5 Project Description

5.1 Construction

5.1.1 Pre-Construction Activities

The following activities must be undertaken before construction:

- Finalise detailed design of dredging, wharf extension and land-side services.
- Obtain all permits and approvals.
- Procure dredging and marine construction contractor/s.
- Site establishment and mobilisation of all construction equipment.
- Pre-dredge surveys.
- Temporary relocation of mussel farm.
- Relocation of impacted swing moorings.
- Implementation and monitoring of mitigation measures and management plans.

5.1.2 Capital Dredging Works

Capital dredging is proposed adjacent to the Breakwater Wharf and in Snug Cove to remove in-situ material as shown on Figure 5-1. The total volume of the capital dredging is 231,500m³ including an overdredging allowance. Capital dredging is defined by Ports Australia (2016, 25) as “the removal and relocation of natural previously undisturbed seabed to increase water depth for shipping channels, swing basins and berth pockets”. The dredging works will be undertaken by a specialist dredging contractor.
Figure 5-1 Proposed Dredge Basin General Arrangement and Setout Details

Design Profiles

The final design maintains a design dredge level of -10.5m chart datum (CD) and accommodates a vessel length of 325m. This includes the Norwegian Breakaway Class vessels which have a draft of 8.6m. Further dynamic mooring analyses in 2016 by WorleyParsons have confirmed that there is sufficient under-keel clearance for both Voyager Class and the Norwegian Breakaway Class vessels during all states of tide. These are some of the largest vessels able to use the berth.

The width of the dredge pocket has also been verified by separate navigation simulations undertaken at the Smartship facility in 2015.

The available geotechnical information indicates the other than rock (OTR) material removed within the dredging footprint will be predominantly sand with some silt and clay. The sand is generally loose to very loose, with some areas that are medium dense. A maximum slope of 1V in 10H (vertical to horizontal) is adopted in the final design dredge batters in sandy materials. Where scour protection is necessary a typical batter slope of 1 in 3 has been adopted.

The final design adopts a 1 in 1 slope in bedrock and a nominal 3m bench in front of the existing sheet pile cells for rock and rock-like materials.

Material Quantities

The final dredge basin design comprises two zones: (i) Zone 1 contains rock and rock-like materials underlying a shallow bed of sediments; and (ii) Zone 2 is expected to comprise of sediments only.

The dredging quantities for these materials are provided in Table 5-1 and are based on the following final design criteria:

- Dredge basin level (clearance depth) -10.5mCD.
- Dredge basin at scour protection mattress -11.5mCD.
- Dredge basin at sediment trap -12.5mCD.
- Overdredge allowance (average) - 0.5m.

Table 5-1 Preliminary dredging quantities

<table>
<thead>
<tr>
<th>Zone</th>
<th>Materials Description</th>
<th>Total Volume to dredge line and level, ( \text{m}^3 )</th>
<th>Approx. volume of rock to dredge line and level, ( \text{m}^3 )</th>
<th>Approx. volume of OTR to dredge line and level, ( \text{m}^3 )</th>
<th>Estimated overdredge, ( \text{m}^3 )</th>
<th>Total Volume including overdredge allowance, ( \text{m}^3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OTR, rock and rock-like materials</td>
<td>15,000</td>
<td>6,000</td>
<td>9,000</td>
<td>3,500</td>
<td>18,500</td>
</tr>
<tr>
<td>2</td>
<td>OTR</td>
<td>158,000</td>
<td>0</td>
<td>158,000</td>
<td>55,000</td>
<td>213,000</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>173,000</td>
<td>6,000</td>
<td>167,000</td>
<td>58,500</td>
<td>231,500</td>
</tr>
</tbody>
</table>
Dredging Methodologies

As discussed in Section 4.2.1 a final design workshop was held to compare options for a dual dredge spread (using a BHD in combination with a TSHD) compared to a single medium sized BHD operating independently. The Final Dredging Plan concluded that the TSHD should not be precluded from the RFT process. The final dredging methodology will be selected by the Department following the dredging contract procurement process.

Accordingly, the EIS has described and assessed the impacts of the three options. These options are described below.

Option 1 BHD

The BHD excavates material and places it into the accompanying hopper barge(s). The material is then transported to and disposed of by bottom dumping at the offshore disposal site. This method generally requires a minimum of two barges operating at a speed of between 6 to 8 knots in open waters, depending on barge size to facilitate continuous dredging.

For a disposal ground within 6nm, each barge would require a hopper capacity of 900m$^3$ to 1,200m$^3$. The stationary BHD removes material at or near its natural moisture content to minimise the generation of plumes.

The purpose built BHD will be stabilised by means of an anchoring system (ie. spuds). Backhoe dredges are used to dredge clay, stone, gravel, loose rock and soil and are readily used in foreshore protection. The BHD is an essential component of the dredge campaign as it will be the only effective means of removing rock material with minimal need for any pre-treatment. In the case where secondary pre-treatment is required to isolated locations in Zone 1 due to potential difficulty of extraction of the rock, mechanical pre-treatment options could include use of rotating drums “Drumcutter” which act similar to a road header and ripper devices which act similar to onshore excavator ripper attachment.

Typical plant likely to be used to fulfil the above dredge method includes:

- Medium BHD currently in use in the region, which is equivalent to approximately a 200 tonne hydraulic excavator and up to 10m$^3$ bucket capacity (Figure 5-2).
- Two appropriately sized barges (i.e. 900m$^3$ to 1,200m$^3$) in size either towed by tugs or self-propelled.
- Appropriately sized tugs or work boats to assist with dredger positioning, move barges and take barges offshore as necessary.
Figure 5-2 Typical Backhoe Dredge

Source: Australasian Marine Associates, 2015a and courtesy of Jan De Nul

Option 2 BHD + TSHD (Single handling method)

This involves bulk dredging of OTR materials using the TSHD and the BHD and hopper barges to remove rock and sediments near existing structures and in areas where the TSHD cannot be manoeuvred. It is envisaged the TSHD would undertake most of the dredging of Zone 2 and the BHD would dredge Zone 1 and a portion of Zone 2, including areas alongside the existing Multipurpose Jetty and Breakwater Wharf. In this scenario both dredges would transport dredged materials directly to the Offshore Disposal Site (ODS). The BHD would require two barges in the order of 900m³ to 1,200m³ for efficient operation and one tow vessel. A towed barge would achieve up to 6 knots in open waters. Accordingly, return transit times of 2 to 3 hours would be expected for each barge movement.

Typical plant likely to be used to fulfil the above dredge methods include:

- Medium BHD currently in use in the region (equivalent to approximately 200 tonne excavator and up to 10m³ bucket capacity).
- Two appropriately sized barges (i.e. 900m³ to 1,200m³) in size either towed by tugs or self-propelled.
- Appropriately sized tugs or work boats to assist with dredger positioning, move barges and take barges offshore as necessary.
- TSHD with approximate 2,900m³ hopper capacity (Figure 5-3).
Figure 5-3 Typical TSHD

Source: Sinisa Aljinovic via MarineTraffic.com, 2005

Option 3 BHD + TSHD (Single handling method)

This option uses the TSHD to deliver most (if not all) dredged materials to the offshore disposal site. Most of the material would be bulked out direct by the TSHD. Material in areas inaccessible or containing material too hard for a TSHD would be dredged by the BHD and loaded into hopper barge(s). The hopper barge(s) would bottom dump the material in deep water within the dredging footprint in an area accessible by the TSHD. Any large rock that cannot be handled by the TSHD would either be disposed of elsewhere within the site (e.g. along the lee side of the breakwater) or at the offshore disposal site via hopper barges.

This option requires a temporary stockpile site within the dredge footprint. A potential suitable site would be the deeper waters within the dredge footprint and outside of the current -7m CD contour. This area is located clear of existing moorings and other marine structures and would allow continued access to these assets.

Typical plant likely to be used to fulfil the above dredge methods include:

- Medium BHD currently in use in the region (equivalent to approx. 200 tonne excavator and up to 10m$^3$ bucket capacity).
- Two appropriately sized barges (i.e. 900m$^3$ to 1,200m$^3$) in size either towed by tugs or self-propelled.
- Appropriately sized tugs or work boats to assist with dredger positioning, move barges and take barges offshore as necessary.
- TSHD with approximate 2,900m$^3$ hopper capacity.
**Scour Protection**

Scour protection will be required in one location (across Zones 1 and 2) as shown on Figure 5-1 of the berth pocket to protect existing and new structures from undermining or loss of structural integrity from scouring forces associated with ship propulsion systems, and tug operations.

Installation of articulated concrete block scour mattresses requires localised deepening of 1.0m below the dredge design level to allow for thickness of the mattress and tolerances for future maintenance dredging, if required. A continuous, durable, woven, polypropylene fabric, (also known as loopmatting) will be used to prevent washout of seabed materials beneath the concrete block units. Scour protection will not be required to protect rock batters or other areas of the dredge basin where scouring will not impact on existing structures.

It is envisaged that scour protection will be installed immediately following dredging works and by the dredging contractor.

**Sediment Trap**

The proposed dredge plant will not be able to safely access the seabed below the seaward end of the Multipurpose Jetty. Therefore, a 1 in 10batter slope above the toe line cannot be formed near the seaward end of the Multipurpose Jetty. A natural slope which is steeper than 1 in 10 is expected to form following dredging. To allow for gradual infilling over the years following dredging, the installation of a sediment trap has been incorporated into the final design with area proposed near the Multipurpose Jetty as shown in Figure 5-1.

**Construction Traffic**

**Water**

During the dredging works, all water borne vessels (BHD and/or TSHD, barges, tugs and work boats) are to typically operate within the defined “Marine Construction Zone” (for dredging and marine structures construction works) and the “Construction Vessel Mooring Zone” (for temporary mooring/anchoring of construction vessels) as shown on Figure 5-4. It is noted that both zones are not for the exclusive use of the contractor. The contractor will be required to co-ordinate the transit of all port users vessels through the “Marine Construction Zone” with the Harbour Master and/or vessel masters including occupants of moorings situated adjacent to the dredge pocket.

The contractor is to allow for the installation of buoys with navigation lights along the boundary of construction and mooring zones as required by the Harbour Master.

**Land**

During the dredging phase, construction traffic will principally be light vehicle with the occasional heavy vehicle accessing the site via Weecoon Street for fuelling/maintenance of dredging plant. The only key material to be delivered to the site by heavy vehicles via road is the scour mattress.

There will be heavy vehicle visits for mobilisation and demobilisation phases but these are not anticipated to exceed 20each (equivalent semi-trailer) for both mobilisation and demobilisation. All dredged material is proposed to be disposed of offshore, therefore no excavated materials will be taken offsite by road.
It is proposed for construction workers to park within the site boundaries, however there may be a need to allow any overflow parking for light vehicles in the area immediately adjacent to the site during periods of peak work.

A land based contractor’s work area has been identified in Figure 5-4. This hardstand area is currently used by commercial fishers to store nets and fishing equipment. Owners of the nets and fishing equipment will be requested to relocate their equipment to within the agreed net mending area to enable this area to be cleared and used as the contractor’s work area. All nets and fishing materials will be removed prior to construction.

Temporary site offices, ablution facilities, workshops, material storage containers and laydown areas will be established within the land based contractor’s work area adjacent to the Breakwater Wharf as identified earlier on Figure 5-4. Temporary fencing and project signage will be erected and a gate will be controlled in which construction traffic will enter and exit the site. Crew transfer and material load out will take place within this land based contractor’s work area. Public access will be restricted where required to ensure that construction activities can be carried out safely. Access for commercial businesses adjacent to the Wharf will be maintained.
Figure 5-4 General Contractors Work Area and Construction Zone

Surveys

The contractor will be required to undertake the following surveys:

- Pre-dredge survey of the dredge area – a reference survey prior to dredging works and used for material removed volume calculations.
- Pre-dredge survey of the offshore disposal site – a reference survey prior to dredging works.
- Progress surveys of the dredge area on a weekly basis – intermediate surveys during dredging works and used for material removed volume calculations.
- Progress surveys of the offshore disposal site as required - intermediate surveys during dredging works and used for assessing the spread of the material within the disposal site.
- Clearance survey of dredge area – high specification survey conducted following dredging activities and used for validation of dredge to design specifications.
- Clearance survey of the offshore disposal site – high specification survey conducted following dredging activities and used for validation of disposal within the disposal site.

The contractor will be required to prepare a Method Statement that clearly sets out the purpose of the surveys, personnel, equipment, calibration methods and calibration frequency, processes used in the reduction to sounding datum and method of classification of results.

No additional side scan sonar survey is proposed as an existing survey was completed in January 2015 for the dredge area.

Temporary Relocation of Mussel Farm

Although the assessed risk of the Project adversely impacting the mussel farm has been assessed to be low, the Department is currently in negotiations with Eden Sea Farms to have the nearby Cattle Bay mussel farm temporarily relocated to an existing Boydtown aquaculture lease on the southern side of Twofold Bay, which is not currently operated by Eden Sea Farms, (Figure 5-5). This will significantly further reduce the risk of the Project having an unforeseen impact on the mussel farm’s ability to catch spat and harvest mussels during the dredging operations and construction. Consultation was carried out by the Department with EPA, DPI-Fisheries and DPI-Food Authority regarding the temporary relocation and these agencies confirmed their support for the relocation.

As background, Twofold Bay was originally one zone for water quality. If there was an elevated water quality result in the very southern part of Twofold Bay, the mussel farm would be shut down. As part of the temporary relocation of the mussel farm, DPI-Food Authority has split the Bay into two zones (Zone A and Zone B). This was done to assist Eden Sea Farms relocation by reducing the chances of a shutdown caused by the dredging. Once the mussel farm has been relocated, it will only be shut down at the new site if the water quality in Zone B does not meet licence conditions. The mussel farm can still operate out of the new farm if there are elevated levels in Zone A.
Relocation of Swing Moorings

Three swing moorings are located within the footprint of the proposed dredging and will therefore be directly impacted by the Project. These swing moorings are numbered: WV006, WV035 and WV052. A further six swing moorings were identified as being impacted by the proposed wave attenuator (a separate proposal known as the Eden Safe Harbour project which is described in Section 9.21.1). Figure 5-6 shows the location of the impacted swing moorings.
RMS advised in writing on 16 September 2015 (Appendix B), that RMS will: (a) liaise with the impacted mooring licence holders; (b) arrange the relocation of the affected moorings prior to 30 June 2017; (c) cover the cost of relocations as per the agreement with Transport for NSW; and (d) take responsibility for the environmental assessment(s) for the relocations, currently done under Part 5 of the EP&A Act.

Figure 5-6 Proposed Safe Harbour Project wave attenuator and the proposed dredge basin
Source: Royal Haskoning DHV, 2016

**Scheduling**

The estimated duration for each dredge option is:

- Option 1 BHD – 15 weeks.
- Option 2 BHD + TSHD (Single handling method) – 10 weeks.
- Option 3 BHD + TSHD (Double handling method) – 6 weeks.

**Work Hours**

For all options, dredging work would be carried out on a 24 hours, 7 days a week basis.

**Workforce**

The estimated workforce is between 12-15 staff/workers for the dredging duration.
5.1.3 Dredge Disposal

**Location and Transport**

The proposed disposal area is a rectangular area of approximately 500m by 1000m located within the eastern section of the disposal ground previously used and much larger disposal ground for Department of Defence’s Twofold Bay project as shown on Figure 1-1. It is situated approximately 6nm east of Twofold Bay. The dredge material will be transported by water from the dredge area to the offshore disposal site under all options discussed in Section 5.1.2 above.

**Sediment Characteristics**

Physical and geochemical tests indicated that sediments from the dredge footprint are considered suitable for unconfined disposal at an offshore disposal site in accordance with the National Assessment Guidelines for Dredging 2009 (NAGD). The sea bottom characteristics of the disposal site are of fine sand. The material that was previously placed at the Twofold Bay project comprised up to 170,000m³ of sandy material with less than 20% mud fraction and greater than 20% gravel fraction. The material was clean with 95% upper confidence limit (UCL) concentrations for the potential contaminants of concern below their respective NAGD Screening Levels.

The sediments to be dredged are expected to be similar in physical characteristics to the bed material for the disposal site. Tributyltin (TBT) is the only contaminant of significance for which 95% UCL of the mean exceeds the NAGD Screening Level. Elutriate tests found the TBT concentrations confirm the bioavailability of TBT is low and that the TBT is likely to be tightly bound to the organic material present in the sediment.

5.1.4 Breakwater Wharf Extension

**Wharf Design Parameters**

The following design parameters have been used in the engineering design for the proposed wharf extension as summarised in Table 5-2.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>260 LOA Cruise Vessel</th>
<th>325 LOA Cruise Vessel</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOA (m)</td>
<td>260</td>
<td>325</td>
</tr>
<tr>
<td>LBP (m)</td>
<td>225</td>
<td>300</td>
</tr>
<tr>
<td>Breadth (m)</td>
<td>32.2</td>
<td>39.7</td>
</tr>
<tr>
<td>Laden Displacement (t)</td>
<td>38,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Draught (m)</td>
<td>7.7</td>
<td>8.8</td>
</tr>
</tbody>
</table>

The engineering design considers vessels up to 325m in length will be accessing the Breakwater Wharf. Currently there are a range of cruise ships that visit Eden and these are largely restricted from entering Snug Cove due to their draft and length. They are required to anchor offshore with passengers using a tender boat to transfer ashore. Figure 5-7 and Figure 5-8 show the proposed marine structures general arrangement for 70m to 260m LOA Ship (Figure 5-7) and a 311m and 325m LOA Ship (Figure 5-8).
Figure 5-7 Marine Structures General Arrangement 70m to 260m LOA Ship

Figure 5-8: Marine Structures General Arrangement 311m and 325m LOA Ship
**Wharf Construction**

A marine structures contractor will mobilise to site at the commencement of the marine structures construction activities. Temporary site offices, ablution facilities, workshops, material storage containers and laydown areas will be established within the land based contractor’s work area adjacent to the Breakwater Wharf as identified earlier on Figure 5-4. Temporary fencing and project signage will be erected and a gate will be controlled in which construction traffic will enter and exit the site. Crew transfer and material load out will take place within this land based contractor’s work area. Public access will be restricted where required to ensure that construction activities can be carried out safely. Access for commercial businesses adjacent to the Wharf will be maintained.

The new 95m long wharf extension will consist of a composite concrete deck suspended on steel tubular piles. The new wharf deck height will be at RL +3.2mCD which is 0.276m higher than the existing wharf coping beam. The steel piles will be driven to a design toe level (level into the seabed) by a piling hammer lifted by a crane mounted either on a barge or from the existing wharf. Figure 5-9, Figure 5-10 and Figure 5-11 provide sections through the existing wharf and the proposed wharf extension (refer to Figure 5-7 for locations of sections).
Figure 5-9 Wharf Extension Sections Sheet 1

Figure 5-10 Wharf Extension Sections Sheet 2
Figure 5.11 Wharf Extension Sections Sheet 3
Rock anchors may be installed in some piles, depending on pile refusal level by drilling down through the preinstalled steel tubular pile with a drill rig, installing steel reinforcement and then pouring in-situ concrete within the pile, to ensure there is a strong connection between the pile and the bedrock.

Prefabricated headstocks shall then be installed by crane onto the piles. Three to four piles will support each of the headstocks (or bents). Prefabricated concrete deck panels will then be lifted into place, spanning across two adjacent headstocks (or bents). Once all deck panels have been installed, gaps will be filled with a gap filler product, before an in-situ concrete topping slab is installed and minor services are fitted to the deck.

The majority of piles are likely to be too long for transportation to the site via road (turning circles too tight for pile length) and are likely to be delivered via water by bulk barge delivery. As the land side construction area may not be sufficient in area to accommodate the bulk delivery of piles and other required activities, an alternative storage location may be required. This may be on floating dumb barges and/or at an alternative storage location with waterside load out facilities such as the PANSW laydown area behind the multi-user wharf on the south side of Twofold Bay. The piles would be offloaded using the ships crane and/or a crane positioned on the multi-user wharf, transported to the laydown area and offloaded using a laydown yard crane. The piles would then be transferred back to the multi-user wharf when required and transported via dumb barge from the load out facility to Site.

New bollards will be required to restrain the bow of the ship and these will be situated on the existing wharf and will require independent foundations. This shall require sections of the existing wharf to be cut away, to enable new piled foundations to be installed including the use of rock anchors. Once the new foundations have been installed, the deck of the existing wharf shall be reinstated and the new bollards installed to the wharf deck. New wharf furniture includes traffic barriers, bollards, fenders and emergency access ladders.

Isometric views from the 3D model produced by WorleyParsons are contained in Figure 5-12 and Figure 5-13 below.

![Isometric view of the proposed Breakwater Wharf extension and dolphins](image)

*Figure 5-12 Isometric view of the proposed Breakwater Wharf extension and dolphins*

*Source: WorleyParsons, 2016*
Dolphin Construction

Three mooring dolphins and two berthing dolphins will be installed along the fender line (berthing face). Each dolphin will consist of 6 steel tubular piles driven into the seabed by a piling hammer suspended from a crane mounted on a barge. Once the piles are established, the pre-fabricated dolphin modules will be installed with bollards on each of the decks, access platform, safety ladders and hand railings fitted. Panel fenders will be installed on the berthing dolphins.

Construction Traffic

Land

Wharf piles and materials are most likely to be delivered by water with some potential delivery by road, if required. All deliveries associated with the dolphins would be by water. Material that would be required to be removed from the site via land will include excavated material (excluding dredge material) from works in the water such as pilling and removal of existing wharf materials for construction of the onshore bollards.

There will be multiple deliveries to the site for temporary works including buildings, plant, ancillary construction materials for the wharf structure as well as rubbish/offcuts/waste materials to be removed from the site. It is estimated that on average there would be a total of approximately 20 heavy vehicles per day for the mobilisation phase of the marine structures contract. It is noted that the pile and dolphin topside delivery may require on some days, more than 10 trucks per day.

Truck lengths employed would vary between small rigid (6.4m), medium rigid (8.8m), heavy rigid (12.5m), truck and dog (18m-19m) and/or semi (19m).

It is proposed that marine structures contractors will park within the site boundary; however there may be a need to allow overflow parking for light vehicles in the area immediately adjacent to the site.
during periods of peak work. A land based contractor’s work area has been identified in Figure 5-4. All work zones will be within the site boundary other than some minor works for installation of the navigation aid (refer to Section 5.1.6 below).

**Water**

As discussed under the heading ‘Land’ above, wharf piles and materials would mainly be delivered by water with all dolphin piling and materials delivered via water. Barges would be used for piling activities and would use a four point anchoring system. All water borne vessels are to generally operate within the defined “Marine Construction Zone” and “Construction Vessel Mooring Zone” as shown on Figure 5-4.

Small works boats would also be active during construction for the transfer of crew, survey, environmental monitoring, and minor construction activities.

**Scheduling**

The estimated duration of the works is as follows:

- Piling including establishment of foundations with impact piling, concreting and formwork – 18 weeks.
- Marine structures for construction of wharf extension and dolphins – 37 weeks.
- Finalise installation of services and commissioning – 4 weeks

**Work Hours**

All works associated with the construction of the Breakwater Wharf Extension (piling and marine structures) will be undertaken within standard construction hours:

- Weekdays - 7am-6pm
- Saturdays - 8am-1pm
- Sundays/Public Holidays – Nil

**Workforce**

The estimated workforce is approximately 40 staff/workers for the marine structures work.

**5.1.5 Services**

The existing wharf contains buried services including electrical, water supply conduits, outlets and telecom pits. Some of the existing electrical and water services will need to be decommissioned/relocated or placed into new conduits on the existing wharf to accommodate the installation of new services for the proposed wharf extension.

The new services will extend the existing services as described below.
**Wharf Lighting and Power Outlets**

- New electrical cables, conduits, pulling pits, junction boxes and distribution boards.
- 8 x LED flood lighting poles (9m high) and fittings to southern side of wharf extension.
- 12 x LED fender line light fittings to northern side of wharf extension.
- 5 x single phase General Power Outlets (GPO) along the wharf extension.

Refer to Figure 5-14 which is the Light and Power Services General Arrangement for the wharf extension.

**Dolphin Lighting**

- 2 x 5m high light pole for each dolphin.
- Each light to contain solar powered LED light fittings.

Refer to Figure 5-15 which is the Berthing and Mooring Dolphin Lighting Arrangement.

**Potable Water**

- 100mm diameter water main along the existing wharf and Wharf extension (replacing decommissioned 100mm diameter asbestos cement (AC) water main).
- 4 x 65mm and 4 x 25mm water connections along the Wharf extension.
- 1 x 65mm and 14 x 25mm water connections along the existing wharf.

Refer to Figure 5-16 which is the Water Services General Arrangement.

**Emergency Water (fire-fighting)**

- 2 x fire hydrants along the Wharf extension.
- 3 x connections to existing fire hydrants.

Refer to Figure 5-16 which is the Water Services General Arrangement.
Figure 5-14 Light and Power Services General Arrangement

Figure 5-15 Berthing and Mooring Dolphin Lighting Arrangement


NOTES
1. LIGHT POLES
   1.1. LIGHT POLES ARE TO BE GALVANIZED STEEL
2. LIGHT FITTINGS
   2.1. LIGHT FITTINGS ARE SOLID POWERED LED TYPE
   2.2. DOLPHINS ARE RESTRICTED ACCESS AREAS. SUFFICIENT PORTABLE LIGHTING FACILITY WOULD BE REQUIRED IN CASE OF ANY MAINTENANCE CONDUCTED IN THE DOCKING.
   2.3. LIGHT FITTINGS TO BE FITTED WITH BIRD ANTI-ROOSTING PROVISIONS; WHERE THE BATTERY CHARGING WOULD BE IMPACTED
   2.4. BATTERY CAPACITY SHOULD BE ABLE TO POWER THE LED LIGHT FOR AT LEAST 24 HOURS (THEAL)
   2.5. THE POSITION & ORIENTATION OF THE LIGHT FITTINGS SHALL NOT IMPACT ON NAVIGATION NOR NEIGHBORING PROPERTIES
Figure 5.16 Water Services General Arrangement

5.1.6 Navigation Aids

Consultation with the PANSW Harbour Master has confirmed that the installation of a lead navigation aid will be required. This lead will be a LED sector light located on the Snug Cove foreshore to the south of the Multipurpose Jetty. It will have a height of 15m (Twofold Bay Height Datum) and have a range of 1.1nm. The sector light will operate during daylight hours.

A green navigation beacon will be installed on the westernmost dolphin. The beacon will be solar powered with flash 1 second on and 9 seconds off and a range of 5nm. The beacon will operate during night hours.

Figure 5-17 shows the location plan of the proposed navigation aids.
Figure 5-17 Aids to Navigation General Arrangement Plan Details

5.2 Operation

5.2.1 Cruise Ship Operation

Cruise ships entering Snug Cove will transit Twofold Bay from the offshore waters of the Tasman Sea and be escorted by tugs, where required. The ships will berth at the new Breakwater Wharf extension and passengers and crew will exit the vessel via a gangway directly onto the wharf.

The duration of port calls is variable based on the individual cruise line operator’s itinerary; however it is expected that arrivals will generally be between the hours of 7:00am to 10:00am with same day departures between 3:00pm and 6:00pm.

It is noted that:

- Vessels up to 60m in length and draft of 4m will continue to be able to berth at the existing Breakwater Wharf.

- There will be no overnight berthing of cruise ships except in the event of unforeseen circumstances including mechanical failure, adverse weather and so forth.

- Should overnight stays (outside of unforeseen circumstances) become a requirement of cruise ship operators in the future, then this would be the subject of a separate approval.

- Other potential future users of the wharf extension (for example, Royal Australian Navy, Aquaculture and Oil and Gas Industry) would be the subject of a separate approval.

The cruise ship schedule published by PANSW (as of August 2016) is set out in Table 5-3 with additional information on each ship’s maximum passenger and crew numbers included. Analysis of the schedule reveals the following:

- Nine individual cruise ship operators have planned for ships in their fleet to visit Eden over all seasons in the current shipping schedule.

- Smallest cruise ship scheduled to visit is the M/S Sirena at 180m LOA.

- Largest cruise ship scheduled to visit is the Norwegian Jewel at 294m LOA. This ship is also the largest in terms of maximum passenger (2,376) and crew (1,100) numbers. The combined total being 3,376 persons on board.

Based on background research, once the extension is complete and shore access is enhanced, it is considered reasonable to anticipate that other cruise ships (including additional international cruise ships) will be attracted to include Eden in their itinerary as a consistently accessible and safe transit port destination.

It is expected that the number of cruise ships that will be docking per year at the wharf, once it is operational will be between 40-60 ships a year. This equates to approximately two to three visits a week having regard to the cruise ship season which is from November to April. This increase in visitation is consistent with the significant and sustained growth that is being experienced of the Australian ocean cruise industry.

Section 5.2.5 discusses customs and quarantine requirements.
## Table 5-3 Eden Cruise Ship Schedules 2016-2019

### EDEN CRUISE SHIP SCHEDULE - AUGUST 2016

<table>
<thead>
<tr>
<th>Arrival Time</th>
<th>Arrival Date</th>
<th>Departure Time</th>
<th>Departure Date</th>
<th>Vessel Name</th>
<th>LOA</th>
<th>Passengers</th>
<th>Crew</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00</td>
<td>19-Nov-16</td>
<td>18:00</td>
<td>19-Nov-16</td>
<td>MAASDAM</td>
<td>220</td>
<td>1,258</td>
<td>580</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>07:00</td>
<td>21-Nov-16</td>
<td>16:00</td>
<td>21-Nov-16</td>
<td>NOORDAM</td>
<td>285</td>
<td>1,924</td>
<td>800</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>10:00</td>
<td>14-Dec-16</td>
<td>18:00</td>
<td>14-Dec-16</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>10:00</td>
<td>17-Dec-16</td>
<td>18:00</td>
<td>17-Dec-16</td>
<td>MAASDAM</td>
<td>220</td>
<td>1,258</td>
<td>580</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>08:00</td>
<td>31-Dec-16</td>
<td>16:00</td>
<td>31-Dec-16</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
</tbody>
</table>

### Season 2016-17 ship visits 14

<table>
<thead>
<tr>
<th>Arrival Time</th>
<th>Arrival Date</th>
<th>Departure Time</th>
<th>Departure Date</th>
<th>Vessel Name</th>
<th>LOA</th>
<th>Passengers</th>
<th>Crew</th>
<th>Operator</th>
</tr>
</thead>
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<tr>
<td>08:00</td>
<td>15-Nov-17</td>
<td>17:00</td>
<td>15-Nov-17</td>
<td>PACIFIC EDEN</td>
<td>219</td>
<td>1,258</td>
<td>557</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>20-Nov-17</td>
<td>16:00</td>
<td>20-Nov-17</td>
<td>NOORDAM</td>
<td>285</td>
<td>1,924</td>
<td>800</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>08:00</td>
<td>01-Dec-17</td>
<td>16:00</td>
<td>01-Dec-17</td>
<td>NORWEGIAN JEWEL</td>
<td>294</td>
<td>2,376</td>
<td>1,100</td>
<td>Norwegian Cruise Line</td>
</tr>
<tr>
<td>08:00</td>
<td>14-Dec-17</td>
<td>17:00</td>
<td>14-Dec-17</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>18-Dec-17</td>
<td>17:00</td>
<td>18-Dec-17</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>07:00</td>
<td>19-Dec-17</td>
<td>16:00</td>
<td>19-Dec-17</td>
<td>M/S SIRENA</td>
<td>180</td>
<td>826</td>
<td>373</td>
<td>Oceania Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>20-Dec-17</td>
<td>16:00</td>
<td>20-Dec-17</td>
<td>NOORDAM</td>
<td>285</td>
<td>1,924</td>
<td>800</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>10:00</td>
<td>22-Dec-17</td>
<td>17:00</td>
<td>22-Dec-17</td>
<td>NORWEGIAN JEWEL</td>
<td>294</td>
<td>2,376</td>
<td>1,100</td>
<td>Norwegian Cruise Line</td>
</tr>
</tbody>
</table>

### Season 2017 ship visits 17

<table>
<thead>
<tr>
<th>Arrival Time</th>
<th>Arrival Date</th>
<th>Departure Time</th>
<th>Departure Date</th>
<th>Vessel Name</th>
<th>LOA</th>
<th>Passengers</th>
<th>Crew</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>02-Jan-18</td>
<td>17:00</td>
<td>02-Jan-18</td>
<td>SILVER SHADOW</td>
<td>186</td>
<td>382</td>
<td>295</td>
<td>Silversea Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>06-Jan-18</td>
<td>16:00</td>
<td>06-Jan-18</td>
<td>NORWEGIAN JEWEL</td>
<td>294</td>
<td>2,376</td>
<td>1,100</td>
<td>Norwegian Cruise Line</td>
</tr>
<tr>
<td>07:00</td>
<td>22-Jan-18</td>
<td>16:00</td>
<td>22-Jan-18</td>
<td>M/S SIRENA</td>
<td>180</td>
<td>826</td>
<td>373</td>
<td>Oceania Cruises</td>
</tr>
<tr>
<td>09:00</td>
<td>24-Jan-18</td>
<td>18:00</td>
<td>24-Jan-18</td>
<td>M/S SIRENA</td>
<td>180</td>
<td>826</td>
<td>373</td>
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<tr>
<td>07:00</td>
<td>28-Jan-18</td>
<td>17:00</td>
<td>28-Jan-18</td>
<td>PACIFIC EXPLORER</td>
<td>261</td>
<td>1,998</td>
<td>924</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>04-Feb-18</td>
<td>17:00</td>
<td>04-Feb-18</td>
<td>PACIFIC ARIA</td>
<td>219</td>
<td>1,500</td>
<td>602</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>18-Feb-18</td>
<td>18:00</td>
<td>18-Feb-18</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
<tr>
<td>10:00</td>
<td>19-Feb-18</td>
<td>17:00</td>
<td>19-Feb-18</td>
<td>NORWEGIAN JEWEL</td>
<td>294</td>
<td>2,376</td>
<td>1,100</td>
<td>Norwegian Cruise Line</td>
</tr>
<tr>
<td>12:00</td>
<td>24-Feb-18</td>
<td>20:00</td>
<td>24-Feb-18</td>
<td>SEVEN SEAS VOYAGER</td>
<td>206.5</td>
<td>700</td>
<td>447</td>
<td>Regent Seven Seas Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>03-Mar-18</td>
<td>18:00</td>
<td>03-Mar-18</td>
<td>PACIFIC JEWEL</td>
<td>245</td>
<td>1,950</td>
<td>712</td>
<td>P&amp;O Cruises</td>
</tr>
</tbody>
</table>

### Season 2018 ship visits 18

<table>
<thead>
<tr>
<th>Arrival Time</th>
<th>Arrival Date</th>
<th>Departure Time</th>
<th>Departure Date</th>
<th>Vessel Name</th>
<th>LOA</th>
<th>Passengers</th>
<th>Crew</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>11-Jan-19</td>
<td>17:00</td>
<td>11-Jan-19</td>
<td>M/S MARINA</td>
<td>239</td>
<td>1,252</td>
<td>780</td>
<td>Oceania Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>24-Jan-19</td>
<td>16:00</td>
<td>24-Jan-19</td>
<td>M/S MARINA</td>
<td>239</td>
<td>1,252</td>
<td>780</td>
<td>Oceania Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>29-Jan-19</td>
<td>17:00</td>
<td>29-Jan-19</td>
<td>NOORDAM</td>
<td>285</td>
<td>1,924</td>
<td>800</td>
<td>Holland America Line</td>
</tr>
<tr>
<td>08:00</td>
<td>25-Feb-19</td>
<td>18:00</td>
<td>25-Feb-19</td>
<td>CRYSTAL SERENITY</td>
<td>250</td>
<td>1,070</td>
<td>655</td>
<td>Crystal Cruises</td>
</tr>
<tr>
<td>08:00</td>
<td>29-Mar-19</td>
<td>16:00</td>
<td>29-Mar-19</td>
<td>M/S MARINA</td>
<td>239</td>
<td>1,252</td>
<td>780</td>
<td>Oceania Cruises</td>
</tr>
</tbody>
</table>

### Total ships 10

### Season 2017-18 ship visits 5

**Source:** PANSW, 2016.

* The number of cruises booked at the moment is 5 but this is expected to increase significantly closer to the date.
5.2.2 Marine Vessel Simulations

Marine vessel simulations incorporating full mission bridge simulations were carried out by Smartship Australia (2015) based on two dredging conditions: -9.5m (for vessels up to 260m LOA) and -10.5m (for vessels between 260m and 315m LOA).

The two cruise ship models used were: Regal Princess (for vessels up to 260m LOA – Figure 5-18) and the Costa Diadema (for vessels between 260m and 315m LOA – Figure 5-19). Vector tug models used were Svizter Mars (ASD tug with a bollard pull of 63t) and Neptun (conventional twin screw tug with a bollard pull of 40t). These two cruise ship models were selected because of their limited manoeuvrability for the range of LOA considered and can be considered worst-case scenarios.

Figure 5-18 Simulation of the Regal Princess at the Breakwater Wharf Extension
Source: Smartship Australia, 2015

Figure 5-19 Simulation of the Costa Diadema at the Breakwater Wharf Extension
Source: Smartship Australia, 2015
The simulations conducted to date by Smartship Australia have verified that the design is appropriate and not expected to change. Further simulations recommended by Smartship Australia (2015) are required purely for operational reasons.

5.2.3 Transport and Access

A Traffic, Parking and Pedestrian Impact Assessment has been undertaken by McLaren Traffic Engineering (Appendix J). Concept options have been recommended to facilitate the safe pedestrian access to nearby tourist attractions and pick-up and drop-off of passengers for buses and taxis at Snug Cove. Refer to the summary below of proposed transport and access improvement works identified in the Traffic, Parking and Pedestrian Impact Assessment and further discussion in Section 9.5.

**Wharf Bus and Taxi Pick-up & Drop-off**

The proposed concept is a shared bus/taxi zone. It includes one-way circulation of the existing loop road and four linemarked loading bus bays for coach size buses, 14.5m long and two taxi bays with a signposted 10km/h zone for the Wharf area. Linemarked pedestrian access to each bus bay as well as linemarking of bus bays and access roads is proposed. This allows for safe pedestrian loading of four buses at any one time.

**Traffic Controllers and Pedestrian Path**

Under existing operations, Cruise Eden sets up a temporary marquee for pedestrians and provides traffic controllers to guide the flow of pedestrians to designated locations. This arrangement will continue with the marquee to be established in a suitable location near the shared bus/taxi zone.

The concept shows signposted 10km/h speed limits with a 2m linemarked footpath on the north side of the Wharf providing access to the local shops. The concept is to remove the current footpath on the southern side of the road and shift the road alignment slightly to enable a greater footpath width on the northern side for installation of a safe and direct path for pedestrians to the local shops.

**Wayfinding Signage**

Installation of signage near pedestrian decision routes is proposed to inform passengers of safe pedestrian access. Signage is proposed in the following areas:

- near the access to Warrens Walk, to prevent pedestrians access along Albert Terrace.
- at the intersection of Imlay Street / Albert Terrace to prohibit pedestrians from crossing from the east of Imlay.
- at pedestrian decision route on Weecoon Street to inform pedestrians/passengers of the direction to the lookout and to Eden Town Centre.
- on the wharf to inform pedestrians/passengers of loading bus and taxi areas.

The Department will be responsible for installation of signage within the Crown Reserve and BVSC for lands outside the Crown Reserve.
**Imlay Street/Albert Terrace Intersection**

The existing footpath from Warrens Walk to Eden Town Centre is along the east side of Imlay Street. This footpath takes pedestrians past the Whale Museum and to the intersection of Imlay/Albert Terrace. An important consideration is pedestrians crossing along the east side of Imlay Street towards Eden Town Centre as this does not provide safe pedestrian access.

To improve the current operation of the intersection for pedestrians and vehicles, it is proposed that linemarking, signage, a pedestrian refuge and an additional footpath including pram ramps and barriers be installed along with the extension of the median.

It is understood that BVSC has already identified, as part of their ‘Action on Imlay’ project that the Imlay Street/Albert Terrace intersection has existing traffic management and pedestrian safety issues. It is proposed that the intersection improvement works identified in the Traffic, Parking and Pedestrian Impact Assessment be incorporated into BVSC’s detailed design and implemented as part of the upgrade of the intersection and Master Plan for Imlay Street.

**Other Works**

The Department will be responsible for maintaining the existing emergency assembly point located on the southern side of Weecoon Street, near the Gotcha Bait & Burley second building.

The Department will continue to be responsible for maintaining existing port infrastructure including roads and footpaths within the Crown Reserve. Routine maintenance activities include potholes resurfacing and removal of tree roots that displace paving.

**Traffic Management Plan**

McLaren Traffic Engineering has prepared the framework for an operational Traffic Management Plan (Operational TMP) which would be prepared post-approval (refer Section 9 of the Traffic, Parking and Pedestrian Impact Assessment).

**5.2.4 Services**

As outlined in Section 5.1.5, new services will be installed to support the operation of the wharf extension including electrical, potable water and emergency water (fire-fighting).

Existing public amenities (male, female and disabled toilets and showers) are located in a brick building at Snug Cove. It is not proposed to provide any additional public amenities.

There are no requirements for sewer connections or fuel provision. Each cruise ship has the capacity to manage without these requirements using careful management and scheduling.

**5.2.5 Customs and Quarantine**

All passengers and crew would be subject to customs and quarantine processes carried out on board the ship only.

The existing Breakwater Wharf has a designated (fenced) area for use by Australian Border Force for Quarantine, Immigration and Customs functions associated with vessels using Snug Cove as their first or last port of call in Australia. Two Customs Officers are based at Snug Cove.
There are no additional customs and quarantine requirements for the operation of the Project.

5.2.6 Security

The Port of Eden is a Regulated Port under the Maritime Transport Security and Off Shore Facilities Act 2003. PANSW has an existing security management plan for the Port of Eden for vessels over 500 tonnes visiting the port. Most vessels visiting the port have a security level of one (base level). The plan includes the tug boats operating in the Port of Eden but excludes the fishing fleet.

No temporary security fencing would be erected around the wharf extension when cruise ships are calling at Snug Cove. However, in accordance with ship security plans, access is restricted to only persons having business on board or as bona fide visitors.

5.2.7 Marine Structures Design Life and Maintenance

The intended design life of the new marine structures is 50 years with normal routine maintenance. This includes the adoption of an allowance of 0.2m sea level rise for structures with a 50 year design life in accordance with AS4997-2005 Guidelines for the Design of Maritime Structures. Handrails and gratings (hot dip galvanised) are to have a design life of 20 years.

The most recent condition assessment of the Breakwater Wharf undertaken by Royal Haskoning DHV, (2015) concluded that the wharf structure is likely to have a remaining effective service life of at least 40 years with implementation of a 10 yearly maintenance cycle. This assessment is based on the fact that the wharf structure should be capable of withstanding its original design loads. However this life time of the structure shall be further re-assessed for any impacts due to the upgrading the facility to cater for cruise vessels.

Maintenance of land-side infrastructure and wharf facilities will be undertaken as required, and in line with relevant maintenance plans established for the Crown Reserve.

5.2.8 Maintenance Dredging

The Department will be responsible for any maintenance dredging that is required in the dredge pocket under the Coastal Infrastructure Program. Maintenance dredging is defined by Ports Australia (2016, 25) as “removal of sediments that accumulate in existing channels, berths and swing basins to enable ongoing use of the port.” Maintenance dredging may be subject to separate approvals.

Compared to capital dredging, significantly smaller volumes of material are involved in maintenance dredging and the timeframes over which dredging will occur will be shorter. Any impacts from maintenance dredging are considered to be localised and relatively short term, with limited increases in turbidity adjacent to sensitive environments.

5.3 Staging

Construction of the Project consists of two main stages:

- The first stage consists of dredging works and involves mobilisation of the dredging contractor during the second half of 2017 and a period of up to five months to carry out the dredging works. All material will be disposed offshore 6nm east of the site.
The second stage is the construction of marine structures and onshore works including pilings, mooring dolphins and wharf deck. The second stage is proposed over a 1-year period between 2018 and 2019. It is proposed that the wharf extension would become operational in the first quarter of 2019.

A summary of the main construction timeframes is shown below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Forecast Duration</th>
<th>Quarters measured from Development Consent/Licenses and Permit Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Consent Granted and all licences and Permits issued.</td>
<td>Milestone</td>
<td>Qtr 1</td>
</tr>
<tr>
<td>Dredging Contract including mobilisation, execution of the work and demobilisation</td>
<td>8 months</td>
<td></td>
</tr>
<tr>
<td>Marine Structures Contract including mobilisation, execution of the work and demobilisation</td>
<td>12 months</td>
<td></td>
</tr>
<tr>
<td>Roadworks and line marking</td>
<td>2 months</td>
<td></td>
</tr>
</tbody>
</table>
6 Legislative and Statutory Planning Framework

6.1 International Covenants and Agreements

International agreements applicable to the Project may include, but are not limited to:

- The 1996 London Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (ratified by Australia in 2000);
- The International convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 (MARPOL 73/76) (International Maritime Organisation);
- The International Convention for the Safety of Life at Sea (SOLAS) Regulations;
- The International Convention for the Control and Management of Ships’ Ballast Water and Sediments (International Maritime Organisation (IMO));
- United Nations Convention of the Law of the Sea;
- ANZECC Code of Practice for Antifouling and In-water Cleaning and Maintenance;
- The Convention on the Conservation of Migratory Species of Wild Animals (Secretariat of the Convention for the Conservation of Migratory Species of Wild Animals 1979);
- Japan-Australia Migratory Bird Agreement (JAMBA) 1974;
- China-Australia Migratory Bird Agreement (CAMBA) 1986; and

6.2 Commonwealth Legislation

6.2.1 Environment Protection and Biodiversity Conservation Act 1999

Under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) a referral is required to the Commonwealth Minister for the Environment and Energy for Projects that have the potential to significantly impact on matters of national environmental significance (MNES) or the environment of any Commonwealth land.

Approval for such an action may be required from the Commonwealth Minister for the Environment and Energy. An ‘action’ is considered to include a project, development, undertaking, activity or series of activities.

The nine MNES protected under the EPBC Act are:

- World heritage areas
- National heritage places
- Ramsar wetlands of international importance
- Nationally listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions.
- Protection of water resources from coal seam gas development and large coal mining development.

An EPBC Referral was submitted to DoEE for an earlier alternative version of the Project in October 2015 (EPBC 2015/7582). DoEE determined on 7 December 2015 that the Project as defined at the time of submission was not a controlled action if carried out in a particular manner.

A new EPBC referral will be prepared due to the change in project design following completion of ship simulation. The simulation identified additional dredge volume was required and the referral application must reflect the new volume. The new EPBC referral will be submitted by the Department to the DoEE.

### 6.2.2 Environment Protection (Sea Dumping) Act 1981

The loading and dumping of waste at sea is regulated under the Commonwealth *Environment Protection (Sea Dumping) Act 1981* (the Sea Dumping Act). Permits are required for all sea dumping operations.

The Project includes the dredging of approximately 231,500m$^3$ of in-situ material including overdredging allowance and transportation and placement of the dredge material at an approved location offshore from Twofold Bay.

A Sea Dumping Permit application was lodged with the DoE in November 2015 for an earlier alternative version of the Project. The Sea Dumping Permit (No. SD2015/3102) was granted on 18 February 2016, subject to conditions including strict timeframes. Any delays would require reconsideration and re-submission.

A variation to the Sea Dumping Permit under Section 23 of the *Environment Protection (Sea Dumping) Act 1981* is required due to the change in project design following completion of ship simulation. The simulation identified additional dredge volume was required and the Permit application must reflect the new volume. The variation application is to be submitted by the Department to DoEE.

### 6.2.3 Native Title Act 1993

The Commonwealth *Native Title Act 1993* recognises the traditional rights and interests to land and waters of Aboriginal and Torres Strait Islander people. Under the Native Title Act 1993 (NTA), native title claimants can make an application to the Federal Court to have their native title recognised by Australian law.

Native title cannot be claimed in areas where the law says native title has been extinguished. However, areas where native title may be claimed include:
- Vacant Crown land;
- National Parks;
- State Forests;
- Crown reserves;
- Some types of non-exclusive leases;
- Land covered by permissive occupancies and licences; and
- Inland waters and the sea.

The Department performed a native title investigation and it was established that any Native Title interest that may have existed in that part of the land/seabed of Snug Cove on Lot 111 DP839583 has been extinguished via the acquisition of that land in 1988. Further, based on a search of the Register of Native Title Claims in September 2016 there were no claims registered for the LGA.

Part of the dredging footprint is situated in unsurveyed Crown land of Twofold Bay below Mean High Water Mark adjacent to Lot 111 DP839683 as shown on Figure 1-2. The Department has written to Native Title Services Corp Ltd (NTSCORP) on 19 September 2016 indicating that:

"It is the Department’s view that such acts will be valid under Subdivision K of the Native Title Act 1993 in the event that native title rights and interests are "affected". Although neither the Crown Lands Act 1989 nor Subdivision K of the Native Title Act 1993 provide any procedural rights to native title holders where a licence is to be granted under the Crown Lands Act 1989 over "waters" as defined in s. 253 of the Native Title Act 1993, I am writing as a courtesy to inform NTSCORP, being the Native Title Service Provider for Aboriginal Traditional Owners in New South Wales and the Australian Capital Territory, and performing the functions of a Native Title Representative Body under the Native Title Act 1993.

Relevantly, Subdivision K requires that native title holders be provided with the same procedural rights as the holders of freehold to land adjoining or surrounding those waters. In this respect, holders of freehold of land adjoining or surrounding Crown land do not have any procedural rights under the Native Title Act 1993."

NTSCORP has directed the letter to Eden Local Aboriginal Land Council and comments have been invited from Eden Local Aboriginal Land Council within 30 days of the date of the above letter. A copy of the Department’s letter is in Appendix B. Any response received from Eden Local Aboriginal Land Council will be forwarded to D&PE.

6.2.4 Aboriginal and Torres Strait Islander Heritage Protection Act 1994

The Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1994 provides for the preservation and protection from injury or desecration of significant areas and objects that are of particular significance to Aboriginals or Torres Strait Islanders in accordance with culture and tradition. It enables the Australian Government to respond to requests by an Aboriginal or Torres Strait Islander person (or a person representing an Aboriginal or Torres Strait Islander person) to protect traditionally
important areas and objects that are under threat, if it appears that relevant State or territory laws have not provided effective protection.

There are no significant areas and objects that would be impacted by the Project.

6.2.5 Historical Shipwrecks Act 1976

The Commonwealth Historical Shipwrecks Act 1976 protects historic wrecks and associated relics, more than 75 years old and in Commonwealth waters, extending from below the low water mark to the edge of the continental shelf. The Act aims to ensure that historic shipwrecks are protected for their heritage values and maintained for recreational, scientific and educational purposes.

There are no known shipwrecks in Commonwealth waters that would be impacted by the Project.

6.2.6 Customs Act 1901

The Commonwealth Customs Act 1901 regulates customs operations including designation of the port area for customs purposes, waterfront area control and processes for customs control of goods entering Australia.

As discussed in Section 5.2.5, there are no additional customs and quarantine requirements for the operation of the Project.

6.2.7 Maritime Transport and Offshore Facilities Security Act 2003

The purpose of the Commonwealth Maritime Transport and Offshore Facilities Security Act 2003 is to safeguard against unlawful interference with maritime transport or offshore facilities. This Act establishes a regulatory framework centred on the development of security plans for ships, other maritime transport operations and offshore facilities.

All vessels to be used during construction and operation are subject to the relevant provisions of this Act in relation to security assessments and plans.

6.2.8 Maritime Safety (Domestic Commercial Vessel) National Law Act 2012

The purpose of the Commonwealth Maritime Safety (Domestic Commercial Vessel) National Law Act 2012 is to provide a national law about marine safety for certain commercial vessels, and for related purposes. The Act applies to a “domestic commercial vessel” which is defined as “a vessel that is for use in connection with a commercial, governmental or research activity”.

All domestic commercial vessels that would be used during construction and operation are subject to the relevant provisions of this Act.

6.2.9 Navigation Act 2012

The Commonwealth Navigation Act 2012 is the primary legislative means for the Australian Government to regulate international ship and seafarer safety. The objects of the Act are:

- To promote the safety of life at sea.
- To promote safe navigation.
To prevent pollution of the marine environment; and

To ensure that Australian Maritime Safety Authority (AMSA) has the necessary power to carry out inspections of vessels and enforce national and international standards.

The Project will be carried out in accordance with the provisions of the Act and guided by requirements of PANSW and AMSA regarding ship safety, safe navigation and enforcement of applicable national and international standards. This item is addressed in further detail in Section 9.5 (Traffic, Transport and Access).

6.2.10 Disability Discrimination Act 1992 and Disability Standards for Accessible Public Transport 2002

The Commonwealth Disability Discrimination Act 1992 (DDA Act) aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land.

The Commonwealth Disability Standards for Accessible Public Transport 2002 (DSAPT) is formulated under Clause 33.1 of the DDA Act and requires all new public transport premises, infrastructure and conveyances to be compliant with the requirements of the standard and referenced Australian Standards and Design Rules therein, unless unjustifiable hardship is incurred by implementation.

The Project has been designed to be independently accessible and DDA and DSAPT compliant.

6.2.11 Work Health and Safety Act 2011

The purpose of the Commonwealth Work Health and Safety Act 2011 is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces. The NSW Health and Safety Act 2011 was prepared in accordance with that framework.

The Project will ensure health and safety regulations are met, so far as is reasonably practicable, by eliminating risk to health and safety for the course of the Project.

6.3 NSW Legislation

6.3.1 Environmental Planning and Assessment Act, 1979

Planning Approvals Process

Part 5.1 of the EP&A Act establishes an assessment and approval regime for ‘State Significant Infrastructure’ (SSI). Part 5.1 applies to development that is declared to be SSI by a State Environmental Planning Policy (SEPP).

Clause 2 Schedule 3 of SEPP (State and Regional Development) 2011 (SRD SEPP) includes a definition for “Port facilities and wharf or boating facilities”, being “Development for the purpose of port and wharf facilities or boating facilities (not including marinas) by or on behalf of a public authority that has a capital investment value (CIV) of more than $30 million”.

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Under Section 115U(3) of the EP&A Act, the following development that is declared SSI may be carried out without development consent under Part 4; however, the approval of the Minister for Planning is required prior to proceeding to construction:

(a) infrastructure

(b) other development that (for this Part and within the meaning of Part 5) would be an activity or which the proponent is also the determining authority and would, in the opinion of the proponent require an environmental impact statement to be obtained under Part 5.

The Project is declared to be SSI with a CIV of $44million.

Under Part 5.1 of the EP&A Act, the planning approvals process includes the following key steps:

- Submission of an SSIA with the accompanying supporting document to the Secretary of DP&E under Section 115X of the EP&A Act, to seek SEARs for the Project (Section 115Y).
- Preparation and submission of an EIS under Section 115Y(2), addressing the matters outlined in the SEARs.
- Public exhibition of the EIS for a minimum of 30 days.
- Preparation of response to issues raised in submissions and Preferred Infrastructure Report, if required under Section 115Z(6).
- Assessment of the application by the DP&E and preparation of the Secretary’s environmental assessment report (Section 115ZA).
- Determination of the Project by the Minister for Planning or their delegate.

**Objects of the EP&A Act**

Consideration of the Project against the Section 5 Objects of the EP&A Act 1979 is set out in Table 6-1.

**Table 6-1 Consideration of the Project against the Objects of the EP&A Act**

<table>
<thead>
<tr>
<th>Object of the EP&amp;A Act</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) to encourage:</td>
<td></td>
</tr>
<tr>
<td>(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,</td>
<td>Implementation of the Project will improve access for cruise ships visiting the Port of Eden. This will result in an increase in growth in tourism in Eden and surrounding areas through providing an important boost to the local and regional economy. The Project is directly aligned with a number of Commonwealth, State and Local Government initiatives, strategies and priorities related to promotion of tourism and the region.</td>
</tr>
<tr>
<td>(ii) the promotion and co-ordination of the orderly and economic use and development of land,</td>
<td>The Project comprises the extension of the Breakwater Wharf, an existing use of land to enable passenger cruise ships to berth alongside the upgraded Breakwater Wharf so that passengers can</td>
</tr>
<tr>
<td>Object of the EP&amp;A Act</td>
<td>Comment</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>(iii) the protection, provision and co-ordination of communication and utility services,</td>
<td>embark/disembark directly and safely via the ship’s gangway. The Project will therefore improve access for cruise ships visiting the Port of Eden and will in turn promote an increase in growth in tourism in Eden and surrounding areas. The planning of the Project has carefully considered the utility services requirements for existing and future users. Implementation of the Project will necessitate the relocation of some services and the installation of new services (electrical, potable water and emergency water). This action will ensure the protection and provision of the services as well as their sound coordination of communication and utility services which are very important to securing the benefits of the development to the local and regional economies.</td>
</tr>
<tr>
<td>(iv) the provision of land for public purposes,</td>
<td>Impacts to land currently utilised by the public will be mitigated through mitigation measures in the CEMP, and OEMP.</td>
</tr>
<tr>
<td>(v) the provision and co-ordination of community services and facilities, and</td>
<td>The Project will make use of Warrens Walk, a scenic 600m zig zag public pedestrian access track from the end of Imlay Street to Snug Cove, in the Port of Eden.</td>
</tr>
<tr>
<td>(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and</td>
<td>Some impacts to aquatic and terrestrial ecology are expected to result from the Project. The management of those impacts will not be detrimental because they are considered to be “best practice” management approaches. The Project is consistent with the principles of ecologically sustainable development (ESD) based on the range of ESD initiatives that have been considered in the design and assessment process to date. Consideration of the principles of ESD in regard to the Project is addressed in detail in Section 5.22. This object is not relevant to the Project.</td>
</tr>
<tr>
<td>(vii) ecologically sustainable development, and</td>
<td></td>
</tr>
<tr>
<td>(viii) the provision and maintenance of affordable housing, and</td>
<td>Due to its importance to the local and regional economies and the respective social amenities, the Project has secured funding from three levels of government. Consultation with various government stakeholders has been an ongoing process as discussed in Section 7. Extensive public consultation has been undertaken and will be ongoing, including formal and informal community consultation events and opportunities for comment.</td>
</tr>
<tr>
<td>(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and</td>
<td></td>
</tr>
<tr>
<td>(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.</td>
<td></td>
</tr>
</tbody>
</table>
6.3.2 Environmental Planning and Assessment Regulation 2000

The EIS has been prepared in accordance with Part 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

6.3.3 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (POEO Act) is the primary piece of environmental protection legislation in NSW. Major features of the legislation include: protection of the environment policies relating to water quality, air quality, noise emissions, contaminated land and waste disposal impacts. The POEO Act also regulates activities that have the potential to cause environmental harm.

Chapter 3 of the POEO Act states that an Environment Protection Licence (EPL) is required for scheduled activities. Schedule 1 of the POEO Act lists ‘scheduled activities’ for which an EPL is required under Sections 48 or 49 of the POEO Act.

Clause 19 of Schedule 1 to the POEO Act specifies ‘extractive activities’ that require an EPL and defines ‘extractive materials’ as “clay, sand, soil, stone, gravel, rock, sandstone or similar substances that are not minerals within the meaning of the Mining Act 1992”. A ‘water based activity’ is defined as the “extraction of extractive materials, either for sale or re-use, by means of dredging or other such water-based methods”.

As the proposed dredging involves the extraction of more than 30,000m$^3$ per year of extractive materials (‘water-based extractive activity’), it is considered a scheduled activity, pursuant to Clause 19 of Schedule 1 to the POEO Act and as such will require an EPL.

Section 115ZH(1) of the EP&A Act provides that an authorisation for an EPL under Chapter 3 of the POEO Act (for any of the purposes referred to in Section 43 of that Act) cannot be refused if it is necessary for carrying out an approved SSI and is to be substantially consistent with the approval under Part 5.1 of the EP&A Act.

Consequently, the Project will be required to comply with the relevant environment protection provisions of the POEO Act during construction and operation.

6.3.4 Threatened Species Conservation Act 1995

The Threatened Species Conservation Act 1995 (TSC Act) identifies threatened species, populations, and Endangered Ecological Communities (EECs), critical habitats and key threatening processes. In relation to development assessment, the provisions of the TSC Act have been integrated into the EP&A Act.

Section 5A of the EP&A Act requires that for the purposes of the Act, consideration of whether the Project is likely to impact on threatened species, populations or ecological communities is required. It establishes seven factors on which this assessment must be based (the ‘Seven Part Test’). Where a significant impact is considered likely, a Species Impact Statement (SIS) must be prepared and submitted with the EIS.

Under Section 91 of the TSC Act, the Director-General may grant a licence authorising a person to take action which is most likely to result in harm to any animal that is of, or is part of, a threatened species, population or ecological community. A licence under Section 91 of the TSC Act is not required for the carrying out of an activity authorised under the EP&A Act.
An assessment of the Project against the relevant provisions of the TSC Act and the Framework for Biodiversity Assessment (OEH, 2014) with respect to aquatic and terrestrial ecology is provided in Section 9.3 and Section 9.4 of the EIS.

### 6.3.5 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations. Part 7 of the FM Act requires a permit for a number of activities, including those involving dredging and reclamation work and those involving harm to marine vegetation. However, it is noted that under the provisions of Section 115ZG (1)(b) of the EP&A Act, a permit under section 201, 205 or 219 of the FM Act is not required for an approved SSI.

Section 199 of the FM Act sets out the circumstances in which a public authority (other than local authority) may carry out (or authorise the carrying out of) dredging or reclamation works.

As the Project involves dredging works, the Department is required to notify the Minister for Fisheries in accordance with Section 199, and take into account any matters concerning the proposed work that may be raised by the Minister.

An assessment of the Project against the relevant provisions of the FM Act is provided in Section 9.3 of the EIS.

### 6.3.6 Crown Lands Act 1989

All reserved Crown lands are subject to the general land management objectives and provisions of the *Crown Lands Act 1989* (CL Act), including the reserve management provisions of Part 5. The land management provisions relating to the protection of public land in Division 5 of Part 7 of the CL Act also apply. The objectives and principles of Crown land management are listed in Sections 10 and 11 respectively of the Crown Lands Act 1989.

Lot 1 DP 738477 and Lot 2 DP 747363 were resumed and vested in the Minister for Public Works under the provisions of Part 6 of the *Coastal Protection Act 1979*. The lots were subsequently declared Crown Land under Section 138 of the CL Act by gazette 28 June 1996 (folio 3512) and created as Reserve 180072 for the public purpose of Port Facilities & Services in the same gazette (folio 3516). The wharf and part of the bed of Snug Cove is part of Reserve 180072. Part of the dredging footprint is vacant Crown land.

A Draft Port Management Plan ‘Port Reserve No. 180072’ was prepared in December 2004 by the agency of Lands. It is noted that this plan was never implemented by the Department. The Department is currently reviewing this plan and the need to update and implement.

A Master Plan was adopted in March 2005 by BVSC and amended in December 2013 for Snug Cove and Environs which covers this reserve. The Concept Plan and associated Character Statements, Principles and Controls, reflects the earlier concept for the wharf extension as identified in the Draft Port Management Plan.
6.3.7 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides for the management of all national parks, state conservation areas, karst conservation reserves and regional parks nature reserves, reserves, Aboriginal areas, objects and places and state game reserves.

The Project is not within a national park, state conservation area or reserve.

An Extensive Search of the Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) indicates that there are 7 Aboriginal sites in the vicinity of the site. The Project would not have any impacts on recorded Aboriginal sites. Refer to Section 9.14 for a further discussion on Aboriginal heritage.

6.3.8 Heritage Act 1977

Under Section 57 of the Heritage Act 1977, an approval must be obtained for works that have the potential to interfere with a heritage item or place listed on the State Heritage Register or the subject of an interim heritage order.

There are no heritage items or heritage conservation areas listed on the State Heritage Register or subject to an interim heritage order that are either in, or in the vicinity of the site.

The site is not identified as a heritage item or as being or being within a Heritage Conservation Area (HCA) in Schedule 5 to the Bega Valley Local Environmental Plan 2013 (the LEP).

Under the provisions of Section 115ZG (1)(c) of the EP&A Act, “an approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977” is not required for approved SSI. Additionally, Division 8 of Part 6 of the Heritage Act 1977 does not apply to prevent or interfere with the carrying out of approved SSI.

Part 3C of the Heritage Act 1977 sets out the provisions of the protection of historic shipwrecks. A ‘historic shipwreck’ is defined as:

“historic shipwreck means the remains of any ship (including any articles associated with the ship):

(a) that have been situated in State waters, or otherwise within the limits of the State, for 75 years or more, or

(b) that are the subject of a historic shipwrecks protection order.”

The Project will not have any impacts to the heritage significance of heritage items, heritage conservation areas or historic shipwrecks located in the vicinity of the site. Refer to Section 9.15 for a further discussion on Historic Heritage.

6.3.9 Marine Safety Act 1998

The key objects of the Marine Safety Act 1998 relate to the safe operation of vessels in ports and waterways for those users and amenity of occupiers of adjoining land.
The Project will be carried out in accordance with the provisions of the Act and guided by requirements of PANSW and AMSA regarding ship safety and safe navigation.

### 6.3.10 Coastal Protection Act 1979

The Project is located within the “coastal zone”, however concurrence is by virtue of 115ZG of the EP&A Act.

### 6.3.11 Management of Waters and Waterside Lands Regulations - NSW

Under the Management of Waters and Waterside Lands Regulations – NSW – Regulation 67, Harbour Master approval is required for disturbance of the bed of port. An application is to be submitted to PANSW for approval prior to disturbance.

### 6.4 State Environmental Planning Instruments

#### 6.4.1 State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP identifies development that is SSI. The parameters for the declaration of SSI, being:

*Development is declared, pursuant to section 115U (2) of the Act, to be State significant infrastructure for the purposes of the Act if:*

- *(a)* the development on the land concerned is, by the operation of a State environmental planning policy, permissible without development consent under Part 4 of the Act, and
- *(b)* the development is specified in Schedule 3.

Clause 2 Schedule 3 of the SRD SEPP includes a definition for “Port facilities and wharf or boating facilities”, being “Development for the purpose of port and wharf facilities or boating facilities (not including marinas) by or on behalf of a public authority that has a capital investment value (CIV) of more than $30 million”.

As the CIV for the Project exceeds the $30million threshold, the Project is SSI and therefore falls under Part 5.1 of the EP&A Act, requiring approval from the Minister for Planning. Refer to Section 6.2.1 for further details on Part 5.1 of the EP&A Act.

#### 6.4.2 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

The ISEPP is relevant to the Project and under the ISEPP the Project is permissible without development consent under Part 4 of the EP&A Act.

Clause 68(4) of ISEPP permits development on any land for the purpose of wharf or boating facilities to be carried out by or on behalf of a public authority without consent.
As the Project is for an extension of an existing wharf and is to be carried out by the Department, a public authority, it would be permissible without development consent under Part 4 of the EP&A Act. However, as discussed in Section 6.3.1, the Project is declared to be SSI and requires the approval of the Minister of Planning.

6.4.3 State Environmental Planning Policy No. 14 – Coastal Wetlands

State Environmental Planning Policy No. 14 Coastal Wetlands (SEPP 14) aims to protect and preserve wetlands along the NSW coast. In respect of land to which the policy applies, land cannot be cleared, drained or filled or a levee constructed on the land, without the consent of the council and the concurrence of the DP&E.

Lake Curalo, located 2km to the north of the Project site is the closest wetland identified under SEPP No. 14 which will not be impacted by the Project.

6.4.4 State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) was enacted to provide a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. In accordance with clause 7(1) of SEPP 55, a consent authority must not consent to the carrying out of any development on land unless:

(a) It has considered whether the land is contaminated.

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

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

Acid Sulfate Soils

The adjoining foreshore land at Snug Cove has not been mapped as containing acid sulfate soils on the Acid Sulfate Soils Map of the LEP.

Sediment sampling within the dredge location was completed by AMA across two separate sampling campaigns. All of the sediment results returned a net acidity of <0.02 %S, confirming that the acid production potential of the sediments targeted for dredging to facilitate the Breakwater Wharf Extension is low.

Soil Contamination

Sediment sampling undertaken by AMA (2015a) confirms that the sediments proposed for the capital works dredging were considered suitable for unconfined offshore disposal. All of the samples tested had concentrations within the NEPM Health-based Investigation Levels for Residential Landuse (HIL-A).
**Hazardous Materials**

A Hazardous Substances Survey was undertaken by Safe Work and Environments in September 2016 to identify potentially hazardous substances that would be disturbed or removed during the construction phase of the Project that may impact upon worker health and safety.

The survey comprised visual observation and limited sampling but did not include access to confined spaces, demolition of structures or excavation.

The survey revealed that natural occurring asbestos was discovered at the south-western and south-eastern ends of the breakwall. There is potential for the health and safety of construction workers to be compromised when this material is disturbed. In addition it is likely that subsurface water mains located throughout the site and an electrical mounting board in the carpark are likely to contain asbestos. In addition the tall lights located on the wharf are likely to contain PCBs in the capacitors.

There are no buildings or other structures to be demolished and no other land areas that require remediation.

Refer to Section 9.16 for further discussion.

### 6.4.5 State Environmental Planning Policy No. 62 – Sustainable Aquaculture

**State Environmental Planning Policy No. 62 – Sustainable Aquaculture (SEPP 62)** applies to all developments that have the potential to adversely affect existing or future oyster aquaculture development(s) and/or area(s).

The potential impacts of the Project to aquaculture, specifically the mussel lease areas in Twofold Bay, have been addressed in detail and an assessment of the Project in Section 9.1 of the EIS.

### 6.4.6 State Environmental Planning Policy No. 71 – Coastal Protection

**State Environmental Planning Policy No. 71 – Coastal Protection (SEPP 71)** regulates development in New South Wales’ coastal areas. The policy prohibits certain types of development in the coastal zone and identifies the matters for consideration in the development approval process.

Parts 1 to 6 of SEPP 71 do not apply to the Project which is an SSIA under Part 5.1 of the EP&A Act that is determined by the Minister for Planning. However, consideration has been given to the relevant ‘matters for consideration’ under Part 2 in this EIS.

Further, it is noted however that the Master Plan Snug Cove and Environs (adopted 2005 and amended 2013) has been prepared in accordance with the principles of Part 5 of SEPP 71. Consideration has been given to the Master Plan in the EIS.

### 6.5 Bega Valley Local Environmental Plan 2013

The Project is located on land that is partly subject to the LEP. The site is zoned part IN4 Working Waterfront and Unzoned Land (Figure 6-1).
The objectives of the IN4 zone are:

- "To retain and encourage waterfront industrial and maritime activities.
- To identify sites for maritime purposes and for activities that require direct waterfront access.
- To ensure that development does not have an adverse impact on the environmental and visual qualities of the foreshore.
- To encourage employment opportunities.
- To minimise any adverse effect of development on land uses in other zones."

Both ‘Port facilities’ and ‘Wharf or boating facilities’ are permitted with consent in the IN4 zone. The Project is consistent with the objectives of the zone.

Clause 2.4 of the LEP requires development on Unzoned Land to: not impact adjoining land; consider objectives of adjoining land; and to be appropriate and compatible with permissible land uses to the adjoining land (ie. IN4 zone). The works are in connection and consistent with the IN4 zone.
The Project is permissible without development consent under both Clause 14(1) of the SRD SEPP and Clause 68(4) of ISEPP, the permissibility and consent provisions of the LEP do not apply.

As discussed above, while consent is not required under the LEP, for the purposes of assessing impacts, the following relevant provisions of the LEP has been considered during the preparation of the EIS including:

- Clause 2.4 Unzoned land
- Clause 5.5 Development within the coastal zone
- Clause 5.7 Development below mean high water mark
- Clause 5.10 Heritage conservation
- Clause 5.12 Infrastructure development and use of existing buildings of the Crown
- Clause 6.2 Earthworks
- Clause 6.4 Coastal risk planning

**6.6 Bega Valley Development Control Plan 2013**

As indicated in Section 6.4 above, the permissibility and consent provisions of the LEP do not apply. The provisions of the Bega Valley Development Control Plan 2013 (DCP) have been considered in the EIS.

Section 2.3 relates to the Eden Town Centre. The desired future character statement in Section 2.3.4 states that "There is a strong desire for Eden to maintain its maritime influence and to strongly reflect it in a vibrant contemporary manner in the emergence of the new "Port of Eden". Design principles and general requirements are provided which relate to the town centre.

Section 7.6 of the DCP identifies site specific requirements for ‘Snug Cove’. It requires the area defined in Figure 7.15 of the DCP to be the subject of the Snug Cove Masterplan 2005 (Figure 6-2).
6.7 Summary of Required Approvals

Approvals required for the Project are:

- *Environmental Planning and Assessment Act 1979* – State Significant Infrastructure Approval.

6.8 Summary of Approvals Not Required

Section 115ZG of the EP&A Act specifies that the following approvals are not required for Projects considered under Part 5.1:
• Concurrence under Part 3 of the *Coastal Protection Act 1979* of the Minister administering that Part of the Act.

• A permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*.

• An approval under Part 4, or excavation permit under section 139, of the *Heritage Act 1977*.

• An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*.

• An authorisation referred to in section 12 of the *Native Vegetation Act 2003* to clear native vegetation or State protected land.

• A bushfire safety authority under section 100B of the *Rural Fires Act 1997*.

• A water use approval under section 89, a water management work approval under section 90, or activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

While these approvals would not be required, consultation with the Office of Environment and Heritage (OEH), Environment Protection Authority (EPA) and DPI-Fisheries has been undertaken to date for the Project.
7 Stakeholder Consultation

7.1 Consultation Strategy

This section details the stakeholder and community consultation activities undertaken for the Project. It is important to note that having regard to the background and history of the Project, a number of consultation activities pre-date the preparation of the EIS and demonstrate the early engagement with key stakeholders and the community, in the planning phase of the Project. The Department has involved a large range of stakeholders in the development of the Project and in managing expectations of its scope.

In 2014, the Department developed a Communication and Community Engagement Strategy and Communications Management Plan. It has been effective in identifying the key stakeholders and implementing the appropriate channels and forums for two-way consultation for the Project.

Keeping the community informed of the status of the Project and implementing a number of community engagement activities has been integral to identifying the key community concerns and issues for assessment in the EIS.

In accordance with Part 5.1 of the EP&A Act, consultation for SSI projects is required to occur at the following stages:

- Preparing the SEARs - the Secretary is to consult relevant public authorities and have regard to the need for the requirements to assess any key issues raised by those public authorities

- Preparing the EIS – the SEARs for the Project included three specific consultation requirements. These are addressed in Sections 7.2-7.5.

- Public exhibition - the Secretary must make the EIS publicly available for at least the minimum exhibition period prescribed by the regulations (30 days). During this period, any person (including a public authority) may make a written submission to the Secretary concerning the Project.

7.2 Identification of Key Stakeholders

During the Project planning and preparation of the EIS, the following key stakeholders were identified:
<table>
<thead>
<tr>
<th>Key Stakeholders</th>
<th>Agency/Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Customs and Border Protection</td>
<td>NSW Department of Industry - Lands</td>
</tr>
<tr>
<td></td>
<td>NSW Department of Industry – Office of Regional Development</td>
</tr>
<tr>
<td>Bega Valley Shire Council (Funding Source and LGA)</td>
<td>NSW Department of Planning and Environment</td>
</tr>
<tr>
<td>Bega Chamber of Commerce</td>
<td>NSW Department of Primary Industries - Fisheries</td>
</tr>
<tr>
<td>Commercial Fishers</td>
<td>NSW Environment Protection Authority</td>
</tr>
<tr>
<td>Commonwealth Department of Environment and Energy</td>
<td>DPI-Food Authority</td>
</tr>
<tr>
<td>Commonwealth Department of Infrastructure and Regional Development (Funding Source)</td>
<td>NSW Office of Environment and Heritage</td>
</tr>
<tr>
<td>Cruise Ship Industry (Carnival Australia, Royal Caribbean Cruise Lines, Cruise</td>
<td>NSW Water Police</td>
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<tr>
<td>Lines International Association)</td>
<td></td>
</tr>
<tr>
<td>Cruise Eden</td>
<td>Port Authority of NSW</td>
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<tr>
<td>Department of Defence</td>
<td>Port of Eden Marina Group (POEM)</td>
</tr>
<tr>
<td>Department of Premier and Cabinet</td>
<td>Port of Eden Harbour User Group</td>
</tr>
<tr>
<td>Eden Sea Farms</td>
<td>Roads and Maritime Services</td>
</tr>
<tr>
<td>Eden Resort Hotels (Cattle Bay Marina)</td>
<td>Sapphire Coast Marine Discovery Centre</td>
</tr>
<tr>
<td>• Infrastructure NSW (Funding Source)</td>
<td>Sviser Australasia Eden</td>
</tr>
<tr>
<td>Land based leaseholders within Snug Cove including:</td>
<td>The community and local residents, particularly those within 400m of the site along:</td>
</tr>
<tr>
<td>• Costa's Seafood restaurant</td>
<td>• Albert Terrace</td>
</tr>
<tr>
<td>• Eden Slipway Services</td>
<td>• Bay Street</td>
</tr>
<tr>
<td>• Hooked on Seafood</td>
<td>• By Street</td>
</tr>
<tr>
<td>• Great White Bite café</td>
<td>• Bramble Street</td>
</tr>
<tr>
<td>• Nippers Nautical Nibbles</td>
<td>• Cattle Bay Road</td>
</tr>
<tr>
<td>• South Coast Ice Supplies</td>
<td>• Cocora Street</td>
</tr>
<tr>
<td>• Twofold Bay Quality Bait (including Gotcha and Anderson’s Bait)</td>
<td>• Cosham Close</td>
</tr>
<tr>
<td>• Wharfside restaurant</td>
<td>• Ida Rodd Drive</td>
</tr>
<tr>
<td>• 30 Knots restaurant and cafe</td>
<td>• Imlay Street</td>
</tr>
<tr>
<td>Local Aboriginal Land Councils</td>
<td>• Weecoan Street</td>
</tr>
<tr>
<td>Members of Parliament (Local, State and Federal)</td>
<td>• Victoria Terrace</td>
</tr>
<tr>
<td></td>
<td>Utility Providers (electrical, water and telecommunications)</td>
</tr>
</tbody>
</table>
7.3 Engagement with Stakeholders

To date, stakeholders have been engaged through the following methods:

- **Port of Eden Project Control Group (PCG)** – the PCG was established to oversee the Project and is comprised of cross-agency members committed to deliver an infrastructure solution to meet the needs of the cruise sector and maximise the economic opportunities it will afford the region. The PCG meets quarterly and comprises the following State Government agencies:
  - NSW Department of Industry – Lands
  - Port Authority of NSW
  - Transport for NSW
  - Roads and Maritime Services
  - Department of Planning and Environment
  - Department of Premier and Cabinet
  - Office of Regional Development
  - DPI Industry Policy, Economics and Regional Development Branch

- **Community Liaison Group (CLG) meetings** – the CLG for the Project was formed in January 2015 and is comprised of representatives from the community, business, Eden Local Aboriginal Land Council (LALC), Twofold Aboriginal Corporation, industry and government. The CLG meets monthly, provides a forum for regular updates on Eden Port development projects, gathers community feedback and raises concerns as they arise;

- **Port of Eden Harbour User Group (HUG) meetings** – the HUG meets quarterly to assist DI Lands in resolving operational matters and identifying emerging issues in relation to the operation and maintenance of the Port of Eden;

- **Meeting with Eden LALC and Twofold Aboriginal Corporation** – biannual meetings at Jigamy Farm to provide Project updates;

- **Regular Project Update meetings** with the two major cruise operators (Carnival Australia and Royal Caribbean Cruise Lines);

- **Potential Users Workshops** (by invitation) – to provide existing users of the Port with the opportunity to contribute to the design of the wharf, required dredge pocket and consideration of future proofing of the wharf;

- **Letters** - to RMS regarding relocation of swing moorings, to Native Title Services Corp regarding Native Title Claim and to Eden Sea Farms regarding temporary relocation of their mussel farm;

• Community Information Sessions (open invite) – to provide the community with the opportunity to find out more, ask questions and share views on proposed development in Eden Harbour and Eden town centre. Information stalls are held by the Department, BVSC, Sapphire Coast Tourism, Cruise Eden, Eden Chamber of Commerce and PA NSW. The sessions are held on a bi-annual basis at the Eden Fishermen’s Recreation Club;

• Agency Comment - Referral of the draft REF (2015) to BVSC, EPA, OEH and DPI- Fisheries for comment.

• Public Exhibition of the REF – the REF was publicly exhibited in September 2015 and received four submissions from agencies: BVSC, EPA, OEH and DPI-Fisheries and two public submissions;

• Bega Valley Shire Councillor Updates (quarterly or as required);

• Planning Focus Group meeting and teleconferences with regulatory agencies (as required);

• Specific Working Group Meetings and workshops such as the Aquaculture Focus Group which consists of local operator Eden Sea Farms, the Department, DPI-Fisheries, DPI-Food Authority, EPA, BVSC and PANSW. The Aquaculture Focus Group was established to identify risk associated with dredging adjacent to the existing Cattle Bay mussel farm and mitigation measures that can be adopted to prevent adverse impact to mussel farm operations;

• Industry Surveys;

• Design Workshops with the design consultant, industry, the Department, PANSW, RMS and Transport NSW;

• Briefings with the Commonwealth DoEE in Canberra; and

• Regular communication between the Department and all funding partners via monthly reports.

7.4 Summary of Consultation Activities

Whilst consultation associated with the Eden Breakwater Wharf Extension Project and Safe Harbour Project (wave attenuator in Snug Cove) dates back some five years, a summary of targeted consultation meetings since January 2015 associated with the environmental impact assessment of the Project is provided in Table 7-1. The Table is considered to provide an indication of not only the catchment of the stakeholder representation but also regularity and scope of subject matter considered.
### Table 7-1 Summary of targeted consultation meetings

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Meeting Date/s</th>
<th>Matters Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Liaison Group</td>
<td>Monthly (last Wednesday of the month) Last meeting held 28 September 2016</td>
<td>Eden Port development projects and community feedback</td>
</tr>
<tr>
<td>Harbour User Group (Port of Eden Stakeholder Forum)</td>
<td>Quarterly Last meeting held 11 August 2016</td>
<td>Breakwater Wharf Extension Project and Safe Harbour Project Port repairs and upgrade work General business</td>
</tr>
<tr>
<td>Key Cruise Industry Stakeholders</td>
<td>26-30 March 2015</td>
<td>Eden as a destination Operational, Infrastructure, Service and Safety requirements Visitation – likely frequency and numbers</td>
</tr>
<tr>
<td>Site inspection for Crystal Cruises</td>
<td>5 September 2016 23 September 2016</td>
<td>Eden as a destination Operational, Infrastructure, Service and Safety requirements Visitation – likely frequency and numbers</td>
</tr>
<tr>
<td>Eden Wharf Project Potential Users Workshop</td>
<td>10 April 2015</td>
<td>Potential future users of the wharf, likely vessel size and required wharf design features and channel width</td>
</tr>
<tr>
<td>Design Workshops</td>
<td>Weekly</td>
<td>Operational, Infrastructure, Service and Safety requirements</td>
</tr>
<tr>
<td>Community Information Sessions</td>
<td>Bi-annual 7 September 2015</td>
<td>Proposed development in Eden Harbour and Eden town centre</td>
</tr>
<tr>
<td>Commonwealth Department of Environment</td>
<td>8 May 2015 8 September 2016</td>
<td>Environmental investigations, Preparation of REFs, NSW State Gov Agency comments on REFs, Sea Dumping Permit, EPBC Referral, project timeline</td>
</tr>
<tr>
<td>Bega Valley Shire Council</td>
<td>11 November 2015</td>
<td>Update on Breakwater Wharf</td>
</tr>
</tbody>
</table>
Stakeholder engagement undertaken to date has confirmed high levels of support for the Project. Engagement has also provided information that has been taken into consideration in the design of the project, in particular identifying that an extended wharf which would service ships up to and exceeding 300m in length is the preferred option.

Letters of support for the project have been received from the two major cruise operators; Carnival Australia and Royal Caribbean Cruise Line (RCCL). The letters, from the Director, Marine and Safety at Carnival, dated 3rd December 2012, and from the Regional Vice President, Asia Pacific at RCCL, dated 8th March 2015, confirm that Eden is not a regular destination because of the port's inability to berth vessels alongside and that the anchorage at Eden is an unreliable alternative. The letters state that both companies support the project and if the project permits the berthing of their ships (in RCCL's case ships at least 300m in length), Eden would receive significantly increased port calls from their locally based ships. In the case of Carnival, ships of its international brand would likely follow suit when they are in the region.

Notwithstanding the above, Table 7-2 identifies important issues raised by key stakeholders over the consultation/engagement process outlined in Table 7-2. Some of the issues are identified in the SEARs, others are additional. It is considered that they have currency and the table also indicates where each matter has been addressed in the EIS.

Table 7-2 Key issues raised by key stakeholders

<table>
<thead>
<tr>
<th>MATTERS RAISED</th>
<th>RAISED BY</th>
<th>SECTION OF EIS WHERE ADDRESSED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USERS OF THE WHARF</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely future users of the wharf, and required design features and benefit analysis</td>
<td>Eden Wharf Project Potential Users Workshop</td>
<td>Section 4.2.3</td>
</tr>
<tr>
<td>Preparation of an OEMP</td>
<td>BVSC</td>
<td>Section 10.5.4</td>
</tr>
<tr>
<td><strong>SEDIMENT IMPACTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment sampling undertaken to date representative of total dredge material/area</td>
<td>EPA DPI-Fisheries</td>
<td>Section 9.2</td>
</tr>
<tr>
<td>Sediment quality of Twofold Bay and contamination of sediments with TBT will impact waste classification of dredge material</td>
<td>EPA</td>
<td>Section 9.2</td>
</tr>
<tr>
<td>Topic</td>
<td>Responsible Party</td>
<td>Section</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>What happens if the dredge plume behaves different to predictions in models</td>
<td>OEH</td>
<td>Section 9.2</td>
</tr>
<tr>
<td>Sediment transport modelling</td>
<td>DPI-Fisheries</td>
<td>Section 9.2</td>
</tr>
<tr>
<td><strong>WATER QUALITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composition of sediment, turbidity levels during dredging, dispersal patterns and settling times and how this will impact on receiving waters and sensitive receivers</td>
<td>EPA, OEH</td>
<td>Section 9.1, Section 9.12</td>
</tr>
<tr>
<td>Impacts on ambient water quality resulting from dredging and construction activities</td>
<td>EPA</td>
<td>Section 9.1, Section 9.2, Section 9.3</td>
</tr>
<tr>
<td>Water quality monitoring plan</td>
<td>DPI-Fisheries</td>
<td>Section 9.1, Section 9.10, Section 9.12</td>
</tr>
<tr>
<td><strong>AQUATIC ECOLOGY IMPACTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential dredge plume impacts, including on marine mammals and Eden Sea Farms</td>
<td>Bega Valley Shire Council, DJ-Lands, Eden Sea Farms</td>
<td>Section 9.3</td>
</tr>
<tr>
<td>Potential siltation of sea grass beds</td>
<td>OEH</td>
<td>Section 9.3</td>
</tr>
<tr>
<td>Cumulative impacts on the Twofold Bay ecosystem resulting from the Project and the proposed Cattle Bay Marina</td>
<td>OEH</td>
<td>Section 9.3</td>
</tr>
<tr>
<td><strong>DREDGING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method and impact of dredging and transport of dredge material</td>
<td>DPI-Fisheries</td>
<td>Section 4.2.1</td>
</tr>
<tr>
<td>Dredge disposal</td>
<td>DPI-Fisheries</td>
<td>Section 4.2.2</td>
</tr>
<tr>
<td><strong>NOISE IMPACTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise and vibration impacts during construction and operation</td>
<td>EPA, Local residents</td>
<td>Section 9.6</td>
</tr>
<tr>
<td>Acoustic impacts on marine species</td>
<td>OEH</td>
<td>Section 9.3</td>
</tr>
<tr>
<td><strong>AIR QUALITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential emissions from cruise ships – types of fuels and how these will be managed to protect local air quality and amenity</td>
<td>EPA, Local residents</td>
<td>Section 9.7</td>
</tr>
<tr>
<td><strong>OTHER LOCAL AMENITY IMPACTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours of operation and number of visitors</td>
<td>Local residents</td>
<td>Section 5.2.1</td>
</tr>
<tr>
<td>Management of the wharf</td>
<td>Local residents</td>
<td>Section 10.5.4</td>
</tr>
<tr>
<td>Marine exclusion zones – impacts on southern side of multi-purpose jetty</td>
<td>Port of Eden Stakeholders Forum</td>
<td>Section 5.1.2</td>
</tr>
<tr>
<td>Impact of the Project on existing swing moorings and need for relocation</td>
<td>Port of Eden Stakeholders Forum, DI-Lands, RMS</td>
<td>Section 5.1.2</td>
</tr>
<tr>
<td>Nets to be removed from hardstand area adjoining the breakwater</td>
<td>Port of Eden Stakeholders Forum</td>
<td>Section 5.1.2</td>
</tr>
</tbody>
</table>

**TRAFFIC AND PEDESTRIAN IMPACTS**

| Changes in traffic and pedestrian flows | Port of Eden Stakeholders Forum | Section 9.5 |
| Uneven pavement around T-jetty and Old Co-op | Port of Eden Stakeholders Forum | Section 5.2.3 |
| Increased visitation from cruise line companies | Port of Eden Stakeholders Forum, Cruise Eden, Carnival Australia and Local residents | Section 9.5 |

**WASTE MANAGEMENT**

| Waste generation, classification and management, including appropriate use/disposal of dredge material | EPA | Section 4.2.2  
| Section 5.1.3  
| Section 9.18 |

**NATIVE TITLE**

| Licence to be granted under the Crown Lands Act 1989 over “waters” as defined in the Native Title Act 1993 | DI Lands | Section 9.1.4 |

**UTILITIES**

| Repairs and upgrade work | Port of Eden Stakeholders Forum, Eden Wharf Project Potential Users Workshop | Section 9.17.1  
| Water and sewer servicing strategy | BVSC | Section 9.17.1 |

**APPROVALS**

| Amendment to existing Sea Dumping Permit required – increased dredge volume | Planning Focus Meeting | Section 6.1.2  
| New EPBC Referral required – increased project scope | Planning Focus Meeting | Section 6.1.1  
| Environment Protection Licence required – Water Based Extraction | Planning Focus Meeting | Section 6.2.3  
| Part 7 Fisheries Permits – notification only | Planning Focus Meeting | Section 6.2.5 |

The Department is committed to continuing the established high level consultation and engagement framework with the community and stakeholders throughout the environmental assessment phase of the Project. Further community and stakeholder consultation activities will be undertaken during public
exhibition of the EIS. Such continuity is important to hold the confidence of the participants to facilitate the realisation of this important SSI Project as it will contribute much to the social and economic wellbeing of the local and regional communities. Key consultation activities for the environmental assessment phase of the Project are outlined below.

- **Stakeholder briefings** - Stakeholder briefings with the PCG and CLG would be held to provide updated information and facilitate the opportunity to provide feedback on the EIS.

- **Letterbox drop** - Pre-lodgement community engagement activities would include a letterbox drop to all commercial and residential receivers within close proximity of the Project. Feedback on the Project would be encouraged via the Department's email and website.

- **Community information** - Public exhibition of the EIS would be conducted for a minimum of 30 calendar days in accordance with statutory requirements. Advertisements would be placed by DP&E in newspapers to advise of the public exhibition and where the EIS can be viewed and how to make a submission. The Department will also issue a media release, publish the EIS on their website and hardcopies of the EIS will be sent to all libraries within the BVSC LGA.
8 Identification of Key Issues

The EIS addresses key issues in relation to the Project. These key issues were identified through two primary methods: adherence to the SEARs issued for the Project; and an environmental risk analysis. These methods are described in Section 8.1 and Section 8.2 respectively.

8.1 Secretary’s Environmental Assessment Requirements

The SEARs issued by D&PE on 26 July 2016 identified the following key issues to be addressed in the environmental assessment for the Project:

- Water - Quality
- Biodiversity
- Air Quality
- Noise and Vibration – Amenity
- Noise and Vibration – Structural
- Health and Safety
- Socio-economic, Land Use and Property
- Protected and Sensitive Lands
- Water – Hydrology
- Heritage
- Soils
- Transport and Traffic
- Visual Amenity
- Waste and Chemicals
- Climate Change Risk
- Environmentally Sensitive Design

The above key issues have been assessed in Section 9 of this EIS.

8.2 Environmental Risk Analysis

In addition to the SEARs, an Environmental Risk Analysis was carried out for the Project to identify potential environmental impacts associated with construction and operation of the Project. The Environmental Risk Analysis also considered the proposed mitigation and management measures and any residual risks following their implementation.

The Environmental Risk Analysis process for the Project involved the following steps:

- Identify Project risks.
- Evaluate, analyse and prioritise risks into broad categories (i.e. extreme, high, medium and low risks), based on the likelihood of the risk occurring, and the consequences if it were to occur.
- Assess and treat critical risks – treatment can include actions to reduce either the likelihood or the consequences or both, the off-loading of risks to another party more suitable to accept such risks, or the acceptance and on-going management of a risk.
- Identify opportunities by focusing on the possible additional benefits that could be extracted from the Project.

The purpose of the Environmental Risk Analysis was to ensure that:

- Potential environmental hazards and the risks associated with the Project are identified, prioritised and assessed.
- Mitigation actions needed to prevent or control environmental incidents are determined.
Appropriate documented procedures are planned and developed as required.

A risk register was developed to document the Environmental Risk Analysis and present the identified Project hazards (impacts), their consequence, likelihood and risk severity. The following risk tables (Table 8-1, Table 8-2, Table 8-3 and Table 8-4) were used to classify the consequence and likelihood of each hazard and to calculate the risk severity.

Table 8-1 Environmental Risk Analysis consequence categories

<table>
<thead>
<tr>
<th>Safety and Health</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First aid case.</td>
<td>Minor injury, medical treatment case with/or restricted work case.</td>
<td>Serious injury or lost work case.</td>
<td>Major or multiple injuries permanent injury or disability.</td>
<td>Single or multiple fatalities.</td>
</tr>
<tr>
<td>Financial</td>
<td>&lt;$100,000</td>
<td>$100,000 to $500,000</td>
<td>$500,000 to $5M</td>
<td>$5M to 10M</td>
<td>&gt;$10M</td>
</tr>
<tr>
<td>Schedule Slippage</td>
<td>&lt; 3 days</td>
<td>3 days to 1 week</td>
<td>1 week to 1 month</td>
<td>1 to 6 months</td>
<td>&gt; 6 months</td>
</tr>
<tr>
<td>Project Impact</td>
<td>Impact can be absorbed through normal activity.</td>
<td>An adverse event which can be absorbed with some management effort.</td>
<td>A serious event which requires additional management effort.</td>
<td>A critical event which requires extraordinary management effort.</td>
<td>Disaster with potential to lead to collapse of the project.</td>
</tr>
</tbody>
</table>

Table 8-2 Environmental Risk Analysis likelihood categories

<table>
<thead>
<tr>
<th>Rare</th>
<th>Unlikely</th>
<th>Moderate</th>
<th>Likely</th>
<th>Almost Certain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly unlikely to occur on this project</td>
<td>Given current practices and procedures, this incident is unlikely to occur on this project</td>
<td>Incident has occurred on a similar project</td>
<td>Incident is likely to occur on this project</td>
<td>Incident is very likely to occur on this project, possibly several times</td>
</tr>
</tbody>
</table>
Table 8-3 Environmental Risk Analysis risk matrix

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Consequence</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Certain</td>
<td></td>
<td>H</td>
<td>H</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Likely</td>
<td></td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Unlikely</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>E</td>
</tr>
<tr>
<td>Rare</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

Table 8-4 Environmental Risk Analysis severity ratings

<table>
<thead>
<tr>
<th>Risk Severity Rating</th>
<th>Priority (1 is highest)</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>E- Extreme</td>
<td>1</td>
<td>Immediate attention</td>
</tr>
<tr>
<td>H- High</td>
<td>2</td>
<td>Immediate attention</td>
</tr>
<tr>
<td>M- Moderate</td>
<td>3</td>
<td>Action as soon as practicable</td>
</tr>
<tr>
<td>L- Low</td>
<td>4</td>
<td>Low priority, possibly no action required</td>
</tr>
</tbody>
</table>

The Environmental Risk Analysis identified the following key risks for the Project:

- Water quality
- Aquatic ecology
- Terrestrial ecology
- Noise and vibration

These key risks are addressed in Section 9 of the EIS. The risk register developed to document the outcomes of the Environmental Risk Analysis is provided at Appendix C.