Title of Proposal - AGL Gas Import Jetty Project

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Energy Generation and Supply (non-renewable)

1.2 Provide a detailed description of the proposed action, including all proposed activities.

AGL Wholesale Gas Limited (AGL) is proposing to develop a Liquefied Natural Gas (LNG) import facility, utilising a Floating Storage and Regasification Unit (FSRU) to be located at Crib Point on Victoria's Mornington Peninsula (refer to Figure 1). The Project comprises:

• The continuous mooring of a FSRU at the existing Crib Point Jetty, which will receive LNG carriers of approximately 300 m in length
• The construction of ancillary topside jetty infrastructure (Jetty Infrastructure), including high pressure gas unloading arms and a high pressure gas flowline mounted to the jetty and connecting to a flange on the landside component to allow connection to the Crib Point Pakenham Pipeline Project (Pipeline Project).

The initial purpose of the Pipeline Project is to enable the connection of the AGL Gas Import Jetty Project to the Victorian Transmission System. While the Pipeline Project is the subject of a separate referral, an assessment of the indirect and cumulative impacts of the two projects is presented in Attachment 3.

The FSRU will receive LNG from visiting LNG carriers (that will moor directly adjacent to the FSRU), store the LNG and re-gasify it as required to meet demand within the eastern Australian gas market. The Project life is anticipated to be approximately 20 years. However, it may be extended pending security and stability of gas supply. The Project is expected to employ approximately 40 direct ongoing roles during the operational phase.

The key components of the Project are:

Floating Storage and Regasification Unit (FSRU):

The Project will use an FSRU vessel continuously moored at Berth 2 of the Crib Point Jetty. The Jetty is managed by the Port of Hastings Development Authority (PoHDA). The FSRU will remain an operational vessel, able to be moved as required, such as in extreme weather or for maintenance. The FSRU will be leased by AGL from a third party.

LNG will be procured from suppliers in the Asia Pacific region and globally. Depending on demand, between 12 to 40 LNG carriers per year would moor alongside the FSRU to resupply the FSRU with LNG. LNG will be offloaded via flexible hoses between the vessels over a period of approximately 24 hours, and then the LNG carrier will depart. LNG will be stored on the

FSRU at approximately -162°C in cryogenic storage tanks (maintaining it in its liquid state until it is required for the gas network).

LNG will be pressurised and vaporised in a regasification system on board the FSRU, as required to meet demand. Heat is required to return the LNG to a gaseous state. The proposed design of the FSRU includes the supply of heat from seawater, which will be drawn into the FSRU through the vessel sea chest or dedicated ports in the hull and circulated through heat exchangers. If operating at full capacity, a daily volume of up to 450,000 m3 (450 ML/day) of seawater from Western Port will be pumped at a rate of 5.2 m3/s through the heat exchangers. The water will be returned to Western Port via a six-port discharge arrangement. The water discharge is estimated to be initially 7°C cooler than the ambient seawater temperature and it will produce a body of water 0.3°C cooler than the ambient seawater temperature with the spatial extent likely to be restricted to an area approximately 200 m north and south and 60 m east and west of the discharge point. Within this mixing area, there will be a gradient of cold water decreasing from 7°C to 0.3°C cooler than the ambient seawater temperature. Beyond 200 m from the discharge ports, the temperature difference will be within the natural daily temperature variation of the receiving environment.

To prevent the growth of marine organisms in the heat exchange system on the FSRU, the seawater intake will be subject to an electrolysis process (similar to salt water swimming pools chlorinators) to produce chlorine and hypochlorite. The concentration of residual chlorine at the discharge from the FSRU will be 0.1 mg/L (100 ppb) and within approximately 20 seconds from the time of discharge the initial dilution process will reduce the concentration to 0.005 mg/L, slightly above the ANZECC 2000 trigger value for freshwater environments of 0.003 mg/L for 95 % ecosystem protection (there is no applicable ANZECC guideline trigger value for chlorine in marine environments). Similarly, to the temperature effects, the chlorine concentration in the water discharge will decrease along a gradient from the points of discharge and will reach ANZECC and USEPA guideline objectives within 200 m of the points of discharge.

The regasification system will be capable of delivering 500 million standard cubic feet per day (mmscf/d) (a unit of measurement for gas) of “firm” gas at high reliability and up to 750 mmscf/d on an “as available” basis with lower reliability. This is the equivalent to more than the current Victorian natural gas market. The daily seawater intake of up to 450,000 m3 (450 ML/day) (referred to herein), is based upon the higher regasification rate of 750 mmscf/d, however, it is unlikely to operate at this operating output unless there was a requirement to fill short term shortfalls in the gas market. The seawater intake volume required for the regasification rate of 500mmscf/day is 300,000m3/day.

Four reciprocating gas engines installed on board the FSRU will be used to provide all the power required for operation of the vessel.

Boil-off gas from the LNG tanks on the FSRU will be compressed for recovery and use. Excess boil-off gas can be burned either in a disposal combustor or a minimum send out compressor installed to allow delivery of gas to the transmission network.

On completion of the Project, the FSRU will leave Western Port and continue to be an operational vessel potentially serving other projects.

Crib Point Jetty Infrastructure:

In consultation with PoHDA, the pilots, the harbourmaster and the Victorian Regional Channels Authority (VRCA), AGL has selected southern berth (Berth 2) at the jetty as the berthing location for the FSRU. Arriving LNG carriers will double-berth into the ebb tide facing north, with LNG being transferred to the FSRU from the port side. LNG carriers will depart via the existing deep-water swing basin.

The infrastructure mounted on the Jetty (Jetty Infrastructure) includes high pressure gas unloading arms and a high pressure gas flowline. Gas will be discharged from the FSRU and transmitted through the gas flowline, which will connect to a flange on the landside component to allow connection to the Pipeline Project. A firefighting system will also be installed.

Installation of the unloading arms and the firefighting system will be undertaken from the water using a barge mounted crane. To allow the installation of the new unloading arms, a new gas manifold will be installed around the middle of the pier head. Construction of the gas flowline will involve placing pipe lengths onto the jetty using either a jetty-based crane or a barge mounted crane. The pipe lengths will be welded in position and attached to the jetty along a pipe rack.

To enable these construction works, a temporary construction laydown and vehicle parking areas will be established within the landside disturbance footprint of the Project Site.

The jetty will continue under the management of the PoHDA.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
AGL Gas Import Jetty Project	1	-38.348004085955	145.21569259466
AGL Gas Import Jetty Project	2	-38.348004083901	145.2156730681
AGL Gas Import Jetty Project	3	-38.348004083901	145.2156730681
AGL Gas Import Jetty Project	4	-38.347988937995	145.2183456209
AGL Gas Import Jetty Project	5	-38.348294877281	145.2185016186
AGL Gas Import Jetty Project	6	-38.348371276136	145.21885266645
AGL Gas Import Jetty Project	7	-38.348417216889	145.21885266645
AGL Gas Import Jetty Project	8	-38.348432531152	145.21838467402
AGL Gas Import Jetty Project	9	-38.348707840164	145.21832609499

Area	Point	Latitude	Longitude
AGL Gas Import Jetty Project	10	-38.348922062025	145.2185016186
AGL Gas Import Jetty Project	11	-38.348860809477	145.22505607894
AGL Gas Import Jetty Project	12	-38.347514545796	145.22499749991
AGL Gas Import Jetty Project	13	-38.347514545796	145.22530949399
AGL Gas Import Jetty Project	14	-38.348830349575	145.22540712614
AGL Gas Import Jetty Project	15	-38.348815035396	145.2260313304
AGL Gas Import Jetty Project	16	-38.349901115898	145.22614827366
AGL Gas Import Jetty Project	17	-38.349931741738	145.22546570517
AGL Gas Import Jetty Project	18	-38.351874497471	145.22558264974
AGL Gas Import Jetty Project	19	-38.351874497471	145.22628474545
AGL Gas Import Jetty Project	20	-38.352777113194	145.22634332448
AGL Gas Import Jetty Project	21	-38.352792426534	145.22558264974
AGL Gas Import Jetty Project	22	-38.353740801811	145.22568006841
AGL Gas Import Jetty Project	23	-38.353771428082	145.22540691266
AGL Gas Import Jetty Project	24	-38.35265478095	145.22532902121
AGL Gas Import Jetty Project	25	-38.35265478095	145.22517302351
AGL Gas Import Jetty Project	26	-38.349243311459	145.22497775922
AGL Gas Import Jetty Project	27	-38.349258625547	145.21861856317
AGL Gas Import Jetty Project	28	-38.349579871435	145.21826751531
AGL Gas Import Jetty Project	29	-38.349518619444	145.21577048611
AGL Gas Import Jetty Project	30	-38.348784411138	145.21606316908
AGL Gas Import Jetty Project	31	-38.348004085955	145.21569259466

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The Project is located at the Crib Point Jetty within the Port of Hastings, 65 km south-east of Melbourne on the Mornington Peninsula (refer to Figure 1). An overview of the Project Site and surrounding area and a Project Site Layout is shown in Figure 2 and Figure 3, respectively.

The landside component of the Project Site ('landside component') is located within Crown Allotment 2040, Parish of Bittern (SPI: 2040\PP2159) and situated at The Esplanade, Crib Point, which is Crown land vested to the PoHDA. During construction of the Jetty Infrastructure, the temporary construction laydown and vehicle parking areas will be established on the areas already largely cleared of vegetation within the landside component, which has been defined as the indicative landside disturbance footprint as shown in Figure 3.

The permanent infrastructure of the Project will consist of the flange and the gas flowline as part of the Jetty Infrastructure located within the landside component, connecting to the Pipeline Project described in section 1.16.1.

The FSRU will be continuously moored at Berth 2 of the Crib Point Jetty (the southern berth). The Jetty Infrastructure components of the Project will be established on the Jetty including a short section of pipeline on the landside component. The jetty is located on two parcels of Crown land administered by the Victorian Department of Environment, Land, Water and Planning (DELWP), and is described as:

- Allotment 89C, Parish of Bittern (SPI: 89C\PP2159) – 97 The Esplanade, Crib Point VIC 3919

- Allotment 89D, Parish of Bittern (SPI: 89D\PP2159) – The Esplanade, Crib Point VIC 3919.

PoHDA holds a lease over these parcels of land to operate the Crib Point Jetty.

The Crib Point Jetty is located within Western Port, a large tidal bay opening into Bass Strait, which incorporates around 260 km of coastline. The bay features two large islands: French Island to the north, which is predominantly agricultural but also contains the French Island National Park; and Phillip Island to the south, which is known for its tourism industry. The decommissioned submarine, HMAS Otama, is also moored within the bay, approximately 0.7 km north of the Crib Point Jetty. The Royal Australian Navy Base HMAS Cerberus is a Commonwealth Area located approximately 2.3 km south west of the Project Site.

Key urban centres on the coastline of Western Port and in the vicinity of the Project Site, include the township of Crib Point (approximately 1.5 km south west of the Project Site), the township of Bittern (approximately 3.7 km west, north west of the Project Site) and the township of Hastings (approximately 4 km north west of the Project Site). For more than 50 years, these areas have hosted a number of industrial sites, including petroleum refining and storage, as well as gas and steel processing facilities. The main boat landing point in the bay is located at Hastings.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

8.34 hectares

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title.89C\PP2159, 89D\PP2159, 2040\PP2159

1.8 Primary Jurisdiction.

Victoria

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 01/2019

End date 12/2040

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

Key legislation requiring consideration as part of the Project includes:

State:

Environment Effects Act 1978

A referral has been submitted to the Minister for Planning to determine whether an Environment Effects Statement (EES) is required under the Environment Effects Act 1978.

Environment Protection Act 1970

A Works Approval and Licence will be required for the Project under the Environment Protection Act 1970 as the Project involves the following activities prescribed in the Environment Protection (Scheduled Premises and Exemptions) Regulations 2017:

Air emissions exceeding specified thresholds (Type L01- general emissions to air).

An assessment of air emissions from the FSRU, which is intended to be operated on LNG boil-off gas as the primary fuel, has shown that emissions of NOx, CO and VOCs are likely to exceed the thresholds prescribed for classification as scheduled premises (Type L01 – general emissions to air) (Jacobs 2018b).

The discharge of seawater from the FSRU will also be regulated under the Works approval and Licence under the Environment Protection Act 1970. Any discharge to water associated with the construction and operation of the Project will be subject to the State Environment Protection Policy (Waters of Victoria), including Schedule F8 of the SEPP - Waters of Western Port and Catchment.

Port Management Act 1995

A licence from PoHDA will be required for the Project under the Port Management Act 1995 for use of the berth to continuously moor the FSRU.

Planning and Environment Act 1987

The Project Site is situated in the Shire of Mornington Peninsula. The Mornington Peninsula Planning Scheme (the planning scheme) applies a Port Zone (Clause 37.09) not only to the land area adjacent to Crib Point, but also around the Crib Point Jetty which extends out into Western Port. The jetty and landside component, including the jetty's existing mooring berths, are located in the Port Zone, and are therefore subject to the relevant provisions of the Mornington Peninsula Planning Scheme (refer to Figure 4). The FSRU will be located adjacent to, but outside of the Port Zone. The FSRU is located outside the limits of the planning scheme and therefore the provisions of the planning scheme do not apply to this component of the Project.

Components of the Project within the Port Zone, include construction of the Jetty Infrastructure and associated connection to the Pipeline Project, as described in Section 1.16.1 of this Referral.

The Crib Point Jetty (Berth 1) is used to provide facilities for bulk and container ships and is currently being used by United Petroleum Australia (United) to transfer liquid fuel via a pipeline along the wharf to its onshore storage facility. The current use is best characterised as a 'wharf' under the planning scheme as follows:

Land used to provide facilities for ships, such as bulk and container ships, passenger ships, and defence force marine craft.

The Project is consistent with the existing use of the land for a Wharf and therefore does not require a planning permit for use of land under the planning scheme.

Clause 37.09-4 (Buildings and works) of the planning scheme states:

A permit is required to construct a building or construct or carry out works. This does not apply to a building or works which:

- *Provide for a Wharf or Shipping container storage and other storage and handling*

facilities (other than tanks for bulk liquid storage), navigational beacons and aids, terminals and associated facilities.

The construction of the topside Jetty Infrastructure falls within the scope of this exemption in Clause 37.09-4, and therefore the Project does not require a planning permit for building and works under the planning scheme.

The landside component along with land to the north, south and west, is within the Bushfire Management Overlay of the planning scheme. The Project does not involve building and works associated with any of the uses specified in Clause 44.06-2 (Permit requirement) and therefore no permit is required for the Project under the Bushfire Management Overlay. No other overlays affect the Project Site.

Aboriginal Heritage Act 2006

An Aboriginal Heritage Due Diligence Assessment (Attachment 1) determined that although the Project Site is located within an area of cultural heritage sensitivity, the works do not constitute a high impact activity in accordance with Regulation 43(3) of the Aboriginal Heritage Regulations 2007. Therefore, a mandatory Cultural Heritage Management Plan (CHMP) is not required.

Furthermore, a voluntary CHMP is not recommended in this case given the extent of documented disturbance within the landside component and associated low potential for unknown Aboriginal cultural heritage to be impacted by the Project. There are no registered Aboriginal Places within the Project Site.

Pipelines Act 2005

The high pressure gas flowline that will be mounted to the jetty is entirely within the Port Zone and the Port of Hastings. As the Port of Hastings is a ‘port’ within the meaning of the Port Management Act 1995, a pipeline licence is not required for the high pressure gas flowline under the Pipelines Act 2005.

<u>Other relevant legislation:</u>

The following legislation also applies to the Project:

Marine Safety Act 2010 - Imposes a range of safety duties on the owners, managers, designers, manufacturers and suppliers of vessels, marine safety infrastructure and marine safety equipment used in State waters.

Flora and Fauna Guarantee Act 1988 (FFG Act) - The FFG Act provides a framework for biodiversity conservation in Victoria. Threatened species and communities of flora and fauna, as well as threatening processes, are listed under this Act. FFG-listed flora or fauna species with the potential to be affected by the Project have been assessed.

Biosecurity Act 2015 (Cth) - applies to discharges of ballast water in Australian seas and extends to the FSRU whilst it is in port.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

AGL has a Stakeholder Engagement Plan, predicated on transparency and information sharing, that is used to develop consultation planning, conduct consultation and capture feedback. AGL have engaged with local residents and special interest groups since the announcement of Crib Point as the preferred location, to ascertain the local community's sentiment toward the Project and identify any emerging issues they might have with the proposed development. Consultation activities commenced with key community stakeholders in July 2017 prior to the preferred site selection being announced.

To date, the key community engagement activities have included19 Community Drop in Sessions held over the last 12 months; 19 Project briefings provided to councils, community groups and other interested stakeholder groups in and around the Western Port community; briefings with residents living in the immediate vicinity of the jetty; and the establishment of a website for stakeholder engagement: http://www.engageagl.com.au/. Refer to the Consultation Summary Report (Attachment 2) for a detailed explanation of the consultation held.

All community interactions from consultation activities are recorded in the stakeholder management program, Consultation Manager and summations of issues are included in Attachment 2.

Key community inputs and outputs:

- Background noise monitoring extended to French Island and additional Crib Point areas following community consultation.

- Representatives from Port Phillip Conservation Council, Western Port and Peninsula Protection Council, Westernport Seagrass Partnership, Phillip Island Conservation Society, Western Port Biosphere, Dolphin Research Centre and Phillip Island Nature Parks were provided consultation drafts for review and comment.

- AGL published draft environmental assessment reports to its project website. Community members, Environment Groups and science-based research organisations were invited to provide comment on the reports in advance of submission of this Referral. Comments are included in the Consultation Summary Report (Attachment 2).

- AGL is funding an independent peer review of technical work being organised through Balnarring residents with Save Western Port and Western Port and Peninsula Protection Council invited to participate.

- Western Port Seagrass Partnership providing input and peer review into the design of further and monitoring follow up studies.

- Dolphin Research Centre published an article on their website, summarising the findings of the technical reports and supporting the conclusions.

- Independent Peer review of an inaccurate online article on FSRU BLEVE explosions undertaken and provided to the community.

- Property report providing 30 years of property price trend data for suburbs with similar facilities provided to community in response to questions on property price impacts

AGL will continue to proactively work with the community so they are kept informed of Project updates and to address concerns as they arise. The stakeholder engagement summary report provided in Attachment 2 outlines planned activities for remainder of 2018.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

A suite of environmental impact assessments, including a cumulative impact assessment for the Jetty Project and the Pipeline Project, as listed below have been undertaken for the Project to assess impacts under the EPBC Act, *Environment Effects Act 1978*, *Environment Protection Act 1970* and other Victorian legislation. The environmental impact assessments have studied the Project Site as an assessment area. However, in some cases, a wider assessment area (e.g. the Flora and Fauna Assessment extended beyond the Project Site) or a broader study area (e.g. Environmental Noise Assessment studied noise impacts in and around Crib Point) has been used. The findings of the environmental impact assessments informed the size and location of the disturbance footprint to avoid sensitivities such as native vegetation and to understand broader environmental impacts. As shown in Figure 3, the indicative landside disturbance footprint is a smaller proportion of the Project Site than originally assessed.

Jacobs Group (Australia) Pty Ltd (Jacobs) has been engaged to project manage the preparation of the following environmental and planning assessments and specialist studies:

- Jacobs 2018a, Aboriginal Heritage Due Diligence Assessment
- Jacobs 2018b, Air Quality Impact Assessment
- Jacobs 2018c, Contaminated Land Assessment
- Jacobs 2018d, Environmental Noise Assessment
- Jacobs 2018e, Flora and Fauna Assessment
- Jacobs 2018f, Greenhouse Gas Emissions Assessment
- Jacobs 2018g, Historic Heritage Assessment
- Jacobs 2018h, Hydrology Impact Assessment
- Jacobs 2018i, Social Impact Assessment

CEE - Consulting Environmental Engineers and Scientists (sub-consultant to Jacobs) has extensive experience in the marine environment and has been responsible for preparing the following assessments:

- CEE 2018a, Plume Modelling of Discharge from LNG Facility
- CEE 2018b, Chlorine in seawater heat exchange process at Crib Point
- CEE 2018c, Assessment of effects of cold-water discharge on marine ecosystem
- CEE 2018d, Modelling and Assessment of Biological Entrainment into Seawater Heat Exchange System
- CEE 2018e, Marine Ecosystem Protected Matters Assessment
- CEE 2018f, Effects of LNG Facility on Sea Level and Seabed at Crib Point Jetty

Ethos Urban (sub-consultant to Jacobs) has extensive knowledge on landscape and visual impact assessments and has been responsible for preparing the following assessment:

- Ethos Urban 2018, Landscape and Visual Impact Assessment

In assessing both the potential cumulative and indirect impacts associated with the AGL Gas Import Jetty Project and the Crib Point Pakenham Pipeline Project (Pipeline Project), AGL has also relied upon specialist environmental and planning assessments carried out by AECOM, and has been responsible for preparing the following assessment:

- AECOM 2018, Cumulative Impact Assessment

AGL plans to undertake marine monitoring studies/activities to inform the development of the environmental management measures for the Project prior to operation, which will include:

i. Particle entrainment modelling: involving the development of a fit-for-purpose base hydrodynamic model if required (or potentially refining one of the existing models) for estimation of entrainment. The objective of the modelling will be to:

a) Provide water current vectors at key meaningful sites in North Arm; and

b) Provide simplified entrainment percentage contours around the FSRU.

ii. Plankton and larval sampling program: A medium-term plankton and larval sampling program will be designed and implemented to validate concepts of larval and plankton distribution and dispersion models presented within this referral and support the effectiveness of the intake design to mitigate entrainment effects. The program will also provide further information for lower intensity monitoring of the spatial and temporal variations in plankton populations in North Arm during the initial phases of operation. Sampling may negate the need for additional modelling if the results are conclusive in determining plankton and larval distribution and impact.

iii. Investigations of the benthic habitats: An investigation will be undertaken to verify the understanding of the benthic habitats and invertebrate community in the North Arm channel within approximately 5 km of Crib Point. The spatial and temporal distributions of marine fauna and flora surrounding the FSRU will be documented. The investigation will be a one-off

sampling program prior to commencement of operation. The results of the investigations will inform the scope of potential EPA license compliance monitoring requirements.

iv. Seawater monitoring: Documentation and understanding of short (hour) and long-term (seasons/years) temporal and spatial variation in ambient seawater temperature is a key input to assessing the extent of potential cold-water differential and chlorine concentration effects of the water discharge on the marine ecosystem. A long-term water quality data set exists at an EPA monitoring site approximately 2 km north of the Crib Point Jetty, providing record of seasonal and inter-annual variations but does not provide information on short term variations due to tidal influences. AGL proposes to undertake monitoring of short and long-term water temperature and salinity (to identify correlations between temperature and salinity and hence density variation) at depths of approximately 2 m and 10 m above the seabed. Monitoring will be undertaken using an in-situ water quality monitoring station (i.e. a multi parameter data logger) positioned in the water continuously for a period of 12 months. The logger will be serviced and data downloaded at 6 week intervals. Field measurements will also be undertaken at 6-weekly intervals to capture water profiles of salinity, temperature, turbidity, dissolved oxygen and depth at a range of monitoring sites along the main channel within 4 km of Crib Point.

v. Ghost shrimp study: The study will aim to deliver an updated understanding of the potential presence and distribution of ghost shrimp at Crib Point, given the species has not been observed for over 50 years. These shrimp species are likely to be found buried deeper in the seabed than can be sampled by standard grab methods, so a small ‘venturi’ sampler will be used to sample the indicative presence of these species at multiple sites along the seawater dispersion pathway around Crib Point and at reference sites..

1.15 Is this action part of a staged development (or a component of a larger project)?

No

1.16 Is the proposed action related to other actions or proposals in the region?

Yes

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation).

Jetty Upgrade

The Jetty Upgrade by PoHDA comprises the refurbishment (strengthening and modifications) of the existing Crib Point Jetty, and construction of additional mooring and berthing dolphins to provide a suitable berth to receive ships like the FSRU and a double-berthed LNG carrier alongside and will be undertaken prior to the Project and the arrival of the FSRU. The upgrade works are not dependent on the Project as the refurbished jetty could be utilised for an alternative shipping activity and will therefore be the subject of separate assessment and approval processes in accordance with relevant legislative requirements. Consent under the *Coastal Management Act 1995* has been issued for the Jetty Upgrade.

As such, the Jetty Upgrade does not form part of the activities comprising the proposed action

as described in this Referral.

Flattening the Seabed

The movement of vessels of various sizes along Western Port bay has resulted in the creation of a high spot on the seabed in the vicinity of the southern end of the existing Berth 2 wharf infrastructure. VRCA, as part of their routine maintenance activities for maintaining operation of the jetty will be flattening the high spot. This is also required to accommodate ships like the FSRU and LNG carriers. A Coastal Management Act consent has been issued for this work.

As such, flattening the seabed does not form part of the activities comprising the proposed action as described in this Referral.

Crib Point Pakenham Gas Pipeline Project (Pipeline Project)

The Pipeline Project involves the development of a bi-directional pipeline between Pakenham and Crib Point, by APA and will allow the connection of the Project to the Victorian Transmission System (VTS). The Pipeline Project comprises:

- Approximately 55 km high pressure natural gas transmission pipeline from the End of Line facilities at Crib Point Jetty to a new connection point into the VTS at Pakenham

- End of Line facilities, situated adjacent to Crib Point Jetty, including metering, pigging facility, odourant facility, nitrogen storage and injection, gas analysers and vent stack.

- End of Line facilities situated at Pakenham including scarper station, metering, filtration, heating, pigging facility and a vent stack.

- Two main line valves.

- Cathodic protection system.

APA will separately refer the Pipeline Project for a decision as to whether it is a controlled action. To enable a comprehensive assessment, APA and AGL have jointly prepared a cumulative assessment of the impacts of the Pipeline Project together with the Project. A Cumulative Impact Assessment (AECOM, 2018) is included in Attachment 3.

The Project is being referred separately to the Pipeline Project as the construction and operation of the Pipeline Project will be carried out and managed by a different proponent and accordingly, will be the subject of separate assessment and approval process in accordance with relevant legislative requirements including the *Environment Effects Act 1978* and the *Pipelines Act 2005*. AGL will not build or own the pipeline infrastructure, it will be owned and operated by APA.

In addition:

- Purpose – AGL is proposing the direct importation of LNG and is assessing the impacts of the FSRU associated with these activities, whereas the pipeline is a long-term asset and may in the future be used by other third parties to import/export natural gas to or from Pakenham. The

Pipeline Project is proposed as a bi-directional pipeline, allowing for the commissioning of the pipeline from existing supply sources via Pakenham and future supply to communities along the route from either the Project or from Pakenham.

- Timing – The pipeline and FSRU operation have very different temporal impacts given that the major potential impacts of the pipeline relate to construction (12 months), whereas the major potential impacts of operating the FSRU will be approximately 20 years.

- Location / Environment – The majority of potential impacts of the FSRU will be marine based (with potential exception of noise/air emissions and social impacts) and operationally focused, whereas the impacts of the Pipeline Project will be land-based and construction focused. Similarly, the assessment requirements for each project differ significantly ? the FSRU operation requires assessment of the marine environment, whereas the pipeline is a linear land-based project and will have very different assessment requirements (e.g. impacts >40 km from the jetty).

- Approvals and Regulation – The FSRU and pipeline activities are not subject to the same State/local regulatory regime and have no joint authorisations.

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

Yes

2.3.1 Impact table

Wetlands	Impact
Western Port Ramsar site: Intake of up to 450,000 m3 of seawater per day from the lower North Arm of Western Port Ramsar site for heating of cold, liquid natural gas (LNG at -162°C) as part of the regasification process.	• Potential for entrainment of small marine organisms (zooplankton and phytoplankton), drifting eggs, larvae and larval fish) in the central part of the water column adjacent to the intake. It is assumed that all of these biota will not survive as a result of mechanical damage and exposure to chlorine biocide. It is expected that any direct effects of entrainment will be

Wetlands	Impact
	contained within the lower North Arm. The potential effects of entrainment will be greatest within approximately 750 m of the intake, with a potential entrainment rate of about 10% for sites on the western edge of the channel (including the adjacent mudflats), but overall the proportion of larvae entrained from populations of widespread biota in Western Port is less than 1% and the effect is likely to be undetectable in other segments of the Ramsar site. • As a result of the design of the intake (velocity of 0.1 to 0.15 m/s, vertical position with the water column and intake screens) large and small mobile animals in the near vicinity of the intake can avoid potentially being drawn into the heat exchange system by detecting the intake and swimming away from the screens.
Western Port Ramsar site: Discharge of up to 450,000 m3 of cold seawater from the FSRU to the waters of North Arm of the Western Port Ramsar site in the vicinity of Crib Point.	• The modelling predicted that the cold-water discharge will produce a body of water from 0.3°C to 7°C cooler than the ambient seawater temperature with the spatial extent likely to be restricted to an area approximately 200 m north and south and 60 m east and west of the discharge point within the lower North Arm, or 0.008 percent of the total Ramsar site. There will likely be no effect on other segments of Western Port. • There will be a potential gradient of decreasing cold water from 7°C to 0.3°C cooler than the ambient seawater within this area and the predicted difference in temperature beyond 200 m downstream from the points of discharge is estimated to be within the natural daily temperature variation of the receiving environment. No cold-water pool forming on the seabed is likely at any stage of the tide with the six-port discharge.
Western Port Ramsar site: Discharge of a chlorine residual in the heat exchange water discharged from the FSRU to the waters of the Western Port Ramsar site in the vicinity of Crib Point.	• The water discharged from the FSRU heat exchange process will contain short-lived residual chlorine 0.1 mg/L (100 ppb) and this is recognised as a potential risk to marine environmental values in the immediate vicinity of the discharge points. Within 20 seconds from the time of discharge the initial dilution process will reduce the concentration to approximately 0.005 mg/L, slightly above the ANZECC 2000 interim working value of 0.003 mg/L. • Potential impacts of the discharge are expected to be confined to an area of approximately 200 m

Wetlands	Impact
	north and south and 60 m east and west of the discharge point. This area represents 0.008 percent of the total Ramsar site. Potential impacts may include toxic effects to chlorine sensitive species; effects on physiological functions of chlorine sensitive biota; and/or effects on reproductive responses of chlorine sensitive species. • The discharge of water via the preferred six-port discharge shows that a combination of dilution and time to react with seawater constituents in the marine environment would result in environmentally safe concentrations of chlorine that will protect beneficial uses of the seawater returned to Western Port.
Western Port Ramsar site: Shipping berthing, departing, loading and unloading operations within the Western Port Ramsar site.	• There will be potential for discharge of contaminants to the marine environment (e.g. fuels, oils, etc) from leaks or spills, however this is considered unlikely with strict control measures in place. Also LNG carriers and FSRU's typically use natural gas to fuel their engines therefore reducing the risk of spills. (Methane is lighter than air and therefore cannot form a slick if released.). • Potential for operational noise and vibration associated with the FSRU and visiting LNG carriers, including the potential for underwater noise impacting on marine fauna. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and impacts to terrestrial and marine fauna species are not considered significant. • Potential for introduction of marine pests / introduced species to the local environment via the FSRU and visiting LNG carriers. The FSRU and visiting LNG carriers will contribute to the risk of introduced pests to Western Port to an existing background of shipping and recreational vessels already operating in Western Port. There is considerable commercial and recreational vessel traffic between Western Port and Port Phillip Bay, which contains substantial numbers of exotic marine species that have not yet been recorded in Western Port. • The potential contribution of the FSRU and visiting LNG carriers to these impacts will be managed

Wetlands	Impact
	through strict operational controls and applicable legislation including monitoring of the seawater discharge from the FSRU, ballast water requirements and biosecurity management measures for visiting LNG carriers.
Western Port Ramsar site: Construction activities located topside of the existing Crib Point Jetty, located within the Western Port Ramsar site and within the landside component.	• Potential for discharge of sediment runoff from the land due to exposure of soils to erosion from works on the landside component. • Potential for discharge of contaminants to the marine environment (e.g. fuels, oils, etc) from leaks or spills. • Potential for construction noise and vibration, including the potential for underwater noise impacting on marine fauna. • Potential for introduction of marine pests / introduced species to the local environment via barges used for the construction activities. • No dredging is needed for this Project. Hence, there will be no disturbance of the seabed or mudflats, no generation of sediment plumes of turbidity in the marine environment. • These potential impacts will be mitigated through the development and implementation of a Construction Environmental Management Plan and activity-specific work method statements prior to the commencement of works. Additionally, the relatively small footprint of land-based construction activities and a construction timeframe of approximately 6-12 months will also serve to minimise construction-related impacts.

2.3.2 Do you consider this impact to be significant?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Dense Leek-orchid (Prasophyllum spicatum)	Around 80 individuals of this species are known

Species	Impact
	from around eight populations ranging from south Gippsland (Wonthaggi) to the far southeast of South Australia (Duncan 2010). Duncan (2010) identifies that two of these populations occur in Crib Point and one in the nearby Stony Point Rail Reserve. Records in the Victorian Biodiversity Atlas (VBA) indicate the Crib Point sites are located at Disney Road (approximately 1 km from the Project Site) and Crib Point Bushland Reserve (approximately 1.7 km from the Project Site). There are numerous records in the VBA that may be attributed to the Stony Point Rail Reserve, including records in the coastal vegetation. Dense Leek-orchid generally occurs on sandy soils, with some sites seasonally waterlogged. Little is known of specific habitat requirements, and some sites have been disturbed by periodic fire or mowing, which has been reported to be required to stimulate flowering (Duncan 2010). Throughout its range, this species occurs in coastal and near-coastal heathland and heathy woodland. This type of vegetation occurs within Heathy Woodland present within an area of 0.5 ha in the southern section of the Project assessment area of the Flora and Fauna Assessment (Attachment 4). This species was not encountered during a survey of the Project assessment area by Jacobs in February 2018, however the survey was not conducted within the flowering season. The potential direct impact to this species would be disturbance of habitat, however in order to avoid impact to this species, the area of 0.5 ha in the southern section of the assessment area where the Dense Leek-orchid may be present, has been removed from the land disturbance footprint (as shown in Figure 3). The presence of Dense Leek-orchid at other locations (e.g. Disney Road and Crib Point Bushland Reserve) are considered sufficiently remote that the Project will not impact directly or indirectly. Therefore, no impacts are expected to result from the Project as potential habitat is avoided.. Refer to Attachment 4 – Flora and Fauna Assessment.
Australian Fairy Tern (Sternula nereis nereis)	The Australian Fairy Tern nests on sheltered sandy beaches, spits and banks above the high-water mark and below adjoining terrestrial

Species	Impact
	vegetation. The potential impact to this species may include disturbance to potential breeding habitat within the vicinity of the Project Site; and localised impacts from increased noise and vibration associated with construction and operation of the facility. There is some potential for this species to nest in Coastal Dune Scrub along the eastern extent of the landside component (on the cleared land above high-water mark), however these areas are typically very small and of low-moderate quality and are not proposed to be impacted by the Project. Any noise associated with the operation of the facility is not expected to cause significant impact to the species. Construction related noise would be localised and temporary in nature. Therefore, the Australian Fairy Tern is unlikely to be impacted by this Project. Refer to Attachment 4 – Flora and Fauna Assessment.
Swift Parrot (Lathamus discolor)	The Swift Parrot prefers open grassy woodland with dead trees, near permanent water and forested hills, coastal heaths, pastures with exotic grasses, weeds, roadsides and orchards. Eucalypts within the patch of Heathy Woodland south of the jetty access road may provide temporary refuge and feeding habitat for this species during its northern migration. The potential impact to this species may include disturbance to potential roosting habitat within the vicinity of the Project Site; and localised impacts from increased noise and vibration associated with construction and operation of the facility. However, the patch of Heathy Woodland which has potential to be suitable habitat has been excluded from the land disturbance footprint. It is also unlikely this species would make significant use of this habitat. Any noise associated with the operation of the facility is not expected to cause significant impact to the species. Construction related noise would be localised and temporary in nature. Therefore, the Swift Parrot is unlikely to be impacted by this Project. Refer to Attachment 4 – Flora and Fauna Assessment.
Southern Brown Bandicoot (Isoodon obesulus obesulus)	The Southern Brown Bandicoot prefers sandy soil with scrubby vegetation and / or areas with low groundcover that are burned from time to time. Habitat available on the site provides

Species	Impact
	marginal value for this species as dense vegetation below 1 m height is generally absent. This species was formerly recorded in the local area, however there is now doubt as to whether it is still locally present. The potential impact to this species may include disturbance to habitat within the vicinity of the Project Site; and localised impacts from increased noise associated with construction and operation of the facility. Targeted surveying previously undertaken (PKA 2016) encompassing the landside component did not identify this species. Any noise associated with the operation of the facility is not expected to cause significant impact to the species. Construction related noise would be localised and temporary in nature. Therefore, the Southern Brown Bandicoot is unlikely to be impacted by this Project. Refer to Attachment 4 – Flora and Fauna Assessment.
Grey-headed Flying-fox (Pteropus poliocephalus)	The Grey-headed Flying-fox typically camps in gullies not far from water and usually in vegetation with a dense canopy. The potential impact to this species may include disturbance to temporary feeding and breeding habitat, particularly the eucalypts south of the jetty access road within the Project Site and localised impacts from increased noise associated with construction and operation of the facility. However, the patch of Heathy Woodland which has potential to be suitable habitat, has been excluded from the land disturbance footprint. Any noise associated with the operation of the facility is not expected to cause significant impact to the species. Construction related noise would be localised and temporary in nature. Therefore, the Grey-headed Flying-fox is unlikely to be impacted by the Project. Refer to Attachment 4 – Flora and Fauna Assessment.
Cetaceans: Blue Whale (Balaenoptera musculus), Southern Right Whales (Eubalaena australis), Humpback Whale (Megaptera novaeangliae)	Potential impacts to listed cetacean species could occur from operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. The Project Site is remote from whale aggregation areas and plausible migration pathways. However,

Species	Impact
	individuals or pairs stray into the area from time to time. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that are likely to affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for listed cetacean species. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Marine Turtles: Leatherback Turtle (Dermochelys coriacea); Loggerhead Turtle (Caretta caretta); Green Turtle (Chelonia mydas)	There are no records of the Leatherback Turtle and Loggerhead Turtle in Western Port, and one record of a dead Green Turtle on Reef Island in eastern Western Port. Nesting for all three species does not occur in Victoria, with nesting generally occurring in tropical waters such as the Great Barrier Reef. Potential impacts to listed marine turtle species could occur from the operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The

Species	Impact
	number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that are likely to affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for listed marine turtle species. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
White Shark (Carcharodon carcharias)	The White Shark occurs in all oceans of the world, including Bass Strait and Western Port. The seal breeding colony at Seal Rock at the Western Entrance to Western Port is a known feeding area for White Sharks and these sharks have been caught and observed in Western Port from time to time. White Sharks are highly mobile with vast individual geographic ranges. Individuals typically remain resident in one locality only for periods of days or rarely weeks before moving to another area, according to observations of fishermen, divers and marine scientists. Potential impacts to the White Shark (also known as the Great White Shark) could occur from the operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The

Species	Impact
	number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. The key threats to the White Shark are commercial fishing, recreational fishing, shark control activities (beach meshing), trade (fins, jaws and teeth) and tourism (FFG Action Statement No. 185). The Project does not involve these threats and is unlikely to have any indirect adverse effects on White Shark populations. Therefore, there are no apparent direct or indirect pathways related to the Project that are likely to affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for the White Shark. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Australian Grayling (Prototroctes maraena)	The Australian Grayling is a small (300 mm long) freshwater fish that has larval and juvenile stages in the marine environment. The Bass River in south-eastern Western Port (Eastern Basin Segment) and the Bunyip River (upper North Arm segment) in north-eastern Western Port are the two most significant freshwater inputs to the Bay. Adult populations of Australian Grayling are distributed widely in Victorian coastal rivers and streams between the New South Wales border and the Hopkins River in western Victoria, including streams entering the northwest of Western Port. There appears to be some mixing between larval populations during their marine phase (Crook et al, 2006). It is possible that larvae and juvenile Grayling disperse and migrate between freshwater streams in Western Port and Bass

Species	Impact
	Strait via North Arm and the Western Entrance to Western Port. Potential impacts to the Australian Grayling could occur from the operation of the FSRU and visiting LNG carrier, including: 1. Potential entrainment of: a. larvae during dispersion from freshwater streams into the marine environment, and b. juveniles that may live in or migrate through Western Port during their six to ten-month marine phase. 2. Potential effects of the cold-water discharge on dispersing larvae and migrating juveniles. 3. Potential toxic effects of residual chlorine in the cold-water discharge on dispersing larvae and migrating juveniles. The potential impacts to larvae, juvenile and adult populations were assessed as follows: • Larvae: Larvae may disperse into the marine environment during high freshwater flows from the Cardinia Creek, Bunyip River and Lang Lang River. The general pattern of water movement in Western Port indicates a high proportion of larvae would likely follow the currents down the eastern side of French Island via the Corinella and Eastern Basin segments and out to sea past San Remo’s eastern entrance, not past Crib Point in the lower North Arm segment to the Western Entrance. • Juveniles: Juvenile Grayling that live in the marine environment and migrate to suitable river systems are independent swimmers and are likely to avoid the intake current. • Adults: Based on the extent of potential impact pathways and the distribution of adult Grayling, the Project will have negligible effect on adult Grayling populations in freshwater reaches of Victorian streams. In summary, it has been determined that the adult Grayling populations in the rivers and streams would not be exposed to impact pathways and that the proportion of larvae of these species that might disperse via North Arm and be affected by Project processes was low. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

Yes

2.5.1 Impact table

Species	Impact
Cetaceans: Blue Whale (Balaenoptera musculus), Southern Right Whales (Eubalaena australis), Humpback Whale (Megaptera novaeangliae), Brydes Whale (Balaenoptera edeni), Pygmy Right Whale (Caperea marginata), Killer Whale (Orcinus orca)	The Project Site is remote from whale aggregation areas and plausible migration pathways. However, individuals or pairs stray into Western Port from time to time. Potential impacts to listed cetacean species could occur from the operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that are likely to affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for listed cetacean species. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Marine Turtles: Leatherback Turtle	There are no records of the Leatherback Turtle

Species	Impact
(Dermochelys coriacea); Loggerhead Turtle (Caretta caretta); Green Turtle (Chelonia mydas)	and Loggerhead Turtle in Western Port, and one record of a dead Green Turtle on Reef Island in eastern Western Port. Nesting for all three species does not occur in Victoria, with nesting generally occurring in tropical waters such as the Great Barrier Reef. Potential impacts to listed marine turtle species could occur from the operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that are likely to affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for listed marine turtle species. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Dusky Dolphin (Lagenorhynchus obscurus)	The Dusky Dolphin occurs in the southern hemisphere in cool waters from 26°S to 55°S. According to the Atlas of Living Australia, there are no records of Dusky Dolphins in Victorian waters and there does not appear to be any significant breeding or feeding grounds for Dusky Dolphins in Western Port. Potential

Species	Impact
	impacts to the Dusky Dolphin could occur from the operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and the any potential impacts from discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that may affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for the Dusky Dolphin. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Mackerel Shark (or Porbeagle Shark) (Lamna nasus)	The Mackerel Shark is found throughout temperate seas around the world and in Australia from southern Queensland to southwest Australia. It primarily inhabits waters near the continental shelf where it feeds on pelagic fish and cephalopods (squid) but may occasionally and temporarily enter coastal waters. According to the Atlas of Living Australia, there are no records from Victorian coastal waters or Bass Strait. Potential impacts to the Mackerel Shark could occur from operation of the FSRU and visiting LNG carrier, including operational noise and vibration emissions, potential for collision risk with

Species	Impact
	shipping and the FSRU operational intake and discharge. Noise and vibration from the FSRU and visiting LNG carriers will contribute to an existing background of shipping and recreational vessels already operating in Western Port and the impacts are not considered significant for these species. The number of LNG carriers that may visit Western Port for this Project (between 12 to 40 LNG carriers per year) represents approximately 1 percent of the 3,200 ships that pass Western Port on transit to or from the entrance to Port Phillip Bay 40 km to the east, and an even smaller proportion of shipping traffic over the geographic range of individuals that may visit Western Port. Hence the increase risk of ship strike to individual whales that might visit Western Port is insignificant. Entrainment will not affect these relatively large animals and any potential impacts from the discharge of cold-water and chlorine residual is localised within an area of approximately 200 m north and south and 60 m east and west of the discharge point. Therefore, there are no apparent direct or indirect pathways related to the Project that may affect the population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery for the Mackerel Shark. Refer to Attachment 5 – Marine Ecosystem Protected Matters Report.
Migratory Birds	The PMST report (DoEE 2017) identified 54 migratory bird species for consideration. Migratory bird species included under the EPBC Act as MNES are species that migrate through Australia and are identified in an international agreement approved by the Minister. Of the migratory bird species identified in the PMST report, 21 are marine species that are not impacted by the proposed works within the assessment area. Five are terrestrial, some of which may utilise the assessment area for foraging, but this is expected to be very rare and it is not considered significant habitat for these species. The assessment area provides minimal habitat values for these species. Twenty-eight are wetland species and the presence of these species in Western Port is a significant reason for the nomination of Western

Species	Impact
	Port as Ramsar Area. Although some species such as the plovers and sandpipers may occasionally visit, it is not considered to be significant habitat. The landside component does not contain significant habitat for migratory birds. The disturbance footprint of the Project Site has been minimised to avoid disturbance of potentially significant native vegetation. Increased operational activity associated with the FSRU, visiting LNG carrier and landside operations may result in some localised impacts on migratory birds through increased human presence, light and noise. It is not expected this will be significant for terrestrial species given the existing use of the site and limited habitat available in proximity of the Project. Any noise associated with the operation of the facility is not expected to cause significant impact to the species. Construction related noise would be localised and temporary in nature. In summary, this Project is not expected to directly or indirectly impact on migratory bird species listed under the EPBC Act due to the lack of significant habitat within the landside component and also the broader assessment area. Some of the bird migratory species have the potential to occasionally visit parts of the assessment area, however, given the assessment area's limited habitat values these species are not likely to be impacted by the Project. Further, the potential terrestrial habitat and foreshore habitat have been avoided and there will be no impact to tidal mud flats or other estuarine habitat features relied upon by migratory species. Refer to Attachment 4 – Flora and Fauna Assessment.

2.5.2 Do you consider this impact to be significant?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

Yes

2.6.1 Is the proposed action likely to have ANY direct or indirect impact on the Commonwealth marine environment?

No

2.6.2 Describe the nature and extent of the likely impact on the whole of the environment.

Construction

Construction of the Project will not involve any direct removal of habitat or physical damage to the marine environment as works will be confined to topside of the existing jetty and a short section of pipeline on the landside component.

Potential effects on the marine environment during construction of the Project may include:

- Discharge of sediment-laden runoff due to exposure of soils to erosion following works on the landside site
- Discharge of contaminants to the marine environment (e.g. fuels, oils, etc) from leaks or spills
- Construction noise and vibration, including underwater noise impacting on marine fauna
- Introduction of marine pests / introduced species to the local environment via barges used for the construction activities.

Other potential effects during construction of the Project may include:

- Disturbance of the soil within the landside component has the potential to disturb unrecorded Aboriginal sites/artefacts
- Exposure to contaminated soils as a result of excavations on the landside component
- Accidental discharge of contaminants to the land (e.g. fuels, oils, etc) as a result of leaks or spills
- Increased risk of bushfire, due to construction activities
- Impact on local amenity, for the community and wildlife, due to construction works (e.g. dust, noise, construction vehicle traffic).

Operation

During operation of the Project, potential effects on the marine environment may be associated with the FSRU heat exchange process (for the purpose of LNG regasification), which involves:

- Pumping up to 450,000 m3 per day (450 ML/day) of seawater into the FSRU to heat the liquefied natural gas

- Subjecting seawater intake to an electrolysis process (similar to salt water swimming pools chlorinators) to produce chlorine and hypochlorite. This is required to prevent biological growth and clogging of the heat exchange pipework and tanks

- Returning up to 450 ML/day of water to Western Port, initially 7°C cooler than ambient seawater temperature prior to mixing; and containing residual chlorine initially 0.1 mg/L, (100ppb) at the point of discharge which rapidly dilutes to slightly above the ANZECC Guidelines for freshwater in approximately 20 seconds.

These potential impact pathways have been described and modelled in separate reports on plume modelling (Attachment 6), biological entrainment modelling (Attachment 8), the effects of cold-water discharge on the marine ecosystem (Attachment 8) and chlorine behaviour investigation (Attachment 9).

A summary of the assessment findings related to each of these impact pathways is provided below.

Biological entrainment

Modelling and assessment of biological entrainment associated with the seawater heat exchange system has been undertaken by CEE (2018d) (refer to Attachment 8). In addition, the study sought to provide some guidance and best practice examples of the location (i.e. vertically within the water column) and design of the seawater intake, taking into consideration the risks associated with biological entrainment.

The modelling and assessment of biological entrainment provided the following key findings:

- The location of the FSRU is relatively remote from intertidal and nearshore habitats and is located in an area of the channel characterised by planktonic and pelagic marine species.

- The waters of North Arm are well mixed by strong semi-diurnal tidal currents driving the dispersion of planktonic species past Crib Point.

- A Royal Haskoning study (2015) undertaken for the PoHDA indicates that net water movement in Western Port is predominately in a clockwise (northerly) direction. However, persistent strong winds can reverse the direction of the net flow from clockwise to anticlockwise (southerly) (Hinwood, 1979). In contrast to the previous study, a modelling study undertaken by Water Technology (2017), commissioned for this Project, predicted a strong southerly drift past Crib Point, which would facilitate flushing out towards Bass Strait.

- The assessment suggests that the design of the FSRU water intake will minimise the direct risk of biological entrainment and operation on many ecosystem components. For immobile plankton that are dispersed over the water column, the entrainment rate is about 10% for sites on the western edge of the channel (including the adjacent mudflats) within about 750 m north and south of Crib Point, but overall, the proportion of larvae entrained from populations of widespread biota in Western Port is less than 1% and the effect is likely to be undetectable. This is predominately due to the proportion of intake volume in relation to total water flows within the bay, as well as the FSRU siting (i.e. siting of the facility in relation to adjacent key marine habitats, such as intertidal seagrass beds and mangroves stands) and seawater intake system

design measures (i.e. the location of the intake point on the FSRU designed to avoid surface and seabed seawater). Biological entrainment modelling was based upon maximum operation capacity of 450ML/day, however, it is unlikely to operate at this maximum operating output unless there was a requirement to fill short term shortfalls in the gas market. A seawater flow-through rate of 300,000 m3/day (300 ML/day), corresponding to a lower regasification rate is more likely. In this case, the proportion of plankton entrained may be reduced by approximately one third.

- The seawater intake on the FSRU is designed to minimise the entrainment of large marine organisms (e.g. diving birds (cormorants and penguins), mammals (seals and native water rats), fish and molluscs), through the use of appropriate screens and the optimum positioning of the intake vertically within the water column layer, between 5 m to 10 m above the seabed. This location avoids surface and seabed waters, where movements of biota are most likely to be concentrated.

- Larvae that can maintain position in preferred nearshore habitats such as mangroves, seagrasses and shallow nearshore waters are unlikely to be entrained due to the location of the FSRU intake more than 500 m offshore from the low tide mark.

- Larvae, eggs and other propagules (e.g. mangrove seeds) that drift or travel on the water surface or near the seabed are unlikely to be entrained due to the positioning of the FSRU intake at least 5 m below the water surface.

AGL will undertake a plankton and larval sampling program to provide information on the spatial and temporal variations in plankton populations in North Arm and to validate concepts of larval and plankton distribution and dispersion models (see section 1.14).

Cold-water discharge

The behaviour of the cold-water discharge plume was modelled using known and quantified physical fluid dynamics processes, the characteristics of seawater in North Arm of Western Port and tidal current characteristics at Crib Point (Attachment 8).

The modelling indicated that the nature of the water discharge and the engineering design controls proposed will result in no significant effect on the unmodified nature of the aquatic ecosystems, outside of a small area of mixing immediately adjacent to the discharge points. Specifically, the modelling predicted that for the preferred six-port discharge option, the cold-water discharge will produce a body of water from 0.3°C to 7°C cooler than the ambient seawater temperature with the spatial extent likely to be restricted to an area approximately 200 m north and south and 60 m east and west of the discharge point (CEE 2018a). There will be a gradient of decreasing cold water from 7°C to 0.3°C cooler than the ambient seawater within this area and the predicted difference in temperature beyond 200 m downstream from the points of discharge is estimated to be within the natural daily temperature variation of the receiving environment. This field will mix fully with tidal currents that change approximately every six hours. For six discharge ports, the cold-water field is not expected to form at slack water but if it does, it will extend for less than 200 m downstream (north on the rising tide, south on the falling tide) and 60 m east and west of the discharge point. Figure 6 shows an indicative mixing zone based upon these dimensions.

The discharge modelling demonstrates that the cold-water discharge from the FSRU rapidly descends to the seabed (approximately 12.5 m), due to its higher density. The behaviour of the discharge means that key marine habitats in shallow waters adjacent to the FSRU (i.e. saltmarsh, mangroves, mudflats, seagrass beds and channel slope communities) are not predicted to be impacted.

Species that occupy habitats in water depths greater than 12.5 m in the vicinity of the discharge may be exposed to a seawater temperature 0.3°C cooler than ambient seawater temperature. However, this temperature difference is estimated to be within the natural daily variation of the receiving environment.

Biota occupying habitats in water depths greater than 12.5 m depth include benthic invertebrate fauna that live in (infauna) or on (epibiota) the soft seabed of the channel, planktonic plants and animals (phytoplankton and zooplankton) that drift in the tidal currents, and fish that swim along the seabed in the deeper parts of the North Arm channel. There are no seagrasses in this area due to insufficient natural light for seagrass photosynthesis. Exposure of these benthic invertebrate communities to cooler seawater will be intermittent as reversals in tidal currents carry the waters up and down the channel. Mobile species in the area may be exposed over a shorter period and may avoid the cooler seawater by moving higher in the water column or around the water body if affected. The only benthic communities that will be constantly exposed to cooler seawater will be on the seabed directly beneath the FSRU discharge.

On this basis, the cold-water discharge is not predicted to have a measurable effect on benthic species on the seabed adjacent to the FSRU given that the temperature difference is well within the daily natural variation of the receiving environment, as well as the physical tolerances of such species.

Residual chlorine

Chlorine concentration modelling and analysis has been undertaken to determine the potential implications to the marine ecosystem of any residual chlorine in the water discharge from the FSRU. This assessment was undertaken through the modelling of chlorine reduction in the discharge and ecotoxicological testing (Attachment 9).

The results of the modelling and assessment provided the following key findings:

- Chlorine reduction rates in seawater were dependent on a range of factors including water temperature, water quality, discharge configuration and initial chlorine concentration.

- ANZECC water quality guidelines (ANZECC 2000) discuss the determination of safe levels of Total Residual Chlorine (TRC) in aquatic and seawater environments. However, there is not an existing guideline trigger value for chlorine in marine (seawater) environments. Nevertheless, Section 8.3 of the guidelines states that a low reliability trigger value of 3 µg Cl/ L (0.003 mg/L) for 95 % species protection level can be used for marine environments as an interim working value.

- The water discharged from the FSRU heat exchange process will contain short-lived residual chlorine 0.1 mg/L (100 ppb) and this is recognised as a potential risk to marine environmental values in the immediate vicinity of the discharge points. Within 20 seconds from

the time of discharge the initial dilution process will reduce the concentration to 0.005 mg/L, slightly above the ANZECC 2000 interim working value of 0.003 mg/L. The chlorine concentration will continue to decrease along a gradient from the points of discharge and will reach ANZECC and USEPA guideline objectives within a distance of approximately 200 m north and south and 60 m east and west of the discharge point.

The study determined that the discharge of water via the preferred six-port discharge shows that a combination of dilution and time to react with seawater constituents in the marine environment would result in environmentally safe concentrations of chlorine that will protect beneficial uses of the seawater returned to Western Port.

Other potential effects on the marine environment associated with operation of the Project may include:

Ballast water

The FSRU will take local ballast from Western Port and return ballast to Western Port as necessary to control the stresses on the ship's hull. However, as it will be continuously in a 'harbour condition' it will not be exposed to seagoing stresses, hence will not need to take full ballast so the intake volume and discharge volume are reduced compared to a normal seafaring ship.

LNG carriers will arrive full of LNG and will not need to discharge ballast water. As all ships' ballast water may contain an un-pumpable volume of ballast spread across all the ballast tanks, this will be managed by ballast water exchange at sea (at least 200 miles offshore and in greater than 200 m water depth) to ensure any aquatic organisms have been pumped out and tanks are backfilled with clean ballast.

Wastewater

The FSRU will have an on-board sewage treatment plant. Greywater is evaporated and the sludge resulting from the treatment process would be removed by barge.

Hull cleaning and maintenance

With the continuous mooring of the FSRU, it is expected that over time the FSRU hull and propeller will become overgrown with marine biota. It is envisaged that the hull and propeller will need to be cleaned every five years for inspection. AGL is investigating options for hull and propeller cleaning which will include the development of an Environmental Management Plan in consultation with the harbourmaster and the EPA.

2.6.3 Do you consider this impact to be significant?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

Marine

An assessment of the potential effects of the Project on marine ecosystems with respect to relevant Commonwealth and Victorian legislation for marine protected areas, protected marine species and listed processes is provided in Attachment 5: Marine Ecosystem Protected Matters Assessment.

The assessment identified 33 threatened and migratory marine species (excluding birds) and one marine community listed under the EPBC Act and / or FFG Act as potentially occurring within approximately 10 km of the Project Site. Many of these species were identified as being relatively widely distributed and Western Port was shown to represent a small component of their range. Additionally, Western Port was not recognised as a significant aggregation, breeding or feeding location or migratory path for most of the listed threatened and migratory marine species (excluding birds) identified in the assessment.

Of the 33 listed threatened and migratory marine fauna species identified as potentially occurring in the vicinity of the Project Site, four species are listed as endangered and four species are listed as vulnerable under the EPBC Act:

- Endangered marine species: Blue Whale (Balaenoptera musculus), Southern Right Whale (Eubalaena australis), Leatherback Turtle (Dermochelys coriacea) and Loggerhead Turtle (Caretta caretta)

- Vulnerable marine species: Humpback Whale (Megaptera novaeangliae), White Shark (Carcharodon carcharias), Australian Grayling (Prototroctes maraena) and Green Turtle (Chelonia mydas).

In addition to these species, a further five listed migratory marine fauna species that are not listed as threatened under the EPBC Act were also identified as occurring in the vicinity of the Project Site, including Brydes Whale, Pygmy Right Whale, Dusky Dolphin, Killer Whale and Mackerel (or Porbeagle) Shark.

An assessment of the potential effects of the Project on these species is provided in Section 2.4 and 2.5 of this Referral.

Terrestrial

An assessment of the potential effects of the Project on terrestrial flora and fauna has been

undertaken (Attachment 4). The assessment area adopted for the fauna and flora study comprised the landside component and extended outside the Project Site to the north. This was done to understand the wider flora and fauna attributes and to inform the size and location of the disturbance footprint to avoid sensitive vegetation. As shown in Figure 3, the landside disturbance footprint constitutes a small proportion of the Project Site.

The assessment identified the following:

- **Threatened ecological communities**: A search of the PMST (DoEE, 2017) identified two EPBC Act listed threatened ecological communities as potentially occurring within 5 km of the assessment area (Natural Damp Grassland of the Victorian Coastal Plains – Critically Endangered, and Subtropical and Temperate Coastal Salt Marsh – Vulnerable). An ecological field assessment confirmed that the assessment area does not support any EPBC Act listed threatened ecological communities. No FFG listed communities are mapped as occurring within the assessment area and none were observed to be present during the ecological field assessment. Each EPBC-listed threatened ecological community was determined to have a low likelihood of occurrence.

- **Threatened flora**: A search of the PMST (DoEE, 2017) and the VBA (DELWP 2017b) identified one EPBC Act listed flora species as potentially occurring within 5 km of the assessment area, the Dense Leek-orchid (Prasophyllum spicatum). The species has a moderate likelihood of occurring within the assessment area. Twelve flora species listed under the FFG Act and / or the Victorian Advisory List, including the Dense Leek-orchid (Prasophyllum spicatum), were also identified as potentially occurring within 5 km of the assessment area with seven of these, identified as having a moderate likelihood of occurring within the assessment area. For these seven species, the impact assessment determined the likelihood of significant impact to be low for all species.

- **Threatened fauna**: A search of the PMST (DoEE, 2017) identified forty-eight fauna species listed under the EPBC Act. Twenty-four were identified as marine species and eleven as intertidal species. Of the remaining 13, there were five birds (Regent Honeyeater, Painted Honeyeater, Australian Fairy Tern, Swift Parrot, Orange-bellied Parrot), two fish (Dwarf Galaxias, Australian Grayling), one frog (Growling Grass Frog) and five mammals (Swamp Antechinus, Southern Brown Bandicoot, Greater Glider, Smoky Mouse, Grey-headed Flying-fox).

A likelihood of occurrence assessment identified the Swift Parrot (Lathamus discolour), Australian Fairy Tern (Sternula nereis nereis), Southern Brown Bandicoot (Isoodon obesulus obesulus) and Grey-headed Flying-fox (Pteropus poliocephalus) as having a moderate likelihood of occurring within the assessment area. The Jacobs Fauna and Flora assessment (2018e) determined the likelihood of significant impact to be low for all other species previously recorded within a 5 km radius of the Project Site and deemed as having a moderate or low likelihood of presence within the Project Site.

3.2 Describe the hydrology relevant to the project area (including water flows).

The Project Site, and much of the surrounding area, is located on the low-lying coastal plains formed by the emergence of the sea floor during the Pliocene and early Pleistocene. The

topography of the landside component is generally flat, with a gentle slope (<5% gradient) towards the shoreline. Site elevations range from approximately 10.0 mAHD in the south west corner of the site to approximately 1.0 mAHD at the eastern boundary. Topographical bathymetry data indicates that the current seabed level in the vicinity of Berth 2 is approximately 13 m to 15 m below Lowest Astronomical Tide. The vast majority of the Crib Point Jetty is between 10 m and 20 m above sea level.

Key hydrological features relevant to the Project Site are described below.

Wetlands and waterways

The existing Crib Point Jetty is located within the boundary of the Western Port Ramsar site and extends approximately 660 m east into the North Arm from the boundary of the landside component. The FSRU will be located within the Western Port Ramsar site. The landside component is not located within the boundary of the Western Port Ramsar site, however the Ramsar site adjoins the north, south and east boundaries of this property. The eastern portion of the landside site and adjoining jetty are identified as being within the Western Port Nationally Important Wetland.

The waters of Western Port cover an area of 680 km2 of which 270 km2 are exposed as mud flats at low tide. Western Port features two large islands: French Island (located approximately 4.3 km east of Crib Point Jetty) and Phillip Island.

The high environmental, social and economic worth of Western Port is recognised through the declaration of Western Port as a Ramsar site, an UNESCO Biosphere reserve, and through the presence of several Marine National Parks within the Ramsar site (Churchill Island, French Island, Yaringa).

The landside component does not contain any designated waterways or other waterbodies.

Flooding and inundation

Due to the surrounding topography, the landside component has only a small upstream catchment and no significant overland flow paths. There are no identified flood overlays (Floodway Overlay, Land Subject to Inundation Overlay or Special Building Overlay) in or around the study area in the Mornington Peninsula Planning Scheme. However, the landside component is identified by Mornington Peninsula Shire Council as a ‘Designated Flood Prone Area’ for the purposes of assessing any building permit requirements. The landside component is not affected by 1% AEP flood extents.

An assessment of the hydrology of the landside component (Attachment 11) concluded that the Project will not significantly alter the existing hydrology given that the site has been previously cleared and levelled, and the Project has only a small footprint that will not significantly change the impervious area or rate of runoff generation.

Tide levels for the Crib Point Jetty based on Port of Melbourne Corporation data for Western Port (Stony Point), and Chart Datum Mark No. 259 Bittern (1.690 m below AHD), indicate a Highest Astronomical Tide (HAT) level of +1.62 mAHD, a Lowest Astronomical Tide (LAT) level of -1.69 mAHD and a Mean Sea Level (MSL) of -0.09 mAHD. Based on these levels, the vast

majority of the landside component, with the exception of a narrow band along the eastern boundary, would not be subject to tidal inundation during HAT. The top of kerb on the existing jetty is approximately 1.69 m above HAT.

As the Project is intended to operate for approximately 20 years, the sea level rise predictions for 2040 have been selected as the most relevant. Based upon current predictions from the Victorian Coastal Inundation Dataset (2040), sea level is predicted to rise by 0.2 m by 2040, which results in marginal fringe sea level risk impacts along the eastern boundary of the landside component and around the jetty. This data does not include a 2040 storm tide extent, as this information is not currently available.

Groundwater

Groundwater is present at approximately 6.8 m to 7.5 m below ground level and is tidally influenced. There are no registered extractive uses of groundwater in the vicinity of the Project Site.

Historic groundwater sampling conducted in 2009 and 1997 and summarised in Jacobs (2017) identified the presence of total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (MAHs) and metals (including aluminium, cobalt, chromium, copper, lead and zinc) in groundwater. More recent groundwater sampling conducted in March 2017, identified concentrations of metals (copper, nickel and zinc), chloride, sodium and total dissolved solids in exceedance of assessment criteria adopted for industrial land use (refer to Attachment 12).

Project activities are not likely to intersect or interact with groundwater on the site.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

Vegetation

Biogeographically, the Project Site lies on the coast of the Gippsland Plain Bioregion. Coastal systems in this area are typically made up of Heathy Woodlands and Herb-rich Woodlands on sandy soils (DELWP 2017b).

As discussed in section 3.1, the assessment area adopted for the Flora and Fauna Assessment (Attachment 4) comprised the landside component and extended outside the Project Site to the north. The study determined that the assessment area does not contain any EPBC Act or FFG Act listed threatened ecological communities. Vegetation modelling provided by DELWP indicates that the assessment area contains areas of native vegetation consisting solely of EVC 48: Heathy Woodland, as well as areas cleared of native vegetation.

A review of historical photography shows that the assessment area was largely clear of native vegetation in the 1960’s. Earthworks associated with construction of the port infrastructure significantly affected the area such that is has been levelled and much of the sandy topsoil collected and mounded onsite.

The Jacobs study assisted in defining the landside disturbance footprint to that of an existing open area which contains various exotic pasture grasses including Brown-top Bent *Agrostis*

capillaris and broad-leaf weeds amongst native species such as Burgan and Prickly Tea-tree that are kept low through regular slashing. Aerial imagery shows that much of these areas have been open and slashed since at least 1990. However, some areas, namely the less fertile portions are dominated by native shrubs that are persisting under the slashing regime. Within the land disturbance footprint, an area of approximately 0.44 ha of native grass will require removal for the Project. For the purposes of Clause 52.17 (Native Vegetation) of the Mornington Peninsula Planning Scheme, it is considered this vegetation is regeneration less than 10 years old and exempt from the need for planning approval.

The study included a survey of vegetated land in the south of the assessment area (south of the jetty access road) which was originally planned as a construction laydown area. The Jacobs study determined that one EPBC listed threatened flora species has the potential to occur within the native vegetation in this parcel of land, Dense Leek-orchid (listed under the EPBC Act and the FFG Act). Accordingly, AGL excluded this parcel of land (approximately 0.5 ha) from the landside disturbance footprint and will therefore not disturb this area due to the potentially significant vegetation.

Some native vegetation will be removed as part of the Pipeline Project and the Jetty Upgrade Project. Approvals will be sought by APA and PoHDA, respectively.

The seabed around the Crib Point Jetty comprises unconsolidated sediments. Mangroves grow on the upper intertidal mudbanks north and south of Crib Point. Seagrasses grow on the muddy and sandy seabed from the mid-tide mark to a maximum water depth of 7 m, which is approximately 400 m inshore of the proposed location of the FSRU. The seabed below 7 m deep (i.e. beyond 400 m from shore) and extending to at least 1 km seaward of the FSRU, is bare of vegetation due to insufficient light penetration. No marine vegetation (saltmarsh, mangroves, seagrass or macroalgae) will be removed for the Project.

Soils

According to previous geotechnical investigations, the landside component overlies the Baxter Sandstone geological unit, which is a sedimentary formation comprised of fluvial sandstone, conglomerate, siltstone and ironstone (Jacobs, 2017).

Soil profile logs indicate a layer of fill to a depth of 0.4 m to 1.0 m below ground level across the site and consisting of silty / sandy gravel within existing unsealed roads, and sand or clay fill in adjacent areas. Underlying the fill material are layers of silty sand followed by silty clay. Rock outcrops were observed within the foreshore.

The Project Site is not included in an Erosion Management Overlay under the Mornington Planning Scheme and there is no evidence of highly erodible soils or land stability issues.

Contamination

An assessment of potential soil and groundwater contamination risks associated with the Project is provided in the Contaminated Land Assessment (Attachment 12) and includes consideration of the findings of previous contamination investigations:

Jacobs, 2017, Baseline Environmental Contamination Investigation, Factual Report, prepared

for Port of Hastings Development Authority, 1 June 2017PPK Environment & Infrastructure Pty Ltd, 1998, Statements of Environmental Audit, Port of Hastings Sites, prepared for Department of Treasury and Finance, September 1998.

Soil samples collected on the landside component and surrounds during previous investigations by PPK (1998) and Jacobs (2017) identified concentrations of metals (arsenic, lead, chromium, zinc and vanadium), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Samples were collected generally in fill soil at depths less than 1 m below ground level, except for a sample where the maximum chromium concentration was reported at 6 m below ground level. Additionally, perfluoroctanesulfonic acid (PFOS) was reported in a soil sample collected from 0.1 m below ground level by Jacobs (2017) in the south-eastern portion of the landside site. During a site inspection by Jacobs (2017), an area of burnt ground was observed in the central portion of the landside component, which appeared to be related to surficial burning of waste or timber.

Potential Acid Sulphate Soil (PASS)

PASS has not been identified within the landside component. Areas approximately 50 m to the north of the site however have been identified as PASS. No laboratory analysis for PASS has been reviewed in the assessments conducted to-date. However, based on the maps prepared by the (then) Victorian Department of Primary Industries, the presence of PASS beneath the landside component has not been identified, however quaternary sediment deposits which underlie the adjacent Jacks Beach Reserve are PASS (Victorian Resources Online, 2003).

Based on the limited Project activities proposed on the landside component, minimal disturbance of PASS or contamination is likely to occur, and implementation of general good practice construction and management measures would be sufficient to minimise the risk of adverse impacts on soils, surface and groundwater resources, including the adjacent Western Port Ramsar site.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

Designated as a wetland of international significance in 1982, the Western Port Ramsar site covers 59,950 ha of Western Port. Western Port is one of 66 Ramsar areas in Australia, one of 11 Ramsar sites in Victoria and the third most important area for wading birds in Victoria. The Ramsar site consists of large shallow intertidal areas dissected by deeper channels, and a narrow strip of adjacent coastal land in some areas.

Western Port has six segments based on its hydrodynamic characteristics. The Ramsar site includes part of the Western Entrance segment, and all of the Confluence Zone, lower North Arm segment, upper North Arm segment, Corinella Segment and Eastern Basin.

The Port of Hastings, its existing port facilities, shipping channels and dredged shipping berths, including the existing Crib Point Jetty are located on the western side of the lower North Arm segment of the Ramsar site. The western side of the lower North Arm segment of the Ramsar site is an operating commercial port which contains four shipping jetties, five berths, a naval base, three recreational yachting marinas and two substantial recreational boat launching

facilities. The landside component is directly adjoined to the north, south and east by the Ramsar site but is not located within the boundary of the Ramsar site (see Figure 3).

The Australian Government Ecological Character Description for the Western Port Ramsar Wetland (KBR 2010) identified nine critical ecosystem components and processes for the Western Port Ramsar site: wetland bathymetry, geomorphology and sedimentation, seagrass, mangrove and saltmarsh, significant flora species, waterbirds, marine invertebrates, fish, and significant fauna species.

The Ramsar site supports the Australian Fairy Tern, which is a species of global conservation significance; and the Dense Leek-orchid which is listed as vulnerable under the EPBC Act. Saltmarsh vegetation within the Ramsar site provides important habitat for the Orange-bellied Parrot, which is listed as critically endangered under the EPBC Act.

Within the Ramsar site there are extensive areas defined as ‘wetlands’ (see dark blue shading in Figure 5), Marine National Parks (French Island Marine National Park, Yaringa Marine National Park, Churchill Island Marine National Park) and the French Island National Park.

The defined wetlands area excludes the Crib Point Jetty and areas of deeper open water and including the designated Port of Hastings waters surrounding the Crib Point Jetty. Hence, the Project Site is located outside of the defined ‘wetlands’ areas and therefore outside of the ecologically significant areas of Western Port as defined by the Ecological Character Description. The Project Site is also located outside of any National Parks or Marine National Parks.

3.5 Describe the status of native vegetation relevant to the project area.

As discussed in Section 3.3 of this Referral, the landside component is an existing open area that is regularly slashed. The area contains a mixture of exotic pasture grasses such as Brown-top Bent *Agrostis capillaris* and broad-leaf weeds amongst native species such as Burgan and Prickly Tea-tree that are kept low through regular slashing. Aerial imagery shows that much of these areas have been open and slashed since at least 1990. However, some areas, namely the less fertile portions are dominated by native shrubs that are persisting under the slashing regime. For the purposes of Clause 52.17 (Native Vegetation) of the Mornington Peninsula Planning Scheme, it is considered this vegetation is regeneration less than 10 years old and its removal is exempt from the need for planning approval.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The landside component is relatively flat with a gentle (<5%) slope towards the shoreline and elevations ranging from approximately 10.0 mAHD in the south west corner down to approximately 1.0 mAHD along the eastern boundary.

The water depth at the location of the FSRU is approximately 13 m from seabed to sea surface at LAT, with approximately 3.31 m additional depth at HAT. To reduce the potential effect of the intake of seawater on ecosystem components, the seawater intake would be positioned in the

water column layer approximately between 5 m to 10 m above the seabed.

3.7 Describe the current condition of the environment relevant to the project area.

The Project Site is within the Port of Hastings, which is a commercial trading port within Western Port, serving international shipping operations. The Project site is a brownfield site, the landside area is disturbed (excepting the area to the south of the jetty access road) and the sea floor has been modified by the jetty construction and capital dredging.

An average of 142 vessels ranging in size up to 100,000 tonnes (includes oil tankers, product tankers, very large gas carriers and small LPG ships) use the Port of Hastings each year (based on ship movements over the past five years). The Port of Hastings includes designated port waters within Western Port, and port facilities include Stony Point jetty and depot, Long Island liquid berth, Crib Point liquid berths and the BlueScope Steel Wharves. The Project Site is located partially within the Western Port Ramsar site (as described in section 2.3.1 of this Referral). As described by KBR (2010), the Ramsar site is a particularly good example of a natural wetland marine embayment with extensive intertidal flats, mangroves, and saltmarsh within the bioregion. The site regularly supports one ecological community and seven wetland dependent fauna species listed under the EPBC Act; and large numbers of migratory waterbirds, breeding of waterbirds and nursery grounds for fish.

The existing concrete jetty at Crib Point was constructed as part of BP’s refinery infrastructure in the 1960s. The refinery closed in 1986 and the southernmost berth (Berth 2) at the jetty was decommissioned. The northernmost berth (Berth 1) remains in operation for the transfer of liquid fuel by United Petroleum.

Earthworks associated with construction of the port infrastructure in the 1960’s significantly affected the site such that it has been levelled and much of the sandy topsoil collected and mounded on the site’s northern boundary of the Port Zone. A review of historical photography shows that the entire Port Zone land area was largely clear of native vegetation in the 1960’s (refer to Figure 4.2 in the Historic Heritage Assessment (2018g)), but since that time, some areas of native vegetation have re-established.

As discussed in Section 3.3 of this Referral, the landside disturbance footprint of the Project Site is an existing open area that is regularly slashed.

Evidence of soil and groundwater contamination has previously been recorded on the landside component, as described in Sections 3.2 and 3.3 of this Referral.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

A Historic Heritage Assessment undertaken by Jacobs (2018g) (Attachment 13), included searches of the following heritage registers: Commonwealth Heritage List (CHL), National Heritage List (NHL), World Heritage List (WHL), Victorian Heritage Register (VHR), Victorian Heritage Inventory (VHI), Mornington Peninsula Planning Scheme Heritage Overlay (HO), Register of the National Estate (RNE) or the National Trust (NT) register.

No places listed on the CHL, NHL or the WHL were identified within or in proximity to the Project Site.

The following listed historical heritage places were identified within the broader study area surrounding the Project Site:

- One heritage place immediately adjacent to (within 50 m of) the Project Site - Former BP Refinery Administration Building (VHR H1016/HO240/RNE 103692) - listed on the VHR, HO and the RNE

- Three heritage places within proximity to (within 1 km of) the Project Site, including Woolley's Cool Room (HO322) – listed on the HO, William (Bill) Woolley's Homestead (H7921-0112) - listed on the VHI, and the HMAS Otama (B6683) - listed on the NT register.

Following a search of the relevant heritage registers, review of previous literature and analysis of relevant reports, the following predictive summary statements can be made:

- Within the Project Site, there is little potential for previously unidentified historical heritage places to be present:

- Despite the long-term use of the site for industrial purposes, there is likely to be little information to be gained from any physical/archaeological remains at the site

- Due to the changes related to the industrial use of the site, there is little likelihood of earlier historical archaeological remains having survived this level of disturbance.

- Within the immediate vicinity of the Project Site (the assessment considered a radial area of approximately 100 m) there is little potential for unidentified historical heritage places to be present:

- Due to the aerial imagery not detecting any obvious historical heritage features

- The Hastings District Heritage Study did not identify any places apart from those listed above

- In addition, the restricted nature of the works being localised to areas of prior disturbance suggests that it is unlikely that unidentified heritage places will be discovered.

The Project Site is situated outside the VHR heritage boundary of the Former BP Refinery Administration Building (VHR H1016/HO240/RNE 103692) and will therefore not directly impact on this heritage place. Depending on the method of construction and details of the proposed works, there is some potential for indirect impacts on this heritage place from construction activities (e.g. vibration, noise and dust). To minimise the potential for indirect impacts, it is proposed that an assessment of the proposed methods of construction be undertaken in accordance with the Victorian EPA Noise Control Guidelines (Publication 1254, Oct. 2008) and construction activities managed in accordance with the Environmental Guidelines for Major Construction Sites (EPA Publication 480, February 1996).

Due to the distance between the Project Site and the other historical heritage places identified

in the vicinity, there are unlikely to be any impacts on Woolley's Cool Room (HO322), William (Bill) Woolley's Homestead (VHI H7921-0112), or HMAS Otama (NT B6683).

The Historic Heritage Assessment concludes that the Project will not impact on the national heritage values of any national heritage places.

3.9 Describe any Indigenous heritage values relevant to the project area.

The following Aboriginal cultural heritage assessments have been undertaken for the landside site:

- Jones 2015: Allotment 2040, The Esplanade, Crib Point: Cultural Heritage Assessment and Implications for development - prepared for the Port of Hastings Development Authority.

- Jacobs 2018a: AGL Gas Import Jetty Project, Aboriginal Heritage Due Diligence Assessment - prepared for AGL (refer to Attachment 1).

Jones (2015) determined that the "area has undergone significant ground disturbance as defined by the Aboriginal Heritage Regulations 2007", and further observed that no surface evidence of Aboriginal cultural remains and that it is unlikely that Aboriginal cultural material exists on the site.

Jacobs (2018e) determined there are no Aboriginal Places located within the Project Site and there is only a single Aboriginal Place located within 3 km of the Project Site (Jacks Beach; VAHR 7921-0369), which includes shell midden and surface scatter components.

Jacobs (2018e) also determined that the Project Site is within an area of cultural heritage sensitivity as defined in the Aboriginal Heritage Regulations 2007, Division 3 as it is located within:

- 200 m of the high-water mark of Western Port (in relation to the section of onshore pipeline connecting to a flange to allow connection to the Pipeline Project); and

- the defined boundary of the Western Port Ramsar site

However, the Project was determined not to constitute a high impact activity in accordance with Regulation 43(3) of the Aboriginal Heritage Regulations 2007, given the long-term use of the site for industrial and port related activities consistent with the activities proposed by the Project. Furthermore, Jacobs (2018e) concluded that given the extent of documented disturbance within the landside component there is only a low potential for unknown Aboriginal cultural heritage to be impacted by the Project.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The FSRU will be continuously moored at Berth 2 of the Crib Point Jetty (the southern berth).. The FSRU will be moored within the limits of the Port of Hastings. PoHDA will licence AGL's

use of the jetty.

The Jetty Infrastructure components of the Project will be established topside on the existing Crib Point Jetty, which is located on two parcels of Crown land administered by the DELWP, and described as:

- Allotment 89C, Parish of Bittern (SPI: 89C\PP2159) – 97 The Esplanade, Crib Point VIC 3919

- Allotment 89D, Parish of Bittern (SPI: 89D\PP2159) – The Esplanade, Crib Point VIC 3919.

The landside component is located within Crown Allotment 2040, Parish of Bittern (SPI: 2040\PP2159), situated at The Esplanade, Crib Point VIC 3919, which is Crown land vested to the PoHDA.

PoHDA will licence AGL's use of this land.

3.11 Describe any existing or any proposed uses relevant to the project area.

The Project Site is a brownfield industrial site within the existing Port of Hastings. The existing Crib Point Jetty is located within an existing deep-water port in a sheltered bay with a berth maintained to a depth of approximately 14 m. The jetty is approximately 970 m in length (total), running west to east (approximately 530 m), with a berthing head running north to south (approximately 440 m). The 'Port of Hastings Land Use and Transport Strategy' identifies the Project Site as being retained in the long-term for use as a liquid bulk terminal.

The existing concrete jetty at Crib Point was constructed as part of BP's refinery infrastructure in the 1960s. The refinery closed in 1986 and the southernmost berth (Berth 2) at the jetty was decommissioned. The northernmost berth (Berth 1) remains in operation for the transfer of liquid fuel by United Petroleum, which operates the Berth 1 jetty head under a licence from the PoHDA. The jetty supports a number of existing pipelines.

As shown in Figure 3, the landside component is cleared of buildings and vegetation. To the south west of the Project Site are existing pipelines and onshore facilities and buildings associated with United Petroleum's current operations. The "End of Line Facilities" for the Pipeline Project will be located immediately north and west of the Project Site

The Project Site is accessed from The Esplanade via an existing access road. To the west of The Esplanade (opposite to the Project Site) is the former BP Refinery, containing old storage tanks, access roads and hardstand areas; and the Victorian Maritime Centre, which is housed in the former BP Refinery Administration Building.

The public land to the north is used as a park, which runs along the coast line to the north and is heavily vegetated. There are walking tracks leading to the coast from The Esplanade in this area, including to a maritime viewing deck overlooking a submarine moored nearby. Woolleys Beach Reserve is located to the south of the Project Site and contains a carpark, BBQ and picnic facilities and a boardwalk. Woolley's Cool Room is located beyond this to the south.

The nearest residential uses include five houses located within a small cluster approximately 600 m north west of the Project Site and the township of Crib Point approximately 1 km south west of the Project Site.

The Project Site is located approximately 2.3 km north east of the HMAS Cerberus, Royal Australian Naval Base. A decommissioned submarine, HMAS Otama, is moored approximately 0.7 km north of the Project Site.

For more than 50 years, Crib Point and surrounding areas have hosted a number of industrial activities, including petroleum refining and storage as well as gas and steel processing facilities. The main boat landing point in Western Port is located at Hastings.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

The Project will be undertaken in accordance with AGL's Environment Policy (Attachment 14) and AGL's Health, Safety and Environment Management System (HSEMS), which establishes the framework to implement the principles of the Environment Policy and defines AGL's Environmental Standards in relation to:

- Land
- Surface water
- Groundwater
- Air emissions
- Greenhouse gas emissions
- Biodiversity
- Noise emissions
- Waste
- Cultural heritage.

Environmental management of the operation of FSRU and Jetty Infrastructure will be in accordance with the AGL HSEMS minimum controls, which will be incorporated into the Project Environmental Management Plan (to be prepared).

The Project will comply with the environmental management requirements of all environmental approvals, including the Works Approval and the Licence from EPA Victoria.

As a construction contractor for the Jetty Infrastructure is not yet engaged for the Project, it will be a requirement of the contractor's contract with AGL to prepare a Construction Environmental Management Plan (CEMP) and prepare activity-specific work method statements prior to the

commencement of works. The contractor's CEMP will be developed in alignment with AGL HSEMS requirements.

AGL HSEMS will integrate with the Port of Hastings SEMP and HSE System to regulate the environmental aspects of the FSRU during the operational phase. LNG transfer operations will occur in accordance with the Port of Hastings Operating Handbook.

Key measures incorporated into design of the Project to avoid or minimise environmental impacts, include:

• Selection of a historically cleared and disturbed site within an existing industrial port facility, and selection of a FSRU as opposed to an on-shore storage and re-gasification facility, to minimise potential impacts on terrestrial flora and fauna.

• Selection of a berth at an existing, operational jetty for mooring of the FSRU so as to minimise physical disturbance to the marine environment that would be required for construction of a new jetty.

• The seawater intake on the FSRU will be positioned and designed to minimise the entrainment of marine organisms as confirmed by the CEE studies. The key design mitigations (or alternative designs that are demonstrated to achieve the same effect) are recommended:

- The seawater intake opening is to be designed so that seawater is drawn into the intake in a horizontal plane at a speed < 0.15 m/s and oriented parallel to the ambient tidal currents.

- The seawater intake is to be positioned in the water column layer between 5 m to 10 m above the seabed.

- The seawater intake is to be fitted with bar grills (either 100 mm horizontal by 100 mm vertical or 50 mm horizontal spacing of vertical bars) to reduce the likelihood of larger mobile marine animals and drifting debris from entering the seawater heat exchange system.

• The marine assessments undertaken by CEE considered single, double and six-port discharge arrangements for the return of the water from the FSRU heat exchange system. The six-port discharge is to be adopted to minimise the cold-water plume and achieve chlorine dilution to environmentally safe concentrations by:

- Maintaining a high enough water velocity to facilitate mixing of cooler seawater and return to ambient seawater temperature.

- Facilitating prompt mixing of residual chlorine to encourage rapid dilution i.e. within 20 seconds from the point of discharge, the residual chlorine reduces to 0.005mg/l.

- Facilitating mixing so that a smaller area of deeper channel seabed may experience seawater temperatures up to only 0.3°C below ambient temperature (e.g. 19.7°C instead of 20°C in summer, or 9.7°C instead of 10°C in winter).

• The residual chlorine concentration at the outlet point will be monitored and operations maintained to ensure the concentration does not exceed of 100 ppb (0.1 mg/L).

- Boil-off gas from the LNG cargo tanks within the FSRU will be compressed for recovery and use or as fuel to the vessel power generation system.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

The proposed environmental outcome for the Project in relation to Matters of National Environmental Significance is that there will be no significant impacts on any such matter.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

In summary, the key reasons why the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act are as follows:

- The Project Site does not contain any listed threatened ecological communities.

- The area disturbed for this Project is confined to the land disturbance footprint (as shown on Figure 3), containing a mixture of exotic pasture grasses and weeds amongst native species such as Burgan and Prickly Tea-tree that are kept low through regular slashing. This area represents approximately 0.44 ha of native vegetation and will require removal for the Project. For the purposes of Clause 52.17 (native vegetation) of the Mornington Peninsula Planning Scheme, it is considered this vegetation is regeneration less than 10 years old and removal is exempt from the need for planning approval.

- The assessment of impacts to listed threatened and migratory species are presented in Sections 2.4.1 and 2.5.1 of this Referral. The impacts to listed threatened and migratory species are not considered significant for the following reasons:

    - Of the threatened and migratory marine species listed under the EPBC Act as potentially occurring within approximately 10 km of the Project Site, the Australian Grayling was identified with a potential to be affected by the Project impact pathways. However, an assessment of the Australian Grayling determined that the adult Grayling populations in the rivers and streams would not be exposed to impact pathways and that the proportion of larvae of these species that might disperse via North Arm and be affected by Project processes was low.

    - For all other EPBC listed threatened or migratory marine species detected within 10 km of Crib Point jetty, there are no apparent direct or indirect impact pathways that are likely to affect population size; area of occupancy; population continuity; critical habitat, breeding cycle; or species recovery. In general, this is due to many of these species being widely distributed, with Western Port shown to represent a small component of their range; and Western Port is not recognised as a significant aggregation, breeding or feeding location or migratory path.

- The relatively small footprint of land-based construction activities will enable potential adverse effects on the ecological values of the Western Port Ramsar site to be effectively managed through standard controls to be developed and implemented in a Construction Environmental Management Plan.

- The Project will not involve any direct removal of mangroves, seagrass or intertidal habitats within the Western Port Ramsar site.

- The Project will not impact on any saltmarsh, mangrove, seagrass or channel slope communities and sensitive species that occupy depths less than 12.5 m within the Western Port Ramsar site as a result of discharges from the FSRU heat exchange process, as the water discharge plume will not extend to these shallower depths.

- As described in Section 1.14 of this Referral, AGL plans to undertake additional environmental studies and monitoring to inform an EPA works approval application and operational environmental management measures, in accordance with the *Environment Protection Act 1970* and relevant associated regulations, including the State Environment Protection Policy (Waters of Victoria). This includes:

    - Plankton and larval sampling program

    - Particle entrainment modelling (pending outcome of plankton and larvae sampling program)

    - Investigations of the benthic habitats

    - Seawater monitoring

    - Ghost shrimp study.

- An analysis has been undertaken of the potential effects of the Project's impact pathways on the Ramsar selection criteria for Western Port (see Q5.2 Attachment A - Assessment of Ramsar Selection Criteria). The assessment determined there was negligible risk to five of the seven applicable Ramsar criteria. There is negligible risk in relation to direct effects on waterbird populations. There is possible interaction of the Project (cold-water discharge, residual chlorine and entrainment pathways) in relation to four of the five Ramsar criteria due to potential localised effects on the planktonic life stages of some marine invertebrate species. However, this interaction will occur within a confined part less than 1% of North Arm within the larger Ramsar site.

- An assessment has been undertaken against the EPBC Act Policy Statement 1.1 - Significant Impact Guidelines, whereby an action is likely to have a significant impact on the ecological character of a declared Ramsar wetland if there is a real chance or possibility that any of the following five criteria are met. An assessment of the Project against each of the five criteria is provided below.

(1) Areas of the wetland being destroyed or substantially modified:

- No areas of the Western Port Ramsar site will be destroyed or substantially modified. The Project Site is located outside of the defined 'wetlands' area of the Western Port Ramsar site and therefore outside of the more ecologically significant areas of Western Port.

- The Project does not involve any construction works that will cause physical disturbance to Western Port as Project activities will occur on the FSRU, topside of the existing jetty and within

the landside component (which is outside the boundary of the Ramsar site).

- Operationally, the proposed water discharge will descend to the seabed and will be 0.3°C below the ambient seawater temperature upon reaching the seabed. The mixing zone is likely to be restricted to an area approximately 200 m north and south and 60 m east and west of the discharge point. There will be a gradient of decreasing cold water from 7°C to 0.3°C cooler than the ambient seawater within this area and the predicted difference in temperature beyond 200 m from the discharge point is within the natural daily temperature variation of the receiving environment. Therefore, the cold-water discharge will have a negligible effect outside the mixing zone and will not substantially modify the Ramsar wetland.

- The Project will not involve any removal of mangroves, saltmarsh or seagrass beds or physical disturbance of intertidal flats.

(2) A substantial and measurable change in the hydrological regime of the wetland:

- There will be no substantial and measurable change in the hydrological regime to the Western Port Ramsar site.

- An assessment of the hydrology of the landside component (Attachment 11) concluded that the Project will not significantly alter the existing hydrology given that the site has been previously cleared and levelled, and the Project has only a small footprint that will not significantly change the impervious area or rate of runoff generation.

- An assessment by CEE(2018f) of the predicted sea level change in as a result of the Project showed there would be a very small reduction in water level (approximately 0.3 mm) in the upper part of Western Port due to the constriction in flow caused by any two ships berthed side by side at Crib Point Jetty. This reduction is considered to be insignificant in relation to tidal and monthly variations in sea level in Western Port.

- The FSRU will pump up to 450,000 m3 per day (450 ML/day) of seawater into the FSRU to heat the liquefied natural gas and return an equivalent volume of water to North Arm if operating at maximum capacity. However, it is unlikely to operate at this maximum operating output unless there was a requirement to fill short term shortfalls in the gas market. Therefore, a seawater intake volume of 300,000m3/day (300ML/day) corresponding to a lower regasification rate of 500mmscf/day is more likely.

(3) The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependent upon the wetland being seriously affected:

- Native species dependent on Western Port are not expected to be significantly impacted.

- As discussed in Criterion 4, above, the Project may affect some plankton and planktonic life stages of some marine invertebrate species through biological entrainment, exposure to cooler seawater and residual chlorine from the FSRU discharge. However, these potential effects are limited to a confined part of the North Arm, within the Ramsar site and are unlikely to affect benthic marine invertebrate populations or EPBC Act listed threatened species.

- As discussed for Criterion 5 above, there is negligible risk in relation to direct effects on waterbird populations.

(4) A substantial and measurable change in the water quality of the wetland

- There will be no substantial and measurable change to the water quality of Western Port.

- Berth 2 at the Crib Point Jetty is outside the defined wetland area of the Ramsar site. The determined water quality effects associated with the water discharge (i.e. short lived residual chlorine levels and cooler seawater water temperature) are predicted to occur only within a small area (200 m north and south and 60 m east and west of the discharge point with background levels achieved outside of this area of initial mixing.

- There will be no changes to the physical appearance of the water discharge and therefore use of the water for aesthetic enjoyment will not be impacted.

- Any residual chlorine concentration in the water discharge will be managed at less than 0.1 mg/L, which is substantially below the 1 mg/L minimum limit for swimming pools (Health (Infectious Diseases) Regulations 2001). Furthermore, this level of residual chlorine is well below the Australian Drinking Water Guideline value of <5 mg/l (NHMRC 2017) and as such poses no risk to primary or secondary contact recreation.

- The predicted difference in temperature between the water discharge after initial mixing (200 m north and south and 60 m east and west of the discharge point), the ambient seawater is well within the natural daily temperature variation of the receiving environment and as such it is considered that the beneficial use will not be impacted.

- A program of further investigation of the marine effects is proposed as detailed in section 1.14 of this Referral.

(5) An invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread):

- Ships entering Western Port must comply with the *Commonwealth Biosecurity Act 2015*.

- The environmental and economic threat posed by marine pests to Western Port is recognised by the PoHDA and Parks Victoria. The discharge of ballast waters is prohibited in port waters (PoHDA, 2017). LNG carriers entering Australian waters must manage ballast water according to the Australian Ballast Water Management Requirements, which align with the International Convention for the Control and Management of Ships Ballast Water and Sediments 2004.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

AGL is committed to protecting ourselves, our customers, our communities and the Environment from preventable risks and harm. As part of this, we are driven to achieve excellence in environmental management and performance. Working in partnership with the broader business, AGL's team of environmental specialists work to:

- Create a culture where protecting the environment is front of mind for everyone;
- Ensure that every AGL site has robust environmental practices in place; and
- Continuously improve our environmental management and performance so we can achieve zero harm to the Environment.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

No. There are no past or present proceedings under a Commonwealth, State or Territory law associated with AGL Wholesale Gas Limited.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

AGL has an Environment Policy that is signed by the AGL Chief Executive Officer and is applicable to all AGL employees, contractors, products, services and AGL operational and joint venture sites. The Environment Policy outlines AGL's vision to "protect the environment and minimise our environmental footprint in the areas we operate, in collaboration with our stakeholders".

AGL has a Health, Safety and Environment Management System (HSEMS), that forms the foundation to the principals in the Environment Policy. AGL's Environmental Standards in the HSEMS include:

- Land
- Surface Water
- Groundwater
- Air Emissions
- Greenhouse Gas Emissions
- Biodiversity
- Noise Emissions
- Waste
- Cultural Heritage

AGL environmental management process and practices align with the requirements of the Environmental Management System Standard (ISO 14001:2015).

Environmental management of the Project will be in accordance with the AGL HSEMS requirements, which will be incorporated into the Project Environmental Management Plan.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

No

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
CEE 2018a, Plume Modelling of Discharge from LNG Facility – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
CEE 2018b, Chlorine in seawater heat exchange process at Crib Point – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
CEE 2018c, Assessment of effects of cold-water discharge on marine ecosystem – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
CEE 2018d, Modelling and Assessment of Biological Entrainment into Seawater Heat Exchange System – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
CEE 2018e, Marine Ecosystem Protected Matters Assessment – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
CEE 2018f, Effects of LNG Facility on Sea Level and Seabed at Crib Point Jetty – AGL Gas Import Jetty Project. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
DELWP 2017a. Western Port	Reliable	None

Reference Source	Reliability	Uncertainties
Ramsar Site Management Plan Summary. Department of Environment, Land, Water and Planning, East Melbourne		
DELWP 2017b. Victorian Biodiversity Atlas. <http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/victorian-biodiversity-atlas> Department of Environment Land Water and Planning, Government of Victoria.	Reliable	None
DoEE 2017a. Protected Matters Search Tool.http://www.environment.gov.au/epbc/protected-matters-search-tool	Reliable	Relevant limitations and uncertainties are described within the report.
Jacobs 2017, Factual Report - Baseline Environmental Contamination Investigation, Report prepared for Port of Hastings Development Authority, 1 June 2017.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018a, Aboriginal Heritage Due Diligence Assessment– AGL Gas Import Jetty Project. Report for AGL. July 2018	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018b, Air Quality Impact Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018c, Contaminated Land Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018d, Environmental Noise Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018e, Flora and Fauna Assessment – AGL Gas Import	Report was prepared by suitably qualified persons and	Any relevant limitations, assumptions and other

Reference Source	Reliability	Uncertainties
Jetty Project. Report for AGL. August 2018.	are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	uncertainties are described within the technical report.
Jacobs 2018f, Greenhouse Gas Emissions Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018g, Historic Heritage Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018h, Hydrology Impact Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jacobs 2018i, Desktop Social Impact Assessment – AGL Gas Import Jetty Project. Report for AGL. August 2018.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Jones 2015: Allotment 2040, The Esplanade, Crib Point: Cultural Heritage Assessment and Implications for development - prepared for the Port of Hastings Development Authority.	Reliable	None
KBR 2010. Western Port Ramsar Wetland Ecological Character Description. Report for Department of Sustainability, Environment, Water, Population and Communities, Canberra.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Patel et al. (n.d), LNG Vaporizer Selection Based On Site Ambient Conditions, Dhirav Patel, John Mak, Daniel Rivera, Joanne Angtuaco, Fluor. http://www.gastechnology.org/training	Reliable	None

Reference Source	Reliability	Uncertainties
/documents/lng17-proceedings/materials-4-dhirav_patel.pdf		
PKA 2015. Ecological (Flora & Fauna) Assessment Crib Point Jetty, Port of Hastings. Paul Kelly & Associates Ecological Services, Gardenvale, Victoria.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
PKA 2016. Southern Brown Bandicoot Isoodon obesulus survey at Crib Point Jetty, Port of Hastings. Paul Kelly & Associates Ecological Services, Gardenvale, Victoria.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
PPK Environment & Infrastructure Pty Ltd 1998. Statements of Environmental Audit, Port of Hastings Sites, prepared for Department of Treasury and Finance, September 1998.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Site Geotechnical, 2016. Geotechnical Investigation & Pavement Design Report, prepared for the Port of Hastings Development Authority, 7 April 2016, R6017-R1.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.
Songhurst, B., 2017. The Outlook for Floating Storage and Regasification Units (FSRUs), The Oxford Institute for Energy Studies, OIES PAPER: NG 123, July 2017.	Reliable	None
Victorian Resources Online 2003.	Reliable	None
AECOM, 2018. Cumulative Impact Assessment - APA Crib Point Pakenham Pipeline Project and AGL Gas Import Jetty Project. Report prepared for APA and AGL.	Report was prepared by suitably qualified persons and are considered accurate and reliable. Where there is uncertainty, the precautionary principle has been applied.	Any relevant limitations, assumptions and other uncertainties are described within the technical report.

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

The following alternatives in technology, design and site location were considered and assessed by AGL, but were determined to be less optimal in achieving overall project objectives:

Alternative locations

Studies identified the following potential sites for AGL to import gas:

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

Other sites including Newcastle, Geelong and Port of Melbourne were evaluated and ruled out due to a lack of suitable berths, lack of market or shipping channel access.

The evaluation process considered several factors including: access to key gas markets; cost of incremental pipeline transmission; availability of suitable land for onshore facilities; cost of existing or new build pipelines; existing investments within AGL's wholesale gas portfolio; marine and port suitability; and regulatory approval timelines and their impact on the project timeline.

The Port Adelaide site was assessed as less optimal for this project compared to the Crib Point location for the following reasons:

- Extensive dredging would be required to create a new berth at the Outer Harbour, immediately west of Pelican Point power station.
- The location provides access to existing pipelines at Torrens Island via a new 6 km pipeline. However, access the wider market would be inferior due to extensive pipeline network modifications, including the reversal of the Moomba to Adelaide Pipeline and the South-East Gas Pipeline, and an interconnect between the pipelines.
- Limitations on access to a broader market (i.e. constraints to supply of the east coast gas market).

The Port Kembla site was assessed as less optimal for this project than the Crib Point location for the following reasons:

- The berth identified as unutilised is adjacent to the breakwater would require dredging and has safety issues associated with the vessels being unable to depart from the berth unassisted as the rock armour increases the risk of damage to LNG vessels.

- To properly supply the broader east coast market, two export pipeline routes are required to connect into the Moomba to Sydney Pipeline (which is bi-directional) and to connect into the Eastern Gas Pipeline (EGP), which will also need to be modified to allow for bi-directional flow, and significant pipeline modifications required to transport gas to other demand centres.

Onshore terminal

An onshore terminal for the re-gasification and storage of LNG, as an alternative to a FSRU, was not favoured for the following key reasons:

- The FSRU will be moored at the end of the jetty further from communities, providing a larger noise and safety buffer zone. For a FSRU, an ignition exclusion zone would be over the water away from land and vegetation.

- The FSRU can be built, commissioned and all safety and production systems verified for optimal operating parameters prior to being brought to site.

- If any safety or operational issues arise, the FSRU will be capable of departing the berth and returning to a ship yard for maintenance or an alternate vessel can be sourced.

- Utilisation of an FSRU avoids the impact of building large-scale infrastructure onshore (e.g. re-gasification plant and storage tanks). As the FSRU is an operating ship, when the Project concludes the FSRU can be relocated and reused elsewhere, thereby averting a sunk cost and the community is not left with redundant aboveground infrastructure.

Re-gasification alternatives

A number of methods for re-gasification are available. Selection of an optimum process is dependent upon various factors including: plant site location; climatic conditions; throughput capacities; energy efficiency and emissions; and regulatory approvals.

A range of worldwide studies have examined the current re-gasification processes and summarised the relative merits as follows:

- Open loop - For an open loop system the seawater typically passes once through the heat exchange system. The energy used to pump the seawater through the heat exchanger consumes about 1.5% of the send-out gas for power generation, similar to onshore terminals (Songhurst 2017). Seawater is generally used as a heat source for vaporising and warming LNG, except in cold climates (Patel et al. (n.d)).

- Closed loop – A closed loop system uses steam with water/glycol circulating within the heat exchange system. The water/glycol mixture is pre-heated by steam from the ship’s boilers. This method uses a further 1% of the send-out gas to heat the circulating fluid to vaporise the LNG (i.e. a total consumption of 2.5% (Songhurst 2017)). This reduces the plant output and revenue, and contributes to a significant increase of greenhouse gas emissions.

- Intermediate fluid vaporisation process (IFV) – IFV involves a two-stage vaporisation process – the first using propane and the second with the seawater or other heating medium. IFV reduces the risk of freezing by not contacting the LNG with seawater and can also use compact heat exchangers reducing weight and size, however the major disadvantage is the introduction of highly flammable propane onto the FSRU (Songhurst 2017).

- Ambient air heating – Air, as another source of heat is used in warmer climates through ambient air vaporisation (AAV). Such technology is better suited to warmer climates, where there are higher ambient temperatures all year round, and is therefore not suitable for Crib Point. In addition, AAV often requires larger infrastructure and can produce vapour fogs.

A study on LNG vaporizer selection by Patel et al. (n.d) concluded that “for fuel savings and minimizing greenhouse gas emissions, use of “free heat” from ambient air or seawater is the most desirable”.

The preliminary design of the FSRU allows for heat to be provided in open loop mode (no boiler support).

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

GM–Energy Supply & Origination

9.2.2 First Name

Phaedra

9.2.3 Last Name

Deckart

9.2.4 E-mail

pdeckart@agl.com.au

9.2.5 Postal Address

699 Bourke Street
Docklands VIC 3008
Australia

9.2.6 ABN/ACN

ABN

26072948504 - AGL WHOLESALE GAS LIMITED

9.2.7 Organisation Telephone

131245

9.2.8 Organisation E-mail

pdeckart@agl.com.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, PHAEDRA DECKART, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 10.10.2018

I, PHAEDRA DECKART, the person proposing the action, consent to the designation of AGL WHOLESALE GAS LIMITED as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: 10.10.2018

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

GM–Energy Supply & Origination

9.5.2 First Name

Phaedra

9.5.3 Last Name

Deckart

9.5.4 E-mail

pdeckart@agl.com.au

9.5.5 Postal Address

699 Bourke Street
Docklands VIC 3008
Australia

9.5.6 ABN/ACN

ABN

26072948504 - AGL WHOLESALE GAS LIMITED

9.5.7 Organisation Telephone

03 8633 6000

9.5.8 Organisation E-mail

pdeckart@agl.com.au

Proposed designated proponent - Declaration

I, PHAEDRA DECKART, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: ..... Date: 10.10.2018

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Senior Environmental Consultant

9.8.2 First Name

Shelley

9.8.3 Last Name

Ada

9.8.4 E-mail

shelley.ada@jacobs.com

9.8.5 Postal Address

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Melbourne VIC 3000
Australia

9.8.6 ABN/ACN

ABN

37001024095 - JACOBS GROUP (AUSTRALIA) PTY LTD

9.8.7 Organisation Telephone

03 8668 3000

9.8.8 Organisation E-mail

shelley.ada@jacobs.com

Referring Party - Declaration

I, Shelley Ada, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature: Shelley Ada Date: 09/10/2018

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. 2.3.1_impact_table.pdf
2. 2.4.1 Impact Table (version 2).pdf
3. 2.4.1_impact_table.pdf
4. 2.5.1 Impact Table (version 2).pdf
5. 2.5.1_impact_table.pdf
6. Attachment 5 - Marine Ecosystem Protected Matters Report (v3).pdf
7. Attachment 8 - Effects of Cold-water Discharge on Marine Ecosystem (v3).pdf
8. Q 5.2 - Attachment A - Assessment of Ramsar Selection Criteria.pdf
9. Q5.2 Attachment A - Assessment of Ramsar Selection Criteria.pdf
10. attachment_1_-_aboriginal_heritage_due_diligence_assessment.pdf
11. attachment_2_-_agl_gas_import_jetty_consultation_summary.pdf
12. attachment_3_-_cumulative_impact_assessment.pdf
13. attachment_4_-_flora_and_fauna_assessment.pdf
14. attachment_5_-_marine_ecosystem_protected_matters_report.pdf
15. attachment_6_-_plume_modelling_of_discharge_from_lng_facility.pdf
16. attachment_7_-_modelling_and_assessment_of_biological_entrainment.pdf
17. attachment_8_-_effects_of_cold-water_discharge_on_marine_ecosystem.pdf
18. attachment_9_-_chlorine_in_seawater_heat_exchange_process.pdf
19. attachment_10_-_effects_of_lng_facility_on_sea_level_and_seabed.pdf
20. attachment_11_-_hydrology_impact_assessment.pdf
21. attachment_12_-_contaminated_land_assessment.pdf
22. attachment_13_-_historic_heritage_assessment.pdf
23. attachment_14_-_agl_environment_policy.pdf
24. figure_1_-_location_overview_a4.pdf
25. figure_2_-_project_site_and_key_features_a4.pdf
26. figure_3_-_project_site_layout_a4.pdf
27. figure_4_-_planning_zones_a4.pdf
28. figure_5_western_port_ramsar_site.pdf
29. figure_6_-_proposed_indicative_mixing_zone_a4.pdf