored at the Crib Point Jetty and traversing the Port area and the entrance to Western Port Bay. The LNG carriers will typically be moored at the Jetty for up to 36 hours while unloading and will not add any significant visual impacts to those already associated with the FSRU. In terms of additional ship movements, forty additional ships would be a discernible, but not significant increase on the recent average of approximately 100 -140 calls per annum. The increase would be relatively minor compared to earlier years when there were over 700 calls per annum.

The PDS includes projections for future cargo movement, and although the 'high' growth scenario provides for a significant increase in tonnage, the 'moderate' scenario provides for more modest, incremental growth. Even if the number of additional ship movements associated with the Project is a large proportion of total calls, the IAC does not consider the visual impacts of additional ships transiting through Western Port Bay and its approaches would be significant or unacceptable.

On balance, the IAC is satisfied that while the FSRU and associated LNG carriers will have some negative visual impacts, these impacts are relatively confined and when considered within the context of the Port, are acceptable. Although the scope to reduce these impacts is limited, some mitigation measures, such as those related to landscaping, will have potential to mitigate impacts from some vantage points and are supported.

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<sup>173</sup> Amenity impacts on Woolleys Beach North are discussed in Chapter 16.4

## 12.6.4 Findings

The IAC finds:

- The visual impacts of the FSRU and LNG carriers are consistent with the context of the Port and its role as State infrastructure.
- The FSRU will have some visual impact, most notably within short range views from the public domain, including the Woolleys Beach Reserve and The Esplanade.
- LNG carriers will have minimal additional visual impact, either when moored or transiting to the Crib Point Jetty.
- The EPRs will provide an acceptable framework for managing the visual impacts of the FSRU and LNG carriers.

## 12.7 Lighting

### 12.7.1 Background

This sub chapter specifically addresses the visual impacts associated with the lighting of the FSRU and CPRF. Environmental impacts associated with lighting in relation to shorebirds is discussed in Chapter 5.6.

The IAC is satisfied that lighting issues associated with the pipeline element of the Project (specifically the above ground MLVs and PDF) can be managed through the CEMP requirements and do not require further assessment or discussion.

Technical Report I assessed the impacts of light spill from the FSRU and CPRF, based on light spill calculations (LSC) provided by AECOM. The assessment reached two overarching conclusions:

There are no highly sensitive publicly accessible night-time views or viewpoints impacted.

The LSC demonstrates that no receptors in the surrounding area are subject to increased lux levels from direct light sources <sup>174</sup>.

However, the assessment noted that it was difficult to quantitatively assess secondary light sources (such as reflections or glow) and their impacts given the limitation of the modelling. Instead, the analysis primarily relied on qualitative assessments that adopted what it described as a '*conservative*' approach to determining impacts.

The assessment identified five viewpoints and assessed the combined extent of direct light spill and increase in sky glow for each site. It concluded the significance of the impacts would range from '*negligible*' (the HMAS Otama lookout and the Pinnacles on French Island), '*minor*' (the Victorian Maritime Centre and Woolleys Beach North) and '*moderate*' (the residential property at 103 The Esplanade).

The assessment found that:

The proposed changes to light sources around Crib Point are within an area of existing port and maritime industrial associated activities, and as such are in keeping with the night-time character of the foreshore landscape as a generally dark landscape punctuated by concentrated locations of lighting associated with port and maritime industrial activities <sup>175</sup>.

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<sup>174</sup> EES Technical Report I, Appendix E

<sup>175</sup> EES Technical Report I, Appendix E

The assessment concluded the impact would be consistent with the draft evaluation objective, subject to the recommended mitigation measures and recommended that:

The reflectivity of all surfaces of proposed infrastructure, built form and ground surfaces illuminated by the proposed light sources is minimised to the greatest extent possible to minimise reflection, illumination and sky glow <sup>176</sup>.

### 12.7.2 Evidence and submissions

The Proponents submitted lighting impacts were acceptable, subject to proposed mitigation measures. This was particularly so when considered in the context of an *‘existing, operating port and industrial facilities that enjoy long-term policy support’*. They submitted this was true, regardless of whether the views were during the day or night, or whether they were from *‘Phillip Island or French Island, from open water, or from nearby land – public or private’*.

Mr Burge included an assessment of lighting impacts in his evidence and provided a supplementary report following a night time inspection of the area when a petrol tanker was moored at Crib Point Berth 1 <sup>177</sup>. He viewed the tanker and Jetty from the Stony Point Jetty, Woolley’s Beach (south of the Jetty), the Victorian Maritime Centre, the HMAS Otama lookout and the Hastings Marina.

Mr Burge noted the CPRF and FSRU would be in an area that includes many light sources of various intensity, including existing lighting at the Jetty and other foreshore locations inspected. He concluded the EES assessment of lighting impacts was appropriate and that, based on his methodology, there would be a *‘minor to low level of change’*. His supplementary report confirmed his initial assessment.

Mr Cook gave evidence in relation to the AECOM light modelling that was relied upon in Technical Report I and provided updated advice about the applicable lighting standards and guidelines. In response to submissions about visual impacts, Mr Cook referred to the role of AS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting and advised *‘there are no current design and project impediments to prevent the detailed design documentation achieving design compliance in accordance with the standards’*. He recommended a lighting report be commissioned to demonstrate adherence to the applicable standards and guidelines, including the relevant mitigation measures.

Many submitters raised concerns about night time lighting impacts associated with the FSRU and CPRF. Save Westernport raised concerns about the methodology relied on by Mr Cook and submitted he took *‘an inappropriately rigid quantitative approach to the assessment of lighting impacts on amenity’*. Save Westernport contended Mr Burge’s evidence underplayed lighting impacts and his subjective assessments were, in general, *‘selective and inconsistent’*.

FICA submitted lighting on the FSRU would be highly visible from French Island and there were no mitigation measures to address this. Other submitters expressed similar concerns in relation to views from Phillip island.

### 12.7.3 Discussion

The IAC is satisfied night time lighting issues are mainly related to the FSRU, rather than the CPRF or Jetty infrastructure. The shielded location and comparatively small size of the CPRF would reduce its visibility. There is scope to design the lighting to minimise off site impacts.

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<sup>176</sup> EES Technical Report I, Appendix E

<sup>177</sup> D537

It will sit within existing lighting on the Jetty and with associated onshore infrastructure, including the gatehouse and the United Petroleum pump station. The Jetty is currently illuminated for security and access purposes and is already reasonably visible from some viewpoints during the night. For these reasons, it is not expected the CPRF would significantly change the existing level of lighting or visual prominence of the area.

The FSRU lighting is potentially more problematic given its size and relative prominence, and because it is in a broader area where background lighting is generally confined to particular sources and areas such as Stony Point, Hastings and Long Island. This is in contrast, for example, with the Port of Melbourne that sits within a broader urban area that is highly illuminated.

In reviewing the FSRU's impacts, the IAC notes the EPRs include two amenity related landscape and visual EPRs and a related marine environment EPR:

**EPR-LV04**

**Reflective surfaces**

Minimise reflective surfaces on infrastructure to reduce reflection of artificial light where practicable.

**EPR-LV05**

**Design of lighting for land-based works**

Design the land-base components of the Gas Import Jetty Works to comply with Australian Standard AS 4282:2019 Control of the Obtrusive Effects of Outdoor Lighting.

**EPR-ME12**

**Limiting lights to the number for safe operations**

Limit lights to the number for safe operations. Reduce direct light spill where possible subject to meeting navigation and vessel safety standards.

Notably, there is no EPR that directly addresses the visual impacts of FSRU lighting, despite this being an issue that would benefit from careful design and management. Mr Cook was not aware of the lighting regulations or requirements that relate to ships but supported a recommendation that FSRU lighting be further considered as part of the Project's approval. Consequently, the IAC has recommended the following additional landscape and visual EPR:

**FSRU lighting**

Configure the number, intensity and direction of lights, and the reflectivity of surfaces on the FSRU in order to minimise its landscape and visual impact, subject to meeting navigation and vessel safety standards.

Mr Cook was not concerned about '*reflectivity*' because of the extent of piping on the FSRU photos that he had seen, however the IAC is not certain this is representative of all FSRUs, or all parts of FSRUs, and has therefore included reflectivity in the EPR.

The IAC agrees with Mr Cook's recommendation that a lighting report be prepared to demonstrate adherence to the relevant guidelines, standards and EPRs. The Incorporated Document includes a requirement that the Development Plan include '*Lighting details for the Project*' but does not provide any guidance about what it might contain or what it should address<sup>178</sup>. The IAC recommends this be replaced with the following requirement, consistent with Mr Cook's general recommendation:

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<sup>178</sup> Clause 4.4.2 f)

A lighting plan that describes the key lighting details of the project (including the CPRF, associated Crib Point Jetty infrastructure and FSRU) and demonstrates how it implements and complies with relevant standards, guidelines and EPRs.

### **103 The Esplanade, Crib Point**

S2785 raised concerns about the visual impacts (particularly light impacts) on the residential property at 103 The Esplanade, Crib Point. At the invitation of the submitter, the IAC was able to inspect the property as part of the accompanied inspections held during the day on 2 December 2020. The FSRU will be directly visible from parts of this property and will be particularly prominent when lit up during the night time. While there would be scope to filter this view and reduce visual impacts through additional landscaping, this would potentially impact on other views from the property and would be unlikely to block all views of the illuminated FSRU or the associated skyglow. The IAC accepts this will affect the residential amenity of the property and is not a good outcome for the landowners.

However, the IAC has to balance residential amenity expectations associated with one property, with policy support for developing a State significant port. In this context, the IAC supports the siting of the FSRU, although the additional and revised EPRs recommended by the IAC will better mitigate lighting impacts.

#### **12.7.4 Findings**

The IAC finds:

- The lighting impacts associated with the pipeline and associated infrastructure, the CPRF and the Crib Point Jetty are acceptable and can be appropriately managed.
- The lighting on the FSRU will be the most impactful element of the GIJW, particularly from some short range views.
- An additional EPR related to lighting on the FSRU should be included.
- A lighting plan should be prepared under the Incorporated Document that demonstrates how relevant lighting standards, guidelines and EPRs are implemented and achieved.

#### **12.7.5 Recommendations**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **New EPR LV07 (FSRU lighting)**

This change is included at Appendix G.

##### Incorporated Document

**Include the following change:**

- **Revised Clause 4.4.2 f) (Development plans)**

This change is included at Appendix F.

### **12.8 Landscape and visual conclusions**

The IAC concludes that:

- Landscape and visual impacts are consistent with the draft evaluation objective.

- Landscape and visual impacts can be acceptably managed through the recommended mitigation measures.
- There are no landscape or visual impacts that preclude the Project being approved.

## 13 Transport

### 13.1 Introduction

Transport effects were discussed in EES Chapter 15 and Technical Report J, (Traffic Impact Assessment (TIA) prepared by AECOM).

TN05 and TN45 provide further information from the Proponents on transport issues.

The relevant draft EES evaluation objectives are:

**Energy efficiency, security, affordability and safety** - To provide for safe and cost-effective augmentation of Victoria’s natural gas supply in the medium to longer term.

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Table 11 lists the transport evidence that was provided.

**Table 11** Transport evidence

Party	Expert	Firm	Area of expertise
Proponents	Ms Dunstan	Traffix Group	Traffic
Mornington Peninsula	Ms Marshall	Ratio Consultants	Traffic

### 13.2 Key issues

The key issues are:

- Road capacity and safety issues relating to construction of the Project.
- Road maintenance and safety issues relating to operation of the Project.

### 13.3 Construction issues

#### 13.3.1 Background

EES Technical Report J identified the following construction transport impacts:

- road link capacity
- road closure impacts on local access in Hastings
- road Network Infrastructure Assessment
- dirt from construction on roads
- pedestrian/cyclist access in Hastings
- public/school bus impacts
- road closures outside of Hastings
- access tracks, particularly sight distance issues
- railway level crossings.

In response to these issues, the EES proposed six EPRs to manage transport impacts of the Project, five of which related to construction impacts as follows:

- EPR-TP01 Traffic Management Plan (TMP)
- EPR-TP02 Stakeholder consultation on transport changes
- EPR-TP03 Road Safety Audit (RSA)
- EPR-TP04 Pavement strength survey
- EPR-TP05 Public Transport Disruption Management sub-plan.

Attachment J to the CEMP included POS A8 that combined the relevant parts of the relevant EPRs into controls to be applied to the construction of the gas pipeline. EPR-TP01 requires the TMP required in the EPRs be coordinated with the TMP required in CEMP POS A8.

One difference of note between the EPRs and CEMP POS is that POS A8 requires the TMP to include car parking management, whereas the TMP in the final version of the EPRs (applying to the CPRF) did not.

### **13.3.2 Evidence and submissions**

Ms Dunstan's evidence was, in summary, that the TIA identified the key impacts of the Project and the EPRs and CEMP would sufficiently manage any traffic impacts. With respect to construction, she opined the traffic volumes used in the TIA were overly conservative and the impacts were overestimated.

The submission of Mornington Peninsula relied on evidence from Ms Marshall that the TIA did not sufficiently include accurate data to allow a proper assessment of existing or future traffic conditions. Ms Marshall was critical of the lack of actual count data and the absence of more detailed peak hour traffic movements. Concerns about the traffic volume inaccuracies in the TIA were raised in the Cardinia submission which called for more accurate up-to-date traffic information to be used in preparation of the TMP.

Other concerns raised by Ms Marshall included:

- The proposed RSA and TMP ought to specifically nominate six intersections for assessment which she considered may be at higher capacity and safety risk due to construction traffic.
- Access track locations should be fixed early in the design process so that any impacts on road users and property owners could be assessed.
- A car park management plan should be prepared for the construction phase of the Project as part of the TMP.

Ms Dunstan provided a response to the criticisms of the TIA traffic volumes and Ms Marshall's evidence as follows:

- The TIA, perhaps confusingly, used one way traffic volumes instead of two-way volumes in Table 5-5. Ms Dunstan agreed that this was not the normal convention.
- The TIA used a combination of actual traffic volumes (where available) and estimated volumes in its analysis.
- The actual traffic count data from Mornington Peninsula was more reliable than the Department of Transport database relied upon by AECOM in the TIA. This led to significant differences in (corrected) actual traffic volumes for Tyabb-Tooradin Road, The Esplanade and Dandenong-Hastings Road.
- The AECOM estimates of construction traffic generated by the Project were overly conservative.
- Despite the corrections required, the projected change in level of service in the more critical PM peak for most roads was marginal.
- The TMP required in EPR-TP01 and POS A8 would provide a more detailed analysis with up-to-date traffic data and more 'known' construction details. She noted the TMP is required to be approved by Councils and the relevant road authorities.
- All critical intersections should be reviewed as part of the TMP, but she did not agree that it was necessary to specifically nominate intersections.

- Access track locations did not need to be resolved prior to preparation of the TMP and it is more appropriate to finalise access track configuration once construction schedules and methods are more defined.

Ms Dunstan did not object to a car park management plan being included as a sub-plan in the TMP.

Several submitters, including S583, raised general concerns about risks to local drivers, pedestrians and cyclists of additional traffic generated by the Project.

TN45 responded to the issue of sight distance at access track intersections with local roads, and noted the TIA recommended:

The proponents investigate access track alignment modifications to improve safe intersection sight distances, and if access track alignments cannot be altered due to constraints, the proponent consider:

- (a) Management measures such as advanced warning signage and a reduced posted speed limit to be agreed with the road authority
- (b) Avoidance measures such as removing the access track with construction vehicles accessing the ROW via other tracks <sup>179</sup>.

The TIA recommended a RSA be undertaken upon finalisation of the proposed routes and access tracks to ensure safe vehicle movements to the satisfaction of the responsible road management authority. This approach was reflected in the revised CEMP POS J A8 requirements for the TMP.

TN5 (D94) documented consultation undertaken between the Proponents, VicTrack and the Department of Transport on the Project. VicTrack confirmed in principle approval of the proposed pipeline alignment, subject to APA entering into an Asset Licence which covers access to VicTrack land, as well as requirements and procedures for any activity or works associated with the Project.

### 13.3.3 Discussion

The issues in dispute between the Proponents and Mornington Peninsula were essentially resolved through the response provided by Ms Dunstan to Ms Marshall's evidence and the agreed changes to EPR-TR03 shown in the Day 4 version of the EPRs <sup>180</sup>.

The TMP required in the EPRs and CEMP provide for a more detailed analysis of local road capacity and safety issues and require that public transport (including school buses), pedestrians, cyclists, level crossings, car parking, pavement strength and access points are all considered in consultation with stakeholders. Ultimately the TMP is to be approved by the relevant Councils and road authorities.

The IAC accepts the TIA contained some confusing and inaccurate existing traffic data, identified in Ms Marshall's evidence and acknowledged by Ms Dunstan. The IAC agrees with Ms Dunstan the estimates of construction related traffic in the TIA were very conservative. The IAC accepts the overall conclusion of Ms Dunstan that the additional traffic generated by construction is modest in volume and likely to have little impact on the local road network. The movement of construction workers will be spread out over time and, even in the more critical PM peak period, will likely have little impact on the capacity of existing intersections.

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<sup>179</sup> D327

<sup>180</sup> D426 paragraphs 117-123

Traffic from pipeline construction will result in very localised issues that can be controlled by temporary and short duration road closures and other traffic control measures.

The IAC notes the construction sequencing and method would be much better known by the time the TMP is prepared. Any as yet unidentified issues can be drawn out in consultation with stakeholders at the time it is prepared.

While it would be ideal to be able to finalise all the access track locations early in the assessment process, the IAC accepts this is not possible until the final pipeline alignment is known, and construction methods determined. The IAC has made recommendations in Chapter 5 in relation to avoiding impacts on native vegetation, these must be considered in siting of any access tracks.

The IAC is satisfied the EPRs and CEMP POS A8 adequately allow for proper safety assessments to be made and acted upon.

One difference of note between the EPRs and the CEMP is that POS A8 requires the TMP to include car parking management, whereas the TMP in the final version of the EPRs (applying to the receival facility) do not. The IAC considers that car parking issues are just as likely, if not more likely, to occur at the construction site for the CPRF and Jetty works.

#### **13.3.4 Findings**

The IAC finds:

- The road traffic impacts of the Project during construction are not likely to be significant.
- The proposed EPRs TP01 to TP05 and CEMP POS A8 that require the preparation of a TMP and RSA to be approved by the relevant Councils and the road authority are supported as modified in the final versions, subject to the addition of a requirement for a car parking management sub-plan in the TMP <sup>181</sup>.

#### **13.3.5 Recommendation**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following change:**

- **Revised EPR TP01 (Traffic Management Plan)**

This change is included at Appendix G.

### **13.4 Operation issues**

#### **13.4.1 Background**

EES Technical Report J identified the following impacts during the operation of the Project:

- road deterioration due to Nitrogen Trucks
- safety and amenity impact of B-Doubles through Hastings/Somerville
- impact of workforce and heavy vehicle movements during operation.

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<sup>181</sup> D602 and D582

The EES proposed the preparation of a TMP and RSA that will assist in mitigating any Project impacts during the operation phase. Two EPRs were specifically designed to mitigate the impacts on the nitrogen and odorant transport route:

- EPR-TP04 Pavement strength survey
- EPR-TP06 Nitrogen transport plan.

### 13.4.2 Evidence and submissions

Ms Dunstan's evidence was that, once completed, the Project would have minimal impact on the transport network. She noted the number of workers and vehicle movements (less than 100 vehicles per day) would be very low.

Ms Dunstan commented on the use of B-Double trucks to transport nitrogen and odorant to the CPRF. She noted there are at least two alternative routes that bypass the Somerville and Hastings town centres, the most logical route via Coolart Road. She identified the number of deliveries will be low (six deliveries per day or around 900 per year) and trucks will be able to use already approved B-Double routes for the majority of their journey, with the exception of Woolleys Road. She noted EPR TP06 requires the preparation of a Nitrogen Transport Plan that identifies the preferred route, management measures at key intersections and permit requirements for non B-Double parts of the route.

Ms Marshall made the following comments in her evidence:

- Due to the regularity and extensive time frame that B-Doubles are expected to deliver Liquid Nitrogen to the CPRF, the preferred route once identified, should be included in the Pavement Strength Survey (EPR-TP04).
- Coolart Road seems the most appropriate route for nitrogen and odorant trucks.
- The Nitrogen Transport Plan should be updated every five years.
- A RSA should be undertaken of the preferred route.

Ms Marshall generally agreed the EPRs and CEMP were otherwise acceptable in relation to operational traffic impacts of the Project.

Ms Dunstan responded to Ms Marshall's evidence as follows:

- It is only necessary that a pavement strength survey be undertaken for those sections of the Nitrogen Truck route that is not an approved B-Double route.
- She had no preferred route for the Nitrogen Trucks but agreed the RSA should examine critical intersections along the route once chosen.

Several other submitters (including S476, S932, S1514 and S2385), raised general concerns about the safety of nitrogen and odorant travelling through Crib Point or Hastings.

Mornington Peninsula's closing submission supported Ms Marshall's position the Nitrogen Transport Plan be updated every five years to assess the ongoing suitability of the route having regard to changes in land use and road safety conditions<sup>182</sup>. Council supported the evidence of Ms Marshall that an RSA should be carried out for the preferred Nitrogen Truck route.

TN45 responded to questions from the IAC regarding the removal of oily sludge from the FSRU. It was explained that oily sludge would be removed by trucks, but required 12 truck movements per year, negligible in traffic impact terms.

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<sup>182</sup> D426 paragraphs 122-123

### 13.4.3 Discussion

Acknowledging the requirements in the TMP, the IAC agrees it is unnecessary to require pavement strength assessments for any part of the Nitrogen Truck route that is on approved B-Double routes. The IAC agrees with the submissions of the Proponents and the evidence of Ms Dunstan in this regard.

The IAC believes it would be useful to include a RSA for the preferred Nitrogen Truck route and actions taken to mitigate any issues in EPR-TR06. The IAC is of the view that it is not clear in EPR-TR03 if the RSA is to cover the Nitrogen Truck route, so it is better to spell it out.

The IAC is not convinced of the need for the Nitrogen Transport Plan to be reviewed every five years. The IAC considers it is self-evident that if land use circumstances change, the Plan can be reviewed when required.

### 13.4.4 Findings

The IAC finds:

- The proposed EPRs and CEMP POS A8 adequately address transport issues in the operational phase of the Project, subject to adding to EPR-TP06, a requirement to carry out a RSA for the Nitrogen Truck route once a preferred route is determined.

### 13.4.5 Recommendation

The IAC recommends:

#### Environmental Performance Requirements

**Include the following changes:**

- **Revised EPR TP06 (Nitrogen Transport Plan)**

This change is included at Appendix G.

### 13.5 Transport conclusions

The IAC concludes that:

- The transport impacts are consistent with the draft evaluation objectives.
- Transport impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no transport impacts that preclude the Project being approved.

## 14 Safety, hazard and risk

### 14.1 Introduction

Safety, hazard and risk effects were discussed in EES Chapter 16 and Technical Report K. The following documents provided to the IAC are relevant:

- EES Attachment IX Pipeline Licence Application
  - Attachment 3a - Draft Safety Management Plan
  - Attachment 3b - Peer Review of Safety Management Plan
  - Attachment 4 – Safety Management Study summary
- Technical notes TN16, TN18, TN19, TN30, TN32, TN48, TN49, TN50, TN51 and TN52
- Pipeline Safety Management Study (SMS) (D96) (provided to the IAC in confidence)
- Quantitative Risk Assessment (QRA) Report – Gas import jetty and pipeline project (D128)
- QRA Report – Pakenham Delivery Facility (D129)
- EES Technical Report A.

#### 14.1.1 Scope of the IAC’s consideration

Safety, hazard and risk in this context relate to the construction and operation of the Project.

The Proponents focussed submissions on safety, hazard and risk on gas safety. They submitted the scope of the IAC’s consideration should be limited in the following way:

Although safety is part of the IAC’s Terms of Reference, the IAC is not tasked with making recommendations about the specifics of safety regulation. Because of the regulatory regime, the IAC is not required to examine potential impacts in the same way as for other specific potential environmental effects. The IAC should consider, on all the available information, whether the Project appears able to meet safety standards under applicable legislation <sup>183</sup>.

The IAC accepts this proposition in general terms and limited its assessment to the following aspects of each component of the Project:

- establishing whether the safety and risk assessments have been adequately carried out considering the stage the Project is at
- whether all reasonably foreseeable risk categories have been considered
- whether risks can be appropriately mitigated through existing regulations, EPRs or the CEMP
- whether there any identified risks that appear fatal to the Project proceeding.

#### 14.1.2 Background

The relevant draft evaluation objectives are:

**Energy efficiency, security, affordability and safety** - To provide for safe and cost-effective augmentation of Victoria’s natural gas supply in the medium to longer term.

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Table 12 lists the safety, hazard and risk evidence that was provided.

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<sup>183</sup> D589, paragraph 380

**Table 12 Safety, hazard and risk evidence**

Party	Expert	Firm	Area of expertise
Proponents	Captain Noon	Port Operation Management Services	Maritime and port operations/safety
Proponents	Ms Filippin	R4Risk	Safety
CEG	Mr Wardrop	Safety, Environment and Emergency Response Associates	Environmental science (oil spills)

Mr Ramsay gave evidence in relation to gas safety issues solely at the G and K O'Connor site (see Chapter 20.2).

### (i) Safety study and risk management methodology

The methodology for assessing process hazards and their associated risks for the purposes of land use planning is well established in Australia. Key guidelines are documented within NSW Hazardous Industry Planning Advisory Papers (HIPAP) and associated guidelines<sup>184</sup>.

Appendix A to Technical Report K sets out the methodology adopted for each of the respective safety studies, hazard and risk assessments either completed or planned to be completed for the Project. The studies and assessments are summarised below.

#### HAZID

A Hazard Identification (HAZID) study is a qualitative technique for identification of hazards and threats and can be applied all stages of a Project.

HAZID studies completed included all the main elements of the Project including the FSRU, CPRF and PDF. Credible risk scenarios identified in the HAZID studies were carried forward into the QRA and fire safety studies.

#### Fire Safety Study

The objective of the fire safety study is to ensure fire protection systems in place and available at a facility are suitable to meet risks presented by potential fire scenarios. This is achieved by modelling likely impacts of a fire and then determining fire protection resources needed to protect against those events.

HIPAP Paper No. 2 provides guidance on fire safety studies and was adopted for the FSRU and Jetty piping.

#### Safety Integrity Level (SIL) Assessment

The main objective of a SIL assessment is to assess the integrity level for all instrumented protection functions (known as safety instrumented functions or SIFs) provided to reduce the likelihood and consequences of major incidents to personnel.

The FSRU design development included SIL assessment and verification to assure the required integrity of instrumented protection systems on board the vessel. In addition, SIL Assignment workshops were undertaken to assess the requirements for instrumented protective functions for operation of Jetty Infrastructure, CPRF and PDF. The outcomes from the SIL

<sup>184</sup> Extracted from evidence of Ms Filippin (D81)

assessment will be included in the design of protective functions for the pipeline. A copy of the SIL was provided to the IAC in TN50 (D365).

### **Pipeline Safety Management Study**

The pipeline Safety Management System (SMS) assigns location classes along the route of the pipeline to:

- identify and validate threats to the pipeline
- provide assurance threats to the pipeline and associated risks are identified and understood by those responsible for addressing them
- develop appropriate controls, plans and action items to manage the risks.

The Crib Point to Pakenham Preliminary Pipeline SMS Workshop was conducted using methodology as defined in standards AS 2885.1 and AS 2885.6.

An SMS was prepared for the pipeline and provided to the IAC on a confidential basis (D96).

### **HAZOP**

A Hazard and Operability (HAZOP) study is a design review technique used for hazard identification, and for identification of design deficiencies which may give rise to hazards or operability problems.

HAZOPs have been conducted for all areas of the Project, including a HAZOP that looked specifically at interfaces between Project areas that have different operating organisations.

### **Quantitative Risk Assessment**

The objective of the QRA is to systematically address the likelihood and consequence of all potential hydrocarbon related risks for the Project in order to determine if such risks are tolerable in accordance with the established risk criteria. Recommendations are made for risk reduction measures where the resulting risk levels have potential to exceed the tolerable risk criteria. The QRA process focuses on the effects of a potential major incident and those atypical events with the potential to have impacts outside the boundaries of the Project.

The output from the QRA is a set of risk numbers that estimate the risk at each specific location. The risk from each individual event is combined to form contours of cumulative risk resulting from all modelled events.

Preliminary QRAs were completed for the FSRU, Jetty Infrastructure, CPRF and the PDF.

Appendices C and D of Technical Report K set out the results of the QRA for the GIJW and PDF respectively.

Copies of the more detailed QRA reports were provided to the IAC:

- D128 QRA Gas import jetty and pipeline project - DNV GL Australia
- D129 QRA Pakenham Delivery Facility – Advisian.

### **Formal Safety Assessment**

A Formal Safety Assessment is a requirement of both the Gas Safety (Safety Case) Regulations that apply to the Jetty piping and CPRF, and the Occupation Health & Safety (MHF) Regulations which AGL are using as a basis for their assessment of the FSRU.

A Formal Safety Assessment includes:

- A process of HAZID that ensures all hazards with the potential to result in a major incident (as defined in the OH&S (MHF) Regulations) are identified.

- Identification of control measures for major incidents that enable the risk from those events to be managed to a level that is reduced 'So Far As Is Reasonably Practicable' (SFAIRP).

## **(ii) Iterative process**

Each of the risk studies and assessments emphasised that risk assessment is an iterative process, and further work will be undertaken on each study as the design of the Project is further developed.

The EES noted:

The safety, hazard and risk studies are an iterative process that will be updated at different stages of the Project as the level of design detail and definition develops. The hazard and risk studies will be revisited when detailed designs for Project infrastructure are finalised after the EES process. Final approvals related to safety and risk will be required from relevant regulatory authorities before the Project starts operating <sup>185</sup>.

## **14.2 Key issues**

The key issues are:

- Safety, hazard and risk associated with the Jetty and CPRF works.
- Safety, hazard and risk associated with the Pipeline and associated infrastructure.
- The impacts of increased shipping activity and oil spills.

## **14.3 Jetty and CPRF works**

### **14.3.1 Background**

#### **(i) Relevant safety protocols and regulations**

The CPRF and the Jetty infrastructure will be regulated under the *Gas Safety Act 1997* and the *Gas Safety (Safety Case) Regulations 2018*.

The FSRU is not currently designated as a Major Hazard Facility (MHF) under the *Occupational Health and Safety Regulations 2017* but was assessed in the EES as if it will be in the future. Worksafe Victoria advised the Proponents it expects the FSRU will be classified as an MHF.

#### **(ii) EPRs**

The following EPRs relate to safety, hazard and risk at the GIJW, FSRU and CPRF:

- EPR-HR01 Gas Import Jetty Works safety standards
- EPR-HR02 Process control system and automated emergency shutdown systems
- EPR-HR03 Fire protection
- EPR-HR04 Dangerous goods
- EPR-HR05 Monitoring of chemical and fuel storage facilities
- EPR-HR06 Emergency response plans
- EPR-HR07 Site safety advisor.

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<sup>185</sup> EES Chapter 16, page 16-1

### 14.3.2 Evidence and submissions

The Proponents relied on the peer review evidence of Ms Filippin of work done to date. She considered the range of preliminary HAZID and risk assessment studies undertaken for the GIJW were suitable for this stage of the Project.

Ms Filippin noted the QRA was undertaken based on the preliminary design for the GIJW and in accordance with widely accepted HIPAP guidelines. Her evidence noted that, in line with guidance from HIPAP and the approach considered appropriate for this type of project, an iterative approach to assessing risk is being undertaken. Ms Filippin concluded the definition of hazardous scenarios, assumptions related to consequences and likelihood of potential major incidents were considered acceptable and suitably conservative for the Project.

She noted further risk studies will be undertaken as part of the Formal Safety Assessment required by the Gas Safety (Safety Case) Regulations for the Jetty gas piping and CPRF. This will include studies to demonstrate the adequacy of controls and to demonstrate risks are reduced SFAIRP.

Ms Filippin made the following recommendations:

- The next revision of the QRA should include an assessment of societal risk compared with published societal risk criteria <sup>186</sup>.
- As part of the iterative risk process, consideration needs to be given to the Victorian Interim Risk Criteria and WorkSafe Victoria advisory areas and potential implications for future land use within the immediate vicinity.
- The iterative risk approach for the GIJW should continue to be followed and future risk studies should address the general requirement to demonstrate that risks have been reduced so far as is reasonably practicable.

In response to the first of these recommendations, the Proponents provided TN19: Societal Risk Technical Memorandum for AGL FSRU QRA report <sup>187</sup>. The report analysed offsite risk of multiple fatalities based on average and maximum population density of nearby land use and concluded the proposed facilities met the indicative societal risk criteria as stipulated in HIPAP-4.

In relation to the ongoing iterative review, the Proponents submitted safety and hazard risks will continue to be assessed and addressed through Safety Case regimes under the *Gas Safety Act* and (if the FSRU is classed as an MHF) the *Occupational Health & Safety Act*. Should the FSRU be classified as an MHF under the OHS Regulations, there will be a further requirement to develop a safety case for the FSRU which must incorporate an adequate demonstration that risks from the facility have been reduced SFAIRP.

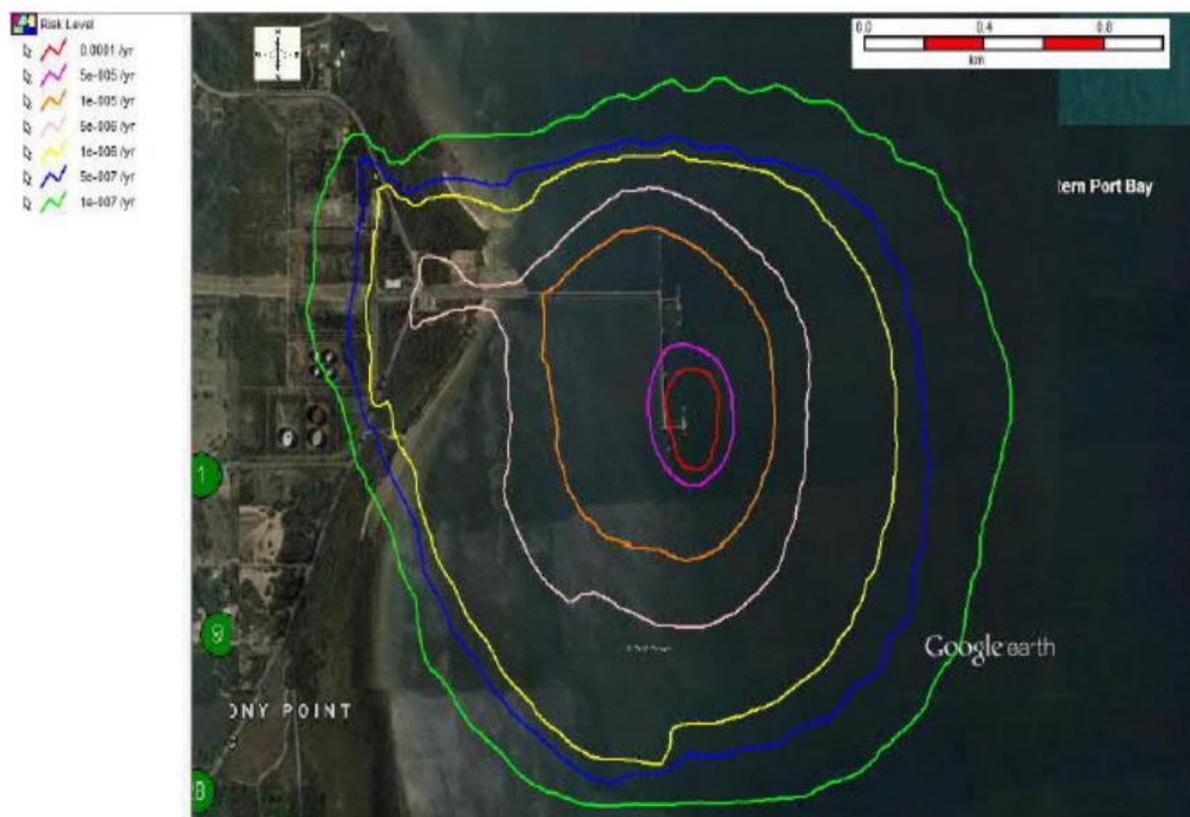
In response to potential implications for future land use, the Proponents drew the IAC's attention to Technical Report K, Appendix C – QRA results for the GIJW. Figure 13-4 (reproduced as Figure 14) of that report maps the risk of individual fatality or injury from a major explosion on the FSRU.

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<sup>186</sup> Societal risk is a measure of the risk that the events pose to the local population, taking into account the distribution of the population around the facility. It is expressed in terms of the likelihood of event outcomes that affect a given number of people in a single incident (e.g. the likelihood of event outcomes that affect up to 10 people, or the likelihood of event outcomes that affect up to 100 people).

<sup>187</sup> D239

Figure 14 LSIR contours Gas Import Jetty Works - FSRU<sup>188</sup>



The following observations were made in the EES about these risk contours <sup>189</sup>:

- The ‘50 in a million likelihood of fatality’ (pink line), the 5.0E-05 risk contour, considered tolerable for industrial land use, is restricted to the immediate area around the FSRU and Berth 2.
- The ‘10 in a million likelihood of fatality’ (orange line), the 1.0E-05 risk contour, tolerable for active open spaces, extends across the Jetty approach but does not extend to the shoreline.
- The ‘5 in a million likelihood of fatality’ (white line), the 5.0E-06 risk contour, considered tolerable for commercial developments extends to the shoreline and encroaches upon a public access recreational area, identified as the closest point at which the public can get near to the FSRU. This area was assessed as an open space and meets the criteria of not exceeding 1.0E-05 per year likelihood as defined in HIPAP 4.
- The ‘1 in a million likelihood of fatality’ (yellow line), the 1.0E-06 risk contour, considered tolerable for residential areas extends to the western side of the CPRF and crosses over a number of roadways. The land use within this contour is a mix of industrial land and open space with some commercial development, including the Victorian Maritime Museum.
- The ‘5 in 10 million likelihood of fatality’ (blue line), the 5.0E-07 risk contour, considered tolerable for sensitive land use remains on industrial, commercial and open space areas around the berth and the CPRF. There are no hospitals, schools or other sensitive receptors impacted by this contour.

<sup>188</sup> EES Technical Report K Appendix C Figure 13-4

<sup>189</sup> EES Technical Report K Appendix C pages C-1, C-2

#### The Proponents submitted:

The reality is that the Crib Point Jetty has the benefit of, on one side, a large buffer of land zoned for industrial and ports uses and, on the other side, open water. This buffer of non-sensitive uses greatly reduces safety risks by reducing the consequence of any safety incident. From a safety perspective, the Gas Import Jetty Works are well located

<sup>190</sup>.

The IAC requested a Location Specific Individual Risk (LSIR) contour map in the event of blast and/or fire at CPRF. This was provided in TN52 (extracted from D128). The further information shows the impact of a blast from the CPRF presents a very similar risk to the Victorian Maritime Museum and somewhat lower risk to Picnic Point.

Captain Noon's evidence provided the IAC with an appreciation of the process of navigating Western Port, berthing vessels at Crib Point (including tugboat operation) and safety protocols in place to operate the Jetty. He noted the various existing operating responsibilities for the Port and concluded that *'from a purely operational perspective, which includes Pilots, tugs, linesmen etc bringing in these vessels is business as usual'*.

TN16 (FSRU Safety: International classification and regulation) provided background on how FSRUs are regulated for safe design and operation.

Save Westernport raised concerns about the adequacy of the preliminary risk and safety assessments undertaken to date and whether AGL could be relied upon to do the necessary follow up work to a standard required. Several submitters raised similar concerns (including S2136, S2465, S3004, S3129, S3130 and S3197). S2086 provided a detailed submission on the flaws of the risk assessment that was critical of identification of risks and lack of detail in assessment.

A number of submitters raised general concerns about the risk to residents of Crib Point and users of the foreshore relating to the location of the FSRU and CPRF. Several submitters raised concerns about the impact of bushfire on the CPRF and the increased risk that this may present for residents.

### **14.3.3 Discussion**

The IAC notes the extensive work done to date on identifying and assessing risks associated with the Jetty, FSRU and CPRF.

The IAC accepts the evidence of Ms Filippin that the risk identification and assessment for the Jetty, FSRU and CPRF has been rigorous and to an appropriate level commensurate with the stage of the Project. No risks have so far been identified that cannot be either eliminated or mitigated to an acceptable level.

The IAC notes the results of the preliminary QRA that show acceptable quantitative risk levels for the nearby land use including residential areas, the Victorian Maritime Centre and the foreshore.

The IAC understands the concerns of some submitters that there are still some unknowns that have not been fully assessed, but is comfortable that further, more detailed assessment will follow if and when the Project proceeds.

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<sup>190</sup> D589 paragraph 384

The IAC accepts the evidence of Captain Noon that operation of the Jetty, including berthing and unloading of the LNG tankers, presents no unusual challenges for the Port and procedures are well covered by existing operating practices.

The IAC is comfortable that regulation through the *Gas Safety Act, Gas Safety (Safety Case) Regulations* and, in the case of the FSRU, most likely as a MHF under the *Occupational Health and Safety Regulations*, combined with the identified EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.

The IAC notes concerns raised in relation to bushfire risk and is comfortable that fire protection systems and emergency management plans required for the Project will adequately address fire risk. A Bushfire Management Plan is required to be prepared in accordance with the Incorporated Document.

#### **14.3.4 Findings**

The IAC finds:

- The risk identification and assessment work done to date for the Jetty, FSRU and CPRF is to a standard appropriate to the current stage of the Project.
- The preliminary QRA shows no unacceptable risk levels for nearby land uses including residential areas, the Victorian Maritime Centre and the foreshore.
- Further, more detailed risk assessments must be undertaken if and when the Project proceeds.
- The proposed operation of Jetty, including berthing and unloading of the LNG tankers are well covered by existing Port operating practices.
- Existing regulations combined with identified EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.

### **14.4 Pipeline and associated infrastructure**

#### **14.4.1 Background**

##### **(i) Relevant safety protocols and regulations**

The Pipeline Works will be regulated under the *Pipelines Act 2005* (Pipelines Act), the *Gas Safety Act 1997* and the *Gas Safety (Safety Case) Regulations*, administered by Energy Safe Victoria (ESV).

The PDF includes additional monitoring and regulating the gas and process integrity and was assessed for risk as a hazardous development. The NSW HIPAP guidelines were used as the methodology for assessing process hazards and their associated risks for the PDF.

##### **(ii) EPRs and CEMP controls**

The following CEMP POS apply directly to the pipeline works:

- F1 to F12: Fuels and chemicals
- P1: Pakenham delivery facility.

The risk assessment study area for the pipeline included an area 640 metres on either side of the pipeline (the Pipeline Measurement Length or PML)<sup>191</sup>.

#### 14.4.2 Evidence and submissions

##### (i) Gas pipeline

The Proponents noted the following information in TN18 (D171) on design of the pipeline:

- AS2885 imposes different design standards for each Location Class. However, APA has designed the physical protection measures for the pipeline to a 'T1 – Residential' standard for the entire length. That is, the depth of cover (minimum 1200mm) and wall thickness (minimum 10.41mm) are sufficient for all expected threats for the length of the pipeline.
- In addition, APA decided to implement 12.7mm wall thickness in Sensitive areas ('S – Sensitive' secondary Location Class, in which a 'T2 – High Density' Location Class standard applies), although that is not a mandatory requirement for Sensitive locations.

The Proponents advised AS2885.6 requires the SMS for the pipeline to be updated at least every five years or whenever there is a change in land use. The process of an SMS includes an assessment of land use within the PML. If the appropriate location class changes as a result of new, more sensitive, uses within the PML of the pipeline, APA may be required to implement additional control measures – such as additional patrols and marker posts. The Proponents submitted that, because the pipeline has been designed to a 'T1 – Residential' standard, APA is well placed to adapt to changes in land use in the future.

The Proponents relied on the evidence of Ms Filippin who noted the work done to date on risk assessments for the pipeline and PDF in accordance with AS/NZS 2885 Pipeline – Gas and liquid petroleum.

Ms Filippin's evidence was threats identified, definition of the hazardous scenarios and assumptions related to consequences and likelihood of potential major incidents, were generally considered acceptable and suitably conservative for the stage of the Project. She reviewed the SMS process undertaken for the pipeline and considered it suitable and detailed to a level that would be typically expected for the stage of the Project.

Ms Filippin noted:

An iterative approach to risk assessment is being undertaken as the project design progresses. It is expected that further risk studies will be undertaken as part of the FSA required by the Gas Safety (Safety Case) Regulations for the pipeline. This will include studies to demonstrate the risks have been reduced SFAIRP and that the pipeline and associated facilities can be operated safely. This is in line with the guidance from AS/NZS 2885 and the Pipeline Licence requirements and is considered appropriate for this type of project.

Ms Filippin's recommendation in relation to the pipeline and PDF was:

- The iterative risk approach for the Pipeline Works continue to be followed and that future risk studies address the general requirement to demonstrate that risks have been reduced so far as is reasonably practicable.

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<sup>191</sup> The pipeline measurement length is the area of consequence in the extremely unlikely event of a full loss of containment of the gas (full-bore rupture of the pipeline) plus the gas being ignited, which may cause injury after 30 seconds of exposure.

No substantive submissions were received challenging the safety and risk assessment process for the pipeline.

## **(ii) Pakenham Delivery Facility**

Ms Filippin noted the QRA undertaken for the PDF and accepted the assumptions and assessments made. She noted, however that changes have occurred to nearby land use and made several recommendations for further analysis<sup>192</sup>.

Ms Filippin proposed the PDF be treated as an MHF for the purposes of assessing the cumulative risk from the facility and how it might affect nearby land use. Her recommendations in relation to the PDF included:

- Given the changes that have occurred to the industrial site near the PDF since the QRA was completed, and the potential for further development in the vicinity of the facility in future, it is recommended that an evaluation of the societal risk is undertaken for this facility considering the current and potential future land uses.
- Given the changes that have occurred to the industrial site near the PDF since the QRA was completed, and the potential for further development in the vicinity of the facility in future, it is recommended that an evaluation of the risk of property damage/accident propagation is undertaken for this facility.
- As part of the iterative risk process, consideration needs to be given to the Victorian Interim Risk Criteria and Work Safe Victoria advisory areas and the potential implications for future land use within the immediate vicinity.

### **Societal risk**

In response to the first of these recommendations, APA commissioned a further QRA report from Advisian that estimated risk levels associated with an accidental gas release leading to a fire event against various criteria proposed in HIPAP-4, *'Risk Criteria for Land Use Planning'*, including societal risk<sup>193</sup>. The analysis concluded the facility does not pose a level of risk on surrounding land which exceeds the limits outlined in the HIPAP-4 criteria. The report assessed the level of risk is within the limits of what may be accepted from a societal perspective.

The report noted the ALARP (as low as reasonably practicable) principle requires that regardless of risk level, all practicable risk reduction measures should be implemented. The report recommended a physical barrier between the facility and the freeway *'as an effective means of diverting gas with high horizontal momentum upwards, significantly reducing the risk associated with release events towards the proposed Pakenham East precinct'*.

### **Land use risk assessment**

The Proponents drew the IAC's attention to Technical Report K, Appendix D – QRA results for the PDF which maps the risk of individual fatality or injury from a major explosion within the PDF. The assessment indicated the risk criteria for the current land uses including nearby residential areas, rail yard and freeway are all met.

In order to properly plan for the proposed future development of the Pakenham East PSP, the Proponents suggested the following<sup>194</sup>:

Risks associated with the PDF should be mitigated such that the location specific individual risk (LSIR) contour for '1 in a million per year' (1.00E-06) does not affect any

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<sup>192</sup> QRA Pakenham Delivery Facility – Advisian 2018 (D129)

<sup>193</sup> TN48 (D355)

<sup>194</sup> D376

area subject to an applied residential zone under Cardinia Planning Scheme clause 37.07 – Urban Growth Zone, schedule 5 - Pakenham East PSP to the satisfaction of ESV.

The area between the '1 in a million per year' (1.00E-06) and the '0.1 in a million per year' (1.00E-07) LSIR contours should be subject to controls requiring notification to APA of proposals for sensitive uses (for purposes of AS2885).

The Proponents proposed new POS P1 in the CEMP Attachment J designed to cover the first of these recommendations. In relation to the second risk, the Proponents submitted that it would best be addressed by adding controls to the Pakenham East PSP (see Chapter 15.4).

### **14.4.3 Discussion**

The IAC notes the extensive work done to date on risk identification and assessment for the pipeline and associated infrastructure.

The IAC accepts the proposed design for each location class is conservative and agrees this will build in some resilience of the pipeline design to accommodate future intensification of land use along the alignment.

The IAC accepts the evidence of Ms Filippin that the risk assessment in EES Technical Report K and the SMS are generally considered acceptable and suitably conservative for the stage of the Project.

The IAC notes the iterative nature of safety assessments and that more detailed analysis will be completed as the Project design develops and the fine detail of the pipeline alignment.

The IAC accepts the regulations that apply the *Pipelines Act*, *Gas Safety Act* and *Gas Safety Regulations*, combined with the proposed controls in the CEMP Attachment J, will properly control and mitigate risks associated with the pipeline and associated infrastructure.

The IAC accepts the evidence and recommendations of Ms Filippin in relation to the PDF. The IAC notes the recommendation to assess societal risk has been responded to. The other two recommendations for further work can be acted upon in the next version of the safety assessment as the Project proceeds.

The IAC agrees with the proposed approach to include a new POS P1 in the CEMP to ensure appropriate mitigation of risks associated with the PDF. This was included in the Day 4 version of the EPRs and has been retained in the recommended EPRs at Appendix G.

### **14.4.4 Findings**

The IAC finds:

- The risk identification and assessment work done to date for the pipeline and associated infrastructure is to a standard appropriate to the current stage of the Project.
- More detailed risk assessments must be undertaken if and when the Project proceeds. The next versions of the risk assessment for the PDF should act on the further work and recommendations of Ms Filippin.
- Existing regulations combined with the CEMP will properly control and mitigate risks associated with the pipeline and associated infrastructure.

## 14.5 Impact of increased shipping activity and oil spills

### 14.5.1 Background

Section 7.4.2 of EES Technical Report A lists potential risks of the Project associated with increased shipping activity, including spills, vessel grounding, seabed scouring and whale strike.

Although many of the operational issues are picked up in the general safety assessment for the Jetty, FSRU and CPRF, the IAC received a substantial number of submissions more specifically relating to the impacts of increased shipping activity and particularly oil spills.

### 14.5.2 Relevance of additional shipping traffic

#### (i) Evidence and submissions

The Proponents submitted that shipping to and from the Port is an approved activity, shipping is not part of the IAC Terms of the Reference and the EES therefore does not include a detailed analysis of the potential for oil spills<sup>195</sup>. This was somewhat contradicted by evidence called by the Proponents on shipping from Captain Noon and responded to submissions and evidence on oil spills.

In TN30 (D264), the Proponents submitted that:

- The Jetty is located within the Port of Hastings, which has operated as a commercial port serving domestic and international shipping for over 50 years.
- There is no cap on the number of vessels that may use the Port in a given year.
- The Port has significant capacity, and historically has accommodated over 700 vessels in some years.
- Over the last decade, around 100-140 vessels have entered and left the Port each year.
- The number of ships associated with the Project – expected to be a maximum of 40 per annum – fits within the normal variation in annual visitation.

The Proponents submitted any potential impacts associated with increased shipping and port activity are properly categorised as impacts associated with the existing, ongoing, policy-supported use of the Port for port activities. They noted potential impacts associated with increased shipping will be closely managed in accordance with existing procedures and no environmental approval would typically be required for increased shipping and port usage.

The Proponents submitted:

Potential impacts associated with increased shipping and port activity will be the same whether they arise from the Project or the increased use of existing berths and any additional or cumulative impact of additional port activity and shipping movements is therefore outside the scope of the IAC's Terms of Reference<sup>196</sup>. (IAC emphasis)

The Proponents noted that, '*despite these impacts being outside the IAC's Terms of Reference*', EES Technical Report K and Attachment I: MNES dealt with potential risk pathways due to extra ship movements associated with the Project. They submitted analysis of potential impacts of these shipping and port activities demonstrated the cumulative impact of

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<sup>195</sup> D589, paragraphs 413, 414

<sup>196</sup> TN30

additional port activity and shipping movements associated with the Project is, if relevant to the IAC's Terms of Reference, negligible.

Mornington Peninsula made submissions in relation to increased shipping traffic from the Project increasing the risk of oil spill and therefore increasing risk to the Ramsar site<sup>197</sup>. It submitted in the context that the number of vessels in the Port of Hastings has declined significantly over recent years, the projected increase in shipping due to the Project ought to be seen as significant.

Further, that while the expansion of the Port may have broad policy support, that is by no means certain and in any case should not necessarily be assumed to apply to Crib Point. Mornington Peninsula submitted that it is not valid to argue that the impact of the Project is not relevant, because it may have happened anyway. In other words, it challenged the Proponents' argument that because increased shipping did not need approval it was outside the scope of the IAC to consider the impact.

## **(ii) Discussion**

The IAC does not agree that risks associated with shipping are outside the scope of the IAC's review. The Scoping requirements identify the following key issue:

Workforce, nearby operations and public safety risks associated with the construction or operation of the project, including risks associated with or compounded by potential external threats (e.g. bushfire).

The IAC is of the view the additional shipping traffic generated by the Project is directly associated with operation of the Project and is therefore relevant. The IAC notes that, in any case, the EES assessed the impacts of shipping movements associated with the Project, including the risk of oil spills.

## **(iii) Findings**

The IAC finds:

- The impacts of increased shipping traffic generated by the Project is directly associated with the operation of the Project and is relevant to the IAC's considerations.

### **14.5.3 Oil spills**

#### **(i) Background**

EES Technical Report A Section 7.9 assessed risks and potential impacts on the marine environment from oil or fuel spills from LNG tankers or the FSRU in the event of accident or collision. The assessment included examination of contamination from:

- spill from break in hydraulic hose
- small diesel spill
- large spill of diesel or fuel oil
- LNG spill.

Of these, the report identified a large spill of oil or diesel as having potential for widespread effects. EES Technical Report A included analysis, reviews and modelling undertaken for spills that would be similar to what may be expected to be more likely in Western Port Bay. In

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<sup>197</sup> D426

particular, the analysis referred to the Asia-Pacific Applied Science Associates (APASA) oil spill model which assessed spills of 200 tonnes of heavy fuel oil at McHaffie’s Reef on Phillip Island and two scenarios of 66 tonnes of diesel from Long Point Jetty. The APASA model examined the effects of those assumed spills under tidal currents and northerly winds (during winter) and southerly winds (during summer).

Relevantly, the assessment noted:

The FSRU and LNG carriers are not transporting crude oil or refined oil products and have very limited volumes of bunker fuels or marine diesel onboard as they are primarily powered by boil-off gas from their own cargo. This reduces the consequence of a spill substantially from oil or petroleum transport tankers which are the basis of historical concerns about an oil spill in Western Port <sup>198</sup>.

The assessment noted the FSRU and LNG vessels are double-hull vessels, making the likelihood of a breach of fuel tanks much less.

Technical Report A assessed the risk of contaminant spills during operation of the FSRU and Jetty infrastructure, concluding the likelihood for contamination due to leaks or spills of significant quantity from vessels ranked as rare. The consequence for a spill was ranked as major. This resulted in a risk rating of Medium.

Technical Report A assessed the risk of contaminant spills during construction of the FSRU and Jetty infrastructure, concluding an unlikely likelihood and minor consequence result in a risk rating of Low. Any spills are most likely to be small to negligible and contained before reaching the marine environment.

Section 7.9.5 of Technical Report A summarised the protocols that would be in place to manage any potential spill:

- All vessels are equipped with a Shipboard Oil Pollution Emergency Plan which provides guidance to the crew onboard on the measures to be taken if an oil pollution incident has occurred or is likely to occur.
- The risk of spills and leaks during FSRU operation would be managed with documented standard operation procedures and by ensuring compliance with the PHDA Safety and Environmental Management Plan and Port Operating Handbook.
- Emergency management and response in the event of a spill or leak, would be a component of the emergency management structure implemented at Crib Point under the PHDA Emergency Management Plan.
- The FSRU requires an EPA Works Approval and would operate pursuant to an operating licence for a scheduled activity under the *Environment Protection Act*.

## **(ii) Evidence and submissions**

The Proponents relied on evidence from Captain Noon who noted the Harbour Master, under the *Marine Safety Act*, must ensure the safety of persons and the safe operation of vessels, and minimise the effect of vessel operations on the environment. Strict International Conventions, Regulations and Guidelines coupled with the Australian Acts, Regulations and Inspection Authorities ensure design, management and operation of vessels have the lowest possible impact on the environment. This includes requirements that the FSRU hold international maritime certificates, including the Safety Management Certificate, Certificate of Fitness and a valid International Oil Pollution Prevention Certificate (IOPP).

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<sup>198</sup> EES Technical Report A page 395

Captain Noon noted *‘since the modern day inception of the port in the 1960’s there has been no major oil spill and no major shipping accident, including collision and grounding’*.

He gave evidence the EES correctly identified possible scenarios where an FSRU and LNG carrier could potentially harm marine biodiversity and how, based on existing Port requirements, each scenario would be managed. He noted oil spill modelling was not presented in the EES and *‘as there is no example to draw from in Western Port the dynamic nature of the tides and weather conditions make for an almost unlimited amount of scenarios’*. He opined Technical Report A correctly stated the area impacted would depend on the time and duration of the spill in relation to tides and wind patterns. He advised the mitigation measures evolving from the identified risks were correctly identified and are already part of the operating standards and protocols within the Port operating boundaries.

In response to S27, Captain Noon gave evidence the costs associated with ship sourced oil spills are met by those responsible through a number of International Conventions, agreements and National arrangements, and added:

For FSRU and LNG carriers, as non oil tankers, The International Convention on Civil Liability for Bunker Oil Pollution Damage 2008 provides strict liability for fuel oil spills for owners of ships >1000 gross tonnage and requires them to carry compulsory insurance to cover any pollution damage. In other words it is the owners of a tanker that spills the oil that are liable regardless of whose fault <sup>199</sup>.

Mornington Peninsula and Bass Coast submitted that oil spills, if they occur, would have long term impacts <sup>200</sup> The Ramsar site management plan for Western Port noted impacts of oil spills have been observed to last for decades <sup>201</sup>.

The Councils submitted an increase in the number of ships necessarily leads to an increase in the risk of an oil spill – an event that all parties recognised could be disastrous for Western Port. They submitted no attempt was made to understand the environmental effects of a spill at Crib Point, rather than anywhere else in Western Port. Further, more specific modelling should have been undertaken to *‘at least provide a preliminary understanding of what that impact looks like in spatial terms, what receptors (e.g. seagrass) would be likely to be affected, and how long any impact is likely to last’*.

The Councils said the IAC supported the Project, it should at least recommend the preparation of a Supplementary EES which assesses, among other things, assess what the impact of an oil spill at Crib Point would be. They submitted no mitigation is proposed, and instead reliance is placed on terms of the *International Convention on Civil Liability for Bunker Oil Pollution Damage 2001*, referred to in evidence of Captain Noon. Further, they contended that consideration be given to requiring AGL to pay a refundable bond to meet a percentage of the cost of an oil spill if it occurs.

Save Westernport raised concerns about the impact of additional shipping traffic in the channel and the risk of accident on docking or unloading and subsequent risk of gas explosion. Several other submitters (including the Victorian National Parks Association, S425, S524, S932, S1032, S1069, S1118, S1632, S1680 and S2089) raised general concerns about spills, accidents, fires and explosion risk.

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<sup>199</sup> D69 page 26

<sup>200</sup> D426

<sup>201</sup> Melbourne Water, Western Port Site Management Plan (2016), p.102

The CEG submitted it was deeply concerned about potential for significant impacts on the marine environment resulting from accidental or unintended leaks or spills (including oil spills). It said in order to properly assess the acceptability of potential spill risks, the environmental impacts of those risks need to be understood. It submitted that it was not sufficient to merely assert that spills are ‘rare’ and ‘would be managed by PHDA’.

CEG relied on the evidence of Mr Wardrop that, due to the speed at which currents move in Western Port Bay, potential exists for shoreline impacts to occur from a spill at Crib Point in under an hour. His evidence was that it would not be possible to respond in time to prevent environmental damage.

Mr Wardrop’s evidence critically reviewed the EES assessment against what he submitted was a widely accepted systematic methodology. In summary, Mr Wardrop found the EES analysis presented in Technical Report A lacked sufficient detail to provide an adequate basis for Project assessment. He detailed materials not addressed and scenarios not analysed. His opinion was that particular oil spill scenarios for Crib Point had not been modelled and impacts on local sensitive receptors not assessed. Mr Wardrop was critical of the PHDA Safety and Environment Management Plan and the Port Operations Handbook, which he claimed did not contain procedures for responding to oil spills. He gave evidence there is no Australian Maritime Safety Authority spill management plan for Western Port.

In response, the Proponents submitted Mr Wardrop misunderstood the stage of the assessment process at which the EES sits and added in their closing statement:

He was looking for a level of detail – specifics of products and quantities – that undoubtedly will be required, but cannot sensibly be, and is not required to be, considered at this stage. He had not allowed for further, subsequent layers of assessment. The EPRs include requirements in relation to equipment maintenance (EPR-AQ09), fuel and chemical leaks/spills (EPR-C08), and emergency planning (EPR-HR07) <sup>202</sup>.

The Proponents submitted the Incorporated Document required both a CEMP and an OEMP be prepared, both of which must address hazardous substances management. They submitted these requirements would ensure Mr Wardrop’s concerns are addressed at an appropriate level of detail at the appropriate time.

Under cross examination, Mr Wardrop accepted the EPRs, CEMP and OEMP were appropriate.

In closing, PHDA advised it has developed a ‘whole of port’ Emergency Management Plan (EMP) for management of emergencies within the Port <sup>203</sup>. This plan aligns with the State Emergency Response and Recovery Planning arrangements, under which the PHDA manages the first strike response for oil spills within the Port’s waters. The PHDA listed additional emergency and safety management measures for the general safety of Port operations including:

- State owned oil spill equipment which is located at the PHDA Stony Point Depot and allows for a rapid response and deployment, if required.
- The PHDA undertakes regular oil spill training, drills and exercises, and specific works to minimise the impact of emergencies through effective preparation, coordination response and recovery.

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<sup>202</sup> D589

<sup>203</sup> D562

- The PHDA undertakes regular oil spill response training with Port stakeholders, contracted services and support agencies to maintain the competency and capability of Port personnel.

### **(iii) Discussion**

The IAC accepts the evidence of Captain Noon and submissions of PHDA that there are competent and effective systems and protocols in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill.

The IAC notes the work done on reviewing spill scenarios undertaken in Technical Report A but shares the concerns raised by several submitters and the evidence of Mr Wardrop that no modelling was done for the immediate vicinity around Crib Point for the most likely spill scenarios. The IAC considers it would have been better if the EES included this work at an early stage.

The fact that this modelling has not been done to date is not fatal to the Project and the IAC notes there are mitigating factors that reduce the risk of any oil spill, such as the use of double hulled ships, the relatively low number of additional ship movements and reliable existing controls (including speed limits) on shipping.

The IAC accepts the Proponent's submission that more detailed modelling and risk assessment can be done in the next stages of the Project. The IAC is of the view that future risk assessment work should include more specific modelling of potential spill impacts at Crib Point and further review the impacts of additional shipping movements.

### **(iv) Findings**

The IAC finds:

- Competent and effective systems and protocols are in place or will be put in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill.
- The EES would have benefited from modelling of spill scenarios specific to Crib Point.
- If the Project proceeds, future risk assessment work should include more specific modelling of potential spill impacts at Crib Point and further review of the impacts of additional shipping movements.

## **14.5.4 Other shipping impacts**

### **(i) Background**

Technical Report A provides an assessment of the other potential risks of shipping activity discussed below. Several submissions made general or specific reference to these risks.

### **(ii) Seabed scour (FSRU)**

Expected local seabed scour is assessed as negligible, as very small quantities of sediment are involved, there would be a brief local increase in turbidity but no large scale or long term increase, and Western Port benthic biota are adapted to relatively strong currents. The likelihood for seabed scour is ranked as likely. The combination of likely occurrence and negligible consequence results in a risk rating of Low.

**(iii) Seabed scour (LNG carriers and tugs)**

The consequences of the expected local seabed scour due to tugboat operations was assessed as negligible, as very small quantities of sediment are involved, there would be a brief local increase in turbidity but no large scale or long term increase, and Western Port has a naturally mobile seabed. The likelihood for seabed scour is ranked as likely. The combination of likely occurrence and negligible consequence results in a risk rating of Low.

**(iv) Vessel grounding**

The consequences of an LNG carrier grounding on the edge of the channel is assessed as negligible, as the vessel can be retrieved on the following high tide and the risk of storm damage to a large vessel is minimal. In summary, the likelihood of vessel grounding is ranked as possible. The combination of a likelihood of possible and negligible consequence results in a risk rating of Low.

**(v) Whale strike**

Humpback Whales and Southern Right Whales visit Western Port during seasonal migrations between summer feeding in the productive Southern Ocean and winter breeding in the warmer coastal Australian waters. Killer Whales have been reported around the seal colony at the western entrance of the Bay.

Phillip Island Conservation Society (S2915) raised concerns about potential whale strike, including possible measures to avoid whale strike through observation and warning systems<sup>204</sup>. It made reference to systems in place in the United States and Canada<sup>205</sup>.

Whale strike was briefly addressed in the evidence respectively of Mr Chidgey and Dr Wallis<sup>206 207</sup>. Mr Chidgey noted Western Port is not known to be an aggregation or breeding area for Southern Right Whales. These whales rarely enter Western Port or are spotted around the entrance to the Bay. Dr Wallis calculated the probability of an LNG carrier striking a whale is 0.005 (or 1 in 200) in 25 years.

The EES assessment concluded the increase in likelihood of whale strike resulting from the addition of up to 40 LNG carriers to the existing and future shipping traffic in these areas is not significant, noting LNG carriers are operating at relatively low speed compared to the much larger number of smaller recreational vessels.

EES Attachment I (MNES) noted:

Operations of LNG carriers would be in accordance with Part 8 of the EPBC Regulations (Interacting with Cetaceans and Whale Watching) and the Port of Hastings Port Operating Handbook and Port of Hastings Harbour Master's Directions including measures relating to vessel speed (see mitigation measure MM-ME05).

FSRU and LNG carriers would comply with the maximum allowed vessel speeds and with operational instruction if a marine mammal is encountered. The risk of LNG carriers colliding with Humpback Whales or Southern Right Whales is considered very low<sup>208</sup>.

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<sup>204</sup> D293

<sup>205</sup> D2-6

<sup>206</sup> D71, pages 27-28

<sup>207</sup> D70, section 8.6.4

<sup>208</sup> EES Attachment I page 117

#### **(vi) General navigation issues**

Captain Noon gave evidence the DNV-GL QRA referenced in Technical Report K section 6.4 considered appropriate hazards and risks associated with approach, mooring, ship to ship transfers, and ship and berth collisions at the Crib Point Jetties. From an operational perspective, the methodology and measurable factors used in the study appear reasonable. He added in terms of the roles and responsibilities, PHDA and the VRCA are correctly identified as regulating the safe movement of the FSRU, safety at the berth and the movement of the LNG carriers within the Port limits.

Captain Noon gave evidence that, with the exception of the nearby decommissioned submarine, hazard identification, risks assessments, and mitigation measures have been adequately identified and assessed. He recommended the decommissioned submarine be included future hazard and risk assessments.

#### **(vii) Discussion**

The IAC notes the low risk ratings for seabed scour and vessel grounding and sees no reason to question the findings of the EES on these issues.

The IAC notes the concerns of submitters in relation to potential whale strike, but accepts the EES conclusion, supported by the evidence of Mr Chidgey and Dr Wallis, that the marginal increase in the probability of whale strike from the Project is very small and does not warrant any Project specific response. There may be merit in improved whale monitoring and warning systems in Australian waters generally but that is not a matter for this EES.

The IAC accepts the evidence of Captain Noon that existing controls on ship navigation in Western Port will adequately address shipping traffic from the Project and agrees with his recommendation to include the decommissioned submarine in future hazard and risk assessments.

#### **(viii) Findings**

The IAC finds:

- The risk of the Project from other shipping impacts, including whale strike, is generally low and the existing port navigation and operating practices are adequate.
- Future iterations of Project hazard and risk assessments should review risks associated with increased shipping and the navigation risk of the nearby moored decommissioned submarine.

### **14.6 Safety, hazard and risk conclusions**

The IAC concludes that:

- Safety, hazard and risk impacts are consistent with the draft evaluation objectives.
- Safety, hazard and risk impacts can be acceptably managed through the recommended EPRs and CEMP.
- There are no safety, hazard and risk impacts that preclude the Project being approved.

## 15 Land use

### 15.1 Introduction

Land use effects were discussed in EES Chapter 17 and Technical Report L. Additional material was provided in TN04 and TN47.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Table 13 lists the land use evidence that was provided.

**Table 13** Land use evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr Biacsi	Contour	Town planning (GIJW)
Proponents	Mr McBride-Burgess	Contour	Town planning (pipeline)
Proponents	Ms Filippin	R4Risk	Safety

Mr Biacsi provided an addendum to his evidence report in response to questions from the IAC and a supplementary report following his inspection of the Crib Point area <sup>209</sup> <sup>210</sup>.

There are no specific 'land use' mitigation measures although various EPRs and CEMP POS are applicable.

### 15.2 Key issues

The key issues are:

- The Project's consistency with role of the Port, as expressed in relevant land use policy.
- The extent which the Project, particularly the pipeline, might have unacceptable land use impacts.

### 15.3 The role of the Port of Hastings

#### 15.3.1 Background

EES Chapters 2 and 17 outlined the benefits of locating the Project within the Port. Technical Report L describes the role of the Port, including the Crib Point Jetty, and the broader land use policy and planning context within which it sits. This includes an overview of relevant documents that are referred to in Appendix E of Report No. 2.

#### 15.3.2 Evidence and submissions

The Proponents submitted the Project, specifically the Crib Point elements, was consistent with the role of the Port as defined in a range of land use policy and planning documents were described at length in their submissions and in Mr Biacsi's evidence.

<sup>209</sup> D176

<sup>210</sup> D494

The Proponents highlighted that:

- (a) the Crib Point Jetty and the surrounding waters form part of the Port of Hastings;
- (b) the entirety of the Port of Hastings is designated under Plan Melbourne as constituting “state significant infrastructure”;
- (c) the land in the immediate vicinity of Crib Point Jetty is designated under Plan Melbourne as being regionally significant; and
- (d) local policy expressly recognises the important contribution that the Port of Hastings makes to the Victorian economy, and its significant competitive advantages <sup>211</sup>.

In this context, they submitted that *‘the strategic significance of the Port, and the designated role that it plays within the network of ports within Victoria, is not within the scope of the IAC’s Terms of Reference and is accordingly not before the IAC’*. They added the IAC’s assessment of acceptability of the impacts associated with the Project *‘must proceed on the basis of the Port’s existing strategic designation’* and recognise that:

- (a) the Proponents do not need permission for shipping;
- (b) the Minister’s decision to require an EES did not refer to shipping;
- (c) the description of the Project in the Scoping Requirements makes no reference to shipping; and
- (d) the only mention of shipping in the Scoping Requirements is in relation to cetaceans <sup>212</sup>.

Mr Biacsi’s evidence highlighted the strategic significance of the Port and referred to various land use policy documents that describe its role <sup>213</sup>. These include the Mornington Peninsula Planning Scheme, Plan Melbourne, the Port of Hastings PDS, the Hastings Port Industrial Area Land Use Structure Plan and the Mornington Peninsula Localised Planning Statement (MPLPS). This review led him to observe that *‘it is appropriate from a land use planning viewpoint that the potential afforded by the Port of Hastings to accommodate the Project at Crib Point should be seriously entertained as it is aligned with the strategic planning that has secured the designation and significance of the Port as an important infrastructure asset to the State’*.

In response to concerns raised in submissions about industrialisation of the Port, Mr Biacsi’s evidence was *‘the Project is not a catalyst for further industrialisation but an example of a use that is consistent with the long-standing designation and functioning of the Port.’* He noted the Port *‘has a long history of accommodating and handling hazardous cargo’* and *‘is supported by significant pipeline infrastructure that complements its functioning as a bulk fuel trading port’*. He noted planning for the Port, including establishment and protection of significant land buffers, protected the opportunity for future Port growth and development.

Mr Biacsi acknowledged other issues raised in submissions, including environmental impacts, and noted these needed to be considered in light of the technical evidence and assessed in terms of the likely impacts and the extent to which the mitigation measures would be *‘effective and deliver the necessary certainty’*.

Mr Biacsi reviewed the exhibited Incorporated Document and land use related mitigation measures. He generally supported these, subject to some minor refinement to the Incorporated Document and in the expectation the mitigation measures would be further refined to take account of other technical evidence.

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<sup>211</sup> D589

<sup>212</sup> D589

<sup>213</sup> D68

The PHDA provided an overview of the history of the Port, its broader role within the Victorian port system and its current and projected operations, including those at Crib Point <sup>214</sup>. The PHDA emphasised the role of the PDS in port planning and the Port's capacity to meet *'the logistics needs of the State given its transport links, land availability, and existing and potential port infrastructure'*.

Mornington Peninsula and Bass Coast, who did not call planning evidence, acknowledged the Crib Point Jetty and associated Port Zone land were within the declared Port, and that the Port was designated as 'State significant' in policy. They further noted the Special Use Zone 1 industrial land to the west of The Esplanade was designated as *'regionally significant industrial land'* and seemed to argue this in some way diminished the role or State significance of the Crib Point facility.

Both Councils submitted the industrial nature of the Project went beyond what should typically be expected of a port related use and noted Mr Biacsi's similar observation. They submitted the Port Zone is not *'generally available'* for industrial uses and highlighted other policy considerations that needed to be balanced against policy support for port related activities. They concluded that *'whilst the Port of Hastings is an operating commercial Port of State significance – recreation, nature conservation and tourism are nevertheless intended to be 'major considerations' in decision-making and there is no basis for treating development of the Port as being of such overriding significance as to justify ignoring clearly demonstrated impacts'* <sup>215</sup>.

The CEG supported the Mornington Peninsula and Bass Coast submissions, particularly in relation to their concerns about an *'industrial facility'* at Crib Point and the need to consider the Project within the broader policy framework, not just port related policy.

Save Westernport described what it called the *'location fallacy'* and submitted that although the Jetty was within the Port, the Project would introduce a different type and level of industrial activity, particularly compared to the past and current use of Crib Point <sup>216</sup>.

Many submitters shared the concerns about the 'industrialisation' of the Port, particularly at Crib Point, and questioned whether the Port had a viable future given the environmental values and sensitivities of Western Port Bay.

### 15.3.3 Discussion

There is clear, unambiguous policy support for the continued operation and future growth of the Port of Hastings, including operations at Crib Point. This policy support exists in a comprehensive range of policy documents, including those at State level (Plan Melbourne, the PDS and the Victorian Freight Plan), regional level (the MPLPS) and local level (the Mornington Peninsula Planning Scheme). This policy framework does not anticipate or promote the closure of the Port or its de-industrialisation, despite the aspirations of many submitters who queried its ongoing environmental viability. On the contrary, the policy framework not only supports its ongoing operation but actively promotes its growth and development. In this context, it is notable that although the recent Victorian Freight Plan identified Bay West as the preferred location for Victoria's second container port, the Port of Hastings is retained as a reserve option in the event Bay West does not proceed.

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<sup>214</sup> D562 and 231

<sup>215</sup> D426

<sup>216</sup> D485

Despite the strong policy support for the Port, the IAC agrees with submitters that the Port's future development and growth will be contingent on how it responds to the environmental values and sensitivities of its location. It will need to take into account a broad suite of policies, not just port related policies. This is reflected in a range of policy documents, including the PDS that highlights the need to consider the Port's future development in the context of the Ramsar designation, the protection of coastal mangroves and saltmarshes, the recreational values of the Bay, and traffic, noise, landscape and visual issues. This is reflected in the MPLPS that includes the port related strategy:

Planning will provide for the protection of the important values and resources of Western Port and its land catchment having regard to the importance of recreation, nature conservation and tourism. These will be major considerations in the planning and management of the area for port and port related industrial purposes <sup>217</sup>.

The need to balance potentially competing policies was noted and acknowledged by many during the Hearing, including the Proponents (through Mr Biacsi's evidence), Mornington Peninsula and Bass Coast. The IAC understands a balanced assessment of the Project must have regard to the complexities and potential contradictions within the policy framework. It agrees with the Proponents that a balanced assessment must have regard to the ongoing role of the Port. This approach underpins the IAC's discussion of many of the issues raised by submitters and provides an important part of the policy context within which it has assessed the acceptability of various impacts.

#### **15.3.4 Findings**

The IAC finds:

- There is clear land use policy support for the continued operation and future growth of the Port of Hastings, including Crib Point.
- Land use decisions about the Port must be made within the broader policy framework that recognises the environmental and other values that might be impacted by future development, including the Project.

### **15.4 Land use impacts**

#### **15.4.1 Background**

The key land use impact raised in submissions related to the pipeline element of the Project and the extent to which safety concerns might impact on land use planning, particularly in relation to urban and agricultural areas.

EES Chapters 16 and 17, and Technical Reports K and L assessed the Project's safety and related land use impacts. The study area for the pipeline assessment included a 200 metre buffer either side of the pipeline and a 500 metre catchment around the CPRF and the PDF. The assessment had regard to existing conditions and reasonably foreseeable future land uses, taking into account existing planning scheme provisions and planning policies that guide future land use and development.

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<sup>217</sup> PDS strategy 43

### 15.4.2 Evidence and submissions

The Proponents outlined how the pipeline route had been determined and the basis for its construction standard. They relied on the evidence of Ms Filippin and Mr McBride-Burgess and provided supplementary material in TN04 and TN47.

In summary, the PML represents the radial distance heat contour for an ignited full bore rupture of the pipeline and is used to determine the standard to which the pipeline is designed, constructed and operated. It extends for 640 metres either side of the pipeline. For this project, the pipeline has been designed to at least a ‘T1 – Residential’ standard with some sections designed with a secondary location class of ‘S – Sensitive’.

The Proponents advised APA would be obliged to monitor land uses within the PML on an ongoing basis and potentially introduce additional pipeline control measures<sup>218</sup>. The IAC notes it would be open to APA to have input in land use decisions within the PML where appropriate. They noted that because of the proposed pipeline design standard, there would be negligible chance of land use changes within the PML requiring a higher standard pipeline. In the event the Urban Growth Boundary is expanded within the PML and a new PSP is prepared, APA would anticipate seeking the inclusion of PSP pipeline controls similar to those it sought for the recent Pakenham East PSP.

The ‘notification area’ or ‘area of consequence’ applies within 50 metres either side of the pipeline. The Proponents advised this was determined based on the energy release rate from the worst credible hazard scenario identified at the SMS workshop (as discussed in Chapter 14). It represented the area within which particular sensitive uses might be exposed to an unacceptable level of safety risk. Within this area, APA would request that relevant Councils notify it of any applications for sensitive uses as defined in AS2885.6 and listed in TN04. The Proponents added that APA does not expect notification of other proposals and does not have an interest in other land uses, including ‘*standard or medium density residential or retail development*’.

The Proponents’ advice about the PML and notification area was generally consistent with Ms Filipin’s evidence in which she noted the PML is not an exclusion zone or a buffer, rather it is used to inform risk assessment. She made various recommendations about further risk assessment work that should be done, including recommendations relating to the GIJW and PDF (see Chapter 14).

Mr McBride-Burgess supported the pipeline alignment although he recommended various changes discussed Chapter 14. In terms of land use impacts, his assessment of the various planning controls and policies, particularly within the notification area, led him to conclude:

The introduction of the Pipeline will not unreasonably limit the ability for Hastings to grow as envisioned with the adopted Hastings Structure Plan.

Between Hastings and the Pakenham Delivery Facility the pipeline alignment typically extends through agricultural and rural living land uses which would only experience short term amenity impacts during the construction phase. End use impacts largely relate to the introduction of easements along the pipeline alignment<sup>219</sup>.

In relation to the GIJW, Mr Biacsi supported the EES finding that land use impacts would largely be confined to the Special Use Zone 1 area that operates as a defacto buffer around the Jetty. He concluded this was consistent with the zoning regime and land use policies for this area.

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<sup>218</sup> AS2885.6

<sup>219</sup> D86

The Proponents noted Cardinia Planning Scheme Amendment C234 (Pakenham East PSP)<sup>220</sup> included a requirement in Clause 66.06 that the pipeline licensee/operator be notified of applications for various sensitive uses within 50 metres of the existing high pressure gas transmission pipeline. They submitted the IAC should recommend that similar controls be applied to:

- (a) the notification area of the proposed pipeline;<sup>221</sup> and
- (b) the area where the Pakenham Delivery Facility results in a comparable level of risk (with this area to be determined following a revised QRA)<sup>222</sup>.

Cardinia raised concerns about the pipeline's land use impacts in relation to growth corridor land (particularly the Pakenham East PSP area) as well as non-growth corridor land. These concerns were twofold:

- Firstly, the extent to which adjacency to the measurement length (and/or the notification area) might impact upon future changes of use and/or development of land; and
- Secondly, the extent to which landowners/occupiers affected by land in the measurement length have been notified of the proposal and had the opportunity to participate in the IAC process <sup>223</sup>.

Cardinia sought clarity in relation to:

- what is a sensitive use for purposes of the pipeline adjacency; and
- the extent to which APA will seek to prevent the use, influence the nature of the use (scale, density, other conditions) and/or need to make procedural control changes of its own through the SMS <sup>224</sup>.

Casey raised concerns about pipeline impacts on agricultural productivity (see Chapter 18).

Mornington Peninsula and Bass Coast raised issues relating to the role of the Port and Crib Point, and potential business, tourism and agricultural impacts (see Chapters 17 and 18).

The Victorian Planning Authority (VPA) made a written submission in relation to the pipeline and the Pakenham East PSP. It noted various discussions held with APA about potential land use impacts and how they might be addressed. The VPA requested that:

- Implications for the Pakenham East PSP are clearly discussed within the EES inclusive of a reassurance within the document (consistent with advice provided to the VPA by APA) that the pipeline will be designed and constructed such that there will be no adverse impacts upon the future development within this precinct, which will be predominately residential.
- The EES be more specific about the 640m measurement length that applies to both sides of the proposed pipeline and should articulate how the increased design and construction standards of the pipe, particularly in the vicinity of the PSP area, will lead to a reduction in its length or a change in how it is the measurement length is interpreted / responded to;
- The Advisory Committee require APA and AGL to engage with the VPA when revising the EES to ensure that it adequately addresses the above matters and remains consistent with advice already provided to the VPA by APA. I note also that the VPA, Melbourne Water and DELWP are not referred to in the stakeholder

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<sup>220</sup> The Amendment, including Clause 66.06, was approved on 21 January 2021

<sup>221</sup> The IAC assumes that this refers to the area within the Pakenham East PSP and not the entire length of the pipeline

<sup>222</sup> D589

<sup>223</sup> D442

<sup>224</sup> D442

engagement sections of the EES and have apparently have not previously been included in this process <sup>225</sup>.

### **15.4.3 Discussion**

#### **(i) The Pipeline Measurement Length and notification area**

The IAC is satisfied the definition of the PML and notification area are consistent with AS2885 and notes the notification area was supported at the SMS workshop. It accepts Ms Filippin's evidence and her recommendations for further risk assessment work (see Chapter 14).

The IAC agrees the PML is not an exclusion zone or a buffer, rather it is used to inform pipeline risk assessment. Nevertheless, APA would be obliged to monitor land uses within the PML and would have the opportunity to respond to relevant land use proposals.

The IAC is satisfied the notification area has been appropriately determined and that APA's intention to consult with relevant Councils and to request it be notified of applications for sensitive uses is generally consistent with current practice. The IAC is satisfied the proposed list of sensitive uses is appropriate.

The IAC has broadly reviewed the pipeline route through the PML and notification area and agrees with Mr McBride-Burgess the land use impacts, particularly through Hastings, will be negligible. Impacts on agricultural areas and specific sites raised by submitters are discussed in Chapters 18 and 20.

#### **(ii) Statutory mechanisms for managing land uses in the pipeline notification area**

The Proponents sought a recommendation from the IAC that the pipeline and PDF be the subject of a planning scheme amendment that would introduce a planning permit application referral requirement for sensitive uses within the associated notification areas. This would be similar to the changes to Clause 66.06 included in the approved Cardinia Planning Scheme Amendment C234.

While the IAC acknowledges the rationale for the request, it was not anticipated in the exhibited EES and was only raised late in the Hearing process. For these reasons, the IAC is not prepared to support this, particularly in the absence of further consultation with stakeholders, including APA, the VPA, Cardinia, DELWP and landowners.

Nevertheless, the IAC would not have any in principle concerns about an appropriate control being implemented, subject to APA reaching agreement with the relevant stakeholders.

#### **(iii) Pakenham East Precinct Structure Plan area**

The VPA's submission raised issues related to the treatment of the pipeline in the Pakenham East PSP area and referred to various discussions it held with APA about related matters. Cardinia raised similar concerns about these issues, particularly in relation to potential land use impacts outside the notification area.

The IAC is satisfied the concerns raised by the VPA and Cardinia have been addressed by the advice and commitments provided by the Proponents in their submissions and evidence and these do not require any further response or recommendations. Nevertheless, the IAC encourages the Proponents to continue their discussions with the VPA and Cardinia about

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<sup>225</sup> D234

how the Project might impact the Pakenham East PSP and whether and how a referral control might be implemented.

#### **(iv) Consultation**

Cardinia raised concerns about the adequacy of community consultation related to potential land use impacts within the broader PML. The Proponents provided comprehensive material about the nature and extent of consultation during the EES process and submitted they had met the approved consultation plan required under the Scoping Requirements Report and had complied with the requirements of the *Pipelines Act*.

The IAC is satisfied affected landowners within the notification area were adequately consulted, including direct consultation regarding acquisition of the pipeline easement. In terms of the broader PML area, the Proponents advised that a project ‘flyer’ was circulated within most of this area, and the majority of landowners had received this. They highlighted other consultation mechanisms used, including newspaper and radio advertisements. The IAC is satisfied there has been adequate consultation within the PML, either directly or indirectly, and landowners have had the opportunity to inform themselves of the PML and its possible implications. The IAC notes submissions and evidence from the Proponents that land use implications for the area outside the notification area, but within the PML, are negligible.

#### **(v) Land use impacts resulting from the Gas Import Jetty Works**

There were few specific submissions about possible land use impacts associated with the GIJW, although there were general concerns about safety issues. These were addressed in the evidence of Ms Filippin who referred to the inner and outer advisory areas and the land use risks and limitations associated with them. As discussed in Chapter 14, she recommended further risk assessments be undertaken as part of the iterative risk assessment process, a position the IAC supports. As noted in Chapter 14, the results of the preliminary QRA show acceptable quantitative risk levels for the nearby land uses including residential areas, the Victorian Maritime Centre and the foreshore.

In a broader sense, the IAC agrees with Mr Biacsi that the Jetty is extensively buffered by areas zoned Special Use Zone 1 (Port related uses) and distant from the Crib Point and Hastings urban areas. These are some of the factors that support the ongoing use and development of the Jetty area and make it suitable for uses that might have off site impacts.

### **15.4.4 Findings**

The IAC finds:

- Potential land use impacts associated with the pipeline would be predominantly confined to the pipeline notification area and are considered to be acceptable.
- Potential land use impacts associated with the GIJW would be predominantly confined to the surrounding Special Use Zone 1 area and are generally acceptable.

## **15.5 Land use conclusions**

The IAC concludes that:

- Land use impacts are consistent with the draft evaluation objective.
- Land use impacts can be acceptably managed through the recommended mitigation measures.
- There are no land use impacts that preclude the Project being approved.

## 16 Social

### 16.1 Introduction

Social effects were discussed in EES Chapter 18 and Technical Report M. Stakeholder engagement was discussed in EES Chapter 26. Additional material was provided in TN08 and TN14.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Technical Report M – Social Impact Assessment (SIA) was prepared by Mr Weston of Public Place Melbourne Pty Ltd.

Table 15 lists the social evidence that was provided.

**Table 14 Social evidence**

Party	Expert	Firm	Area of expertise
Proponents	Mr Boushel	Jacobs	Social impact assessment/research
CEG	Ms Rosen	Symplan	Social impact assessment, planning
Bill Genat	Professor Small	La Trobe University	Health and social research

Mr Boushel’s evidence was supplemented by reply evidence (D169) and a PowerPoint presentation at the Hearing (D341).

Ms Rosen’s evidence was supplemented by a PowerPoint presentation at the Hearing (D476).

Professors Small’s evidence was supplemented by reply evidence (D152) and a PowerPoint presentation at the Hearing (D506).

The following EPRs apply to social impacts:

- SO01 Consultative mechanisms for information and enquiries
- SO02 Consultation on recreational activities at Woolleys Beach
- SO03 (deleted from exhibited iteration)
- SO04 Source local workers
- SO05 Community fund
- SE01 Stakeholder Engagement Management Strategy
- SE02 Complaints management system.

### 16.2 Key issues

The key issues are:

- Efficacy of and engagement through the SIA.
- Amenity impacts on the Woolleys Beach North reserve
- Whether social impact mitigation can be managed.

## 16.3 Efficacy and engagement

### 16.3.1 Background

The EES notes the SIA ‘*was compiled in accordance with well-established procedural steps*’, these being:

- scoping
- profiling/data collection
- impact assessment/prediction and evaluation
- mitigation.

These steps are unpacked in various ways in the SIA.

In the context of the Project, Mornington Peninsula was described in the SIA as:

... a well-known tourist destination boasting a wide variety of attractions, such as beaches, wineries, and golf courses, and the area is home to numerous holiday homes. In contrast, the urban settlements of Crib Point and Hastings accommodate largely permanent populations with a relatively ‘low’ socio-economic status compared to the Hastings-Somerville District, nearby rural areas and Greater Melbourne <sup>226</sup>.

The SIA is largely descriptive, with little in the way of specific fit for purpose new research. The key focus of assessment noted the impacts of the Jetty works largely related to impacts on the Bay and changes to access and amenity to the local communities of Crib Point and Hastings. For the Pipeline works, these related to occupation of private land and changes to access and amenity. The SIA noted that for both key components, there will be changes to socio-economic conditions.

Community engagement was primarily undertaken by the Proponents in the early inception stages of the Project. Chapter 26 of the EES considered Stakeholder Engagement and the IAC was advised the Proponents engaged with a variety of stakeholders since the inception of the Project in July 2017.

### 16.3.2 Evidence and submissions

#### (i) Efficacy

In acknowledging the range of various social impact issues raised by submitters, the Proponents contended:

At a high level, the Proponents’ response to these issues is to acknowledge that some impact will occur, but that, first, the social impact assessment undertaken has been sufficient for the purpose of developing appropriate mitigation measures for the Project’s potential social impacts. And second, that the proposed mitigation measures – in the form of EPRs and the CEMP – are well-designed to address the community’s concerns, enhance benefits for the local community, and improve the social outcomes of the Project <sup>227</sup>.

The evidence of Mr Boushel was descriptive and focussed on the exhibited SIA, the social issues raised through the public submission process and the mitigation measures (D82). In that regard, he provided additional mitigation measures in response to his review of submissions. He made a supplementary statement in response to the RFI from the IAC and the evidence of Ms Rosen and Professor Small (D169).

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<sup>226</sup> Technical Report M, p29

<sup>227</sup> D340

In response to Ms Rosen’s evidence where she was critical about the efficacy of the SIA, Mr Boushel did not support that contention. While noting he too had some criticisms of the exhibited SIA, he said *‘The findings of the assessment, however, can be relied upon as the issues raised in the submissions are largely considered and assessed within the assessment’*<sup>228</sup>.

Mr Boushel gave evidence about the tangible social benefits, such as increased gas availability, potential employment opportunities, and the community fund. He noted that for the community fund to be successful, the whole community would need to accept it (for which he noted that would be highly unlikely).

Mr Boushel spoke of the intangible social impacts and observed that new environmental projects often generate fear within communities, especially in the planning phase of road and energy proposals. In this case, he noted that very few people have seen a project of this type before, hence the heightened concerns.

Mornington Peninsula did not address social impacts, nor did it call social planning evidence.

The CEG provided detailed submissions on social impacts and called evidence from Ms Rosen. With regard to the efficacy of the SIA, CEG contended:

As is relevant to the Scoping Requirements, the EES SIA is insufficient to form the basis of any conclusion as to the:

- a. characterisation of the existing environment; or
- b. assessment of likely effects – that is, the likelihood and significance of any social impact.

That is because of three interrelated factors:

- a. first, a lack of necessary and appropriate primary research;
- b. second, inadequate consideration of the vulnerability of the affected community; and
- c. third, a failure to consider the cumulative effects of those individual potential impacts identified in the EES<sup>229</sup>.

## **(ii) Engagement**

The SIA noted consultation about the Project occurred in late 2018 and early 2019, well before the technical studies were completed and well before the EES could be considered holistically. One of the difficulties in undertaking a SIA as part of the EES process is that such work is undertaken early in the process, usually in parallel with the various technical studies. The authors of a SIA generally rely on the findings of those technical studies to inform their considerations about social impacts. These findings are generally taken at face value, well before they can be tested in a public hearing process, both directly and through competing evidence and through submissions. In reality, it is not until the submission and hearing process that the full range of social impacts – both positive and negative – can be fully understood.

The Proponents expressed concern about how the Project was portrayed by the CEG and particularly Save Westernport, including for example, showing the Project as an oil rig in early publicity material. There was significant use of social media in generating opposition to the Project and while that was a fair avenue to generate interest, The Proponents noted *‘the deliberate avoidance of the official information was regrettable and inappropriate’*. Through

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<sup>228</sup> D169, paragraph 13

<sup>229</sup> D483, paragraphs 205, 206

the very high number of submissions and the high number of community groups and submitters seeking to be heard, there is no doubt the social media campaign had an impact.

The Proponents questioned Ms Rosen about what he considered her over reliance on social media and other material published by Save Westernport. He contended she did not bring a fair and balanced approach to her evidence. While Ms Rosen disagreed with that contention, she did concede that she did not look much beyond what was provided to her by Save Westernport.

Mr Boushel was cross examined at length by the IAC and Mr Forrester for the CEG. Amongst other issues, the IAC explored the methodology of his evidence statement and his reliance on the primarily desktop research of others.

In giving her evidence, Ms Rosen focused mainly on the Crib Point elements of the Project. She summarised her opinion that the social disbenefits outweigh the social benefits and the proposed mitigation measures would be unlikely to mitigate potential social impact. She highlighted the relative socio-economic disadvantage of the Hastings and Crib Point communities, noting the vulnerability of these communities and their capacity to cope with the Project. Ms Rosen highlighted the temporary construction and the permanent operational changes, including the impact on visual amenity from various areas along Western Port Bay. She argued AGL did not have a social licence to operate the facility, a position with which the Proponents rejected. They said social licence '*... is not an objective test for decision makers*'.

Ms Rosen was critical of the SIA in that it was inadequate for the type of project under assessment and that '*Best practice should go beyond compliance with evaluation objective and scoping requirements*', which '*should seek to avoid rather than minimise*'<sup>230</sup>. She concluded Western Port Bay was an inappropriate setting for the Project, the cumulative disbenefits on the local community outweigh the cumulative benefits to the broader community and the proposed mitigation measures would be unlikely to address community concerns. Further she contended the SIA findings should not be relied upon as the evidence base lacked rigour.

The CEG concluded that Ms Rosen's evidence supported a conclusion that the limitations and failures of the SIA meant its findings should not be relied upon.

Professor Small gave evidence on the community engagement process and her perceived inadequacy of the SIA, including the way in which the social research was undertaken. She concluded that '*... there remains a need for a much more comprehensive and robust assessment of social impact to be conducted*'<sup>231</sup>. She was critical of the methodology employed through the EES, in that it did not respond to the scoping requirements, and that the lead author for the SIA relied too heavily on secondary data with no or little contact or communication with the local community.

Most submitters did not support the Project, and many spoke of the impacts the Project would have on them and their families/friends. Fear of amenity impacts (light spill, noise, visual bulk), fear of loss of valued open space, fear of fire and explosion, fear of irreparable damage to the marine environment, fear of loss of access to the Bay, fear of impacts for continuing use of gas as a fossil fuel and fear of the unknown were common issues raised.

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<sup>230</sup> D476, page 35

<sup>231</sup> D113, page 14

Many submitters spoke passionately about their relationship with Western Port Bay, the peacefulness of Woolleys Beach, the opportunity to engage with the extensive marine environment and the overall ambience of the area.

Many local submitters advised they have lived harmoniously with the Port of Hastings and with Crib Point in particular for long periods but were adamant the permanent mooring of the FSRU and its operations would liken the Bay to a *'floating industrial factory'* that would have continuous 24 hour impacts. Submitters from further afield, both elsewhere on the Mornington Peninsula and beyond shared many of these views.

The IAC notes several issues were raised about consultation regarding Aboriginal cultural heritage (see Chapter 19.3).

### 16.3.3 Discussion

#### (i) Efficacy

While the IAC accepts the SIA considered the relevant scoping requirements, it did not undertake new research to support the overall assessment. In particular, it did not conduct one on one research in the form of community engagement or surveys. Nor did the peer review witness for the Proponents do this. The key engagement was undertaken by the Proponents directly through the early community engagement program. The SIA noted that since 2017, the Proponents held over 30 open public meetings with more than 1,500 attendees. Since that time *'... there is a network of community led environmental groups which have taken an active interest in and/or oppose the Project due to its potential environmental impacts'*.

Mr Boushel observed similarly and noted the SIA is *'... largely reliant on feedback sourced from the broader consultation undertaken by APA and AGL with limited consultation undertaken directly for the social impact assessment'*. Further, in relation to the secondary information relied upon, he observed *'As this feedback was collected for a different purpose, it is less likely to capture the kind of social information that social impact assessments seek to consider'*. In saying that, Mr Boushel did not undertake direct consultation either, including by telephone or survey, which could have been attempted, even in the COVID period.

In response to questions from the IAC, Mr Boushel argued the purpose of the SIA was not to increase community buy-in but to consider the relevant social impacts and mitigation measures. He acknowledged that the lesser the level of consultation, the greater the risk, but noted in this case, the high number of submissions did support that there was significant community awareness of the Project. He agreed with the IAC that it was very important to ensure people are aware of a project such as this and that while the SIA is not deficient, it does have some limitations.

In considering community impacts, the SIA provided the following summary:

The environmental, commercial, and recreational values of Western Port currently coexist in relative harmony. However, there is a clear tension between the aspirations of different sections of the community with regard to Western Port and in particular the balance struck between preserving and enhancing the bay's environmental values and natural landscape setting, and the utilisation of port infrastructure for industrial purposes

<sup>232</sup>.

The IAC considers this comment to be the essence of the differing views of parties and submitters. The key issue is whether those views can be reconciled, and if not, how they can best be mitigated, if at all.

The Proponents addressed many aspects of the SIA and social impact evidence in its closing submissions. They reiterated the continual presence of the Port since the 1960s and the type of activity it undertakes, including as an industrial Port that has long been used for fuel transport, amongst other uses. The Proponents observed:

... the Port and its industries are important resources within the social and economic fabric of Hastings and Crib Point. The sustainability of the Port should not be seen as a negative social effect. Rather, the Port will continue to provide a basis for employment and careers in the area. While the Bay's tourism values are also a resource it is stretching the facts and local policy to place this resource above the Port in the area around the jetties. ...

This analysis should lead to the conclusion that there are no unacceptable social effects and that the level of social impact is within policy expectations for the area and capable of management as proposed in the EPRs <sup>233</sup>.

The IAC disagrees *'that there are no unacceptable social effects'* and ultimately concludes that while there are some impacts that are acceptable, there are others that are unacceptable to others in the immediate local community. Many of these impacts are intangible, such as the fear and anxiety expressed by many submitters. It is difficult to nuance the psychological impacts the Project may have on people, and while many of the tangible parameters relating to noise, lighting, visual impact can be quantified and benchmarked as mitigation measures through the EPRs, the genuinely held concerns of many submitters cannot be reconciled in this way, nor should they be underestimated.

The IAC accepts the role of the Port and its place as one of four main Ports in Victoria, as well as the State and local planning policy and land use context of the Port. However, what is proposed is the permanent mooring of an FSRU for up to 20 years and the conversion of LNG to gas for transport to Pakenham through a new pipeline. The FSRU is a new and a different use, with different issues and impacts. Most other jetties in the Port and the Crib Point Jetty in particular, have ships calling in and leaving over a short period of time. Indeed, it was difficult during the course of the Hearing to find a time to observe a ship that was calling into Crib Point.

What was not considered well was the extent of community interest in the Project from wider areas in and around Western Port Bay, the Mornington Peninsula and well beyond. The overall conclusion of the SIA and the evidence of Mr Boushel noted the wide range of concerns that in the opinion of the IAC, were not appropriately acknowledged. Significant reliance was given to the positive technical assessment in the EES, thus influencing the general findings of the SIA and the recommended mitigation measures.

The IAC considers that while the SIA was adequate, it was not sufficiently robust for this particular matter. While potential social (and environmental) effects can technically be mitigated, little regard was given to the intangible impacts resulting from fear, anxiety and psychological stress.

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<sup>233</sup> D589, paragraph 454 (h), (i)

## (ii) Engagement

The authors of the SIA did not undertake direct and meaningful social research or engagement with potential stakeholders, nor did the social impact experts. All relied on what was prepared by the Proponents in the Stakeholder Engagement report and various secondary resources, and the technical information in the EES. Ms Rosen conceded she largely relied on secondary research and information provided to her by Save Westernport. By the time of the Hearing, there was significant community opposition to and about the Project.

Due to the nature of this Project, the IAC is concerned about the low level of meaningful consultation with directly impacted communities. Apart from consultation for the pipeline route, there should have been an attempt to undertake consultation in a more inclusive and rigorous manner. There is no doubt that AGL attempted to consult in the early phases of planning for the Project, but that did not carry through to the SIA process. It has caused the IAC to wonder whether this did not occur due to early engagement being unsuccessful, and the view that there was 'little point' due to the vehement nature of opposition.

The IAC heard from submitters who spoke of the early engagement process where executives of AGL reportedly told the local community that *'you will need to take one for the team here'* in relation to the Project being located at Crib Point. No doubt that was a poor choice of words to a concerned and in the terms described by Ms Rosen, a sometimes vulnerable community, but having been said, it stuck in people's minds and heightened concerns about the Project.

Mr Forrester explored the issue of community vulnerability with Mr Boushel who agreed the most vulnerable socio-economic groups of Mornington Peninsula are those likely to be the most affected by the Project. Further, the type of employment opportunities that might accrue from the Project might not necessarily be the skill set available from within the Crib Point/Hastings communities. There was significant concern about potential employment opportunities, to which the Proponents amended EPR S004 to develop a local procurement plan for employment of local communities and contractors, which the IAC supports.

Through cross examination, the Proponents were very critical of Ms Rosen about her reliance on what they termed the very deliberate campaign by Save Westernport in particular to produce material in opposition to the Project that painted it in a very negative way. The Proponents contended that much of what was produced in this campaign was inflammatory, exaggerated and untrue. There is no doubt in the IAC's mind the campaign was very successful in turning people's minds against the Project. In saying that, the IAC considers community leaders and organisers have a responsibility to ensure they are fair and balanced in such campaigns, as they play on the sensitivities of many people to feel fear and concern in a very real way.

However, the IAC read and heard from many articulate submitters who did express genuine and sincere concerns about the impacts of the Project on their livelihood, their perceptions about the impacts on the Bay, and their concern about the change in the nature of port activity at Crib Point as part of the Port of Hastings. These submissions, while not backed with evidence, were important in the considerations of the IAC.

That the CEG called social impact evidence in support of its position was helpful to the IAC. It agrees with the concerns raised by the Proponents about the reliance of Ms Rosen on material produced by Save Westernport and it was not helpful to the IAC that Ms Rosen, like Mr Boushel, did not undertake primary research. However, Ms Rosen did provide a detailed

evidence report (D105) and PowerPoint (D476) that well documented the concerns about community engagement.

In responding to the SIA and the evidence of Mr Boushel, the Proponents noted *'the scope of the social impact assessment was limited at the outset'* due to what they said was the agreement of DELWP that a standalone SIA social impact risk assessment need not be undertaken. They noted that direct consultation was invited, but only three local residents sought to participate <sup>234</sup>.

The Proponents noted they consulted as required in relation to the scoping requirements and that *'The fact that some submitters are not happy with the consultation does not mean that it was inadequate, and it is unfair to castigate the Proponents for following their obligations in relation to consultation'* <sup>235</sup>.

One of the difficulties in assessing social impacts for this Project (and other large scale infrastructure) is that there are, no doubt, many silent voices. Due to the campaign waged by Save Westernport, those who perhaps might support the Project might have been reluctant to put their names on a submission. This is not able to be quantified but there may be some unknown local support for the Project.

A further observation is that the advantage of the Crib Point location is that apart from the five properties along the Esplanade, there are no direct communities living close to the Jetty who are immediately and directly impacted. The foreshore and jetty infrastructure are separated from Crib Point township by various port related infrastructure and bushland. If driving directly through Crib Point, there is very little sense of the Jetty and Port infrastructure. This is a key locational advantage that raises different locational contexts compared with some major road and other significant infrastructure projects.

The IAC undertook various site inspections during its proceedings. Recognising the COVID restrictions and typical spring weather, the IAC was surprised by the low numbers of people walking in and around the foreshore during its visits. On one day, one member noted little recreational water activity while on another day another member noted significant recreational/fishing boat activity. On one inspection, while a ship was docked at the Jetty, a member observed the key noise impact was from speed boats in the Bay.

Consultation in relation to the pipeline route by the Proponents was more targeted and generally provided for one on one consultation with affected landowners. There were few submissions from landowners affected by the pipeline route. The IAC agrees most landowners appeared to engage with APA regarding the pipeline and as the works will move along that route in a systematic and coordinated manner, the impacts will be short term and likely negligible. The IAC agrees direct impacts for the pipeline will diminish over time.

#### **16.3.4 Findings**

The IAC finds:

- While the SIA was adequate, it has significant limitations through the lack of direct research and consultation with the local communities and interest groups.
- The SIA was heavily reliant on assuming that all technical components of the Project would be satisfactorily assessed and mitigated, so therefore the social impacts could be mitigated accordingly.

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<sup>234</sup> D589, paragraph 454

<sup>235</sup> D589, paragraph 482

- Intangible impacts were not appropriately recognised or addressed in the SIA.
- Stakeholder engagement was evident since mid-2017 but did not result in demonstrated community understanding or acceptance of the Project.
- The engagement process for the Jetty component of the Project through the SIA and the evidence of the Proponents was limited and lack the benefit of ongoing and direct consultation.
- The engagement processes for the pipeline component of the Project was generally acceptable.

## 16.4 Woolleys Beach North

### 16.4.1 Background

The exhibited EES included the following mitigation measure (MMSO02):

#### **Consultation on recreational activity at Woolleys Beach**

The Crib Point Stony Point Committee of Management Inc. and the community will be consulted with to identify a suitable foreshore location and propose additional recreational infrastructure, to accommodate activity displaced from Woolleys Beach North.

This mitigation measure applies to the ‘picnic area’ within the Woolleys Beach Reserve that is immediately to the south of the Jetty and described in the EES as ‘Woolleys Beach North’. The site is accessed from The Esplanade and includes a car park and some recreational infrastructure.

### 16.4.2 Evidence and submissions

The Proponents Day 1 version of the EPRs revised the mitigation measure (EPR-SO02) to read:

The Crib Point Stony Point Committee of Management Inc. and the community will be consulted with to identify a suitable foreshore location and propose additional recreational infrastructure and measures to improve access, to accommodate activity displaced from Woolleys Beach North <sup>236</sup>.

The additional text (underlined) was added in response to changes proposed by Mr Boushel who gave evidence that:

This mitigation is appropriate. While the amenity impacts will have an adverse impact on users of Woolleys beach, the severity of this is reduced by the presence of the existing port and associated operations. Existing users have been able to coexist with existing operations and this mitigation will assist in them adapting to this change <sup>237</sup>.

The Proponents retained the Day 1 version of the EPR in the Day 2 and Day 3 versions but deleted it from the Day 4 version. In their closing submission, the Proponents proposed that it deleted because:

- access to or use of this area would not be prevented or limited
- noise from the FSRU and CPRF would be noticeable, but not enough to limit its use.

The Proponents submitted some submissions about this mitigation measure and the use of Woolleys Beach North were based on the incorrect assumption that the Project would

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<sup>236</sup> Day 1 EPRs (D174)

<sup>237</sup> D82

physically prevent access to the picnic area. They advised this was not the case, nor was it ever the case, but accepted there was confusion about the access.

Mornington Peninsula raised concerns about the possible noise impacts within the Woolleys Beach Reserve, including the HMAS Otama lookout and Woolleys Beach North.

The CEG raised concerns about the meaning of the exhibited mitigation measure (EPR-SO02), the responsibility for actioning it, how it would be funded and whether an alternative site was capable of being provided. They relied on Ms Rosen's evidence and submitted the mitigation measure should require that *'All costs associated with mitigating severance and displacement are to be borne by the proponent'*.

Similar concerns were raised by other submitters.

### 16.4.3 Discussion

EES Appendix M assessed the amenity impacts along the Woolleys Beach Reserve, including discussions with the Crib Point Stony Point Foreshore Committee of Management Inc (Foreshore Committee). Those discussions indicated the Reserve *'typically offers a quiet and tranquil setting for visitors'* but noise associated with the occasional use of Berth 1 reduced visitation, particularly to Woolleys Beach North. The assessment noted that:

Changes to amenity may permanently alter the pattern of use of the Woolleys Beach Reserve for some users during the life of the Project. Some existing activity may migrate southward to Woolleys Beach South and/or be displaced to other locations <sup>238</sup>.

This conclusion led to the following recommendation being translated into the exhibited mitigation measure:

In consultation with Crib Point Stony Point Committee of Management Inc. and the community, identify a suitable foreshore location to accommodate activity displaced from Woolleys Beach North. Develop comparable recreational infrastructure to that found at Woolleys Beach North at the replacement site, as required <sup>239</sup>.

The IAC's reading of Appendix M is that the mitigation measure was intended to address the amenity impacts and consequent loss of open space utility that would result from the Project, including noise, lighting and visual impacts. Despite the Proponent's submissions, it was not based on a perceived lack of physical access.

The IAC agrees with the EES, experts and many submitters that the open space utility of Woolleys Beach North will be unacceptably impacted by the Project and that it would be appropriate to provide an alternative site. Despite Mr Boushel's observations about the extent of the impacts, he agreed with Ms Rosen they warranted a mitigation measure.

Whether or not this is possible and how it might be done are matters for the Proponents to discuss with the Foreshore Committee and other stakeholders, but it should be retained as an EPR. The EPR should require the associated costs are borne by the Proponents and funded separately to the proposed community fund included as EPR-SO02.

To facilitate this, the IAC has included the following EPR in Appendix G:

#### **Woolleys Beach North**

Consult with the Crib Point Stony Point Foreshore Committee of Management Inc., stakeholders and the community to identify a suitable foreshore location and provide appropriate recreational infrastructure that accommodates activity displaced from

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<sup>238</sup> EES Technical Report M, page 3

<sup>239</sup> EES Technical Report M, page 60

Woolleys Beach North (immediately south of the Jetty). All costs are to be borne by the Proponent and are to be funded separately from the Community Fund.

In reaching these conclusions, the IAC expects the existing picnic area would be retained given access to the associated beach area is important for groups such as the Victorian Sea Kayak Club (S995). The purpose of the EPR is to identify an additional site that would have an acceptable level of amenity for general community use.

#### **16.4.4 Findings**

The IAC finds:

- The Project will have unacceptable amenity impacts on the recreational utility of the picnic area at Woolleys Beach North (to the immediate south of the Jetty).
- The Proponents should fund the investigation and possible provision of a suitable alternative facility elsewhere in the Woolleys Beach Reserve.

#### **16.4.5 Recommendation**

##### Environmental Performance Requirements

**Include the following changes:**

- **New EPR-SO07 (Woolleys Beach North)**

This change is included at Appendix G.

### **16.5 Whether mitigation can be managed**

#### **16.5.1 Background**

The exhibited EES included several mitigation measures in relation to social impacts, which in summary primarily related to:

- consultation for information and inquiries
- access and recreational activity at Woolleys Beach
- sourcing of local workers
- a community fund
- stakeholder engagement management strategy
- complaints management system.

The proposed mitigation measures were discussed and amended during the course of the Hearing, and there was particular emphasis on EPR SO05, which related to a proposed community fund of \$7.5 million if the Project proceeded. Interestingly, that figure was not included in the relevant EPR.

#### **16.5.2 Evidence and submissions**

In discussing the social effects of the Project, the Proponents noted ‘tangible’ social impacts can be measured and managed by the EPRs relating to environmental impacts, and ‘intangible’ impacts in essence related to perceptions and fears were not supported by the evidence.

At the Hearing, Mr Boushel provided further recommended changes to the mitigation measures, including in relation to noise monitoring, further consultation, sourcing local workers for employment opportunities and improvements to the complaints management system. These were generally accepted by the Proponents.

As noted, Mr Boushel gave evidence about intangible social impacts such as fear, psychological concerns and the perceived threat of safety and risk. He noted the concern about the Project in the community and the level of uncertainty about what is proposed. Mr Boushel indicated the mitigation measures would allay some of those fears, and noted these allow for discussion, access to monitoring information and inquiries. He said:

During construction, this information will address some of the community's fears, however it is likely that many of these concerns will persist until the community can witness first hand the operation of the project and demonstration that the environmental and safety controls are sufficient <sup>240</sup>.

Many submitters did not share that view. Ms Rosen built on this, as did the submissions of the CEG.

While Mornington Peninsula did not call social impact evidence, Ms Morris questioned Mr Boushel about the scope and operation of the community fund in the context of social disadvantage of Hastings and Crib Point. In that regard, Mr Boushel affirmed his opinion the operation of the fund should be in concert with Council and the community to ensure it realises defined community benefits.

Mornington Peninsula conceded the Project will provide employment opportunities, and said:

The vast majority of these are, however, short term construction jobs. While the provision of extra employment is always a positive outcome, the temporary nature of the jobs means that they do not provide long term benefits with the build period being estimated at 18 – 24 months. In terms of ongoing employment, the Project will employ relative few people – in the order of 40 persons <sup>241</sup>.

In relation to the community fund, the CEG submitted there could be no certainty that the proposed community fund:

- a. is sufficient to provide for those works and measures required to mitigate social impacts, both in the context of the EES SIA not identifying what those social impacts will be, and in the context of not knowing what is to be provided to mitigate them;
- b. is to be managed and disbursed in a manner which will achieve effective mitigation <sup>242</sup>.

### 16.5.3 Discussion

The IAC agrees with the Proponents and most submitters that the operational phase of the GIJW is the most contentious aspect of the Project in terms of social impacts. In relation to the EPRs, the IAC considers that while they may go some way to assist in mitigation, they would not mitigate the social and other impacts of the Project in a manner that can resolve all concerns.

The IAC deals with each of the mitigation measures in turn.

#### (i) Consultation for information and inquiries

This EPR was amended in response to the evidence of Mr Boushel and the IAC is comfortable with the revised version.

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<sup>240</sup> D82, paragraph 113

<sup>241</sup> D426, paragraph 75h

<sup>242</sup> D426, paragraph 228

## **(ii) Sourcing local workers**

While the original EPR noted local workers will be sourced for employment, Mornington Peninsula and the CEG, amongst others, considered the EPR to be too vague. Both suggested expanding it to be clear there will be a specific plan to procure such workers, and that workers could be drawn from the whole Shire, rather than the loosely defined ‘local’ area.

While the IAC supports that change, it considers the final sentence relating to reporting back ‘... via one of the reporting mechanisms already proposed for the Project’ to be vague. The IAC recommends this be amended to be more specific and read ‘Provide a status report on the employment of local workers to Council and in the Stakeholder Engagement Management Strategy on an annual basis for the construction phase of the Project and then annually for its first five years of operation’.

## **(iii) Community fund**

As part of its RFI, the IAC directed the Proponents to provide further information to explain how the proposed community fund would be realised and how consultation with landowners proximate to the Jetty works was undertaken. These were addressed through the evidence of Mr Boushel in TN8 and TN14.

There was significant discussion about this fund and how it would operate. While Council and others supported the fund if the Project proceeded, there were differing opinions about how it should operate. The Proponents advised that:

In addition, AGL has made a commitment to a Community Fund of \$7.5 million to be managed by a panel of community-based representatives if the Project proceeds. The fund would be established as a mechanism for sharing some of the benefits of the Project with the local community, particularly the townships of Crib Point and Hastings.<sup>243</sup>

Three key issues need to be resolved here. Firstly, the figure of \$7.5 million does not appear in the EPR, secondly, there is no guidance about the timing of this and thirdly, such a fund would require careful and inclusive management.

Taking the third point, most of the discussion relating to this fund at the Hearing was about its implementation. Some submitters suggested actioning of the fund could be likened to a ‘bribe’, but putting that to one side, many submitters suggested it could cause tension in the community if funds were allocated to particular organisations or groups. The Proponents were cognisant of that position and tried to work through it. However, the EPR leaves the issue wide open, and it relies on:

- identifying which community stakeholders should be involved in the allocation of fund decision making
- how it is to be managed
- what projects should be the recipients of funds.

The first and second issues relating to security of the fund and how it is to be expended are also unresolved. The Proponents agreed to funding an independent facilitator to help manage the fund, at its (the Proponents) expense.

The IAC recommends a number of changes to EPR SO05 that:

- the figure of \$7.5 million is included in the EPR

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<sup>243</sup> EES Chapter 18, page 18-9

- include relevant Council input (for example, this could be its community development team) as part of the decision making process for the fund
- determine that the fund should commence as soon as all permissions are granted to commence the construction works
- separate to the \$7.5 million fund, the Proponents fund an independent facilitator to work with the Crib Point and Hastings communities to establish a Committee of Management to manage that fund
- the Committee of Management could then determine how the annual funds should be expended, assuming it will occur over a 5 to 10 year period (although that would be up to those managing it).

#### **(iv) Stakeholder engagement and complaints management strategies**

Should the Project proceed, these are good initiatives, and most are supported. One of the issues raised by the community (and by other communities for major projects) is the lack of clarity about who is responsible for such a strategy and for ensuring follow up. Stakeholder engagement is often tied in with complaints management and the IAC considers that a relevant heading and a hyperlink be included in the Stakeholder Engagement Management Strategy to ensure the complaints management system can be better accessed. The complaints management system is a key component of the overall stakeholder management strategy. The IAC has recommended changes to the EPR accordingly.

Further, the EPRs should be renumbered from SO01 to SO05 as follows:

- SO01 Consultative mechanisms for information and enquiries
- SO02 Consultation on recreational activity at Woolleys Beach
- SO03 Source local workers
- SO04 Community fund
- SO05 Stakeholder Engagement Management Strategy
- SO06 Complaints management system.

#### **16.5.4 Findings**

The IAC finds:

- If the Project proceeds, the EPRs should be amended and adopted as recommended in Appendix G.

#### **16.5.5 Recommendations**

The IAC recommends:

##### Environmental Performance Requirements

**Include the following changes:**

- **Consequential renumbering of the SO EPRs**
- **Revise EPR SO03 (Source local workers)**
- **Revise EPR SO04 (Community fund)**
- **Revise EPR SO05 (Stakeholder Engagement Management Strategy)**

These changes are included at Appendix G.

#### **16.6 Social conclusions**

The IAC concludes that:

- The social impacts are generally consistent with the draft evaluation objectives.
- The tangible social impacts can be acceptably mitigated but the intangible impacts less so.
- There are no social impacts that preclude the Project being approved.

## 17 Business

### 17.1 Introduction

Business effects were discussed in EES Chapter 19 and Technical Report N.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

The Business Impact Assessment (Technical Report N) covered the three directly affected municipalities (Mornington Peninsula, Casey and Cardinia) and the Western Port marine environment<sup>244</sup>. Within this broader area, the assessment largely focussed on Hastings and the associated commercial areas. It noted an earlier pipeline alignment through Hastings (along the Frankston-Flinders Road) had been shifted to the Stony Point rail corridor to minimise construction access issues for existing businesses.

The EES proposed two '*business*' mitigation measures (EPRs) relating to:

- implementing a stakeholder engagement management strategy
- realigning the pipeline alignment through Hastings along the Stony Point rail corridor.

The CEMP Appendix J included a control relating to sourcing local materials and labour, while Appendix D provided a complaint management process.

Table 15 lists the business evidence that was provided.

**Table 15 Business evidence**

Party	Expert	Firm	Area of expertise
Proponents	Mr McNeill	Ethos Urban	Economics
Bass Coast	Mr Moore	EarthCheck	Tourism

Mr McNeill provided a supplementary report (D496) following his inspection of Hastings and Crib Point, in which he confirmed his initial evidence report.

### 17.2 Key issues

The key issues are:

- The business impacts resulting from the construction and operation of the Project.
- The employment impacts of the Project.
- The tourism impacts of the Project.

### 17.3 General business impacts

#### 17.3.1 Background

EES Chapter 19 and Technical Report N assessed the potential impact on '*non-agricultural*' businesses. The assessment involved consultation with business stakeholders, together with risk and impact assessments. It focussed on businesses within Hastings and construction

<sup>244</sup> Technical Report N, page 6

impacts related to traffic, access and amenity issues. The assessment concluded the Project would satisfy the draft evaluation objective.

### **17.3.2 Evidence and submissions**

Mornington Peninsula and Bass Coast acknowledged the Project would provide employment opportunities and agreed this would be a positive outcome. However, they noted the majority of these opportunities would be short term construction jobs and there will be few ongoing jobs. They submitted these employment opportunities did not outweigh the disbenefits of the Project.

Cardinia submitted Technical Report N should have assessed the possible impacts on businesses within the PML, particularly the impacts on agriculture.

Some submitters raised concerns about various amenity and access issues that might affect business operations during construction. Other submitters raised concerns about potential impacts on tourism and agricultural businesses (see Chapters 17.4 and 18). A number of organisations and businesses raised concerns about environmental damage within Western Port Bay and the possible impacts on commercial and recreational fishing. (see Chapter 4.3)

Some submitters supported the Project on the basis it would create employment opportunities and contribute to energy security.

The Proponents submitted the EES had adequately addressed business impacts, including agricultural and non-agricultural impacts. They submitted business impacts post-construction would be negligible and construction impacts on non-agricultural businesses would be minimal.

The Proponents highlighted the revised alignment through Hastings would minimise construction impacts on businesses.

They submitted the Project would bring employment and economic benefits to the local area, in addition to the contribution it would make to the State economy through the augmentation of Victoria's gas supply. The PHDA submitted the Port is a significant local employer and that this would increase if the Project proceeded.

The Proponents relied on peer review evidence of Mr McNeill who reviewed EES Chapter 19 and Technical Report N. Mr McNeill's assessment led him to conclude that:

- The Project is unlikely to cause adverse impacts of an unacceptable level during construction or operation.
- EES Chapter 19 and Technical Report N satisfactorily address business impacts.
- The Project includes various features (utilising the rail corridor through Hastings, the use of HDD, minimising the number of businesses impacted at any one time and regular stakeholder consultation) that will limit construction disturbance to an acceptable level.
- The underground pipeline (excluding the above ground MLV and PDF infrastructure) will have minimal operational impact.

Mr McNeill noted Technical Report N did not address regional tourism impacts or the positive business impacts associated with the construction and operation of the Project. He concluded the proposed mitigation measures were satisfactory.

### 17.3.3 Discussion

#### (i) Construction impacts

Business impacts during construction of the Project are likely to be more prevalent for the pipeline element, rather than the Jetty works, given the geographic extent of the pipeline and the likely disruption associated with laying the pipeline. This is particularly so where the pipeline route traverses commercial and other urban areas in and around Hastings.

In order to minimise these impacts, the Proponents proposed various mitigation measures, including:

- Shifting the pipeline route through Hastings from along the Frankston-Flinders Road to the Stony Point rail corridor in order to minimise access disruption to existing businesses (reflected in the exhibited pipeline route maps).
- Proposing a stakeholder engagement management strategy, including the participation of *'adjoining, affected landowners, businesses and other community groups'* (EPR-SO04).

Other relevant mitigation measures include:

- EPR-SO05 Complaints management system
- EPR-TP Stakeholder consultation on transport changes.

The IAC agrees the realigned route through Hastings will reduce business access issues and is satisfied that other business impacts can be managed through the recommended EPRs.

Business impacts associated with the GIJW will be more confined and will likely be limited to additional road traffic over the construction period. These impacts will not be significant and can be effectively managed through the recommended mitigation measures.

#### (ii) Operational impacts

Business impacts arising from the pipeline element of the Project will be minimal given that it largely underground. Above ground pipeline infrastructure, such as the MLVs and PDF, will have minimal impact given they are located in agricultural, rather than urban areas, and are of relatively small scale. Nevertheless, some submissions raised site specific pipeline issues (see Chapter 20).

In an overall sense, the operation of the CPRF and FSRU are expected to have minimal business impacts given their confined location and distance to commercial areas, however many submissions raised issues related to tourism, agricultural and fishery businesses.

Cardinia submitted the Business Impact Assessment should have considered the broader area within the PML rather than just the areas immediately adjacent to the pipeline. Land use impacts of the PML are discussed in Chapter 15, in which the IAC noted the area of impact is largely confined to the 50 metre notification area either side of the pipeline, rather than the broader PML.

#### (iii) Employment impacts

The Proponents advised the Project is expected to employ more than 500 workers at the peak of the construction phase, with the majority of the construction workforce being specialists sourced from elsewhere in Victoria and interstate. They advised that the Project, when

operational, would create 40 permanent positions at Crib Point, although the number was expected to be greater given the need for rotating shifts for some roles <sup>245</sup>.

The Proponents proposed to develop ‘*a local procurement plan that focuses on Mornington Peninsula Shire, with targets for local employment and social procurement for the project and its contractors*’ <sup>246</sup>.

The IAC agrees with Mr McNeill these employment opportunities would be a positive business impact, and there will be opportunities to support local businesses. However, the IAC notes most jobs would be short term construction jobs and operational employment would not be significant.

### **17.3.4 Findings**

The IAC finds:

- Business impacts during the construction and operation of the Project will be limited and can be appropriately managed.
- The Project will generate local employment and opportunities for local businesses, although this will be focussed on the Project’s construction rather than its operation.

## **17.4 Tourism**

### **17.4.1 Background**

The only references to tourism in EES Chapter 19 and Technical Report N noted there are tourism developments in Mornington Peninsula and the Victorian Maritime Centre opposite the Crib Point Jetty is a tourist attraction. Technical Report L included some reference to tourism policies but did not provide a tourism impact assessment. This was despite the Scoping requirements specifically identifying the ‘*Potential for project works and operations to affect business (including farming and tourism) ...*’ as a key issue <sup>247</sup>.

As many submitters noted, the coverage of tourism issues in the EES was inadequate.

The Proponents relied on the economic evidence of Mr McNeill who responded to tourism issues raised in submissions, but his assessment of possible tourism impacts was limited in scope and detail, and consequently not as helpful as a more thorough analysis as part of the EES might have been.

### **17.4.2 Evidence and submissions**

Mornington Peninsula and Bass Coast expressed concerns about ‘*the lack of significant consideration given to potential regional tourism impacts*’.

Bass Coast relied on the evidence of Mr Moore who highlighted the significance of tourism, particularly nature-based tourism to the Phillip Island tourism region, including policy support at local, regional, State and Commonwealth levels. He noted the EES overlooked potential impacts outside the Project area, including impacts within Bass Coast and Phillip Island.

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<sup>245</sup> EES Chapter 2, page 2-43

<sup>246</sup> EPR-SO02

<sup>247</sup> Scoping requirements for the Gas Import Jetty and Crib point to Pakenham Gas pipeline EES, page 17

Mr Moore identified two potential impact types associated with the Project:

- Reputational risk, particularly in terms of the region’s status as a nature-based destination.
- Environmental damage that would directly harm the environmental assets on which tourism is based.

In relation to reputational risk, Mr Moore highlighted the impact of negative news cycles associated with the Project and possible impacts on tourism branding and positioning this might have. He cited recent environmental degradation of the Great Barrier Reef and resource development in northern Queensland as examples of how reputational damage can impact tourist visitation.

In relation to environmental damage, Mr Moore conceded that assessing the risk of environmental damage was outside his area of expertise but gave examples of where environmental accidents had impacted on tourism.

Mr Moore concluded the EES failed to adequately address possible tourism impacts, particularly within the broader region. In this context, he recommended that:

- The scope of the EES should have included Bass Coast Shire.
- The EES assessment should address regional tourism, including reputational risk and detrimental environmental impacts, including modelling and sentiment testing.

Other submitters, such as Save Westernport raised concerns about possible tourism impacts resulting from ‘*industrialisation*’ of the region, particularly damage that might be done to the local tourism ‘*brand*’, including the tourism values of the Mornington Peninsula, Phillip Island and French Island. The Mornington Peninsula Vignerons’ Association Incorporated (S1479) and S23, for example, expressed concerns about possible negative impacts on the tourism, hospitality and wine industries on the Mornington Peninsula, while FICA (S3197) submitted the Project would harm the natural values that attract tourists to French Island. Other submissions expressed concerns about potential impacts on Phillip Island tourism.

The Proponents disputed Mr Moore’s findings on the basis he had ignored the existing conditions of the Port, including the storage and shipping of hazardous materials since the 1970s. They submitted these activities had co-existed with the growth of regional tourism, including nature-based tourism, and noted the Phillip Island and San Remo Visitor Economy Strategy 2035: Growing Tourism 2016 did not mention the Port’s existing function or identify as a tourism constraint or threat<sup>248</sup>.

The Proponents submitted Mr Moore’s concerns about ‘*reputational risk*’ were ‘*speculative at best*’ and all tourist areas have to manage such risks, including those in proximity to ports, airports and industry.

In relation to environmental damage, including oil spills from shipping, the Proponents agreed these impacts could be significant, but submitted they were a low probability. They noted that existing shipping movements (including cruise ships) represented a risk and that shipping numbers could increase significantly without any approvals being required and in addition to this project.

Mr McNeill supported the Business Impact Assessment in the EES, although he agreed it did not address the broader regional tourism issues raised by Bass Coast and others. He

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<sup>248</sup> Adopted by Bass Coast in August 2016 and prepared by EarthCheck Pty Ltd

acknowledged the significant contribution tourism makes to the local and regional economies and agreed with Mr Moore's observations about this. Mr McNeill's review of the Business Impact Assessment and potential tourism impacts led him to note that:

- Potential impacts are likely to be restricted to the Gas Import Jetty works area. As much of the Gas Pipeline will be located underground, the impact on regional tourism can be expected to be negligible.
- The Port of Hastings is an established and operational port facility, and the Crib Point Jetty is presently used by other vessels on a regular basis. The port's existing and future function is supported in local and state policy.
- The majority of tourism activity on the Mornington Peninsula is located some distance from the Gas Import Jetty works area.
- In terms of the potential for landscape and visual impacts, I refer to Chapter 14 of the EES (Landscape and visual) and Technical Report I: Landscape and visual Assessment, the risk assessment contained therein, and the proposed mitigation measures <sup>249</sup>.

On the basis of this assessment, Mr McNeill did not support the further work recommended by Mr Moore and concluded that the Project is '*unlikely to result in a material risk to the regional visitor economy*'.

### 17.4.3 Discussion

Mr Moore's concerns about '*reputational risk*' were focussed on negative perceptions of the Project, particularly through negative news coverage and broader concerns about the environmental impacts that many submitters anticipated. These concerns were largely focussed on operation of the FSRU and to a lesser extent the additional shipping movements associated with the LNG carriers. The pipeline works were not specifically raised as a tourism concern.

The IAC agrees reputational risk is a relevant consideration and acknowledges the Project has received significant negative media coverage and is opposed by many in the community. However, it believes the likely or potential impacts on the region's tourism reputation or brand have been overstated by some submitters.

Firstly, the Crib Point element of the Project (including the FSRU and additional shipping) is broadly consistent with the function and reasonable expectations about the operation of a State significant port that has a 40 year history as a hub for importing, exporting and storing fuel. In light of this, it seems unlikely that people's perceptions of the Port and its influence on tourism will change markedly if the Project proceeds. As the Proponent's noted, the existence of the Port does not seem to have been a constraint on regional tourism in the past and there is no clear basis on which to expect this would change significantly in the future.

Secondly, the IAC was not presented with any empirical or survey evidence that negative media reporting or public perceptions of the Project had or would influence travel or holiday preferences or had diminished the region's tourism reputation. Although Mr Moore cited examples of other areas where tourism visitation might have decreased in response to environmental issues, it is not clear they are directly relevant or comparable to this Project.

Mr Moore's second area of concern related to the tourism consequences of potential environmental damage, particularly significant events such as large scale oil spills. This is an understandable concern shared by many and noted by the Proponents. Their view was that

while the consequences of such an event could be significant, the probability was low. They noted that many of these risks currently existed given the existing ship movements in the Port and nature of the cargo that many ships carried.

In assessing this issue, the IAC had regard to the EES safety, hazard and risk assessment and the relevant evidence as discussed in Chapter 14 <sup>250</sup>. The IAC had regard to the operational elements of the Project, particularly the FSRU, and their potential environmental impacts.

On balance, the IAC is satisfied the risks of a significant environmental event are limited and notes many of these risks already exist because of the nature and operation of the Port.

Submitters raised concerns about the visual and landscape impacts of the FSRU and additional shipping in the tourism context. As discussed in Chapter 12, the IAC acknowledges the FSRU will be a visible element of the local landscape, particularly at night time, and from some viewpoints. However, the IAC does not believe it will become a dominant feature as feared by some or that its visibility will have any discernible impact on tourism. Similarly, the IAC does not consider the additional shipping movements would be problematic given the increase would be relatively minor and shipping numbers could increase (or decrease) regardless of the Project. It is not clear that ships in a port, including the cruise ships that anchor off Cowes, are universally viewed as a poor landscape or tourism outcome.

#### **17.4.4 Findings**

The IAC finds:

- Tourism, including nature-based tourism, is a significant contributor to the local and regional economies.
- The EES had inadequate regard to possible impacts on local and regional tourism.
- The construction and operation of the Project are not expected to have discernible impacts on local and regional tourism, including nature-based tourism.
- Environmental accidents, such as large scale oil spills, would have significant tourism impacts but have a low probability of occurring.

#### **17.5 Business conclusions**

The IAC concludes that:

- Business impacts are consistent with the draft evaluation objective.
- Business impacts can be acceptably managed through the recommended mitigation measures.
- There are no business impacts that preclude the Project being approved.

## 18 Agriculture

### 18.1 Introduction

Agriculture effects were discussed in EES Chapter 20 and Technical Report O. Additional material was provided in TN04, TN11 and TN17.

The consideration of agriculture impacts was focussed on the proposed pipeline construction and operation. The GIJW would not impact on agricultural land. Other chapters relevant to agricultural impacts include Chapter 17 Business with respect to agricultural business activity and Chapter 21 Pipeline route options and site specific submissions.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

No evidence specific to agriculture was presented to the IAC. Table 17 lists evidence that has some relevance to agriculture.

**Table 16** Agriculture related evidence

Party	Expert	Firm	Area of expertise
Proponents	Mr McNeill	Ethos Urban	Economics
Proponents	Mr McBride-Burgess	Contour	Pipeline Planning

### 18.2 Key issue

The key issue is:

- The potential loss and disruption of agricultural land and production.

### 18.3 Loss and disruption of agricultural land and production

#### 18.3.1 Background

The EES described the pipeline alignment as affecting approximately 173 hectares of agricultural land within Melbourne’s inner food bowl between Crib Point and Pakenham <sup>251</sup>. Along the pipeline alignment, there is a mixture of land uses predominantly agriculture for grazing, beef, dairying, cropping and equine uses. There are some capital-intensive enterprises such as broiler production based in sheds.

There are three different soil associations along the pipeline alignment:

- Bittern Association
- Dalmore Heavy Clay Association
- Narre Association <sup>252</sup>.

Each soil association supports various agricultural activities along the pipeline alignment and has significantly different profile textures, nutrient status and drainage characteristics requiring specific treatment methods during rehabilitation of soil disturbance.

<sup>251</sup> The inner food bowl is part of the peri-urban land area surrounding metropolitan Melbourne and contributes to fruit and vegetable production.

<sup>252</sup> Refer to Figure 20-1 in Chapter 20, Volume 2 of the EES.

North of the South Gippsland Highway, the pipeline alignment traverses the Koo Wee Rup-Longwarry Flood Protection District. This area is recognised in both the Casey and Cardinia Planning Schemes as highly productive agricultural land. Intensive cropping occurs within this area, including asparagus growing. The pipeline alignment has attempted to avoid the intensive higher-value vegetable growing areas, although some areas are affected.

The EES identified the following agricultural issues associated with the construction and operation of the pipeline:

- temporary removal of agricultural land from production
- restricted access to land
- loss of production from disturbance (such as dust or noise)
- facilities and capital improvements loss
- drainage and irrigation impacts
- biosecurity
- adequacy of rehabilitation.

The EES indicated the pipeline alignment has been progressively refined resulting in a reduced footprint affecting approximately 118 hectares of agricultural land, including 2.79 hectares of intensively higher-value agricultural land. The former represents 0.03 per cent of Melbourne's inner food bowl and the latter represents 0.06 per cent of land identified for seasonal vegetable production in the inner food bowl.

The EES described that temporary removal of agricultural land from production or restriction on access due to construction would be minimised through the selection of a pipeline alignment that avoided intensive higher-value agricultural land and minimised diagonal passage through landholdings. Where possible, the construction ROW would follow roadways, drainage reserves, existing easements and property boundaries. Where impacts are unavoidable, the EES outlined that compensation for the pipeline easement would address any temporary removal of agricultural land from production or restriction of access where direct losses were caused by the pipeline. Compensation would be agreed and paid directly to affected landholders under the *Pipelines Act* and *Land Acquisition and Compensation Act* as appropriate.

### **18.3.2 Evidence and submissions**

Casey and Cardinia raised concerns regarding disruption to farming activity, additional costs to farmers due to interruption of access to farms where the pipeline would cross properties and lack of consideration to impacts on farming diversification or future changes to farming practices. Most of these concerns were based on construction and operation of the pipeline where it diagonally crosses farm paddocks.

Other submitters such as S1303, S1305 and S1309 and S3777 expressed concerns over easement acquisition and compensation processes.

The Proponents submitted these impacts have been minimised through careful alignment of the pipeline. They considered this has largely occurred through locating the pipeline within or adjacent to existing pipeline corridors and along property boundaries or in road reserves. Direct impacts would be mitigated by compensation and through property management plans developed in consultation with landowners and occupiers.

The Proponents submitted in instances where properties have been diagonally crossed, benefits from a shorter construction time with less disturbance and less noise, dust and restrictions on access would be achieved.

In response to concerns over potential restrictions to current farming activity and future changes to farming practices such as infrastructure construction or introduction of cropping activity, the Proponents considered the Project would not have significant effects. They referred to Technical Report O and the evidence of Mr McNeill and Mr McBride-Burgess, suggesting the pipeline crossing of agricultural land has little impact on ongoing agricultural viability for current or future farmers. Grazing activities and cropping activity, which usually occurs to a depth of 0.3 metres would continue without restriction.

Technical Report O concluded that provided soil reinstatement is appropriately undertaken, no ongoing loss of production is expected to occur. The report acknowledged, however, that future agricultural uses may be impacted by restrictions on what can occur over the pipeline easement. A line of sight is required to be maintained between pipeline markers which would mean structures that restrict these sight lines would not be allowed. Further, tree roots and heavy items can damage the pipeline and the landowners would need to maintain access to the easement for maintenance and operational purposes.

Future changes to farming operations could be restricted where deep cultivation is proposed. Deep cultivation is typically defined as digging to a depth greater than 0.5 metres and would only apply to specialised crops or instances where it was considered necessary to mechanically dig to a greater than normal depth. Technical Report O and the Proponents recognised cultivation within the pipeline easement to a depth of 0.9 metres can typically continue to take place under the supervision of the pipeline operator. Fences, minor tracks and shallow drains are generally permitted to be constructed on the pipeline easement and are consistent with the continued use of land for agricultural purposes. Again, restrictions on constructing structures within the easement that may limit future expansion of farming operations would be subject to the compensation process.

### **18.3.3 Discussion**

The IAC acknowledges that having farming land dug up for laying a pipeline across or along a paddock would be a concern to landowners and would disrupt farming activity, albeit on a temporary basis. The IAC notes the EES did not attract many submissions from affected farmers about pipeline issues, suggesting any concerns were not overly significant or consultation had satisfactorily addressed issues.

In addition to concerns expressed in submissions, the IAC understands there are biosecurity risks of transmission of pathogens and weeds from one property to the next by construction machinery and the inconvenience of a farmer having to wait until works are completed to get back to running the whole of their farm. There is concern about whether the land will be as productive post-construction and the effectiveness of reinstatement of the soil.

Another issue relates to landowners having a restrictions placed on their land with the pipeline easement and potential frustration in having to seek permission to construct buildings, works or to use the land affected by the easement and liaise with the pipeline operator.

Despite concerns about the impacts to agriculture from construction and operation of the pipeline, the IAC is satisfied they will not be overwhelming to the detriment of being able to continue to farm.

Impacts will not be ongoing or long term as the works will be temporary and of a short duration. The IAC agrees landowner agreements will be important to ensure appropriate arrangements can be temporarily put in place to minimise the extent of disruption and loss of productivity. This includes provision of alternative access arrangements to manage or exclude stock during construction.

There will be paddocks that are crossed diagonally because of the nature of linear construction associated with laying a pipeline. It may be that in balancing competing matters and policy issues, the alignment of the pipeline will need to run through farmland due to the importance of avoiding or minimising environmental impacts from removal of native vegetation or threatened species habitat. It may not always be possible to run the alignment along property or paddock boundaries or within road reserves as these often contain infrastructure and areas of both native vegetation and planted vegetation needed for biodiversity and farming sustainability. The IAC sees value in the Proponents continuing to work with landowners to achieve this balance.

Further landowner-specific biosecurity control measures to mitigate the movement of soil and plant materials between properties and in particular for cropping areas and broiler farms will require ongoing liaison.

The IAC considers an important mitigation measure will be soil reinstatement and rehabilitation following pipeline construction to ensure that soil productivity can be adequately reinstated, and ongoing impacts avoided and minimised.

Appendix C in Technical Report O of the EES includes useful guidance on excavation and soil reinstatement that recognises that although the three soil associations along the pipeline alignment will be subject to common excavation practices, reinstatement will need to be tailored to each soil association.

The IAC notes the soil separation, topsoil retention and reinstatement works, and post-construction monitoring described in TN11 as appropriate with regards to the POS. However, the IAC considers the recommended Part 'b' of the exhibited mitigation measure MM-RH01 from the EES relating to '*a specific rehabilitation method for each soil association based on soil testing of the different soil associations to determine their nutrient and physical characteristics*' should be included in POS R2.

#### **18.3.4 Findings**

The IAC finds:

- The impacts on agriculture would not be significant, subject to ongoing collaboration and liaison with landholders.
- The impacts on agriculture are acceptable subject to the recommended CEMP and POS and subject to amending POS R2 to include reference to a specific rehabilitation method for each soil association.

#### **18.3.5 Recommendations**

The IAC recommends:

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following changes:**

- **Revised R2:**

**Reinstate stockpiled topsoil and sub soils to depths consistent with the original soil horizons.**

**Reinstate soils using a specific rehabilitation method for each soil association as agreed with the landholder, based on soil testing of the different soil associations to determine their nutrient and physical characteristics.**

**Inspect imported fill before use for insect pests and weeds.**

## **18.4 Agriculture conclusions**

The IAC concludes that:

- Agriculture impacts are consistent with the draft evaluation objective.
- Agriculture Impacts can be acceptably managed through the recommended mitigation measures.
- There are no agriculture impacts that preclude the Project being approved.

## 19 Heritage

### 19.1 Introduction

Heritage effects were discussed in EES Chapters 21 and 22, and Technical Reports P and Q. Additional material was provided in TN23.

The relevant draft evaluation objective is:

**Cultural heritage** - To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.

Table 18 lists the heritage evidence that was provided.

**Table 17** Heritage evidence

Party	Expert	Firm	Area of expertise
Proponents	Ms Nicholson	Ecology and Heritage Partners Pty Ltd	Heritage
BLCAC	Mr Ogden	BLCAC	Aboriginal cultural heritage
BLCAC	Dr Tutchener	BLCAC	Aboriginal cultural heritage
BLCAC	Mr Ward	BLCAC	Aboriginal cultural heritage

There are specific EPRs and Pipeline CEMP POS in relation to Aboriginal cultural heritage and historic cultural heritage.

### 19.2 Key issues

The key issues are:

- The adequacy of Technical Report P and lack of draft or approved Cultural Heritage Management Plan (CHMP)s.
- The extent to which the assessment of Aboriginal cultural heritage impacts has had regard to intangible heritage and the broader geographic area where impacts might occur.
- The adequacy of consultation mechanisms to advance the CHMPs that involve the BLCAC and Aboriginal Victoria in the design and construction of the Project.

### 19.3 Aboriginal cultural heritage

#### 19.3.1 Background

Three CHMPs are being prepared for the Project in accordance with section 49 of the *Aboriginal Heritage Act*. This Act requires where an EES is required, the proponent must, before commencing the works, prepare a CHMP for the area in which the works are to be carried out. The CHMPs will be the principal mechanisms for achieving compliance with the cultural heritage draft evaluation objective.

The EES included a range of mitigation measures, expressed as EPRs and CEMP controls, relating to implementing the CHMPs, various construction and salvage requirements and consultation.

**Table 18 Cultural Heritage Management Plans**

CHMP	Area	Registered Aboriginal Party (RAP)	Sponsor	Assessment level
15383	Pipeline works Crib Point to Tooradin	BLCAC	APA Transmission Pty Ltd	Complex
15384	Pipeline works Tooradin to Pakenham	No RAP Aboriginal Victoria is the evaluating body	APA Transmission Pty Ltd	Complex
16300	GIJW Crib Point Jetty	BLCAC	AGL Wholesale Gas Limited	Desktop

The CHMPs have not been finalised, although draft CHMPs are in the process of being prepared. The BLCAC indicated that CHMPs 15383 and 16300 were not yet at the draft stage and did not believe that they should be provided to the IAC<sup>253</sup>. In recognition of this, the IAC did not request copies of draft or associated CHMP documentation.

In response to questions from the IAC about the CHMP approval process and its relationship with the EES, the Proponents advised that:

- CHMPs 16300 and 15383 could be approved by the Registered Aboriginal Party (RAP) (BLCAC) before the EES is assessed by the Minister.
- Aboriginal Victoria cannot make a decision in relation to the approval of CHMP 15384 until after it has considered the Minister for Planning’s assessment of the EES<sup>254</sup>.

The Proponents advised their intention would be to progress all three CHMPs in parallel with the EES process, to the point where they can be approved upon release of the Minister’s assessment.

### 19.3.2 Evidence and submissions

The BLCAC relied on the evidence of its three experts and submitted:

- The archaeological assessments relied on in the EES contain numerous errors and are incomplete.
- The assessments are focussed on tangible cultural heritage and have little regard to intangible cultural heritage.
- Western Port Bay is culturally important to the Bunurong people.

Mr Ogden gave evidence about what the Project area and the surrounding land and waters mean to Bunurong people and whether there are particular cultural heritage risks or issues that arise from the Project.

Mr Ogden concluded the cultural heritage assessments that would underpin the CHMPs were incomplete, they require further work and are too focused on a narrow understanding of heritage. He recommended:

<sup>253</sup> TN23

<sup>254</sup> D404

- The assessment of impacts on Bunurong cultural heritage must be properly completed.
- The assessment should include tangible and intangible places.
- The assessment should consider broader cultural heritage impacts, including how Bunurong people understand their lands and waters.

Mr Ogden agreed these recommendations could be achieved through further investigations and consultation with the BLCAC.

Dr Tutchener gave evidence about the ethnocultural record of the Bunurong and their use and occupation of land and waters in the vicinity of the Project, including Western Port Bay and French Island. He discussed issues and deficiencies associated with the EES, including Technical Report P.

Dr Tutchener noted analysis of tangible heritage was yet to be completed and recommended there be further analysis of potential impacts to intangible heritage before the CHMPs are approved. He noted this analysis would inform an appropriate risk assessment and could be achieved through further consultation with the BLCAC.

Mr Ward gave evidence about:

- Sites and places in the broader area of the Project and the antiquity of those places.
- The sites and places are currently identified within the pipeline alignment and/or Project area.
- The adequacy of assessment undertaken in support of the EES, particularly Technical Report P.
- Particular risks or sites at risk.

Mr Ward advised the background information in support of Technical Report P was incomplete and the assessment should have considered the broader Western Port Bay area, including further consideration of potential impacts on coastal sites through coastal erosion. He believed consultation with the BLCAC about proposed management conditions had been inadequate.

Mr Ward provided advice on various sites that had not been discussed or had been inadequately addressed in Technical Report P and recommended:

- The Proponents have further discussions with the BLCAC about cultural heritage management conditions and the cultural significance of Aboriginal places.
- There be further assessment of potential risks to coastal sites in Western Port Bay.
- The assessment of potential risks to cultural heritage be deferred until the complex assessment has been completed for CHMP 15383, including any additional assessment required for any changes to the current project activity area.

The BLCAC expressed concern the assessment of cultural values had not been finalised, although it noted discussions with the Proponents were continuing. It submitted it would be difficult for the IAC to reach any meaningful conclusions about the Project and the associated Aboriginal cultural heritage issues while critical work remains to be done.

The BLCAC concluded:

... the entire broader Westernport region is highly significant, and the project ought to be seen in this light. Historically important as the place of their ancestors – it remains totemic and vital to Bunurong people today. The project must abide by the interests

held by traditional Owners, listen to them – and understand how this project impacts on both the past, and the future – as well as the present <sup>255</sup>.

Concerns about possible impacts on Aboriginal cultural heritage, including intangible heritage, and the lack of approved CHMPs were recurring themes in many submissions, including those from community groups such as Save Westernport. Individual submitters also raised these issues, including S487 who made a confidential submission focused on matters particular to Bunwurrang/Bunurong women. She submitted:

- the cultural assessment was incomplete
- the significance of the symbolic mother whale and her relationship with the Bay was not properly recognised
- the spirituality of Western Port has been overlooked
- the Project will have a detrimental impact on marine life that will result in environmental degradation
- the overall management plan does not take into account important intangible heritage considerations.

The submitter spoke eloquently about the importance of ensuring that traditional history and indigenous stories are not lost in the considerations of the Project by the IAC.

The Proponents acknowledged the concerns raised by the BLCAC and others. They submitted that *'extensive further consultation'* will be necessary in order to finalise the CHMPs and that intangible heritage can be dealt with through that process <sup>256</sup>.

The Proponents relied on Ms Nicholson's evidence that outlined the CHMP process, the investigations that had been undertaken for the three CHMPs and the proposed mitigation measures, including the heritage places that would be impacted. Ms Nicholson was generally satisfied the proposed mitigation measures were appropriate but acknowledged the concerns raised by the BLCAC about intangible heritage. She agreed further consultation about intangible heritage was required and supported the establishment of a *'whole of project working group'* that would incorporate input from the Traditional Owners.

The Proponents advised they had established a *'working group'* with the BLCAC during the EES exhibition, which is focussed on:

- creating a relationship with the BLCAC
- understanding tangible and intangible impacts, including impacts on Western Port Bay
- developing appropriate mitigation measures <sup>257</sup>.

In this context, the Proponents supported Ms Nicholson's recommendation that a working group be established to advance the CHMPs and proposed that a new *'construction'* EPR-AH03 be included in the EPRs:

#### **Project Working Group**

Develop a project working group that incorporates input from stakeholders relevant to CHMP 15383, 15384, 16300 including the Traditional Owners and Aboriginal Victoria.

They proposed the Pipeline Works control (Consultation Plan, Appendix B – Stakeholder Engagement Matrix) includes a new *'desired outcome'*:

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<sup>255</sup> D559

<sup>256</sup> D589

<sup>257</sup> D589

Coordinated consultation for the cultural heritage management plans for the Pipeline Works and for Cultural Heritage Management Plan 16300.

In relation to intangible heritage, the Proponents acknowledged it is defined in the *Aboriginal Heritage Act* and a CHMP can make provision for it. They noted Ms Nicholson's observation that although CHMPs are typically confined to tangible heritage, there has been a more recent move to acknowledge and address intangible heritage. The Proponents agreed the CHMPs should address intangible heritage in consultation with the BLCAC and submitted this could be achieved through the consultation processes that were in place and recommended. They submitted the IAC should be satisfied that the work done to date, together with the processes for further consultation and assessment, were adequate for it to conclude that the draft evaluation objective would be met. Ms Nicholson expressed a similar view.

Finally, the Proponents noted that Aboriginal place VAHR 7921-1752 (between Bungower Road and Watson Creek) was not included in Technical Report P. They indicated this had been an oversight resulting from a change to the pipeline alignment, but it had been considered and investigated, including test pits excavated in March 2020. They undertook to discuss this and other fieldwork issues with the BLCAC and to include appropriate references in the CHMP.

### 19.3.3 Discussion

#### (i) CHMP approval

Submitters expressed concern the CHMPs had not been approved or draft CHMPs had not been available as part of the EES exhibition. While the IAC understands those concerns, it acknowledges the process for their approval is governed by the *Aboriginal Heritage Act*. The Proponents indicated its intention and willingness to progress the three CHMPs to a point where they can all be approved on release of the Minister's assessment. While the EES process might have been better served if the CHMPs had been further advanced, particularly during the EES exhibition, this is not fatal to the IAC's assessment.

The key issue for the IAC is whether it can be satisfied the evaluation objective '*To avoid or minimise adverse effects on Aboriginal and historic cultural heritage*' is able to be met. Although the absence of approved or agreed CHMPs complicates this assessment, the IAC is satisfied processes are in place to advance the CHMPs. It is not aware of any impediments or factors that would lead it to conclude that CHMPs could not be agreed with the BLCAC and Aboriginal Victoria in the future. The IAC recognises the Project cannot proceed without the necessary CHMPs being approved.

In forming these views, the IAC notes the BLCAC submissions and evidence (in relation to CHMPs 16300 and 15383) did not explicitly oppose the Project. Instead, they highlighted the inadequacy of the cultural heritage assessments undertaken to date and provided guidance about further work needed. These concerns focussed on the inadequate recognition of intangible cultural heritage and the need for a broader definition of the potential impact area, including the broader Western Port Bay area. The Proponents acknowledged these concerns, agreed that further assessments are required and recommended additional consultation requirements to advance the CHMPs.

While the IAC accepts that resolving concerns about intangible cultural heritage and the extent of the impact area will be challenging, it is satisfied the need to address these issues is understood by Proponents and processes are in place to provide a framework for this to occur. As Ms Nicholson noted in response to questions from the IAC, broader issues about intangible

cultural heritage have not typically been the subject of CHMPs but have become more prevalent in recent times.

In relation to CHMP 15384, Aboriginal Victoria is the evaluating body in the absence of a Registered Aboriginal Party. Although Aboriginal Victoria did not make a submission to the IAC, it cannot approve the CHMP until it has considered the Minister's assessment of the EES. Nevertheless, it will be subject to any relevant consultation requirements if approved.

On the basis of the material before it, the IAC is satisfied the evaluation objective can be met, although it acknowledges further work remains to be completed in order to inform the CHMPs.

#### **(ii) Implementing approved CHMPs**

The POS and EPRs include general requirements relating to implementing and complying with approved CHMPs, as well as more specific technical requirements. While the general requirements are relevant to implementing approved CHMPs, the technical requirements are more focussed on matters of detail that might be included in the CHMPs. For this reason, they should be reviewed in order to identify and address any potential inconsistencies with the detail in the approved CHMPs. This is included as a specific recommendation.

#### **(iii) Consultation mechanisms**

As noted earlier, the Proponents proposed additional consultation requirements in the EPRs and the Pipeline Works control (Consultation Plan, Appendix B – Stakeholder Engagement Matrix). The IAC supports these additions and has expanded the application of EPR AH03 so that it applies to the '*design*' phase of the Project as well as the '*construction*' phase. This will provide for earlier input from the BLCAC.

#### **(iv) References to Aboriginal places**

The submissions from the BLCAC raised concerns about the accuracy with which various Aboriginal places had been recorded in Technical Report P, including VAHR 7921-1752.

The Proponents indicated the accuracy of this material would be reviewed with the BLCAC and correct references would be included in the CHMPs.

The IAC supports this and has addressed it in a specific recommendation.

### **19.3.4 Findings**

The IAC finds:

- Further assessment of Aboriginal cultural heritage is required in order to inform the preparation of the CHMPs, particularly intangible cultural heritage and the geographic extent of impacts.
- The recording of Aboriginal places in Technical Report P should be reviewed for accuracy before being included in the CHMPs.
- The recommended consultation processes will provide a suitable framework for advancing the CHMPs.

### **19.3.5 Recommendations**

The IAC recommends:

#### **Environmental Performance Requirements**

**Include the following change:**

- **Revised EPR AH03 (Project Working Group)**

This change is included at Appendix G.

#### Other recommendations

**Review and update CEMP Attachment J (Performance Objectives and Standards), EPRs and other relevant approvals to include any necessary changes needed to implement the three CHMPs when approved.**

**Review the documentation of Aboriginal places in Technical Report P in conjunction with the BLCAC and Aboriginal Victoria (for the relevant CHMPs) and update the relevant CHMPs where appropriate.**

## **19.4 Historic cultural heritage**

### **19.4.1 Background**

Technical Report Q identified 22 historic sites within the vicinity of the Project and provides risk and impact assessments for each site. It concluded two sites could be potentially impacted by the Project:

- Denham Road Farmhouse, 28 Bayview Road Hastings (Victorian Heritage Inventory H7921-0119).
- The former BP refinery Administration Building (Victorian Maritime Centre), 220 – 350 The Esplanade Crib Point (Victorian Heritage Register H1016 and Mornington Peninsula Heritage Overlay HO324).

It recommended site specific mitigation measures for these sites as well as a general mitigation measure (Unexpected cultural heritage finds procedure).

These have been translated into:

- EPR-HHO2 - Unexpected cultural heritage finds procedure.
- CEMP Attachment J, HH3 – Unexpected finds procedure.
- EPR-HHO3 - Condition surveys and monitoring (former BP refinery administration building H1016).
- CEMP Attachment J, HH1 - Condition surveys and monitoring (former BP refinery administration building H1016).
- CEMP Attachment J, HH2 - Horizontal directional drilling (Denham Road Farmhouse, VHI site H7921-0119).

### **19.4.2 Evidence and submissions**

There were few submissions and no specific evidence in relation to historic cultural heritage, however some submissions referred to specific sites such as the Tyabb Waterholes and queried whether the EES heritage assessments were adequate.

### **19.4.3 Discussion**

The IAC is satisfied the EES (Technical Report Q) provided a comprehensive overview of sites within the Project area and the risk and impact assessments of those sites are appropriate. In particular, the IAC supports the proposed '*Unexpected cultural heritage finds procedure*' and the specific mitigation measures in relation to the Denham Road Farmhouse (including the

proposed use of HDD to protect the site) and the former BP refinery administration building (including the condition surveys and monitoring).

Although some submissions raised concerns about other sites, these concerns were not supported by specific evidence that would justify different risk or impact assessments. In relation to the Tyabb waterholes, the IAC notes they are heavily modified and some distance from the pipeline route. It is not expected there will be any impact on that site.

In the absence of any specific evidence to the contrary, the IAC is satisfied the Project is consistent with the draft evaluation objective and will avoid or minimise adverse impacts on historic cultural heritage.

Finally, the IAC believes that CEMP Attachment J (POS), HH3 – ‘*Unexpected finds procedure*’ should be titled ‘*Unexpected cultural heritage finds procedure*’ to be consistent with the corresponding EPR and to better explain its purpose.

#### **19.4.4 Findings**

The IAC finds:

- The assessment of historic cultural heritage and the proposed EPRs and CEMP controls are appropriate.
- The Project is consistent with the cultural heritage draft evaluation objective.

#### **19.4.5 Recommendation**

The IAC recommends:

Construction Environment Management Plan, Attachment J (Performance Objectives and Standards)

**Include the following change:**

- **Rename HH3 to ‘Unexpected cultural heritage finds procedure’.**

### **19.5 Heritage conclusions**

The IAC concludes that:

- Aboriginal cultural heritage impacts will require further assessment through the preparation and approval of the three CHMPs.
- Historic cultural heritage impacts are consistent with the draft evaluation objective.
- Historic cultural heritage impacts can be acceptably managed through the recommended mitigation measures.
- There are no historic cultural heritage impacts that preclude the Project being approved.

## 20 Pipeline route options/site specific submissions

### 20.1 Pipeline route options

#### 20.1.1 Introduction

The pipeline element of the Project includes sections of pipeline where alternative alignments have been documented in EES Attachment VII (Map Book) and discussed in EES Chapter 4 (Project description). They are described as ‘*pipeline options*’ and are generally within the same parcel of land. They are intended to provide some flexibility to address specific landowner requirements, while meeting the pipeline alignment criteria.

These alternative alignments were the subject of submissions from Casey and Cardinia, while some landowners raised site specific pipeline issues.

The relevant draft evaluation objective is:

**Social, economic, amenity and land use** - To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.

Table 19 lists the pipeline options evidence that was provided.

**Table 19 Pipeline options evidence**

Party	Expert	Firm	Area of expertise
Proponents	Mr McBride-Burgess	Contour	Town planning
Proponents	Mr McNeill	Ethos Urban	Economics

The pipeline options are shown in EES Attachment VII (Map book) and include:

- Option BB-10 (Mapsheets 9 and 10)
- Option BG-11 (Mapsheet 9)
- Option AN-9 (Mapsheet 14)
- Option AM-9 (Mapsheet 15)
- Option AE-8 (Mapsheet 16)
- Option Z-8 (Mapsheets 16 and 17)
- Option AU-9 (Mapsheet 17)
- Option D-8 (Mapsheets 17 and 18)
- Option AT-9 (Mapsheet 18)
- Option BE-10 (Mapsheet 18)
- Option AO-9 (Mapsheets 19 and 20)
- Option AG-8 (Mapsheet 20).

The Proponents’ preferred alignments typically cross properties diagonally, while the options follow property or other defined boundaries.

A further option (BH-11) is being considered by the Proponents following further consultation with the landowner<sup>258</sup>. This option would realign the pipeline closer to the affected property boundary than shown in the EES (Mapsheet 19).

Changes to the Reid Parade/Warringine Park HDD arrangements (BJ-11) are being considered by the Proponents in response to a conservation covenant and discussions with the Trust for

<sup>258</sup> EES Alignment Option Information, CPT107 Boundary alignment option, 18 August 2020

Nature <sup>259</sup>. Alignment change BJ-11 is specifically addressed in Chapter 5.3 relating to vegetation issues and Warringine Park.

### 20.1.2 Key issues

The key issues are:

- The merits of the EES pipeline options and how they should be assessed.
- The relative impacts of diagonal and boundary alignments on agricultural productivity and viability.

### 20.1.3 Evidence and submissions

The Proponents outlined the pipeline route selection criteria, including APA's preference for the shortest pipeline route, and advised the preferred alignment will primarily be resolved through land access negotiations with landowners. Where a landowner has identified an alignment preference (e.g. a boundary alignment), that alignment has been agreed with APA where reasonable and practicable. The IAC understands the Map Book reflects the alignments preferred by the Proponents and areas identified as pipeline options are still being discussed with landowners.

Casey submitted the pipeline route through its municipality passes through a *'highly productive agricultural area'* (the Western Port Green Wedge) that has *'a range of versatile soil types, access to water, close proximity to ports, airports, markets and a workforce'*. Casey noted for most of its length, the pipeline would be *'within existing easements, close to property boundaries and in road reserves'*, however, it would dissect nine large agricultural properties and potentially reduce agricultural capacity by:

- reducing access and the amount of available land during construction
- prohibiting the construction of some farming structures and infrastructure
- limiting the depth to which land can be cultivated
- requiring the regulation and supervision of farming activities that would otherwise be permitted.

The Proponents advised that of the nine properties raised by Casey and affected by diagonal crossings, two followed an existing easement, one was aligned along a boundary, and the other six were under discussion with the relevant landowner.

Casey concluded the benefit of the pipeline is uncertain compared to the benefit of preserving productive agricultural land and recommended:

Should the pipeline permit be issued, it should be conditional on relevant landholders identifying their preferred alignment, ensuring minimal disruption in the short and long term <sup>260</sup>.

Cardinia raised similar concerns, including the high quality agricultural land that the pipeline route traverses and the potential impacts on its productivity. Cardinia cited the extensive policy support for protecting agricultural land and:

... it is unacceptable that the pipeline traverses through State significant Green Wedge farming land by dissecting and crossing properties. This pipeline alignment could have a direct impact on an owner's ability to conduct farming activities on the land, or introduce new farming opportunities to that land <sup>261</sup>.

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<sup>259</sup> EES Alignment Option Information, Reid Parade/Warringine Park HDDs, 17 August 2020

<sup>260</sup> D429

<sup>261</sup> D153

Cardinia proposed various changes to the pipeline route in order to minimise its farming impacts and to protect the viability of affected farms. These included:

- Implementing Options BE-10 and AG-8.
- Realigning the pipeline at 45 Bloomfield Lane, Cardinia, Lot 9 PS008853, to the adjacent road reserve, while retaining the MLV in the south-east corner of the property.
- Realigning the pipeline route at Crown Allotment 94A PP3272 Koo Wee Rup Road, Pakenham South to the adjacent road reserve.
- realigning the pipeline route along property boundaries (or if not possible, paddock lines) at 665–735 Manks Road, Cardinia; 2500 Ballarto Road, Cardinia; and 1025 McDonalds Drain Road, Pakenham.
- Realigning the pipeline route so that it does not unnecessarily cross the properties at 95 Adams Road, Cardinia, 765 Koo Wee Rup Road, Pakenham South and 825 Koo Wee Rup Road, Pakenham South.

Cardinia noted the evidence of Mr McBride-Burgess that, where possible, the pipeline should be aligned along property boundaries and avoid the diagonal crossing of properties.

The Proponents provided responses to all proposed changes (including those supported by Mr McBride-Burgess) and noting some were not achievable, were impractical, would have undesirable and unforeseen consequences or were under discussion with the landowners<sup>262</sup>. They highlighted *'All landowners who have requested a boundary realignment have been provided with a boundary realignment option'* and that discussions with landowners were continuing.

Cardinia advised that although it had received a petition about pipeline issues, it had not discussed its proposed route changes with all affected landowners and did not put its views forward as representing agreed landowner positions. Cardinia concluded:

If the pipeline is to proceed, it should be located along property boundaries while avoiding important vegetation. If this cannot be achieved, the third best way is to locate the pipe along paddock lines whilst avoiding important vegetation<sup>263</sup>.

The Proponents relied on Technical Report O and submitted the pipeline would have little impact on agricultural viability and there is not expected to be any ongoing loss of production.

Technical Report O noted:

In order to protect the asset, pipeline easements contain some restrictions on future development. Erecting permanent structures or buildings over the underground pipeline will be prohibited in accordance with the Pipelines Act 2005 and pursuant to agreements with landowners. Generally, excavation works are permitted up to 300 millimetres deep and small plantings with limited root balls that do not impact line of sight of pipeline markers are permitted within the easement, subject to APA approval.

In relation to diagonal property crossings, the Proponents noted only a small portion of the pipeline route will have a diagonal or other non-boundary alignment and discussions were continuing with many affected landowners. They submitted that, in any event, these crossings would have little impact on agricultural production or viability. Mr McBride-Burgess recommended, where practical, diagonal crossings be avoided in order to *'reduce the impacts to private land, and existing and future uses'*. In this context, he supported nine of the options

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<sup>262</sup> D589, pages 149-150

<sup>263</sup> D153

included in the Map book. Mr McNeill supported *‘aligning the pipeline to the perimeter of agricultural properties wherever possible’*.

#### **20.1.4 Discussion**

The IAC agrees with Cardinia and Casey the pipeline route traverses high quality agricultural land recognised in policy and that it is appropriate to consider what, if any impacts, the pipeline will have on agricultural productivity. This broader analysis of agricultural impacts is provided in Chapter 18, where the IAC concluded the Project’s impacts on agriculture would not be significant and would be acceptable subject to various mitigation measures.

In addition to those broader issues, Casey and Cardinia submitted the detailed alignment should avoid the diagonal crossing of properties and instead use property boundaries or other features such as paddock fencing. This position was based on the premise that the diagonal crossing of properties (typically involving pipelines running through the middle of paddocks) would be more disruptive during construction, constrain the siting of some farm infrastructure and restrict the opportunity for deep cultivation. In combination, these constraints would impact on agricultural productivity and farm viability.

The IAC acknowledges these concerns and agrees there could be some benefits from aligning the pipeline with property boundaries but believes the disbenefits of adopting diagonal alignments were overstated and not clearly supported in submissions or evidence.

Firstly, the IAC agrees pipeline construction will be disruptive, but it is not satisfied that using property or paddock boundaries will provide a significantly better outcome than using diagonal crossings. As the Proponents noted, using a diagonal route is typically shorter and faster to construct, and potentially creates less disturbance. The impacts will be temporary, and the IAC would expect the timing and detail of the works, and therefore their impacts, would be discussed and negotiated between APA and the landowners.

Secondly, it is not clear the restrictions on farming infrastructure will be significant or will necessarily be less significant if the pipeline was located diagonally, instead of along a boundary. Some farm infrastructure, such as shedding and storage, is typically located along the boundary of properties or paddocks, and it is conceivable that locating the pipeline in these areas might be more limiting than a diagonal alignment. In any event, possible impacts are best resolved through negotiation with the individual landowners who have a better understanding of how their farms operate, what infrastructure might be built in the future and what the impacts of alternative alignments might be.

Thirdly, the IAC agrees the ‘default’ 0.3 metre limit on the depth of cultivation is a potential constraint, but notes the Proponents’ advice that cultivation within the pipeline easement to a depth of 0.9 metre could continue to take place under the supervision of the pipeline operator<sup>264</sup>. This would not constrain typical farming activities in the area.

Finally, the IAC notes Casey and Cardinia have not discussed their proposed pipeline changes with all affected landowners or were aware of the current extent or status of various negotiations between APA and the landowners. While this is not a criticism, the IAC would be cautious in recommending specific changes to the pipeline route solely on the basis of possible agricultural impacts without landowner input. The IAC notes the Proponents’ advice some of

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<sup>264</sup> Discussed in Chapter 18

the proposed changes were impractical, would have consequences not foreseen in the submissions or were not supported by the landowners.

For these reasons, the IAC does not support the specific changes to the pipeline alignment sought by Casey and Cardinia, although it encourages the Proponents to continue negotiations with affected landowners as well as ongoing consultation with the Councils. It encourages the Proponents to consider the relative impacts of pipeline options on agricultural productivity and viability of the affected properties. This is in recognition of the policy support for protecting the high quality agricultural land in the Western Port Green Wedge and is generally consistent with the recommendation sought by Cardinia.

### **20.1.5 Findings**

The IAC finds:

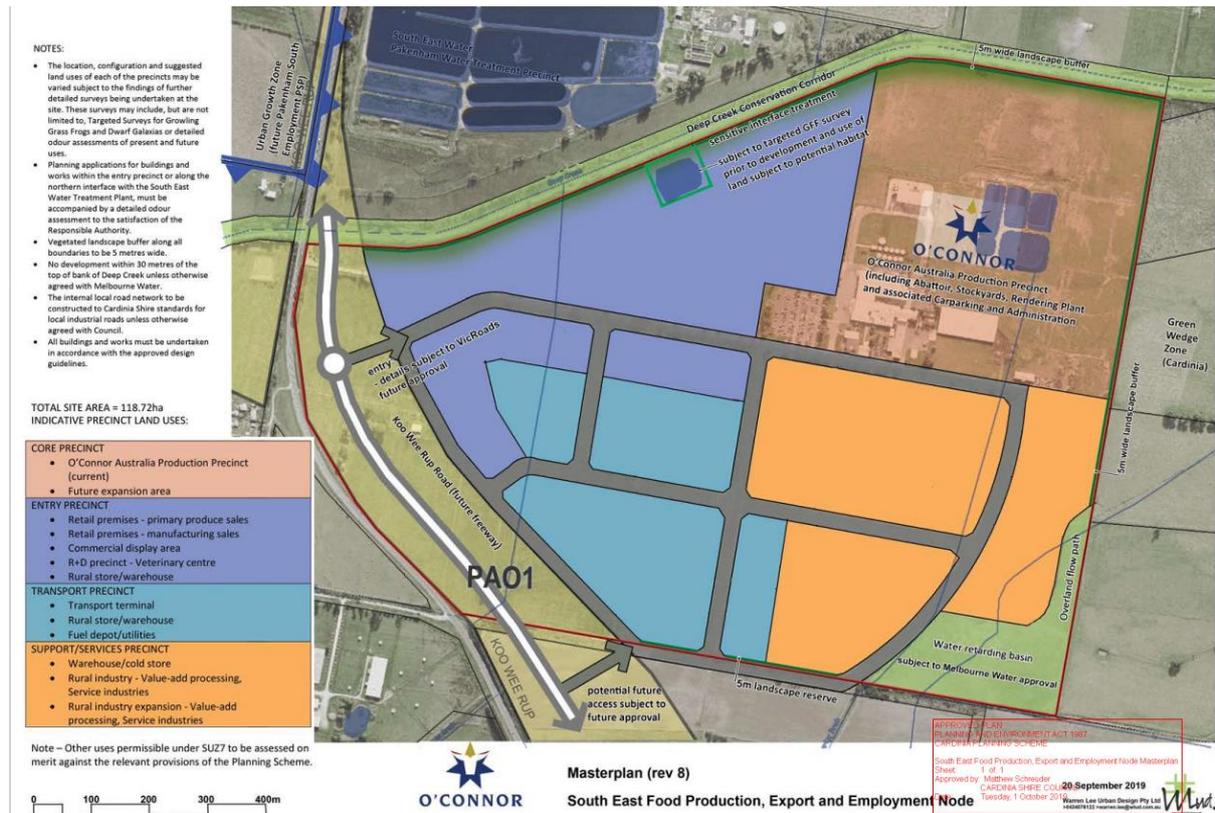
- The relative agricultural impacts of diagonal or property boundary pipeline alignments are best determined on a property by property basis through negotiation between APA and landowners.
- Ongoing discussions and negotiations between APA and landowners about pipeline options through agricultural areas should have regard to minimising any impacts on the agricultural productivity and viability of the property.

## **20.2 G and K O'Connor Pty Ltd**

### **20.2.1 Introduction**

G and K O'Connor (S2307) made a written submission in relation to its land at 910-940 Koo Wee Rup Road, Pakenham South. The submitter operates an abattoir and associated packing facilities on part of the site. The site is zoned Special Use 7 - South East Food Production, Export and Employment Node in the Cardinia Planning Scheme. A Master Plan has been approved by Cardinia Council for staged subdivision and development as a mixed-use agribusiness industrial cluster of businesses complementary to the abattoir at Figure 15. However, the Master Plan does not form part of the Cardinia Planning Scheme.

Figure 15 Approved Masterplan for O'Connor site<sup>265</sup>



A permit is required for subdivision, buildings and works which must be generally in accordance with the Master Plan. The IAC understands that there are no current proposals for subdivision or development beyond the preparation of the Master Plan.

Once fully developed, it is anticipated that up to 2,000 employees would be working at the site.

The pipeline is proposed to traverse the southern and eastern edges of the site as shown in Figure 16.

Figure 16 Proposed pipeline alignment <sup>266</sup>



The ‘notification area’ for the pipeline, within which APA would request Cardinia to advise it of any proposed development is 50 metres either side of the pipeline. The ‘consequence area’ is also 50 metres. The pipeline is set back 10 metres inside the neighbouring farming property, there is a 20 metre road reserve immediately to the south of the O’Connor land and a Master Plan requirement for a 5 metre landscape reserve. This means the 50 metre notification area/consequence area overlaps the area on the land designated as a Transport precinct by approximately 15 metres (see Figure 17).

Figure 17 Southern boundary of the O’Connor land showing the pipeline alignment with a 50 metre ‘buffer’ <sup>267</sup>



A fuel depot is proposed to be located within the Transport precinct which abuts the southern boundary of the site (identified as the blue area on Figure 15).

<sup>266</sup> D387  
<sup>267</sup> D387

## 20.2.2 Evidence and submissions

G and K O'Connor submitted they want to safeguard the future of the site and expressed concern about the potential safety and planning implications of the proposed pipeline.

In their written submission, they submitted the close proximity of the preferred pipeline alignment to their property would introduce a safety risk to future workers. They contended the pipeline should be relocated to eliminate that risk. Failing that, it should be designed in such a way that allows for the future use of their land.

At the Hearing, Mr Morris appeared for G and K O'Connor and submitted:

G&K O'Connor seeks a new or corrected safety assessment which clearly evidences that APA has properly carried out a safety assessment in relation to the approved masterplan which demonstrates either that realignment is necessary or, if realignment is unnecessary, which O'Connor can rely on going forward in future including when it comes to submitted applications and having them referred to ESV.

He submitted that it should not be incumbent on G and K O'Connor to carry out the safety assessment.

G and K O'Connor submitted APA failed to properly recognise the intended future use of the site in locating the pipeline and had incorrectly classified the land as 'rural'. Further, that it had not been given the opportunity to be involved in the preliminary hazard analysis.

G and K O'Connor relied on the evidence of Mr Ramsay who referred to Section 4.7.1 of AS/NZS 2885.1:2018, Pipelines - Gas and liquid petroleum which notes Part 1: Design and construction requires '*the alignment of the pipeline shall be selected with consideration of public safety, pipeline integrity, environmental impact, and the consequences of escape of fluid*'.

The Standard sets out requirements to consider both the current and future land use change:

A pipeline shall be designed in accordance with the requirements of this Standard:

- (a) For the land use existing at the time of design; and
- (b) For the future land use that can be reasonably determined by research of public records and consultation with land planning agencies in the jurisdiction through which the pipeline is proposed.

Mr Ramsay gave evidence the proximity of the proposed fuel depot may cause any pipeline failure event to escalate through release of flammable materials and therefore a secondary location class of Heavy Industrial should be assigned in accordance with AS/NZ 2885.

Mr Ramsay noted that, while AS/NZS 2885 does not specify which location classification should apply to Heavy Industrial, in his opinion T2 was warranted due to the potentially catastrophic outcomes of a failure event. He agreed with the proposition that it would be better to set the pipeline back 50 metres from the title boundary to avoid the consequence area and notification area.

The Proponents submitted that, while they acknowledged it would be possible to adjust the alignment of the pipeline adjacent to the O'Connor land boundary, their position was the exhibited alignment was preferable to that proposed, given negotiations with the affected landowner were well advanced<sup>268</sup>.

The Proponents submitted their proposed alignment was the outcome of extensive technical consideration and consultation with landowners:

As part of that process, the initially proposed alignment was relocated from within the O'Connor site to outside of it. APA's view is that the proposed alignment represents the best balance between the competing interests of the landowner to the south, which uses its land for agriculture, and O'Connor. The currently proposed alignment minimises impacts for agricultural uses and is unlikely to, in APA's view have any material impact on the use of the O'Connor site for a modest fuel depot, as seems to be proposed <sup>269</sup>.

The Proponents relied on the evidence of Ms Filippin that the T1 pipeline location class is appropriate for light industrial, and this was the more appropriate classification for the O'Connor land. She commented on the risk of locating a fuel depot where proposed, noting that for a major escalation event to occur:

- Fuel tanks would need to be within the 50 metre 'credible threat zone' (which she noted meant within 20 metres of the site boundary).
- Tanks would need to be impacted by a fire event.
- Multiple pipeline controls would need to fail.
- Ignition of released gas would be required.
- Release would need to be oriented towards the tanks.

Her evidence was the likelihood of such a combination of events would be very low.

Ms Filippin concluded from a risk management perspective:

- If the pipeline alignment can be modified, this would be the most reliable mitigation.
- If the pipeline cannot be moved due to other constraints, it is recommended revision of the SMS be undertaken to confirm the risk is suitably low and assess whether additional controls are warranted <sup>270</sup>.

The Proponents submitted the Master Plan had been considered in the pipeline SMS but the location of any fuel depot was not yet determined and would need further approval under the Cardinia Planning Scheme <sup>271</sup>.

The Proponents noted an exchange of letters between G and K O'Connor and APA, through which APA sought to obtain details of any development proposals for the O'Connor land. G and K O'Connor acknowledged there are no detailed plans prepared for the location of a fuel depot but maintained the SMS ought to be revised to allow for such a future use.

### 20.2.3 Discussion

The IAC accepts the Proponents' position that the proposed location of a fuel depot is not specifically included in the Master Plan or otherwise in the Cardinia Planning Scheme. It is noted as a possible use in the Transport Precinct. A range of possible uses indicated in Master Plan precincts along the boundary include:

- Transport precinct
  - Transport terminal
  - Rural store/warehouse
  - Fuel depot/utilities

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<sup>269</sup> D376 paragraph 29

<sup>270</sup> D377

<sup>271</sup> The Proponents cited Document 96 (Confidential SMS) Appendix H, CPT Property ID 121. The column 'Plans for future development / change in land use?' says 'Draft masterplan as described in Zone SUZ7',

- Support/services Precinct
  - Warehouse/cold store
  - Rural industry – value add processing, service industries
  - Rural industry expansion – value add processing, service industries.

The IAC notes of all the uses proposed in the Master Plan in proximity to the southern or eastern boundaries of the O'Connor land, fuel depot is the only one likely to cause a level of risk that would conflict with the pipeline.

The IAC notes the Transport precinct (blue on the Master Plan) is approximately 250 metres deep from north to south. The IAC concludes there is sufficient space to locate any fuel storage in the Transport precinct well clear of the 50 metre consequence area. Bearing in mind the road reserve and landscaping strip, a 15 metre set back from the landscape reserve is the minimum that would be required to achieve this. The IAC concludes a design should be achievable for the Transport precinct that would achieve acceptable levels of risk by siting any fuel tanks with appropriate setbacks.

G and K O'Connor sought the flexibility to locate a fuel depot anywhere in the Transport precinct. Further, it sought the SMS be reviewed to assess the levels of risk to potential land uses and appropriate action be taken to relocate the pipeline, if necessary, to avoid risk. Ms Filipin supported the proposal to review the SMS.

The IAC notes the SMS provided on a confidential basis shows an awareness of possible future changes to land use on the O'Connor site. The SMS notes development of the land could disturb the profile of the land but does not identify a fuel depot specifically. It correctly notes a permit would be required for development, buildings or works on the land.

The IAC is of the view that a further safety assessment at this stage would not be useful. Until such time as a concept plan is formalised for development of the O'Connor land which shows the proposed location of land uses, including any fuel tanks, there is little that could be assessed in terms of risk.

The IAC accepts there is a balance to be achieved between the impacts on respective landowners by the Project and notes any relocation of the pipeline further into farming land to the south or east would likely adversely impact those landowners. The IAC is not convinced the theoretical risk of an as yet unplanned fuel depot is a more important consideration.

#### **20.2.4 Findings**

The IAC finds:

- The exhibited alignment of the pipeline in the vicinity of the G and K O'Connor Pty Ltd land is supported.
- No further safety or risk assessments are required for the G and K O'Connor Pty Ltd land at this time.

### **20.3 Evolution Rail Pty Ltd**

#### **20.3.1 Introduction**

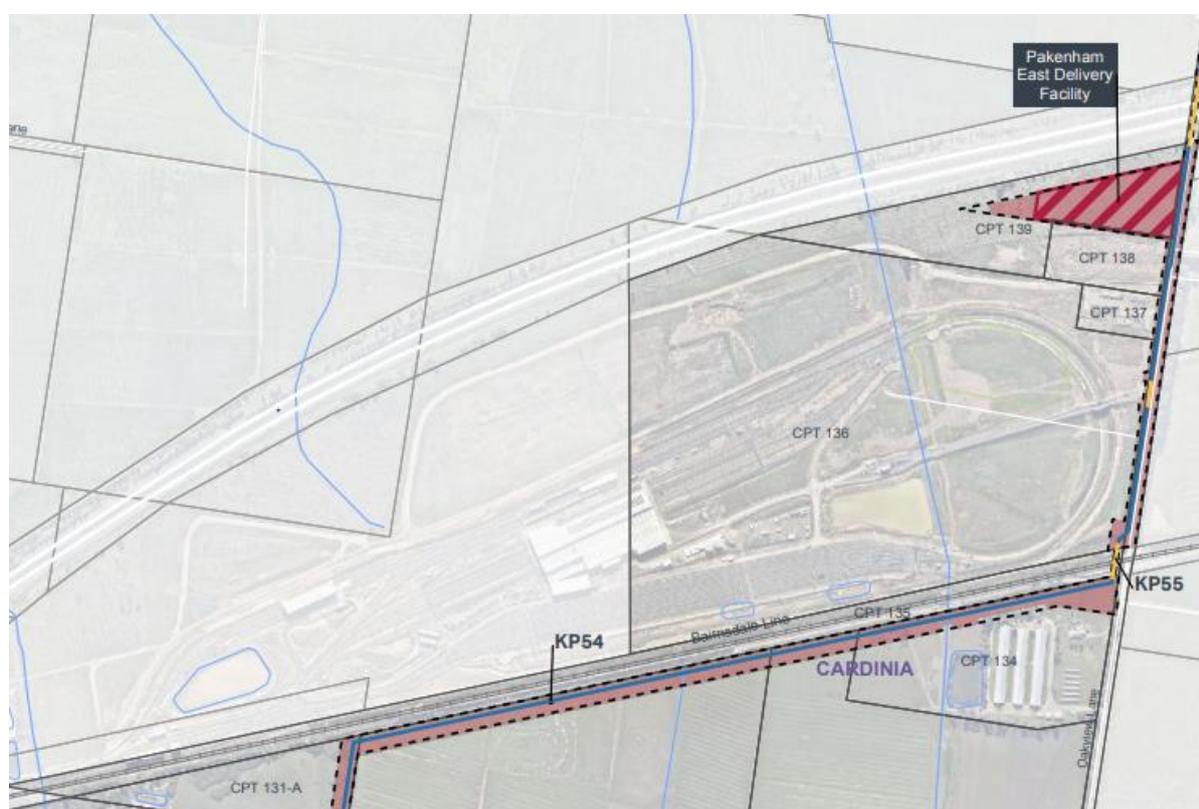
Evolution Rail Pty Ltd (S2322) made a written submission and presented at the Hearing in relation to the proposed pipeline works and PDF adjacent to the Pakenham East Rail Depot (the Depot). Evolution Rail has been contracted by the Victorian Government to finance, design, build and maintain 65 new high capacity trains for the metropolitan network.

Evolution Rail operates the Train Maintenance Facility at the Depot, which is located on a 118 hectare site at 205 Oakview Lane, Pakenham East. The Depot was completed in July 2020 and the registered proprietor is the Head, Transport for Victoria.

The Project proposes the construction of the pipeline along the southern boundary of the Bairnsdale railway line (south of the Depot) and within the Oakview Lane road reserve to the east of the Depot. Construction will be by open cut trenching, except where it crosses the Bairnsdale railway line and the entrance to the Depot (off Oakview Lane) where it will be constructed by trenchless bore. The PDF is proposed be located to the northeast of the Depot and is within the area licensed to Evolution Rail.

The location of the pipeline, PDF and Depot are shown in Figure 18.

**Figure 18** Pipeline and PDF works in proximity to the Pakenham East Rail Depot <sup>272</sup>



### 20.3.2 Evidence and submissions

Evolution Rail raised concerns related to:

- Safety impacts, including risks from gas leaks and explosions, maintenance failures at the PDF and access limitations to the Depot.
- Electrolysis impacts, including possible damage to the pipeline and an increased risk of pipeline failure resulting from Direct Current (DC) stray current.
- Operational impacts, including restrictions on vehicle and rail access to the Depot during construction and operation and potential impacts on existing utility infrastructure.
- Environmental impacts, including impacts on ‘*environmental no-go zones*’ that were established as part of the Depot’s approval and implementation of a

<sup>272</sup> Extract from EES Attachment VII Map book, Mapsheet 24

Threatened Species Management Plan (TSMP) prepared under the *Environment Protection and Biodiversity Conservation Act*.

- Aboriginal cultural heritage impacts, including impacts on the ‘*cultural heritage no-go zones*’ that were established as part of the existing CHMP prepared under the *Aboriginal Heritage Act*.

Evolution Rail submitted further analysis of these issues was required before the pipeline alignment and PDF location were approved. It provided a comprehensive set of ‘*potential solutions*’ to these issues, the main elements of which were:

- Relocation of the PDF and realignment of the pipeline to provide greater separation from the Depot.
- Use of design and construction processes that would ensure vehicular access to the Depot via Oakview Lane at all times and maintain uninterrupted access to utility services.
- Further assessment of potential electrolysis impacts to the pipeline and associated mitigation measures, to the satisfaction of relevant regulatory authorities, including ESV.
- Use of a ‘*construction interface agreement*’ between the pipeline operator and Evolution Rail to address safety, access and operational issues.
- Further assessment of environmental impacts in the context of the TSMP and inclusion of appropriate environmental conditions in the *Environment Protection and Biodiversity Conservation Act* approval and the *Pipeline Act* licence.
- Further assessment of Aboriginal cultural heritage impacts in the context of the existing CHMP to ensure the Project does not impact upon or compromise compliance with that CHMP.

Evolution Rail concluded:

In summary, ER has significant and material concerns in relation to construction and operation of the Proponent’s Pipeline and the chosen location of the Pipeline alignment and PDF as set out above in this submission but particularly in relation to unaddressed safety risks, the potential impact on the Victorian public transport network and disturbance of environmental and cultural heritage no-go zones which have been the subject of targeted protection measures on the Pakenham East Depot site, to date.

The Proponents noted APA and Evolution Rail have had extensive discussions about these matters, which are continuing. The Proponents supported the proposed pipeline alignment and PDF location and submitted alternative alignments and sites were not available because of various constraints and the need to link with the VTS.

In relation to safety risks, particularly gas release from the pipeline and PDF, the Proponents relied on Technical Report K, TN04 and Ms Filippin’s evidence. They noted a QRA had been prepared and discussed with Evolution Rail and other Depot stakeholders and these discussions informed the design and operation of the facilities. The QRA found the hazard levels at the Depot would be acceptable for industrial land in accordance with HIPAP4 (Risk Criteria for Land Use Safety Planning).

The Proponents acknowledged the concerns about electrolysis and noted these risks were well understood by APA and had been the subject of extensive assessment. They noted APA had practical knowledge and understanding of pipeline and electrolysis issues associated with the Depot through its existing gas pipeline that traverses the area. They submitted several mitigation features were incorporated into the pipeline design, in addition to standard

mitigation measures. They noted electrolysis risk was considered in the SMS and would be further assessed in the Safety Case required under the *Gas Safety Act*.

In relation to operational impacts on the Depot, including possible access constraints, the Proponents outlined various measures to manage this, including the need to implement the requirements of the road authority and TMPs that will need to be approved<sup>273</sup>. They indicated that Oakview Lane may need to be limited to one lane for limited times during pipeline construction, but there will be no ongoing impact or limitation on vehicles, including heavy vehicles crossing the pipeline easement.

The Proponents advised that environmental and Aboriginal cultural heritage issues will be addressed through the approvals required under the *Environment Protection and Biodiversity Conservation Act* and the *Aboriginal Heritage Act*. In relation to the existing CHMP and associated no-go zone, they relied on Ms Nicholson's evidence that CHMPs are specific to an activity and the Sponsor of that activity, and the Project would not be permitted to include works that are outside the approvals allowed in proposed CHMP 15384. Ms Nicholson advised '*If the no-go zone is required to be impacted by the pipeline Project, then the approved CHMP for the Project will address this and allow it*'<sup>274</sup>. Ms Nicholson noted there should be further consultation with Evolution Rail to ensure that each of the stakeholders understands their obligations in regard to their respective CHMPs.

### 20.3.3 Discussion

The IAC acknowledges the concerns raised by Evolution Rail and agrees the Pakenham East Rail Depot is State significant infrastructure that needs to be protected.

The general issues associated with hazard and risk are discussed in Chapter 14, in which the IAC noted the risk assessment done in Technical Report K, Appendix D on the PDF and the further work done on societal risk. The IAC noted the QRA risk criteria for current land uses including the Evolution Rail site are all met.

The IAC agrees that electrolysis impacts are potentially significant but notes this issue is well understood and addressed in pipeline legislation and regulation. As the Proponents noted, electrolysis issues influenced the design of the pipeline in this location and will be further addressed in the Safety Case required under the *Gas Safety Act*. The IAC accepts electrolysis impacts can be acceptably managed, subject to the further, more detailed assessments to be undertaken by the Proponents. The IAC was not presented with any evidence that it would be necessary to realign the pipeline in order to address electrolysis issues.

In relation to the operation of the Depot, the IAC agrees maintaining vehicular access through the Oakview Lane entrance is critical, given the lack of alternative access points and the importance of the facility. The loss of this access, even on a temporary basis, must be avoided. Using trenchless boring opposite the Depot entrance would assist this, however the use of the open cut trenching along Oakview Lane would require careful planning to avoid disruption. It is important the implementation and staging of these works be discussed with Evolution Rail and other stakeholders in the area so access issues can be appropriately addressed. The IAC agrees with the Proponents this can be managed through the TMP and through the consultation processes that would be in place<sup>275</sup>.

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<sup>273</sup> POS A8 in CEMP

<sup>274</sup> D381

<sup>275</sup> CEMP POS A1

Environmental impacts, including MNES associated with Southern Brown Bandicoot and Growling Grass Frog habitat, and approval under the *Environment Protection and Biodiversity Conservation Act* are relevant to the concerns raised by Evolution Rail about the various environmental approvals that would be required.

In relation to the PDF, the IAC notes the Proponents' advice that it was sited to avoid the Growing Grass Frog habitat to the north of the site. This is consistent with the relevant plans provide by Evolution Rail and the Proponents. However, the IAC notes the evidence of Mr Lane whose response to Evolution Rail's concerns was that:

... it is difficult to clearly identify if the proposed pipeline footprint will impact an environmental no-go zone as per Evolution Rail's TSMP. To do so requires GIS analysis with accurate CAD files. Impacts on this area will be subject to further analysis. It is recommended that a site-specific CEMP is designed to address all of Evolution Rail's concerns with the project (a-e) <sup>276</sup>.

The IAC supports Mr Lane's recommendation for a site specific CEMP for the PDF and has included this as a recommendation.

The IAC has not reviewed the existing CHMP that applies to the Depot, although it notes that plans supplied by Evolution Rail identify a large 'cultural heritage no-go zone' that overlaps a large part of the PDF site. Presumably, this was identified and implemented as part of that CHMP. As Ms Nicholson noted, CHMPs are specific to projects and sponsors, and a new CHMP (15384) is being prepared for the northern area of the Project, including the PDF site. This process will identify any Project specific constraints or requirements that need to be addressed. In the absence of that CHMP been approved, it is not possible to comment on the implications of where the two CHMPs might overlap or relate to each other.

The IAC agrees with Ms Nicholson there should be further discussions between the stakeholders so that their respective obligations are understood.

#### **20.3.4 Findings**

The IAC finds:

- The issues raised by Evolution Rail Pty Ltd are capable of being addressed through the recommended mitigation measures, the further assessments that will be undertaken and the detailed planning and approvals that would be required.

#### **20.3.5 Recommendation**

The IAC recommends:

##### Other recommendation

**Prepare a site specific Construction Environmental Management Plan for the Pakenham Delivery Facility in response to environmental 'no-go' zones associated with Southern Brown Bandicoot and Growling Grass Frog habitat and addresses:**

- **native vegetation removal**
- **invasion by environmental weeds, pathogens or animals within retained native vegetation**
- **habitat fragmentation and effects on ecosystem function**
- **noise and vibration impacts causing stress/displacement of native fauna**
- **dust impacts on flora and fauna as an ecosystem function.**

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<sup>276</sup> Row 13A in Table 3 of D76.

## 20.4 Other submissions

### 20.4.1 Introduction

Some submitters raised concerns about the impacts of the pipeline on their properties, the compensation and acquisition processes and the consultation with APA.

### 20.4.2 Submissions

S1303, S1305 and S1309 provided a common submission that indicated that their property was within the pipeline route. They opposed the pipeline and raised concerns about discussions held with APA about compensation issues, including adequacy of compensation.

S3777 opposed the pipeline and compulsory acquisition of the pipeline easement over his property.

These submitters did not attend the Hearing and the exact nature of their concerns is difficult to assess on the information provided in their written submissions.

The Proponents provided responses to each submission, as well as an overview of the consultation that had been undertaken and the relevant acquisition and compensation provisions, and submitted:

APA is committed to providing fair, adequate and equitable compensation to impacted landowners and occupiers for disturbance and loss of production in accordance with the Pipelines Act 2005. APA's strong preference is to negotiate purchase of easements. Where this cannot be done and APA receives consent to compulsorily acquire easements, compensation for acquisition of property is dealt with in accordance with the section 151 of the Pipelines Act and Land Acquisition and Compensation Act 1986. Compensation takes into account the market value of the land/interest acquired and the depreciation in value of other adjoining land.

The Pipelines Act 2005 and the Pipeline Regulations detail a process to ensure that landowners and occupiers are engaged in a structured and respectful process leading up to the negotiation of easement rights. It is a specific requirement of the Pipelines Act (Section 17) that the information to be provided to owners and occupiers of land must include details of the procedures that are to be followed under that Act and any other Act to permit the construction and operation of the pipeline, including the procedures for any compulsory acquisition of land <sup>277</sup>.

### 20.4.3 Discussion

The IAC generally supports the pipeline criteria adopted by APA and the exhibited pipeline route, although it understands negotiations with various landowners are continuing and not all issues have been resolved. While the IAC acknowledges the concerns raised by these submitters, the various processes under the *Pipelines Act* provide the legal framework for addressing these matters. The IAC accepts that within this framework, APA's preference is to negotiate agreed outcomes rather than rely on compulsory easement acquisition.

Having reviewed these submissions, the IAC does not believe there are adequate grounds for recommending alternative pipeline alignments.

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<sup>277</sup> D175

## 21 Matters of National Environmental Significance

### 21.1 Introduction

Chapter 22.2 sets out the process for referral of the Project under the *Environment Protection and Biodiversity Conservation Act*. The Project is a ‘controlled action’ as it is likely to have a significant impact on listed MNES.

Clause 39i. of the IAC’s Terms of Reference requires it to prepare a written report that includes:

Specific findings and recommendations about the predicted impacts on matters of national environmental significance and their acceptability, including appropriate controls and environmental management.

The MNES which the proposed action may have a significant impact on are known as the ‘controlling provisions’. The relevant controlling provisions for the pipeline works are:

- Wetlands of international importance (Sections 16 and 17B of the Act).
- Listed threatened species and ecological communities (Sections 18 and 18A of the Act).

The relevant controlling provisions for the GIJW are:

- Wetlands of international importance (Sections 16 and 17B of the Act).
- Listed threatened species and ecological communities (Sections 18 and 18A of the Act).
- Listed migratory species (Section 20 and 20A of the Act).

Attachment I to the EES addresses MNES.

The EES reports a systematic risk-based approach was used to understand the existing environment and potential Project impacts on MNES. The assessment involved:

- a desktop assessment of relevant government curated biodiversity databases
- a desktop review of existing conditions reports, including previous field-based ecological investigations
- field investigations
- targeted threatened species surveys of flora and fauna
- assessment of potential impacts against the MNES Significant Impact Guidelines for the GIJW and the pipeline works.

An ‘EPBC Act Protected Matters’ search was undertaken for the both the GIJW and pipeline works using the DAWE online Protected Matters Search Tool (PMST) to determine the likely presence of any MNES.

The primary consideration relevant to the *Environment Protection and Biodiversity Conservation Act* is whether the Project will have a ‘significant impact’ to an MNES. Impact assessments to determine significant impacts on MNES were undertaken for the GIJW and pipeline works in accordance with the MNES Significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act* for wetlands of international significance, listed threatened species and communities, listed migratory species and to determine cumulative impacts.

The PDF is proposed to be located on a site for which the Department of Transport holds an existing approval under the Act (EPBC 2014/7263) and the conditions of that approval currently apply.

## 21.2 Key Issues

The key issues include:

- Impacts to wetlands of international importance from the GIJW and pipeline works, particularly operation of the FSRU and LNG carrier resulting in:
  - changes to marine water quality from seawater discharges containing CPO and colder water
  - entrainment of marine biota as part of the regasification process with the intake of seawater
  - spills and leaks
  - underwater noise and vibration
  - lighting.
- Impacts to threatened species and ecological communities from the pipeline works, specifically impacts of construction resulting in:
  - vegetation clearance and loss of habitat
  - changes to surface water quality
  - contaminated and acid sulfate soils
  - noise and vibration
  - changes to air quality
  - lighting.
- Impacts to migratory species
  - changes to water quality
  - spills and leaks
  - underwater noise and vibration
  - lighting.

## 21.3 Impacts to wetlands of international significance (Ramsar wetlands)

### 21.3.1 Background

The PMST search identified that the Western Port Wetland of International Significance was a MNES and a controlling provision for both the GIJW and Pipeline Projects.

EES Attachment I, Chapter 6 and Technical Report A described the potential impacts of the Project to wetlands of international significance.

Western Port Bay was designated as a wetland of international importance in 1982 and given special recognition as Waterfowl Habitat under the Ramsar Convention. Ecological character is the combination of the ecosystem components, processes, benefits and services that are critical to the ecological character of the Ramsar site and characterise the wetland at a given point in time.<sup>278</sup> The ECD compromises eight CPS:

- wetland bathymetry
- geomorphology and sedimentation
- flora - seagrass
- flora - mangrove and saltmarsh
- fauna - waterbirds
- fauna - marine invertebrates
- fauna - fish

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<sup>278</sup> Ramsar Convention 2005a, Resolution IX.1 Annex A

- supports threatened species.

Attachment I reported that four of the eight components critical to the ecological character of the Ramsar site relate to fauna, with particular significance placed on waders and waterbirds. Seven fauna species listed under the *Environment Protection and Biodiversity Conservation Act* are regularly supported by the Ramsar site.

The Ramsar site satisfies seven of the nine criteria that determine if a wetland should be listed as internationally significant. At its original listing in 1982, four criteria were satisfied. Since 1982, the Ramsar site has been recognised for an additional three criteria.

The ECD for Ramsar wetlands provides the baseline description of the wetland at a given point in time and can be used to assess changes in the ecological character of these sites <sup>279</sup>. Changes to the ecological character outside natural variations may signal that uses of the site or externally derived impacts on the site are unsustainable. These may lead to degradation of natural processes, and the ultimate breakdown of the ecological, biological and hydrological functioning of the wetland <sup>280</sup>.

The ECD explains ‘limits of acceptable change’:

Limits of acceptable change acknowledge the natural variability exhibited by elements within the wetland ecosystem and establish guidelines that facilitate the assessment of change (either positive or negative) to the ecological character resulting from human activities.

### 21.3.2 Evidence and submissions

The Proponents presented the outcomes of the assessment on wetlands of international importance in EES Attachment I – MNES. As noted in Attachment I:

A Ramsar wetland is an area designated under Article 2 of the Ramsar Convention or a wetland declared by the Federal Environment Minister to be a Ramsar wetland under the EPBC Act

The Proponents submitted the GIJW and pipeline works would not have an unacceptable environmental impact on the Ramsar wetland, with any impacts being localised within proximity to Berth 2 and the FSRU.

The Proponents determined the GIJW is expected to present the greater risk to the Ramsar site due to its location in proximity to six major habitats of the site, being:

- water column
- mud
- seagrasses
- mangrove
- saltmarshes
- rocky reefs.

The pipeline works were considered to have a low Ramsar impact, with the pipeline located in the vicinity of saltmarshes and mangroves habitats. The Proponents submitted the pipeline alignment would not pass through or occur adjacent to any of the other four habitats.

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<sup>279</sup> <https://www.environment.gov.au/water/wetlands/publications/national-framework-and-guidance-describing-ecological-character-australian-ramsar-wetlands#:~:text=Ecological%20character%20is%20the%20combination,1%20Annex%20A>.

<sup>280</sup> Ramsar Convention 1996, Resolution VI.1

The Proponents considered it unlikely the pipeline works would result in changes to wetland hydrology, diversity or structure that would lead to a decrease in Ramsar habitat quality. They reiterated the pipeline would be constructed using HDD to avoid surface impacts in four locations where Ramsar MNES attributes exist. The Proponents' closing submission referred to Mr Lane's evidence that:

Technical Report B provides a detailed assessment of impacts on key components, processes and services (CPS) of the Western Port Ramsar site based on the framework in the site Ecological Character Description (Hale 2016) in Section 7.1.5, p. 177-181 and Table 34. It also assesses impacts against the EPBC Act Significant Impact Guidelines (Appendix A7.3). These are the accepted management and assessment frameworks for Australian Ramsar sites and are used by environmental decision-making bodies regularly to inform their decisions about projects that potentially affect these valuable wetlands. The assessment in Technical Report B is consistent with this approach and provides adequate information to inform a decision on whether the impacts of the Project on the site are acceptable or significant.

...

The requirements of Ramsar site impact assessment in Australia are founded on the EPBC Act Guidelines on Significance and the Limits of Acceptable Change to key components, processes and services in an Ecological Character Description. This is how impacts on the Ramsar site have been assessed in Technical Report B <sup>281</sup>.

Many submitters opposed the Project because:

- it was inappropriately located in a Ramsar wetland
- critical CPS of Western Port Bay are intrinsically linked, each contributing to its ecological character
- the links within the marine environment are not well understood
- Project activities would result in unacceptable impacts to the wetland.

### 21.3.3 Discussion

The marine impacts of the Project are discussed in Chapter 4. The IAC found, in summary, the risks of the Project were not adequately assessed. The IAC concluded it was not established that significant impact will not occur, and it concluded the impact of the Project is unacceptable in a wetland of national and international importance.

The Proponents relied on the assessment of the Project against the LAC and CPS established for the entire Western Port Bay. The IAC appreciates the CPS approach to Ramsar site impact assessment is an Australia-wide, accepted framework for monitoring and assessing impacts on the ecological character of Ramsar sites. However, the IAC considers assessment of the Project's impacts against the recognised, bay-wide LAC and CPS is insufficient and does not provide a relevant representation of the potential impacts of the Project to the Ramsar wetland on a localised scale.

Localised impacts are expected to the CPS within the Ramsar wetland. The Proponent submitted impacts are confined within Port waters and the dredged channel. Irrespective of defined Port waters, the Project's impacts will occur within the wetland of international importance and the IAC has concluded the Project will likely result in a change to the ecological character of part of the Ramsar wetland. The IAC considers that ecological change will be certain within the proximity of the FSRU. The Proponents' marine experts suggested that impacts are likely beyond the FSRU. On balance, the IAC considers the impact will result in a significant change to the ecological character on a local scale and a change to the ecological

character on a broader scale, but the extent of that change is unknown. The IAC considers this represents an issue under the significant impact guidelines of an action likely to have a significant impact on the ecological character of a declared Ramsar wetland where there is a real chance or possibility that it will result in areas of the wetland being destroyed or substantially modified<sup>282</sup>.

The Proponent has not conclusively quantified that potential direct and indirect impacts of the Project to the Ramsar wetland are acceptable. They considered that as the Project is located within an established Port and within Port waters, the potential for adverse impacts should be considered insignificant.

The IAC acknowledges the emphasis placed by the Ramsar Convention on the wise use of listed wetlands. It considers Western Port should continue to be used wisely and potential risks should be well understood to ensure environmental values can be protected and enhanced. The IAC acknowledges submissions that emphasise governments, industries and the community have an obligation to protect and conserve the ecological character of the Western Port Ramsar wetland and ensure any threatening or potentially threatening processes do not result in ecological change.

At the same time, the IAC recognises the Port will continue to be of regional, State and national significance and its use and future operations should continue by balancing use and development of the Port and protection of the Western Port Ramsar wetland.

Based on its assessment of the marine biodiversity impacts in Chapter 4, the IAC believes cumulative impacts of the Project, particularly discharge of chlorinated and chilled seawater, and continual entrainment of plankton have the potential to result in the ‘significant impacts’.

Table 20 summarises the findings of the IAC in relation to the Ramsar wetlands.

**Table 20 Summary of findings in relation to Ramsar wetlands**

Potential Risk	Implications for Ramsar Wetlands	Cross reference
Change in marine water quality	The FSRU will be permanently moored in the Ramsar wetland and regasification of LNG will require a constant supply of seawater. The FSRU will continuously discharge residual concentration of 100 µg/L chlorine produced oxidants (CPO) for the life of the Project. The seawater will be 7°C cooler at the point of discharge. This discharge will result in a change in chemical and physical properties of the water. Direct impacts are expected to be localised to waters immediately around Crib Point. Indirect impacts to the marine water quality and marine biodiversity are not well understood. Although it readily disperses in seawater, evidence indicates the spatial and temporal extent of CPO and its derivatives could persist within the Ramsar wetland well after discharge.  There are no likely implications from the pipeline works to the Ramsar wetland.	Chapter 4.4
Entrainment of biota	The FSRU will draw an average 312,000 m <sup>3</sup> of seawater per day from the Ramsar wetland at a rate of 0.15 metres per second. The intake velocity will result in entrainment and impingement of	Chapter 4.5

<sup>282</sup> Page 13, Significant Impact Criteria for Wetlands of International Importance, MNES Significant impact guidelines 1.1, 2013.

	<p>pelagic marine biota from the Ramsar site up to minimum size of 100 mm. Entrainment will continue for the life of the Project, and it is expected the continual entrainment of phytoplankton, zooplankton, fish eggs and larvae will have localised impacts in the Ramsar wetland. The potential for long term impacts are not well understood.</p> <p>There are no likely implications from the pipeline works to the Ramsar wetland.</p>	
Spills and leaks	<p>In general, existing Port related activities present a risk of spills and leaks to the Ramsar wetlands. Historically, the risks within the Port appear to be effectively managed to avoid or minimise the risks. The additional vessels entering is unlikely to present additional risks beyond those already existing in the Ramsar wetland. Competent and effective systems and protocols are in place to both minimise the risk of oil spill and manage the effects in the unlikely event of a spill.</p> <p>There are no likely implications from the pipeline works to the Ramsar wetland.</p>	Chapter 14.5.3
Noise	<p>Noise during GIJW operations may cause localised impacts to the Ramsar wetland, particularly fish, waterbirds and threatened species, recognised as critical CPS. Air-borne noise and underwater noise may cause behavioural responses, which may result in marine fauna avoiding distances up to 2.09 kilometres from Berth 2 during periods of peak regasification. Long term and permanent adverse impacts are unlikely to result from noise generated at the GIJW.</p>	Chapter 11
Light spill	<p>Light spill may attract or detract some fish, waterbirds and threatened species, but adverse impact from artificial light to the Ramsar wetland is unlikely.</p> <p>There are no likely implications from the pipeline works to the Ramsar wetland.</p>	Chapter 5.6

### 21.3.4 Findings

The IAC finds:

- The GIJW poses a threat to the Ramsar wetland due to its continual seawater intake entraining plankton, fish eggs and larvae, and discharge of chlorinated and cold seawater.
- The Project will result in unacceptable environmental impacts within a segment the Ramsar wetland.

## 21.4 Impacts to Listed threatened species and ecological communities

### 21.4.1 Background

EES Attachment I, and Technical Reports A and B described the potential impacts of the Project in relation to the controlling provision of listed threatened species and ecological communities (s18 and s18A of the *Environment Protection and Biodiversity Conservation Act*).

The Proponents advised that desktop assessments were conducted and, where deemed relevant, targeted surveys were undertaken to assess the presence of listed threatened

species and ecological communities within the GIJW and pipeline project area to identify suitable habitat that threatened species are likely to occur in.

#### **21.4.2 Evidence and submissions**

Chapters 4 and 5 discuss the submissions and evidence relevant to the potential impacts of the GIJW and pipeline works on threatened species and ecological communities.

##### **(i) Gas Import Jetty Works**

The Proponents submitted that 65 threatened species with potential to occur within five kilometres of the study area were identified in the PMST search. Twelve listed threatened species were identified with a medium to high likely potential to occur within the GIJW area:

- Nine bird species (Fairy Tern, Lesser Sand Plover, Greater Sand Plover, Eastern Curlew, Bar-tailed Godwit, Curlew Sandpiper, Red Knot, Great Knot, White-throated Needletail).
- Two whale species (Southern Right Whale, Humpback Whale).
- One fish species (Australian grayling)<sup>283</sup>.

The Proponents submitted that the Fairy Tern and Australian Grayling were the only listed threatened species identified that are not also listed migratory species. Migratory species are discussed in Chapter 21.5.

The EES found that impacts from construction of the GIJW to Fairy Terns were *'likely to be minor and associated with noise and contained within the vicinity of the GIJW'*. The impacts were considered to be short-term and unlikely to impact populations nor harm individuals.

The EES found that the Australian Grayling had the potential to be impacted by the uptake of seawater during operation of the FSRU. The EES indicated that Australian Grayling larvae *'drift downstream and enter Western Port from April to July with a peak in May. Larvae then undergo a period of marine residency before returning upstream as young juveniles from September to December'*<sup>284</sup>.

The Proponents noted that the Dense Leek-orchid was identified under the controlling provisions of the GIJW, but it was not considered further as it would not be impacted by the GIJWs.

Among other submitters, the Silverleaves Conservation Association Inc (S2569) submitted that the threat from the GIJW to Western Port Bay would be unacceptable. They noted the various threatened species in the Ramsar wetland, and that Western Port supports a number of threatened and critically endangered species such as white mangrove communities, high numbers of shorebirds and migratory species including the Fairy Tern, Orange-bellied Parrot and Swift Parrot, and marine megafauna.

The DAWE noted that the Hooded Plover and Australian Fairy Tern which are vulnerable MNES occur in Western Port Bay and suggested that they have not been adequately considered in the EES.

The Proponents submitted that the listed threatened ecological communities identified by the PMST search as likely to occur in the GIJW area were:

- Natural Damp Grassland of the Victorian Coastal Plains – critically endangered.

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<sup>283</sup> Under the *Environment Protection and Biodiversity Conservation Act*

<sup>284</sup> EES Attachment I

- Subtropical and Temperate Coastal Saltmarsh – vulnerable.

The Proponents noted the GIJW would not impact the Ramsar wetland ecological community of Subtropical and Temperate Coastal Saltmarsh and it was not considered a MNES for the purposes of the *Environment Protection and Biodiversity Conservation Act*. The MNES of Natural Damp Grassland of the Victorian Coastal Plains is not present within the GIJW project area.

A number of submissions including S2569 and DAWE expressed concern the EES lacked adequate consideration of the Orange-bellied Parrot and the critical habitat provided by the coastal saltmarsh. The EES found that:

There is a significant distance between the areas above the temperature and chlorine Guideline Values and the various habitat types recognised under the Ramsar Convention. Due to the distance, the likelihood of there being any effect from the discharge on the subtidal reef or seagrass, estuarine areas, intertidal mud flats, intertidal forested wetlands, salt marshes, mangroves and waterbirds is low <sup>285</sup>.

## **(ii) Pipeline works**

The Proponents submitted that 68 threatened species were identified in the PMST search with potential to occur within five kilometres of the study area. These species included birds, fish, frogs, insects, marine and terrestrial mammals, plants, reptiles and sharks.

Of these species, the EES considered eight to have a medium or higher likelihood of occurring within the survey area (described in Chapter 3.0 of Attachment I). The following terrestrial and freshwater MNES species were further assessed in the EES:

- Growling Grass Frog – vulnerable
- Grey-headed Flying-fox – vulnerable
- Southern Brown Bandicoot – endangered and critically endangered
- Dwarf Galaxias – vulnerable
- Australian Grayling – vulnerable
- Swift Parrot – endangered and critically endangered
- Dense Leek-orchid – threatened
- River Swamp Wallaby-grass – vulnerable.

The Southern Brown Bandicoot, Growling Grass Frog and River Swamp Wallaby-grass were the only species of conservation significance under the *Environment Protection and Biodiversity Conservation Act* recorded during targeted field surveys.

The Proponents submitted the listed threatened ecological communities identified by the PMST search as likely to occur in the Pipeline works area were:

- Natural Damp Grassland of the Victorian Coastal Plains – critically endangered.
- Subtropical and Temperate Coastal Saltmarsh – vulnerable.
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – critically endangered.

The EES reported that:

Only one threatened community was determined to have potential to be present within the pipeline alignment: Subtropical and Temperate Coastal Saltmarsh. Field investigations confirmed the presence of Subtropical and Temperate Coastal Saltmarsh within the pipeline alignment in one location at Watson Creek (KP19).

The Proponents advised the pipeline would be constructed using HDD to avoid surface impacts in four locations where Ramsar MNES attributes exist and would avoid impact to the coastal saltmarsh.

The PMST search noted 72 listed marine species and seven whales and cetaceans may also occur. The Proponents submitted that the Pipeline Works would not impact listed marine species.

### **21.4.3 Discussion**

#### **(i) Gas Import Jetty Works**

The effects of the GIJW on listed species and ecological communities relate to construction and operational impacts.

The IAC considers construction impacts will be localised and generally acceptable. There are no ecological communities affected by the GIJW and the works for both the Jetty and the CPRF will have negligible impacts. The Jetty exists and will require upgrading, much of which has been approved through Marine and Coastal Consents obtained by PHDA. The CPRF site has been predominantly cleared of native vegetation and although some further additional vegetation removal may be required, the site has been substantially modified.

Listed species such as the Orange-bellied Parrot, Fairy Tern and White-throated Needletail would be unlikely to be affected by construction of the GIJW. These are all mobile species which would be unlikely to be within the impact area of the proposed works.

The operation of the GIJW has the possibility of affecting one listed vulnerable threatened species not identified as migratory in the EES, the Australian Grayling. The Proponents considered it was not expected to be significantly affected by entrainment or impingement, yet the impact of such effects remain relatively unknown. The EES identified in Technical Report A – Annexure G, a juvenile specimen in September 2019, which had some level of uncertainty with respect to identification. This demonstrates uncertainty there may be a level of risk to this species from entrainment and impingement, but it is not known to what extent this may be the case. The EES relied on the small possibility of effect and the assumption that any migration of juveniles of the species may likely use the eastern arm of Western Port to otherwise dismiss the gravity of impact<sup>286</sup>. This demonstrates the uncertain impact of the Project on this species.

#### **(ii) Pipeline Works**

The Proponents submitted the likelihood of significant impact to the listed threatened species and ecological communities from the pipeline works were negligible to low as the pipeline works are short term and localised. They may result in a temporary degradation or fragmentation of particular habitats but would not lead to a decrease in population sizes and would be unlikely to create permanent alterations.

The IAC generally agrees impacts from construction of the pipeline are temporary and of a short duration, which, although significant at the time, allows the environment to recover. The effects from operation of the pipeline are minor as it will be underground. Effects on vegetation can be offset and the IAC has made recommendations that will assist in further avoiding impacts on those environments considered valuable, such as Warringine Park.

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<sup>286</sup> Technical Report A, page 335

There will be impacts on habitat of threatened species such as the Southern Brown Bandicoot through vegetation removal. However, the IAC has recommended amendments to the CEMP POS that will assist in mitigating the more serious impacts of the works impacting on the species. The short duration of effects and lost habitat, and rapid revegetation of habitat areas post-construction should assist in providing refuge to allow for sustainability and movement of the species.

The pipeline construction will include HDD crossings for the majority of major waterways, which should reduce the significance of impacts on species such as the Growling Grass Frog and other aquatic species including the Australian Grayling and Dwarf Galaxias. The open trenching of those waterways is proposed to be undertaken during drier periods, minimising species impacts and the risk of sedimentation affecting water quality of Western Port Bay.

Flora species such as River Swamp Wallaby-grass have been safeguarded through detection and HDD works.

With respect to listed threatened ecological communities, there is a small area of coastal saltmarsh at KP20 proposed to be impacted by open trenching of the pipeline. In considered this impact, the IAC recommends removal of this community of coastal saltmarsh must be avoided through HDD. The IAC considers this will appropriately safeguard the community, particularly given its close location with extensive saltmarshes within the Western Port Ramsar site.

Table 21 summarises the findings of the IAC in relation to listed threatened species and ecological communities.

**Table 21 Summary of findings on Listed species**

Potential Risk	Implications for Listed threatened species and communities	Cross reference
Vegetation clearance and loss of habitat	Loss of vegetation is expected during the Pipeline Works to have an impact on listed threatened species primarily from removal and disruption of habitat. However, through recommended avoidance of areas of endangered vegetation communities and large scattered trees, together with proposed mitigation measures, impacts are considered to be acceptable.  Vegetation clearance and loss of habitat is not expected during the GIJW to listed threatened species and communities.	Chapters 5.3 and 5.4
Changes to surface water quality	Impact from pipeline works to surface water quality should be avoided through waterways being either crossed by HDD or open trenched during periods of no water flow. Mitigation measures addressing stormwater runoff should reduce potential for sedimentation. Impacts are considered to be acceptable.  Changes to surface water quality is expected around the GIJW and direct adverse impacts are not expected to listed threatened species and communities.	Chapter 6
Contaminated and acid sulfate soils	The short duration and temporary construction of the pipeline should minimise impacts on listed threatened species. Impacts are considered to be acceptable subject to the proposed mitigation measures.	Chapter 8

	Contaminated sediment was measured proximal to the GIJW and impacts are not expected to listed threatened species and communities.	
Noise and vibration	Noise from construction of the pipeline is considered to be temporary and impacts acceptable. Air-borne noise and underwater noise from the GIJW may at times cause behavioural responses, which may result in marine fauna avoiding Berth 2 during periods of peak regasification. Long term and permanent adverse impacts are unlikely to result from noise generated at the GIJW.	Chapter 11
Air quality	Air quality impacts from the GIJW and pipeline works will not impact listed threatened species and communities.	Chapter 10
Lighting	Lighting may cause temporary behavioural changes, but adverse impact listed threatened species and communities is unlikely.	Chapter 5.6

#### 21.4.4 Findings

The IAC finds:

- The likelihood of significant impacts to listed threatened species and ecological communities from both the GIJW and pipeline works are considered low providing the recommended mitigation measures are effectively implemented.

### 21.5 Listed migratory species

#### 21.5.1 Background

EES Attachment I, and Technical Reports A and B described the potential impacts of the Project to the controlling provision of listed migratory species (s20 and s20A of the *Environment Protection and Biodiversity Conservation Act*).

Migratory species are those that migrate to Australia and its external territories or pass through or over Australian waters during annual migrations, including birds, mammals, sharks and reptiles.

#### 21.5.2 Evidence and submissions

Chapter 5 provides further details on submissions and evidence relating to listed migratory species.

The Proponents submitted 54 listed migratory species with potential to occur within five kilometres of the GIJW area were identified in the PMST search. The EES reported that 25 listed migratory bird species were considered to have a medium or higher likelihood of occurring within this area, with eight of these species listed as threatened.

The Proponents described twelve migratory mammals, shark and reptile species as likely to occur in the GIJW area, seven of which are listed as threatened species. The Proponents noted the presence of the following:

- Humpback whales and Southern Right Whales frequent Western Port Bay on occasion, but visits to Western Port were considered the result of wandering from normal migration paths.

- White sharks are highly mobile and have been caught and observed in Western Port Bay, and it was anticipated this species could occasionally pass through the Western Port North Arm.
- Turtles are considered to have a low likelihood of occurring near the GIJW.

A significant number of submissions expressed concern with an increased risk of whale strikes from the additional movements of ships into the North Arm (See Chapter 14).

The GIJW and more broadly Crib Point provide foraging and roosting habitat for multiple migratory bird species, including species listed on one or more of several bilateral Migratory Birds Agreements Australia has with Japan, South Korea and China. Of the significant species recorded or predicted to occur within the GIJW area, 25 listed migratory bird species are considered to have a medium or higher likelihood of occurring within this area. Eight of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act*.

The impacts of the GIJW on migratory birds was raised in several submissions. The Proponents submitted Crib Point is a secondary foraging habitat and does not provide important habitat for migratory shorebirds (see Chapter 5).

Submissions were concerned about lighting impacts on the listed migratory species residing within the GIJW and pipeline project area. Many questioned the adequacy of the Proponents' assessment of the Project impacts against the National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds. The Proponents submitted that light can be effectively managed and there will be no measurable change from GIJW and pipeline works (see Chapter 12.7).

The impact of noise, particularly underwater noise was considered in a number of submissions as a significant issue for migratory species. The Proponents submitted that listed migratory species will not be adversely impacted by air-borne noise from the GIJW and pipeline works. Listed marine species will likely exhibit behavioural responses and avoid underwater noise generated during some GIJW operational scenarios (see Chapter 11).

### 21.5.3 Discussion

The IAC has considered the potential impact pathways to listed migratory species across the GIJW and pipeline works area. A number of listed migratory species are within proximity to the GIJW, including migratory shorebirds, waterbirds, whales and dolphins. Listed migratory species are unlikely to be significantly impacted by the pipeline works.

Impacts to migratory species from the GIJW could potentially occur, with effects associated with water quality, spills and leaks, noise and vibration and lighting.

Table 22 summarises the findings of the IAC in relation to migratory species.

**Table 22** Summary of findings in relation to migratory species

Potential Risk	Implications for migratory species	Cross reference
Changes to water quality	No impact from the GIJW and pipeline works, as any change to water quality will be localised.	Chapters 4, 5 and 6
Spills and leaks	The noted listed migratory species relevant to the GIJW are migratory in nature and would likely avoid an area impacted by	Chapter 14.5.3

	spills and leaks until conditions become favourable. The risk of spills and leaks currently exist within PHDA. The pipeline works are localised and temporary impacts will be unlikely impact migratory birds.	
Noise and vibration	Underwater noise from the GIJW may cause temporary behavioural responses to marine listed migratory species. The extent of species impacts to underwater noise is not fully understood.	Chapter 11
Lighting	Lighting and sky glow may temporarily affect the behaviour of wildlife, particularly migratory birds, but permanent adverse impacts are not expected and species would not be prevented from undertaking critical behaviours such as foraging, reproduction and dispersal.	Chapter 12.7

#### 21.5.4 Findings

The IAC finds:

- There is likely to be some impact from the GIJW on listed migratory species from lighting and noise. It is expected the adaptive behaviours of migratory species in the Project area may be temporarily altered but long term, permanent impacts are not expected.
- The effective implementation of the recommended mitigation measures will assist with managing impacts to Listed migratory species.

#### 21.6 MNES conclusions

The IAC concludes that:

- Impacts to listed threatened species and listed migratory species are likely to be low.
- Impacts to the ecological character within a segment of the Western Port Ramsar wetland is unacceptable.

# **PART C: PROJECT IMPLEMENTATION/ASSESSMENT**

## 22 Project implementation

### 22.1 Key approvals

#### 22.1.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The Project was referred to the Commonwealth Department of Environment and Energy under the Commonwealth *Environment Protection and Biodiversity Conservation Act* on 12 September 2018. The determining authority for the referral is now the DAWE.

The delegate for the Minister for the Environment and Energy determined the Project is a ‘controlled action’ as it is likely to have a significant impact on MNES:

A ‘significant impact’ is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts <sup>287</sup>.

The Project was submitted as two separate referrals on the basis that the GIJW (EPBC Reference Number 2018/8298) and the Pipeline Works (EPBC Reference Number 2018/8297) were substantially different in the type of infrastructure and geographic footprint and would be operated by two separate proponents. The relevant controlling provisions for the pipeline works and GIJW are discussed in Chapter 21.

The EES process is accredited to assess impacts on MNES under the *Environment Protection and Biodiversity Conservation Act* through the Bilateral (Assessment) Agreement between the Commonwealth and the State of Victoria (Schedule 1 (part 5) of the Bilateral Agreement) <sup>288</sup>.

The EES for the Project was undertaken in accordance with the Bilateral Agreement and there is no separate assessment by the Commonwealth. This avoids process duplication and enables alignment of mitigation and requirements under relevant State and Commonwealth legislation.

The Commonwealth Minister or delegate will receive the Minister for Planning’s Assessment under the *Environment Effects Act* at the conclusion of the EES process and use it as the basis for deciding on approval of the Project under the *Environment Protection and Biodiversity Conservation Act*, including any conditions the Commonwealth Minister may deem appropriate.

The Project will require both Victorian and Commonwealth approvals in order to proceed.

The MNES are discussed in Chapter 21 where the IAC concluded that:

- Impacts to listed threatened species and listed migratory species are likely to be low.
- Impacts to the ecological character within a segment of the Western Port Ramsar wetland would be unacceptable.

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<sup>287</sup> Commonwealth Significant Impact Guidelines 1.1

<sup>288</sup> What are generally termed ‘effects’ in the EES process correspond to ‘impacts’ under the *Environment Protection and Biodiversity Conservation Act*.

## 22.1.2 Environment Protection Act 1970

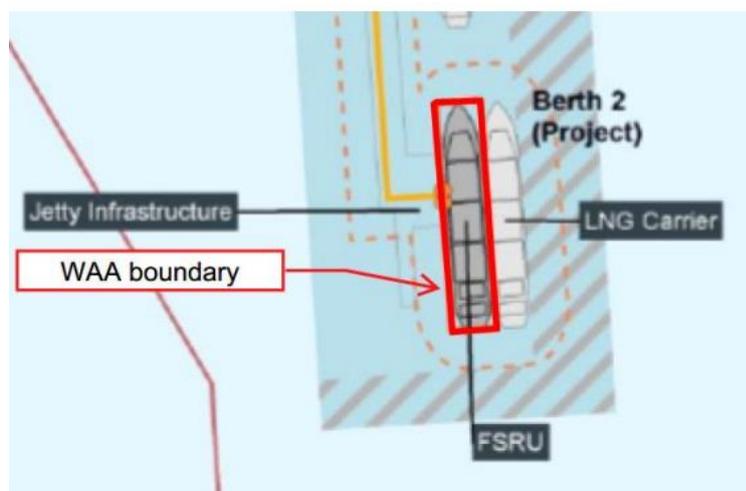
### (i) Background

The Proponents made an application for a Works Approval under the *Environment Protection Act*, which was exhibited concurrently with the EES and attached as Attachment VIII to the EES.

The FSRU is a scheduled premises for the purposes of the *Environment Protection Act* that is 'likely to cause the discharge of waste to the environment' and therefore must obtain a Works Approval. The WAA relates exclusively to the continuous mooring of the FSRU at the Jetty, having regard to its likely emissions and discharges during operation.

The Boundary of WAA is shown in Figure 19.

Figure 19 Boundary of the Works Approval Application <sup>289</sup>



The WAA includes an assessment of the potential environmental impacts associated with the construction and operation of the FSRU including:

- FSRU processes
- energy use and greenhouse gas emissions
- water resource use
- air emissions
- noise emissions
- managing stormwater runoff discharges and discharge to Western Port waters
- land and ground water
- waste management
- risk assessment and environmental management
- operating requirements.

The Proponents advised the WAA was informed by the EES and the specialist studies exhibited as part of the EES.

### (ii) Terms of reference and approval process

The IAC Terms of Reference require the IAC to provide advice to inform the EPA's consideration of the WAA. The advice should recommend avoidance, mitigation or

management measures the IAC considers necessary to ensure compliance with any relevant legislation and/or policy <sup>290</sup>.

The IAC is required to make recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a Works Approval if issued <sup>291</sup>.

The EPA participated in the TRG and provided advice about preparation of the EES. It made submissions to the IAC that outlined its preliminary observations and recommendations.

At the conclusion of the EES process, the EPA must consider the Minister's Assessment of the EES (as informed by the IAC's Report) before deciding the WAA.

The IAC notes that new laws will come into operation on 1 July 2021 under the amended *Environment Protection Act 2017*. The Proponents noted that:

The WAA has been made under the current legislative framework but has had regard to concepts of risk assessment and risk minimisation that will be introduced under the New Environment Protection Act. It is anticipated that the New Environment Protection Act is likely to have commenced by the time that an operating licence is sought for the FSRU and that the operator will need to meet the requirements of the new legislative regime at that time <sup>292</sup>.

The EPA noted applicable policies include the SEPPs, which are statutory instruments made under the *Environment Protection Act*. SEPP (Waters) SEPP (Air Quality Management) are of particular relevance to this Project <sup>293</sup>.

A significant issue is that the Project proposes to discharge wastewater from the FSRU into the waters of Western Port Bay, which is designated as a wetland of international importance under the Ramsar Convention. The EPA submitted that Western Port Bay is therefore water of high conservation value under schedule 5 of SEPP (Waters).

The EPA submitted that SEPP (Waters) relevantly provides:

- (a) at clause 22(3), that the EPA must not approve an application for a new wastewater discharge to surface waters of high conservation value unless the EPA is satisfied that the waste water discharge will be consistent with the requirements of clause 25; and
- (b) clause 25 relevantly provides that the EPA may approve an application to discharge wastewater to surface waters to provide water for the environment or other uses if EPA is satisfied that the wastewater can be treated and managed to a level to protect beneficial uses.

The EPA considers that the Proponent's Works Approval Application does not clearly explain how the FSRU would comply with the requirements of clause 25 of SEPP (Waters). EPA's records indicate this is the first application for permission to discharge wastewaters into waters of high conservation value, under the current or past iterations of the waters policy <sup>294</sup>.

The EPA has a number of matters to consider in relation to the relevance and applicability of SEPP (Waters). It noted this is the first application for permission to discharge wastewaters into waters of high conservation value, under the current past iterations of the waters policy. The IAC does not make any comments in relation to those matters.

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<sup>290</sup> IAC Terms of Reference Clause 21  
<sup>291</sup> IAC Terms of Reference Clause 39h  
<sup>292</sup> D162  
<sup>293</sup> D156  
<sup>294</sup> D156

On 19 November 2020, the EPA issued a notice to the Proponents under section 22(1) of the *Environment Protection Act* requesting further information<sup>295</sup>. The IAC makes no comments on the content of that request and has not seen any response.

**(iii) IAC advice on the WAA**

The IAC has assessed the potential environmental impacts of the proposed FSRU in Part B of the report. A summary of the assessment findings most relevant to the WAA are provided in Table 23.

**Table 23 Summary of issues most relevant to the WAA**

Chapter	Environmental impact	Comments relating to the WAA
4	Marine biodiversity	<p>The marine biodiversity assessments considered potential impacts from the GIJW, primarily from operations of the FSRU and mooring of the LNG carrier when offloading the LNG. Biological and physico-chemical monitoring was conducted which included sampling plankton populations, seabed surveys and water quality monitoring. Physical modelling was performed to understand the hydrodynamic conditions of the marine waters of Western Port Bay and the localised Crib Point environment.</p> <p>Western Port Bay is an area of high conservation value as defined in SEPP (Waters). An objective of SEPP (Waters) is to achieve the level of environmental quality required to protect the beneficial uses of waters. SEPP (Waters) requires that EPA must not approve a new wastewater discharge in waters of high conservation value (Clause 22(3)) which include Ramsar listed wetlands (Schedule 5) unless discharges provide water for the environment or other uses and wastewater can be treated to protect beneficial uses (Clause 25). A mixing zone should not be approved if acute lethality results at the point of discharge.</p> <p>Under normal operation the Project would discharge 100 µg/L CPO. Based on the evidence presented to the IAC, the Project does not comply with the requirements of SEPP Waters. The discharge is considered by the IAC a new wastewater discharge which will be colder than ambient and contain CPO, a recognised toxicant. The GV of 6 µg/L and 0.5°C for CPO and temperature respectively, were nominated as the 99 per cent marine species protection criteria to protect beneficial uses.</p> <p>The Project will impact biodiversity of Western Port Bay by entraining plankton, fish eggs and larvae during intake of an average 312,000 m<sup>2</sup> per day of seawater. Impingement of marine biota is expected although intake velocities are proposed at 0.15 metres per second to reduce entrainment and impingement. The extent of the discharge plume and the mixing zone will be reduced by avoiding discharge during slack tides.</p> <p>The IAC has recommended a GV of 2 µg/L as the 99 per cent marine species protection criteria and the discharge</p>

<sup>295</sup> A draft was provided to the IAC (D431)

concentration from the high velocity discharge ports of the FSRU. The discharge concentration consistent with the 99 per cent marine protection species GV is considered to protect the beneficial uses at the point of discharge, should avoid acute lethality at the point of discharge and will minimise impact to waters of high conservation value. The final decision of the Project's compliance with SEPP (Waters) is a matter for the EPA. In the event the Project is approved, the recommended EPRs should be adopted.

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9	Energy use and Greenhouse gas emissions	<p>For operation, the Project would contribute the equivalent of 0.23 per cent of Victoria's annual Scope 1 and Scope 2 emissions under a closed loop scenario or 0.06 per cent under an open loop scenario. The Project will contribute additional Scope 1 and 2 GHG emissions which, when compared to those at the State level, are relatively low.</p> <p>GHG emissions produced from the Project are unlikely to run the risk of undermining or preventing the development, implementation, or achievement of net zero reduction of GHG emissions by 2050. The FSRU can adjust its gas outputs depending on policy and/or consumer demand or it can relocate elsewhere if need for the facility dissipates.</p> <p>Greenhouse gas impacts can be acceptably managed through the recommended EPRs.</p>
10	Air quality	<p>Air emission assessments were conducted to assess the potential air quality impacts due to construction and operation of the FSRU at Crib Point in accordance with relevant federal and state policies. Air emissions during construction of the GIJW can be effectively managed through the recommended EPRs.</p> <p>The assessment of the GIJW considered potential air emissions during operation of the FSRU and dispersion modelling of likely emissions under a range of worst case operating scenarios. The air emission modelling was considered conservative as it applied higher than expected background concentrations and operating scenarios that would occur for no more than 10 per cent of the year.</p> <p>Predicted emissions of carbon monoxide (CO), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and sulphur dioxide (SO<sub>2</sub>) during worst case scenarios were modelled below SEPP (AQM) design criteria. Under worst case operating scenarios formaldehyde and NO<sub>2</sub> were both modelled to exceed SEPP (AQM) design criteria over water. Formaldehyde was modelled exceeding SEPP (AQM) design criteria over a small area of the Crib Point foreshore. Modelled dispersal plumes for assessed air pollutants did not intersect with sensitive uses, nor the Victorian Maritime Centre or Woolleys Beach Reserve. Odour is not expected from the GIJW.</p> <p>A HHRA determined that formaldehyde and NO<sub>2</sub> emissions from the FSRU would be at significantly lower concentrations than concentrations that cause adverse human health impacts.</p>

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		Air quality impacts can be acceptably managed through the recommended mitigation measures.
11	Noise and vibration	<p>Noise and vibration impact assessments were conducted for a range of operational scenarios at the GIJW. Construction impacts at the GIJW can be effectively managed by implementing recommended EPRs.</p> <p>The FSRU operating at peak regasification was assumed as the worst case scenario at the Jetty. Noise modelling was conducted on five operating scenarios under peak regasification with an LNG carrier unloading LNG. The individual operations of the GIJW are likely to meet the NIRV Recommended Maximum Levels during gas import operations. However, the combined operations at Berth 1 and 2 are likely to result in exceedances of Recommended Maximum Levels at the nearest residence at 103 The Esplanade, particularly when the landside pump is offloading petroleum from a vessel docked at Berth 1.</p> <p>Additional background noise assessments should be conducted over an extended period during a range meteorological conditions to confirm noise emissions at the nearest sensitive receptor operations. Background noise should be measured during operations at Berth 1. This will assist in developing targeted noise amelioration measures to minimise cumulative noise exceedances particularly at night during concurrent operations at Berths 1 and 2.</p> <p>Operational noise from the GIJW requires further consideration to confirm cumulative noise during activities at Crib Point Jetty can be effectively managed to comply with Recommended Maximum Levels between 10pm and 7 am at the nearest sensitive receptor.</p>
14	Safety, Hazard and Risk	<p>The risk identification and assessment work done to date for the Jetty, FSRU and CPRF has been done to a standard appropriate to the current stage of the Project.</p> <p>The proposed operation of Jetty, including berthing and unloading of the LPG tankers are well covered by existing Port operating practices.</p> <p>Existing regulations combined with the identified Project EPRs will properly control and mitigate risks associated with the Jetty works, FSRU and CPRF.</p>

Most relevantly, the IAC found in Chapter 4.4.6 that:

- Based on the evidence presented to the IAC, the Project does not meet the requirements of SEPP Waters Clause 23(2) (a) and (b) and Clause 22(3).
- The seawater discharged from the FSRU is considered a waste stream.
- Discharge from the FSRU would not have a net benefit to the receiving environment, nor are additional water flows required in Western Port Bay.

The IAC recommends that any WA conditions (should the Project proceed) incorporate the IAC's recommended mitigation measures.

### **22.1.3 Planning and Environment Act 1987**

#### **(i) Background**

As noted in Appendix E, the pipeline elements of the Project are exempt from approval under the *Planning and Environment Act* where a pipeline licence is required under the *Pipelines Act*. The components of the Project within the Port of Hastings (the GIJW and FSRU) would require approval under the *Planning and Environment Act* and the Mornington Peninsula Planning Scheme. To facilitate this, the Proponents prepared draft Planning Scheme Amendment C272morn (the PSA) that proposes to:

- amend the schedule to Clause 45.12 Specific Controls Overlay by inserting incorporated document ‘Crib Point Gas Import Jetty Works Incorporated Document, December 2020’
- amend the Schedule to Clause 72.01 (Responsible Authority for this Planning Scheme) to make the Minister for Planning the Responsible Authority for the purpose of the Project
- amend the schedule to Clause 72.03 (What Does this Scheme Consist of?) to insert Planning Scheme Map No 33SCO
- amend the schedule to Clause 72.04 (Documents Incorporated in this Planning Scheme) by inserting the incorporated document
- rezone the northern portion of CA 2040 from the Public Conservation and Resource Zone to the Port Zone
- extend the Port Zone to apply to all of CA 2085
- rezone the small western portion of CA 2085 from Public Use Zone 7 to Port Zone.

The Incorporated Document (prepared under the Specific Controls Overlay) would be the key instrument for approving those elements of the Project within the Port. It would exempt the Project from the need to obtain any further planning approval, subject to satisfying various conditions, including the preparation of various plans.

The Incorporated Document would require preparation of the following plans:

- Development Plan/s (an overarching description of the proposed works)
- Environmental Management Plan (the principal means of implementing the EPRs), including:
  - Construction Environment Management Plan
  - Operations Environment Management Plan
- Bushfire Management Plan.

#### **(ii) Evidence and submissions**

The Proponents outlined the proposed suite of planning controls and submitted the Specific Controls Overlay (and the associated Incorporated Document) was the appropriate planning tool to implement the Project. They noted the Specific Controls Overlay had been used to implement other large projects and relied on the evidence of Mr Biacsi who supported its use for the Project. Mr Biacsi reviewed the exhibited Incorporated Document and recommended four changes that the Proponents subsequently included in the Day 1 version (D172).

As the Hearing progressed, the Proponents proposed further changes that were included in the Day 4 version (D587) that forms the basis of the IAC’s recommended Incorporated Document at Appendix F.

The Proponent’s key changes included:

- requiring the Development Plan and EMP to give effect to the EPRs
- requiring the Development Plan to address access and car parking
- requiring the EMP to be accompanied by a statement explaining any differences in the applied and approved EPRs
- requiring the CEMP to address acid sulfate soil
- requiring that the OEMP include a ‘*statement of anticipated LNG cargoes, not exceeding 40 cargoes or 160 PJ per annum (whichever is the greater)*’
- requiring further consultation with Mornington Peninsula and relevant authorities
- making various plans available on a Project website.

There were few substantive issues raised in submissions about the draft Amendment or the Incorporated Document.

Mornington Peninsula noted the visual impact of existing abandoned infrastructure from previous industrial uses in the Crib Point area and submitted:

... it would be prudent to amend clause 6.0 of the Incorporated Document to make clear that the rehabilitation and decommissioning contemplated by that clause includes the removal of all aboveground infrastructure (noting that clause 6 allows the Minister and the Port of Hastings Development Authority to allow the retention of infrastructure in some circumstances) <sup>296</sup>.

The EPA noted the Incorporated Document makes provision for the EMP to be amended to make it consistent with the new *Environment Protection Act*. The EPA supported the inclusion of this provision and noted a similar provision was included in the Incorporated Document for the North East Link approval.

The CEG submitted the Incorporated Document:

- should provide for a community representative to be involved in development of the EMP
- should require that the ‘*statement of anticipated LNG cargoes*’ should be expressed as ‘an enforceable cap’
- should not provide for the Minister to approve a Project extension beyond 20 years
- should require the various plans approved under the Incorporated Document be publicly available ‘*for the life of the Project*’<sup>297</sup>.

Some submitters opposed the extent of the proposed Port Zone and removal of the Public Conservation and Resource Zone along the northern boundary of the CPRF site. Some were concerned about the extent of the Port Zone and the Specific Controls Overlay to the offshore area, south of the Jetty. These submitters were concerned whether these controls (and the Project) would restrict access to the picnic area and associated beach. The Victorian Sea Kayak Club (S995) and Save Westernport were among those who had these concerns.

The Proponents advised the foreshore north of the Jetty would still be publicly accessible along the waterfront, but not through the CPRF site that would be fenced off for the Project. They advised the picnic and beach areas south of the Jetty would still be accessible from along the waterfront, within the Woolleys Beach Reserve and The Esplanade. However, they agreed with the Victorian Sea Kayak Club that the extent of the proposed Port Zone south of the Jetty

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<sup>296</sup> D564

<sup>297</sup> D549

be reduced to coincide with the existing Port boundary, subject to the views of relevant agencies including DELWP, PHDA and Mornington Peninsula<sup>298</sup>.

Mornington Peninsula supported a review of the extent of the Port Zone in this area in order to minimise any restriction on beach access.

### **(iii) Discussion**

The IAC supports the use of the Specific Controls Overlay and the revised Incorporated Document, noting this approach was generally supported in evidence and submissions.

#### **Incorporated Document**

Clause 4.5.3 requires various stakeholders, including Mornington Peninsula, be consulted during the preparation of the required plans. The IAC is satisfied that Mornington Peninsula can represent community interests and does not agree with the CEG that a *'community representative'* be nominated.

Clause 4.5.5 requires the OEMP include *'A statement of anticipated annual LNG cargoes, not exceeding 40 cargoes or 160 PJ per annum (whichever is the greater)'*. The IAC agrees with the CEG that this is a statement of intent, rather than an enforceable cap, and has included a revised requirement in Appendix F to address this.

Clause 7.0 (Expiry) allows the Minister for Planning to extend the expiry of the approval. This was opposed by the CEG, but the IAC is satisfied this is an acceptable provision and consistent with similar approvals. It does not follow that the Minister would automatically approve any extensions to the specified expiry dates.

Clause 4.11 (Other conditions) requires that various approvals be publicly available *'until the commencement'* or *'during the operation'* of the GIJW. This satisfies the concerns raised by the CEG, but unnecessarily distinguishes between documents being available until commencement or during operation. The IAC believes this should be simplified and all relevant approvals should be available for the life of the Project. The IAC believes this should include a document that lists the relevant EPRs approved by the Minister. Given that the various approvals under the Incorporated Document have their basis in the EPRs, including a copy of them would improve the transparency of those processes and approvals. These matters are addressed in the recommended Incorporated Document at Appendix F.

#### **The extent of the Port Zone**

In relation to the extent of the Port Zone, the IAC accepts that its northern boundary represents the northern extent of the CPRF and the removal of a small area of the Public Conservation and Resource Zone is necessary to facilitate the Project. This area is within the Port, and access along the waterfront will still be possible.

To the south of the Jetty, the draft Amendment proposes a minor expansion of the Port Zone along the waterfront. The purpose of this expansion is not clear and submitters were concerned about its possible implications for access to the picnic area and beach. Although the rezoning would not, by itself, affect access to this area, the IAC agrees with the Proponents that the proposed change to the Port Zone should be reviewed so that it coincides with the Port Boundary. The IAC has included a recommendation to that effect.

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<sup>298</sup> D175

## Other issues

Clause 4.6 (Bushfire Management) requires the preparation of a Bushfire Management Plan. Bushfire risks were raised in submissions and are discussed in Chapter 14.

The IAC believes the Bushfire Management Plan should be prepared in consultation with the relevant fire authority and has included this in the recommended Incorporated Document at Appendix F.

### (iv) Recommendations

The IAC recommends:

#### Incorporated Document

**Include the following changes:**

- **Revised Clause 4.4 (Development Plan)**
- **Revised Clause 4.5 (Environmental Management Plan)**
- **Revised Clause 4.6 (Bushfire Management)**
- **Revised Clause 4.1 (Other conditions)**

These changes are included at Appendix F.

#### Other recommendations

**Review the extent of the proposed Port Zone south of the Jetty to coincide with the existing Port boundary.**

## 22.1.4 Pipeline Licence Application

### (i) Background

The IAC was appointed by an authorised delegate of the Minister for Energy, Environment and Climate Change as a Panel on 11 September 2020 to consider and prepare a report for the Minister in relation to the Pipeline Licence Application under s 40 of the *Pipelines Act 2005*.

The IAC acting as the Panel must, in accordance with s 47(1) of the *Pipelines Act*:

- report to the Minister for Energy, Environment and Climate Change on the submissions; and
- make a recommendation to the Minister for Energy, Environment and Climate Change as to the action that it believes should be taken with respect to the Pipeline Licence Application.

The Minister must consider the following in determining the application under section 49 of the *Pipelines Act*:

- the potential environmental, social, economic and safety impacts of the proposed pipeline
- the potential impact of the proposed pipeline on cultural heritage (including Indigenous cultural heritage)
- the benefit of the proposed pipeline to Victoria relative to its potential impacts.

The Proponents set out the statutory process for the Pipeline Licence Application in its opening submissions<sup>299</sup>. The stages for obtaining a licence were summarised including:

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<sup>299</sup> D162 paragraphs 221 to 225

- the requirement for a consultation plan to be approved by the Minister as a precondition to any application
- pre-licence surveys that includes notification of affected landowners
- formal notification of the pipeline corridor
- submission of the licence application.

All of these steps were completed prior to the exhibition of the EES.

The Proponents advised the IAC that notice of the Pipeline Licence Application was given in accordance with the requirements of the *Pipeline Act* in conjunction with the notice of the EES for the proposed pipeline. The Pipeline Licence Application formed Attachment IX to the EES.

All submissions received in relation to the EES are deemed to be submissions in relation to the Pipeline Licence Application.

## (ii) EES assessment of pipeline impacts

The IAC has assessed the potential environmental, social, economic, safety and cultural heritage (including Aboriginal cultural heritage) impacts of the proposed pipeline in the Part B of the report. A summary of the assessment findings in relation to the pipeline are shown in Table 24.

**Table 24 Summary of assessment of impacts of the pipeline**

Chapter	Environmental impact	Findings relating to the pipeline
5	Terrestrial and freshwater biodiversity	<p>The impacts on native vegetation can be managed through the recommended CEMP POS subject to the addition of further sites for avoidance from removal.</p> <p>Impacts on threatened species have been appropriately avoided and minimised, will not be significant and can readily be managed to within acceptable limits.</p> <p>The proposed mitigation measures should be implemented subject to modifications relating to rapid revegetation for Southern Brown Bandicoot habitat along the length of the pipeline alignment and an appropriate protocol for managing clearing of Swamp Skink habitat.</p> <p>Biosecurity risk can be appropriately managed.</p>
6	Surface Water	<p>The surface water impacts are consistent with the draft evaluation objective.</p> <p>Surface water impacts can be acceptably managed through the recommended CEMP POS.</p>
7	Groundwater	<p>The groundwater impacts are consistent with the draft evaluation objective.</p> <p>Groundwater impacts can be acceptably managed through the recommended CEMP POS.</p>
8	Contamination and acid sulfate soils	<p>Soil and groundwater contamination impacts can be adequately managed by the recommended mitigation measures.</p> <p>Impacts from acid sulfate soils will not be significant and subject to additional sampling in medium to high risk locations and appropriate management guided by the Acid</p>

		Sulfate Soils Management Plan and Acid Sulfate Soils Management Protocol should be acceptable.
10	Air quality	The CEMP POS (as modified) is adequate to manage potential air emissions impacts predicted during construction.
11	Noise and vibration	The noise and vibration impacts of the pipeline are mainly associated with construction. Impacts can be managed through the CEMP POS.
12	Landscape and visual	<p>The landscape and visual impacts of the pipeline and associated works will mainly be confined to the construction phase of the Project, while the impacts associated with its operation will be negligible.</p> <p>Visual impacts of the pipeline and associated works can be managed through the recommended CEMP POS and are acceptable.</p>
13	Transport	The traffic impacts of the pipeline are mainly associated with construction. Impacts can be managed through the CEMP POS.
14	Safety, Hazard and Risk	<p>The risk identification and assessment work done to date for the pipeline and associated infrastructure (including the SMS) has been undertaken to a standard appropriate to the current stage of the Project.</p> <p>Further, more detailed risk assessments should be undertaken if and when the Project proceeds. The next versions of the risk assessment for the PDF should act on the further work recommendations of Ms Filippin.</p> <p>Existing regulations combined with the CEMP POS (as amended) will properly control and mitigate risks associated with the pipeline and associated infrastructure.</p>
15	Land Use	<p>Potential land use impacts associated with the pipeline would be predominantly confined to the pipeline notification area and are considered to be acceptable.</p> <p>Land use impacts are consistent with the draft evaluation objective.</p> <p>Land use impacts of the pipeline can be acceptably managed through the recommended CEMP POS.</p>
16	Social	Social impacts can be adequately managed through the recommended mitigation measures.
17	Business	<p>Business impacts during the construction and operation of the Project will be limited and can be appropriately managed.</p> <p>The Project will generate local employment and opportunities for local businesses, although this will be focussed on the Project's construction rather than its operation.</p>

		<p>The business impacts of the Project would be consistent with the social, economic, amenity and land use draft evaluation objective.</p> <p>The construction and operation of the Project are not expected to have any discernible impacts on local and regional tourism, including nature-based tourism.</p> <p>The tourism impacts of the Project would be consistent the social, economic, amenity and land use draft evaluation objective.</p>
18	Agriculture	<p>The impacts on agriculture would not be significant, subject to ongoing collaboration and liaison with landholders.</p> <p>The impacts on agriculture are acceptable subject to the recommended CEMP POS as amended.</p>
19	Heritage (including Indigenous cultural heritage)	<p>Heritage impacts are consistent with the draft evaluation objective/s, subject to the approval of the three CHMPs.</p> <p>Heritage impacts can be acceptably managed through the recommended mitigation measures.</p>
20	Pipeline route options and site specific submissions	<p>The IAC notes that discussions are continuing between APA and landowners regarding detailed pipeline alignment. The IAC encourages all parties to continue to work towards negotiated outcomes. The IAC has no basis to support realignment of the pipeline on any of the specific properties listed in the report.</p> <p>The IAC recommends that negotiations between APA and affected landowners about pipeline options in farming areas should have regard to minimising any impacts on the agricultural productivity and viability of the property.</p>

There are no environmental, social, economic, safety or heritage impacts of the proposed pipeline component of the Project that preclude the Pipeline Licence Application from being approved.

### **(iii) Benefits relative to impacts**

In assessing the benefit of the proposed pipeline to Victoria relative to its potential impacts, benefits need to be viewed in terms of how the pipeline supports the overall Project.

The EES Executive Summary summarised the benefits of the Project and concluded it would:

- provide gas supply certainty and security for Victorian gas customers in a climate where gas shortfalls are projected for south-eastern Australia
- place downward pressure on gas prices for residential customers as well as vulnerable industrial and commercial customers
- provide a flexible source of gas for gas-powered generation so that customers have secure and stable electricity supply as the National Energy Market transitions to accommodate more renewables
- employ in excess of 500 workers at the peak of its construction and 40 permanent positions at Crib Point during operations
- provide for a local community fund of \$7.5 million.

The IAC has not quantified these benefits and it received numerous submissions challenging the value of some of the claimed benefits. The IAC concludes that, if the Project were to proceed, the above benefits would accrue at least to some measurable degree.

Taking the pipeline in isolation, the IAC concludes the overall impacts of its construction and operation are manageable if the recommended mitigation measures are adopted.

Having regard to the EES assessment, submissions and other material presented to it, the IAC concludes that the impacts of the pipeline relative to the benefits of the Project, if the entire Project proceeds, are manageable and sees no reason to preclude the Pipeline Licence Application being granted.

## **22.2 Other approvals**

### **22.2.1 Aboriginal Heritage Act 2006**

The *Aboriginal Heritage Act* requires the approval of CHMPs for the Project before it can proceed. The operation of the Act is discussed in Appendix E.

Three CHMPs are in preparation but have not been finalised:

- CHMP 15383 (Pipeline works - Crib Point to Tooradin)
- CHMP 15384 (Pipeline works - Tooradin to Pakenham)
- CHMP 16300 (Gas Import Jetty Works - Crib Point Jetty).

The BLCAC is the RAP for CHMPs 15383 and 16300. There is no RAP for CHMP 15384, so Aboriginal Victoria is the evaluating body.

The IAC heard submissions and evidence about adequacy of the work undertaken on the CHMPs to date, including the need to review the accuracy of some background information and address intangible heritage issues.

On the basis of the material presented to it, the IAC concludes there are no Aboriginal cultural heritage issues that preclude the Project proceeding, subject to the CHMPs being approved. In Chapter 19, the IAC recommends further actions so that Aboriginal cultural heritage issues are better managed.

### **22.2.2 Marine and Coastal Act 2018**

The *Marine and Coastal Act* provides for the protection of Victoria's marine and coastal environment and requires consent for any use or development of coastal Crown land within 200 metres inland of the high-water mark.

The elements of the Project that require consent include the mooring of the FSRU, CPRF and Jetty pipeline. Consent has been granted to PHDA to upgrade Berth 2 to accommodate the FSRU. Consent will be required for construction of the CPRF and sections of the pipeline within 200 metres of the high tide mark.

### **22.2.3 Flora and Fauna Guarantee Act 1988**

The *Flora and Fauna Guarantee Act* lists threatened flora and fauna species and communities. The Act works synergistically with the *Wildlife Act* (which covers threatened fauna) by triggering requirements for authorisation only for removing species of flora that are listed under the *Flora and Fauna Guarantee Act* as protected and for species of fish protected under this Act.

A licence or permit is required under section 48 for the removal of flora species protected under the *Flora and Fauna Guarantee Act*. Section 47 limits the need for authorisation under this Act to areas of public land. Section 52 requires authorisation to take species of fish listed as protected under this Act. This may be required for entrainment of fish species by the FSRU.

A range of listed species are present in the Project area and within the pipeline alignment and their removal from public land will require approval under the *Flora and Fauna Guarantee Act*. The operation of this Act is discussed in Appendix E.

The IAC discusses issues relating to the *Flora and Fauna Guarantee Act* in Chapters 5 and 11, where it provides relevant findings. The IAC finds there are no impediments to approval under this Act associated with the pipeline, subject to compliance with relevant mitigation measures. However, the effects of entrainment on fish species may be a matter where the effects of the Project are not acceptable and will require consideration by the decision maker.

#### **22.2.4 Wildlife Act 1975**

Section 28A(1)(a) of the *Wildlife Act* provides for authorisation to hunt, take or destroy wildlife (referred to as an authorisation to control wildlife), while section 28A(1)(f) enables for the care, treatment or rehabilitation of sick, injured or orphaned wildlife.

The IAC discusses matters associated with translocation of wildlife in Chapter 5, where it notes translocation of threatened species is considered an important conservation technique and can offer, for some species, the only method to prevent their extinction or to establish new populations.

On the basis of the material presented to it, the IAC concludes there are no wildlife management issues that preclude the Project proceeding, subject to the proposed mitigation measures.

#### **22.2.5 Water Act 1989**

Under the *Water Act*, Melbourne Water is responsible for managing waterways in the Western Port Bay catchment and administers *By-law No. 2 - Waterways, Land and Works Protection and Management*, which prohibits certain activities without authorisation from Melbourne Water. The operation of the *Water Act* is discussed in Appendix E.

Approval from Melbourne Water would be required for any works on, over or under a designated waterway, or for the GIJW on the land which is subject to the Land Subject to Inundation Overlay. Approval is required before the commencement of construction. Consent for minor waterway work would be required for each crossing of a waterway by the Pipeline.

The IAC discusses Surface Water and Groundwater in Chapters 6 and 7, where it provides relevant findings. The IAC finds there are no impediments to approval under the *Water Act*, subject to implementing the proposed mitigation measures.

## 23 Integrated assessment

This chapter on integrated assessment brings together the IAC's considerations in relation to:

- Net community benefit
- EES draft evaluation objectives
- response to Terms of Reference
- response to draft Evaluation Objectives.

### 23.1 Net Community Benefit

A Project such as this invariably will have competing policy objectives and analysis of these assists to determine whether the Project will result in acceptable outcome that achieves a net community benefit.

Clause 72.02-3 of the Victoria Planning Provisions 'Integrated decision making' provides that:

Society has various needs and expectations such as land for settlement, protection of the environment, economic wellbeing, various social needs, proper management of resources and infrastructure.

Planning aims to meet these needs and expectations by addressing aspects of economic, environmental and social wellbeing affected by land use and development. Planning and responsible authorities should endeavour to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations. However, in bushfire affected areas, planning and responsible authorities must prioritise the protection of human life over all other policy considerations. (IAC underlining)

In considering net community benefit, the 'community' which might be positively or negatively impacted must be acknowledged. It is well recognised that planning is not about maintaining the status quo but, in accordance with section 4(1)g of the *Planning and Environment Act*, planning is to balance the present and future interests of all Victorians. All Victorians includes not just an immediate local community.

The community in this case includes Crib Point, Hastings and Western Port Bay, French Island, the wider Mornington Peninsula, and Victoria in general. The Proponents urged the IAC to recognise the Project would be an asset for all of Victoria in terms of an ongoing and secure energy supply.

Clause 72.02-3 further notes the importance of sustainable development and effective and efficient use of resources.

Disappointingly for a project of this scope, the SIA did not undertake a net community benefit assessment, nor did the relevant witnesses.

This was raised in cross examination by the IAC to Mr Boushel and Ms Rosen, both of whom were questioned about principles of integrated decision making, net community benefit and the value of undertaking such assessments. Neither responded particularly well to the issues and questions put and both noted such an assessment could have been undertaken.

The Proponents addressed net community benefit in their closing submissions. In relation to the 'community' that might be impacted by the Project, they said:

The identification of affected communities requires careful filtering in the context of this Project. Many submitters who live some distance from the Project and Crib Point argued that the implications of the Project aroused a sense of fear and anger because it proposes to import gas, a fossil fuel, despite climate change concerns. The difficulty

with this argument is that it applies to any similar project anywhere in the state. The fear or anger would not be lessened if the Project was shifted elsewhere in Victoria, or Australia. To this extent this impact is not a direct impact of the Project but is more correctly understood as an impact of policy, and climate change concerns.<sup>300</sup>

To a certain extent, that is true. But the matter before this IAC is this Project at Western Port Bay which must be considered by this IAC.

The Proponents argued there should be more targeted consideration of local or nearby community impacts, and *'Fears and concerns for the activity in the Bay must be reconciled with knowledge of, or perhaps ignorance of, industrial port activities at Crib Point and Long Island Point'*. The Proponents noted various factors such as distance of the Jetty from Crib Point township, the long life of the Port, the proposed community fund and the objective analysis of factors such as current policy, traffic, risk and safety all must be taken into consideration in this context.

In relation to the tests to determine net community benefit, the Proponents addressed this in the context of acceptability and highlighted relevant case law. They noted *'The broader community impacts asserted by many submitters, while not central to the EES, in any case must be weighed against the broader implications of the energy supply for the State'*.

The IAC notes many tangible impacts can be mitigated through the EPRs and when considered in isolation, seem acceptable.

The intangible impacts of change and overall impact on lifestyle is more difficult to address. While there are five houses in closer proximity to the Jetty site, Crib Point township is 1.5 to two kilometres away from the Jetty. However, Crib Point and its surrounds (Woolleys and Jacks Beaches) are community assets used by residents and visitors to Crib Point, Western Port Bay and Mornington Peninsula locals, as well those from places beyond. Locals will experience varying levels of disruption as a result of the Project, both during the construction and ongoing operational phases. Others may decide to stay away from the area as a result of the Project.

The IAC accepts the primary starting point for its integrated assessment is that the Port of Hastings and Crib Point Jetty are long standing and legitimate land uses. Local and State planning policy is clear about the role of the Port, yet it comes with a caution that new development be assessed in the context of the designated Ramsar wetland, the UNESCO Biosphere designation (the only such designation in Victoria) and the complex marine environment. The nature of this Project, in that it will realise a permanently operating moored industrial FSRU for a 20 year period, introduces a new type of offshore use that will have potentially significant implications for the immediate marine environment.

The IAC has found there would be unacceptable impacts on the marine environment at Crib Point and potentially within the broader Western Port Bay. There is also the risk of further marine impacts that are not able to be quantified based on the available information.

Taking an evidentiary approach, the IAC has systematically reviewed and assessed each of the key impacts of the Project. Most impacts can be mitigated. In this context and in considering net community benefit, the IAC considers that local benefits include the community fund and some employment opportunities for local residents. Regional and State benefits include increased use of the Port of Hastings and a more secure gas supply.

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<sup>300</sup> D589, paragraph 450

Local disbenefits include intrusion into the Ramsar wetlands/UNESCO Biosphere Reserve, unacceptable impacts to the marine environment, highly negative community perceptions, and some unknown cumulative impacts. Regional or State disbenefits include intrusion into the Ramsar wetlands/UNESCO Biosphere Reserve and unacceptable impacts to the marine environment.

For these reasons, the IAC considers the Project will not result in a net community benefit.

## 23.2 Response to Terms of Reference

This chapter provides the IACs response to its Terms of Reference.

### (i) Clause 39

Clause 39 specifies the matters the IAC’s report must contain. The IAC’s response is included in Table 25.

**Table 25 Summary of IAC response to Terms of Reference Clause 39**

Terms of Reference	IAC response and findings	Relevant report reference
a. Conclusions with respect to the environmental effects of the Project and their significance and acceptability;	The IAC finds the environmental effects of the Project are generally acceptable, except for environmental effects on marine biodiversity. The adverse effects on marine biodiversity would potentially be significant.	Chapter 4: Marine Biodiversity Chapters 5 to 21: various other effects Chapter 23: Integrated assessment
b. Findings on whether acceptable environmental outcomes can be achieved, having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;	The IAC finds impacts on marine biodiversity would be unacceptable having regard to the <i>Environment Biodiversity and Conservation Act</i> , the <i>Environment Protection Act</i> and obligations associated with the Western Port Ramsar designation.	Chapter 4: Marine Biodiversity Chapters 5 to 21: various other effects Chapter 22: various approvals the Project would require
c. Recommendations and/or specific measures that it considers necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development;	If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions that would assist the Project better address environmental effects.	Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions.
d. Recommendations as to	The IAC recommends revised and	Chapters 4 to 21.

<p>any feasible modifications to the design or management of the project that would offer beneficial outcomes;</p>	<p>additional mitigation measures, and additional actions relating to the design and management of the Project. These include the need for additional investigations and monitoring.</p>	
<p>e. Recommendations for any appropriate conditions that may be lawfully imposed on any approval for the project, or changes that should be made to the draft PSA in order to ensure that the environmental effects of the project are acceptable having regard to legislation, policy, best practice, and the principles and objectives of ecologically sustainable development</p>	<p>If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions that would better address environmental effects. The IAC discusses the various approvals the Project would require, including the draft Amendment.</p>	<p>Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions.                  Chapter 22: Draft Planning Scheme Amendment</p>
<p>f. Recommendations as to the structure and content of the proposed environmental management framework, including with respect to monitoring of environmental effects, contingency plans and site rehabilitation</p>	<p>The IAC generally supports the structure of the environmental management framework, but recommends revised and additional mitigation measures, and additional actions. Some of these recommendations relate to additional monitoring, contingencies and site rehabilitation.</p>	<p>Chapters 4 to 21: Where appropriate, these chapters recommend new or revised mitigation measures, and further actions.</p>
<p>g. Recommendations with respect to the structure and content of the draft PSA</p>	<p>The IAC recommends changes to the Incorporated Document included in the draft PSA and a review of the proposed Port Zone boundary.</p>	<p>Chapter 22: Draft Planning Scheme Amendment</p>
<p>h. Recommendations with respect to the WAA, including recommendations about conditions that might appropriately be attached to a works approval if issued</p>	<p>The IAC finds the Project would have unacceptable environmental effects on marine biodiversity. This should inform the EPA’s assessment of the WAA. If the Project proceeds, the IAC recommends revised and additional mitigation measures, and additional actions relevant to the WAA. This should inform the EPA’s assessment of Works Approval conditions.</p>	<p>Chapter 22: Works Approval Application</p>
<p>i. Specific findings and recommendations about the predicted impacts on MNES and</p>	<p>The IAC finds that impacts on the Ramsar wetland (MNES) would be unacceptable. Impacts on other MNES are likely to be low and can be</p>	<p>Chapter 21: MNES</p>

their acceptability, including appropriate controls and environmental management.	managed with the recommended mitigation measures.	
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**(ii) Clause 40**

Clause 40 specifies the matters the IAC’s report should include. The IAC’s response is included in Table 26.

**Table 26 IAC’s responses to Clause 40**

Relevant clause	Terms of reference requirement	Relevant report reference
40a	Information and analysis in support of the IAC’s findings and recommendations.	Parts B and C
40b	A list of all recommendations, including cross references to relevant discussions in the report.	Table 27
40c	A description of the public Hearing conducted by the IAC, and a list of those persons consulted with or heard by the IAC.	Chapter 1 and Appendices B and C
40d	A list of all submitters in response to the exhibited EES.	Appendix B
40e	A list of the documents tabled during the public Hearing.	Appendix D

**Table 27 Cross references between recommendations and discussions**

Recommendation	Relevant reference	report
<b>Environmental Performance Requirements</b>		
Revised EPR-ME16 (Monitoring Program)	Chapter 4	
Revised EPR-C03 (Contaminated groundwater)	Chapter 8	
Revised EPR-C04 (Unknown contamination)	Chapter 8	
Revised EPR-C02 (Acid Sulfate Soil Management Plan)	Chapter 8	
New EPR-GG07 (Certified carbon offsets)	Chapter 9	
Revised EPR-NV06 (Managing cumulative noise impacts)	Chapter 11	
Revised EPR-NV09 (Operations Noise Management Plan)	Chapter 11	
Revised EPR-NV11 (Operational noise cumulative controls)	Chapter 11	
Revised EPR-NV13 (Post-commissioning measurements)	Chapter 11	
Revised EPR-NV14 (Underwater Noise: Detailed Design)	Chapter 11	
Revised EPR-NV15 (Underwater Noise: Ambient Noise Study)	Chapter 11	
Revised EPR-NV16 (Underwater Noise: Post Construction Monitoring and Assessment).	Chapter 11	
Revised EPR-NV01 (Construction noise and vibration management plan)	Chapter 11	

Revised EPR-NV02 (Managing noise and vibration from construction activities)	Chapter 11
Revised EPR-NV03 (Construction noise criteria)	Chapter 11
Revised EPR-NV05 (Noise and vibration monitoring).	Chapter 11
Revised EPR-LV01 (Landscape screening)	Chapter 12
New EPR-LV07 (FSRU lighting)	Chapter 12
Revised EPR-TP01 (Traffic Management Plan)	Chapter 13
Revised EPR-TP06 (Nitrogen Transport Plan)	Chapter 13
New EPR-SO07 (Woolleys Beach North)	Chapter 16
Revised EPR-SO03 (Community fund)	Chapter 16
Revised EPR-SO02 (Source local workers)	Chapter 16
Revised EPR-SO04 (Stakeholder Engagement Management Strategy)	Chapter 16
Revised EPR-AH03 (Project Working Group)	Chapter 19
<b>Construction Environment Management Plan</b>	
Additional native vegetation and large scattered trees is to be avoided. CEMP Attachment G (Environmental Line List)	Chapter 5
New POS B14 (Predator control management)	Chapter 5
Revised POS R14 (Southern Brown Bandicoot habitat)	Chapter 5
Revised POS B14 (Swamp Skink)	Chapter 5
Revised POS T13	Chapter 8
Revised POS E5	Chapter 11
Revised POS E6: Managing noise from construction activities	Chapter 11
Revised POS E7: Offsite noise management measures	Chapter 11
Revised POS HH3	Chapter 19
<b>Incorporated Document</b>	
Revised Clause 4.4.2 f) (Development plans)	Chapter 12
Revised Clause 4.4 (Development Plan)	Chapter 22
Revised Clause 4.5 (Environmental Management Plan)	Chapter 22
Revised Clause 4.6 (Bushfire Management)	Chapter 22
Revised Clause 4.1 (Other conditions)	Chapter 22

### 23.3 Response to draft evaluation objectives

Clause 5a of the Terms of Reference requires the IAC to have regard to the draft evaluation objectives in the Scoping Requirements Report. Table 28 summarises the IAC's findings about the Project's consistency with the objectives and indicates where the relevant discussion can be found in its Report.

**Table 28** Response to EES draft evaluation objectives

Draft evaluation objective	Response
<p><b>Energy efficiency, security, affordability and safety:</b>                      To provide for safe and cost effective augmentation of Victoria’s natural gas supply in the medium to longer term.</p>	<p>The Project is consistent with this draft evaluation objective (Chapters 3.1, 9, 13 and 14).</p>
<p><b>Biodiversity:</b>                      To avoid, minimise or offset potential adverse effects on native flora and fauna and their habitats, especially listed threatened or migratory species and listed threatened communities.</p>	<p>The Project is inconsistent with this draft evaluation objective in relation to Marine Biodiversity (Chapter 4) and MNES (Chapter 21).                      The Project is consistent with this draft evaluation objective in relation to Terrestrial and Freshwater Biodiversity (Chapter 5).</p>
<p><b>Water and catchment values:</b>                      To minimise adverse effects on water (including groundwater, waterway, wetland, estuarine, intertidal and marine) quality and movement particularly as they might affect the ecological character of the Western Port Ramsar site.</p>	<p>The Project is inconsistent with this draft evaluation objective in relation to Marine Biodiversity (Chapter 4) and MNES (Chapter 21).                      The Project is consistent with this draft evaluation objective in relation to Terrestrial and Freshwater Biodiversity (Chapter 5), Surface Water (Chapter 6), Groundwater (Chapter 7) and Contamination and Acid Sulfate Soil (Chapter 8).</p>
<p><b>Cultural heritage:</b>                      To avoid or minimise adverse effects on Aboriginal and historic cultural heritage.</p>	<p>The Project is consistent with this draft evaluation objective (Chapter 19).</p>
<p><b>Social, economic, amenity and land use:</b>                      To minimise potential adverse social, economic, amenity and land use effects at local and regional scales.</p>	<p>The Project is consistent with this draft evaluation objective (Chapters 10, 11, 12, 13, 15, 16, 17, 18 and 20).</p>
<p><b>Waste:</b>                      To minimise generation of wastes by or resulting from the project during construction and operation, including accounting for direct and indirect greenhouse gas emissions.</p>	<p>The Project is inconsistent with this draft evaluation objective in relation to discharge of wastewater from the FSRU (Chapter 4).                      The Project is consistent with this draft evaluation objective in relation to Contamination and Acid Sulfate Soils (Chapter 8), Greenhouse gas (Chapter 9) and Air quality Chapter 10).</p>