Form

Referral of a proposal under s. 38 of the EP Act

PART A: PROPONENT AND REFERRER INFORMATION AND PROPOSAL DESCRIPTION			
Referrer information			
Who is referring this proposal?		✓ **Proponent** ☐ Decision-making authority ☐ Community member/third party	
Name (print) Petrus Wilhelmus Boere *Name of the person or organisation referring*		**Signature** 	
Position	Director	Organisation	Boskalis Australia Pty Ltd
Email	peter.boere@boskalis.com	Phone	041 998 7158
Address	Street No.: Suite 1, Level 3, 9	Street Name: Havelock Street	
	Suburb: West Perth	WA	6005
Date	30 August 2024		
Does the referrer request that the EPA treat any part of the proposal information in the referral as confidential? *Provide confidential information in a separate attachment.*		☐ Yes ☐ No	
Does the referrer confirm that they consent to receive correspondence electronically?		☐ Yes ☐ ~~No~~	
Referral declaration for proponent and Authorised representative: I, Peter Boere, declare that I am authorised to refer this proposal on behalf of Boskalis Australia Pty Ltd (BKA) and further declare that the information contained in this form is true and not misleading. Date: 30 August 2024			
Proponent information			
Name of the proponent/s *Include Trading Name if relevant*		Boskalis Australia Pty Ltd (BKA)	
Australian Company Number(s) ✓ **OR** Australian Business Number(s) ☐		ACN 099 738 333	
Pre-referral discussions			
Have you had pre-referral discussions with the EPA (including the EPA Services of DWER)? *If so, provide name, date, and overview of discussions.* ☐ Yes See below. ☐ ~~No~~ Two pre-referral meetings have been held with DWER:			

- 21 April 2023: Two DWER reps (Tania Liaghati & Capri Beck) attended a joint State regulators' meeting at the BKA office in Perth (along with reps from DPIRD Fisheries and DPLH). The DWER reps provided very clear advice on the EP Act assessment process, relevant WA EIA Guidelines and issues that BKA needs to consider and address.

- 16 May 2024: The BKA General Manager and consultant provided a progress briefing to DWER EIA-North staff (Capri Beck and Sara Jupp) via Teams meeting. The DWER reps provided advice and guidance on key issues that BKA should address thoroughly in the EP Act referral.

There has also been on-going email comms from the BKA consultant keeping the DWER reps informed of progress with field studies etc.

Proposal information

Proposal name: Boskalis Cambridge Gulf Marine Sand Proposal

What is the proposal? (Include general description in the *Instructions and template: How to identify the content of a proposal)*

Pls refer Figure 1 - Location Map attached.

This is a brief summary of the proposal only - pls refer Proposal Content Document for details, as well as the List of Supporting Documents (Referral Reports) below.

1. Boskalis Australia Pty Ltd (BKA) is assessing the feasibility of developing a marine sand sourcing operation in Cambridge Gulf (CG) near Wyndham in the northeast of Western Australia (WA) (Figure 1 attached). The sand in CG is derived from natural terrestrial sources via river inputs. The sand would be exported to Asian markets for use in construction projects. In proposing CG, BKA has screened alternatives as outlined in Referral Report No. 4 - *Impact Assessments* (BKA 2024d) and summarized in the section on alternatives below.

2. The proposal is subject to the WA *Mining Act* including the comprehensive environmental assessment and management framework under that Act. BKA currently holds two exploration tenements in CG, E80/5655 and E80/6009 as shown on Figure 1 attached. These are referred to by BKA as Blocks 4 and 4A respectively. Based on sand distribution, the proposed operational area where BKA proposes to apply for a mining tenement is the western part of Block 4 and all of Block 4A as shown on Figure 1 attached.

3. To support its feasibility assessment BKA has undertaken a wide range of environmental, engineering, economic and other studies since 2018. These studies find that the proposal is feasible and viable and unlikely to cause significant environmental impacts, as defined under the WA *Environmental Protection Act* (EP Act) and the Commonwealth *Environmental Protection & Biodiversity Conservation Act* (EPBC Act). The findings of these studies in terms of State (WA) impact assessments are presented in Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

4. See also Referral Report No. 7 - *Commonwealth Protected Matters* (BKA 2024f) which assesses MNES and other matters under the EPBC Act.

5. Despite the low likelihood of significant environmental impacts, as a responsible company with stringent environmental and social policies, BKA has committed to self-referring the proposal to the WA Environmental Protection Authority (EPA) under section 38 of the EP Act, and to the Commonwealth under Part 7 of the EPBC Act, for their determination of what further environmental assessments might be required, if any. If it is determined that assessment is required under both Acts, BKA will seek a joint process under the WA environmental assessment system, which is accredited by the Commonwealth.

6. Key specifications relating to the proposal include:

    a) Project lifespan: Up to 15 years from commencement of operations.

b) Zero coastal or land-based development: The proposal does not involve the construction and operation of any shore-based facilities and does not involve the alteration of the coastline in any way. It will be a 100% vessel-based marine operation.

c) Marine area: The proposed operational area is located in the central part of the main body of CG where there is a significant seabed sand resource, covering an area of ~100 km^2 as shown on Figure 1 attached. Water depths within the area average -25 m MSL. The seabed within and around the proposed operational area comprises highly-dynamic sand-waves with very little biota and no significant benthic communities, due to the constantly moving substrate, strong tidal currents (>1.5 m/s), constantly high suspended sediments and permanent lack of benthic light (see Referral Reports No.s 2, 4 and 5).

d) Single vessel: The proposed operation will involve a Sand Production Vessel (SPV) based generally on the design of a large Trailer Suction Hopper Dredger (TSHD) (Figure 2 attached). It will be an internationally-registered vessel subject to all relevant regulatory requirements of the International Maritime Organization (IMO) and the Australian Maritime Safety Authority (AMSA). While design is conceptual at this stage, indicative specifications are Length Overall (LoA) of ~350 m, draft of ~19 m, sand capacity 75K m^3 to 125K m^3 and crew of ~25.

e) Zero activity in CG for 86% of time: The SPV will self-load sand in CG for one to two days every two weeks. It will then sail to the sand delivery port in Asia and return to CG two weeks later to repeat the cycle. This means that the SPV will only operate in CG for 52 days per year, or 14% of the time. There will be zero operational activity in CG for 86% of the time during the project's lifespan of up to 15 years. There will be no refuelling or waste discharges in CG.

f) Sand volumes: Exploration surveys indicate that there is a minimum of 300 million m^3 of sand in the proposed operational area and likely several times more. There are several orders of magnitude higher volumes of sand throughout CG overall. It is proposed to export up to 70 million m^3 of sand. This is a maximum of only 23% of the minimum volume of 300 million m^3 of sand estimated to occur in the proposed operational area, and a much smaller % of the volume of sand that occurs throughout CG overall.

g) Low footprint each loading cycle: During each one- to two-day sand loading cycle, the SPV will work over an area of ~0.5 km^2 within the proposed operational area, with a drag-head width of ~6 m. The SPV will remove a layer of approximately 40 cm of sand from the seabed during each loading cycle.

h) End of project seabed condition: At the end of the 15-year project timeframe, if the proposed 70 million m^3 of sand is exported, the area within the proposed operational area will be on average <1m deeper than the pre-project seabed. It will still comprise sand with similar seabed morphology, dynamics and habitat features as before sand sourcing (see Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 20241, b & c)).

i) No significant environmental impacts: Overall, due to the above factors and other factors as assessed in Referral Report No. 4 - *Impact Assessments* (BKA 2024d), and with the implementation of best-practice impact avoidance, prevention, minimization, mitigation, management and monitoring measures, BKA assesses that the proposal is unlikely to cause significant environmental impacts. If the proposal proceeds, BKA will seek to support research and monitoring initiatives to improve environmental protection and biodiversity conservation in the area, in cooperation with relevant stakeholders including TOs (see Referral Report No. 4).

j) Economic benefits & TO support: The proposal will generate a range of economic benefits, including payment of State royalties, payment of voluntary royalties to TO groups, up to 40-50 local jobs, service contracts and business opportunities with priority focus on TOs, and support for local Indigenous Ranger groups and community development. Both TO groups in the area, Balanggarra and Miriuwung-Gajerrong, have issued letters of support for the proposal (included as Annexes to Referral Report No. 3 - *Traditional Owner Matters*, BKA 2024c).

7. Subject to the outcome of the WA EP Act and Commonwealth EPBC Act referral processes, if appropriate BKA plans to apply to the WA DEMIRS to convert the two Exploration Tenements to a single Mining Tenement as per the proposed operational area shown on Figure 1 attached.

Have you provided electronic spatial data, maps, and figures in the appropriate format?

☐ Yes A wide range of supporting maps are included in the attached Proposal Content Document and in the supporting technical Referral Reports (see List of Supporting Documents below), and all electronic spatial data and all other relevant data will be included in the IMSA package submission.

What type of proposal is being referred? *For significant amendment or derived proposal, provide the associated existing Ministerial statement number/s* *For a proposal under an assessed planning scheme, provide the scheme number and name*	☐✓Significant proposal*. *Choose which type of significant proposal* ☐✓new proposal ☐ significant amendment (proposal only) ☐ significant amendment (conditions only) ☐ significant amendment (proposal and conditions) ☐ strategic proposal ☐ derived proposal ☐ proposals of a prescribed class ☐ proposal under an assessed planning scheme *Note: While 'significant proposal' is ticked, the studies commissioned by BKA as presented in the supporting Referral Reports (refer List of Supporting Documents below), indicate that the proposal is unlikely to cause 'significant' impacts as defined under the WA EP Act (or the Cmwlth EPBC Act). However, in accordance with its stringent corporate environment and social policy, BKA has elected to self-refer the proposal under both the EP Act and EPBC Act.

Proposal content*: Complete the corresponding template (Proposal Content Document) from the Instructions and template: How to identify the content of a proposal for the type of proposal identified above. The completed form* ***must be*** *submitted with the referral.*

Please refer the Proposal Content Document as submitted with this Referral.

Alternatives

Please see Referral Report No. 4 - *Impact Assessments*, section on *Assessment of Alternatives*.

1. Currently most construction sand in Australia comes from land-based sources, which can cause relatively high environmental impacts including clearing of terrestrial vegetation and habitat, impacts on terrestrial fauna, potential impacts on freshwater courses and groundwater, high aesthetic impacts, high rehabilitation costs with mixed success rates, and high transport cost and carbon footprint including reliance on trucking and a need for multi-handling.

2. BKA is seeking to develop marine sands as a more sustainable alternative to land-based sands, because:

    a) there is no requirement to clear vegetation/habitat,
    b) there are no impacts on freshwater courses or groundwater,
    c) there are no aesthetic impacts,
    d) there is natural replenishment from catchment sources; and
    e) there are much lower transport cost and carbon footprint through the use of a marine vessel with no need for multi-handling.

3. BKA has undertaken a screening of potential alternative marine sand sites including:

    a) Other potential sites across the north of WA such as, from west to east; Admiralty Bay, Vansittart Bay, Napier Broome Bay and Unsurveyed Bay, as shown on Figure 3 attached. These were screened out as they have lower suspended sediment regimes / clearer water and more significant environmental values including coral and seagrass communities, which are not present in CG (the Balanggarra people referred

to CG as 'brown water country' and the coastal waters west of CG as 'blue water country' – BKA wishes to avoid blue water country).

b) Blocks 1, 2, 2A and 3 offshore from CG as shown on Figure 4 attached. Based on analysis of existing data, Blocks 1 and 3 appear to have very significant sand resources, but were screened out as they are in the Commonwealth Joseph Bonaparte Gulf Marine Park, as was Block 2. While sand sourcing can be permitted in the Multiple Use Zone Marine Park subject to assessment and conditions, as an environmentally-responsible company BKA prefers not to seek to undertake developments in protected areas where suitable alternatives exist.

4. Block 2A is outside of the Commonwealth Marine Park but was screened out as, based on analysis of existing data, it does not appear to have a significant sand resource.

5. There are also two possible alternative sand sources in the immediate vicinity and to seaward of CG as shown on Figure 5 attached:

   a) King Shoals on the western side; and
   b) Medusa Banks on the eastern side.

6. Based on analysis of existing data both of these areas contain sand resources that are likely to be orders of magnitude greater than within CG.

7. However, despite its abundant sand resource, King Shoals were screened out as they are located within a Sanctuary Zone of the State North Kimberley Marine Park (even though benthic surveys indicate that they do not support significant benthic communities – see Referral Report No. 2).

8. Medusa Banks were screened out as they are located immediately offshore from the Cape Domett turtle nesting beach and protecting that beach is an extremely high priority for BKA.

9. The screening process has therefore arrived at Blocks 4 and 4A within CG, equating to DEMIRS Exploration Tenements E80/5655 and E80/6009, as being the preferred site. Benefits of the site within CG include:

   a) There is a very significant sand resource in CG with ongoing natural inputs from the catchment.

   b) There is an existing operational port at Wyndham with commercial shipping traffic through CG, whereas alternatives are 'greenfield' sites with no existing operational activity.

   c) There is very low potential for impacts on other uses and users of the area, as there is very limited use of CG by other marine users, including:

      – only one active gillnet fisherman (currently not active and supportive of the proposal),

      – a focus of recreational fishing on areas near the coast and up inlets, and not in the proposed operational area where strong currents make conditions unworkable for fishing (the sector has been consulted and is not concerned about the proposal); and

      – no tourism sector in CG (although cruise vessels do pass through CG to access the Port of Wyndham for fuelling and resupply, and there are two recreational fishing tour operators based in Wyndham, who target upstream areas and whos' vessels are not certified to operate in CG).

   d) The area is highly dynamic with strong tidal currents (up to 4 knots or >2 m/s), a constantly moving seabed, a permanently dark aphotic resuspension layer at the seabed, and extremely high natural suspended sediment and turbidity levels

e) Due to the extreme environmental conditions the area does not host sensitive benthic ecological communities including coral reefs, seagrass beds, sponge beds, macroalgae communities etc, so there is no potential to impact on such communities.

f) Due to the extreme environmental conditions the sand in the proposed operational area and seabed sediments through CG support very low abundance and diversity of very small benthic invertebrates. Most benthic grab samples from sand areas returned no biota at all with sieving to 500 microns, and some samples from non-sand areas returned small numbers of small hydroids attached to small rocks and some other small invertebrates (see Referral Report No. 2).

10. *Overall, the proposed site in CG is the better option over the assessed alternatives in terms of comparative net environmental outcomes.*

PART B: ASSESSMENT OF ENVIRONMENTAL IMPACTS

Environmental factors

What are the likely significant environmental factors for this proposal?	NOTE: While the ticked environmental factors are relevant to the proposal – impact assessment as outlined in the supporting Referral Reports indicates that the proposal is unlikely to cause significant impacts on any of them. See also tables below for each environmental factor. ✓ Benthic Communities and Habitats ✓ Coastal Processes ✓ Marine Environmental Quality ✓ Marine Fauna ☐ Flora and Vegetation (terrestrial) [no land-based elements] ☐ Landforms [no land-based elements] ☐ Subterranean Fauna [no land-based elements] ☐ Terrestrial Environmental Quality [no land-based elements] ☐ Terrestrial Fauna [no land-based elements] ☐ Inland Waters [no land-based elements] ✓ Air Quality ☐ Greenhouse Gas Emissions [proposal does not meet EPA trigger of 100,000 tonnes/year CO_2e] ✓ Social Surroundings ☐ Human Health [area is uninhabited & no harmful emissions]

*For **each** of the environmental factors identified above, complete the following table, or provide the information in a supplementary report*

Potential environmental impacts – for each environmental factor

See below for each relevant Environmental Factor.

These are summaries only, with full details provided in the supporting Referral Reports as cited.

Environmental factor: Benthic Communities & Habitats (BCH)

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline - Benthic Communities & Habitats.
- EPA 2016, Technical Guidance - Protection of Benthic Communities & Habitats.
- EPA 2021, Technical Guidance - Environmental Impact Assessment of Marine Dredging Proposals.

2. Receiving environment

1. For detailed description of BCH in the LAU, including detailed description of the methods used to assess and map BCH - see Referral Report No. 2 - *Proposal Setting & Existing Environment Descriptions* (BKA 2024b).

2. Refer Figure 5 attached – which is based on the BCH map developed for the Local Assessment Unit (LAU).

3. Refer also Table 1 attached – which addresses each of the eight steps for assessing BCH outlined in *EPA 2016 Technical Guidance - Protection of BCH.*

4. A brief summary of the Receiving Environment for BCH is as follows:

   a) LAU: BKA has adopted a very large LAU that covers a marine area of ~2,850 km^2, very significantly larger than a typical 50 km^2 LAU referenced in the EPA Technical Guidance. This does not in any way imply potential for impacts throughout the area, but reflects BKA's conservatively precautionary approach to assessment, ensuring that all relevant environmental resources and values of the general area are included. As shown on Figure 5 attached, the LAU is centred on the proposed operational area and includes:
      - all coastal and marine areas within the main body of CG,
      - all of the coasts of Adolphus Island at the southern end of the main body of CG,
      - all of the coasts of Lacrosse Island at the entrance to CG,
      - the complex of mangrove-lined inlets and on the eastern side of CG known as the False Mouths of the Ord and part of the Ord River Floodplain Ramsar Wetland,
      - the three mangrove-lined rivers on the western side of CG, from north to south the Helby, Lyne and Thompson Rivers,
      - seaward to include the part of the State North Kimberley Marine Park located just offshore from CG,
      - east along the coastline outside of CG to include the beaches east of Cape Domett; and
      - west along the coastline outside of CG to include the beaches west of Cape Dussejour.

   b) Limiting environmental conditions: The marine environmental conditions in CG are extreme and are not conducive to colonization and survival of benthic organisms, which inhibits the development of significant benthic communities apart from mangroves. Inhibiting conditions are primarily driven by the peak spring tidal range of 8 m, which creates extremely strong tidal currents, which in turn drive other inhibiting environmental conditions. These include very high suspended sediment concentrations, turbidity levels and a permanent aphotic zone at the seabed with zero to near-bed benthic light, due to constant suspension of seabed sediments. The nature of the seabed substrate in CG is also a significant inhibiting factor for benthos. The seabed substrate almost entirely comprises highly mobile sand and mixtures of clay, silt, sand, gravel and/or shell-grit. These substrates are unstable and are constantly moved by the strong tidal currents, and are therefore not suitable for settlement and colonization by sessile benthos, such as corals, sponges, sessile bivalves and oysters, and macro-algae. Increased freshwater inputs with high suspended sediment loads to CG during the wet season is also a major inhibiter of marine benthic biota.

   c) Lack of seagrass, coral, sponge, macroalgae & other primary producer communities: Due to the extreme environmental conditions outlined above, CG does not host significant primary producer communities in the form of seagrass beds, coral reefs, sponge beds, macroalgae communities etc. This was a key factor for BKA in selecting CG in the alternatives screening process.

   d) BCH in the proposed operational area (POA): The POA covers 100 km^2 in the centre-west of the main body of CG as shown on Figure 1 attached. Approx. 75 km^2 (75%) of the POA comprises seabed sand habitat, which is

the subject of BKA's sand-sourcing proposal. These areas comprise large mobile dunes with seabed sand waves, aligned SSW to NNE parallel with the flood and ebb tidal currents. The sand waves have vertical heights ranging from 1 to 8 m and horizontal wavelengths of between 50 and 200 m. Repeat hydrographic surveys measured horizontal migration of the sand waves over distances of up to 10 m in just 27-days over a lunar tidal cycle, from SSW to NNW. This highly dynamic nature of the seabed sand habitat, along with aphotic seabed conditions, inhibits benthos. Most sand samples from BKA's comprehensive benthic grab sampling program returned no biota after sieving to 500 microns, and any biota that was found in sand substrate mainly comprised small amphipods, isopods and brachyurans. The remaining 25% of the POA (the deeper gullies between the sand dunes), comprises various mixtures of clay, sand, shell-grit, gravel and pebbles/small rocks. The main benthic biota in these areas comprises small hydroids and other small organisms attached to pebbles/small rocks. The POA does not support any significant benthic biota or communities.

Mangroves (~350 km^2 / 11.2% of LAU): Mangroves are the most ecologically significant benthic community in CG, although the only cover 11.2% of the marine area in the LAU. They comprise a relatively thin band along most of the coastline inside CG, backed by extensive mudflats and salt-flats to landward. The mangrove communities in CG are naturally dynamic, expanding and contracting in area over decades, including under the influence of tropical cyclones. There has been an expansion of mangroves in the Lower Ord River since 1971, due to increased siltation from damming of the Ord River upstream, which has reduced wet-season flushing in the Lower Ord (Semeniuk 2000 & Wolanski et al. 2001 & 2004).

e) Intertidal mudflats and salt-flats (~602.5 km^2 / 19.2% of LAU): Most of the mangrove areas in CG are backed by extensive mudflats and salt-flats. Both areas are combined as 'intertidal flats' shown in white on the BCH map (Figure 5 attached). They cover a combined area of. These areas are inundated by seawater on spring high tides and partially dry out and are exposed to the sun on spring low tides. They are extremely barren with limited patches of salt-tolerant grasses and succulents (samphire) around their edges and on slightly higher parts of the flats.

f) Intertidal rocky shore & rock platforms (~4.6 km^2 / 0.15% of LAU): There are very few areas of intertidal rock habitat in CG, with patches at the two Capes either side of the entrance be to CG, around Lacrosse Island and at a few rocky points inside CG. These areas are largely devoid of benthic biota, due to the extreme environmental conditions. The most significant biota found during BKA's surveys were turf algae and tidal bands of barnacles on the rock platforms on the seaward side of the two capes and Lacrosse Island.

g) Intertidal cobble & boulder substrate (~0.57 km^2 / 0.02% of LAU): There is intertidal cobble and/or boulder beach substrate along parts of the southern coast and at the eastern tip of Lacrosse Island, and also at Nicholls Point on the northern tip of Adolphus Island. No evidence of benthic communities or biota was observed on these areas by high-res aerial drone photo and video surveys at low tide, with habitat suitability limited by the extreme environmental conditions of the area.

h) Intertidal sand substrate (~73 km^2 / 2.3% of LAU): There are expansive areas of intertidal sandflats along the coast and adjacent to the coast in CG. Detailed analysis of the drone imagery and the observations during the ground surveys did not identify any evidence of seagrass or other benthos on these intertidal banks. Habitat suitability is limited by the highly dynamic nature of the sand substrate and the extreme environmental conditions of the area, with strong tidal currents and high natural turbidity.

i) Subtidal sand substrate (~356 km^2 / 11.4% of LAU): Includes the subtidal sand-substrate in the proposed operational area as summarized above. There are also extensive areas of subtidal sand-substrate throughout the LAU, as shown on the BCH map in Figure 5 attached. These areas doe not support significant benthic communities or biota as outlined for the proposed operational area above.

j) Mixed clay, sand & gravel substrate (~1,460 km^2 / 47% of LAU): This is the most common benthic habitat, comprising 47% of the LAU, including 25% of the POA (as outlined above). These areas do not support significant benthic communities or biota, mainly small hydroids and other small organisms attached to pebbles/small rocks, as outlined for the POA above.

k) Rocky seabed (~3.51 km^2 / 0.1% of LAU): There is a small area of rocky seabed habitat between Cape Dussejour and Fathom Rock near the western entrance to CG. Benthic grab sampling indicates that this area supports a higher abundance and diversity of benthic organisms than other parts of CG, as the rocky seabed provides a better substrate for attachment of these organisms than the predominant mobile sediment areas.

3. Likely environmental impacts

1. For detailed assessment of potential impacts on BCH - see Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. Referral Report No. 4 includes an assessment of potential impacts on BCH against the EPA significant impact criteria outlined in EPA's *Statement of Environmental Principles, Factors & Objectives* (EPA 2018).

3. Refer also Table 1 attached – which addresses each of the eight steps for assessing BCH outlined in *EPA 2016 Technical Guidance - Protection of BCH.*

4. A brief summary of the assessment of potential impacts on BCH follows.

Potential impacts on primary producer / significant benthic communities:

1. As outlined above there is a lack of primary producer / significant benthic communities in CG, such as coral, seagrass, sponge and macroalgae communities, due to permanent lack of light at the seabed, lack of stable hard substrate and constant movement of seabed sediments under the influence of strong tidal currents.
2. There is therefore no potential for impacts from the operation on such communities, which is one of reasons that BKA selected CG in the screening process.
3. As outlined above, ecologically the most significant primary-producer benthic community in the LAU is the mangroves that line the coast, inlets and rivers of CG. These will not be directly affected by the proposed operation, which does not involve the construction and operation of any shore-based facilities and does not involve the alteration of the coastline in any way.

Direct (but temporary) impacts on BCH within the proposed operational area:

1. The main direct impact of the proposed operation on benthic habitat will be the physical removal of sand from within the proposed operational area. As outlined above the sand in this area is largely devoid of benthic biota, due to permanent lack of light at the seabed, lack of stable hard substrate and constant movement of the sand under the influence of strong tidal currents.
2. Removal of sand which contains almost no benthic biota will therefore not cause significant impacts on the benthic community.
3. The very few small benthic organisms that were found to be present in sand areas (amphipods, isopods, brachyurans etc) exist in a highly dynamic, constantly moving substrate. Any organisms removed with the sand will be a temporary impact as the area will be will rapidly recolonized including sand migration from immediately adjacent areas (the SPV will not remove all of the sand from any area, and each run will vacuum only approximately 40 cm from the sand surface).
4. As outlined under the section on Coastal Processes below, at the end of the 15-year project timeframe, if the proposed 70 million m^3 of sand is exported, the sand area within the proposed operational area will be on average <1m deeper than the pre-project seabed, and it will still comprise sand with similar seabed morphology and thus the same habitat features (dynamic sand waves formed and constantly moved by the prevailing hydrodynamics).
5. The proposed operation will not cause any other direct impacts on benthic communities and habitats.

Potential indirect impacts on BCH - sediment plumes & application of ZoHI, ZoMI & ZoI:

1. Potential indirect impacts on benthic communities and habitats include the generation and dispersal of sediment plumes by the operation, which could potentially impact on benthic communities through sedimentation and reduction in light reaching those communities through increased turbidity.
2. However, as turbidity levels in CG are extremely high naturally and there is a permanent aphotic zone near the seabed throughout CG, due to the constant suspension of seabed sediments by tidal currents, there are no sediment-sensitive benthic communities in or near CG such as coral, seagrass, sponge and macroalgae

communities. There is therefore no potential for impacts from sediment plumes from the operation on such communities.

3. Never-the-less, despite the lack of sediment-sensitive benthic communities that might be impacted, in assessing the potential impacts of sediment plumes BKA has applied and followed the *EPA Technical Guidance on Environmental Impact Assessment of Marine Dredging Proposals*, including commissioning comprehensive modelling of likely plume generation and dispersal scenarios (see Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 2024a, b & C)).

4. BKA has assessed the application of ZoHI, ZoMI and ZoI to the proposal and finds that they are not relevant or applicable, given the lack of sensitive benthic communities or biota in or near CG, for which biological trigger levels can be set and biological response modelling undertaken.

5. In addition to the lack of sensitive benthic communities in or near CG that might be impacted, potential impacts from sediment plumes from the operation will be very much reduced by the following factors (as reflected in the modelling studies):

    a) The SPV will only operate in CG for one to two days very two weeks, or 52 days per year. There will be zero operational activity in CG for 86% of the time each year.
    b) The constant movement and reworking of the seabed sediments in CG by strong tidal currents cause the sands to be well-sorted with the finer fractions of silt, which cause turbidity, being separated out and mostly kept in suspension (hence the high natural turbidity levels in CG).
    c) The operation will only target the well sorted sand, which does not contain the fine silts that generate most turbidity (the market requires the sand to meet a minimum grain size, so there is no productive value in taking fine material).
    d) There will be no dumping of sediments in CG, as would normally be carried out for a conventional port dredging operation, and which can be a significant source of sediments plumes. In this case the sand will be exported to the destination market port, eliminating dumping as a source of sediment plumes in CG.

6. While not really necessary given the above factors, as an additional precaution the SPV will be fitted with best practice turbidity reduction measures, including a 'green valve' at the overflow water intake and discharge of overflow water at the keel rather than at the gunwale.

Potential indirect impacts on BCH - possible changes to coastal processes:

1. The proposed extraction of up to 70 million m^3 of sand over 15 years could potentially affect the existing sediment dynamics and coastal processes in CG, which could potentially cause indirect impacts on benthic communities - in particular the mangrove communities that line the coast, inlets and rivers of CG.
2. As outlined above the eastern coastline and False Mouths of the Ord appear to be naturally highly dynamic with numerous areas of significant natural erosion and undercutting of mangroves.
3. As outlined under the section on Coastal Processes below, in assessing the potential impacts BKA has followed the *EPA Environmental Factor Guideline on Coastal Processes*, including commissioning comprehensive modelling of likely changes to coastal processes (still underway) (see Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 2024a, b & c)).
4. These studies indicate that the operation is unlikely to cause significant changes to coastal processes, and thus is unlikely to cause significant impacts on mangroves or other benthic communities and habitats.

Potential indirect impacts on BCH - possible marine pollution:

1. When operating in CG the SPV could be a potential source of marine pollution, which in turn could potentially impact on benthic communities (noting that there are no significant benthic communities in CG except for mangroves).
2. Potential vessel-sourced pollution includes possible oily bilge water discharges, sewage discharges, garbage discharges and potential fuel oil spills in the event of an incident such as a grounding or collision with another vessel.
3. The risk of such pollution will be avoided and minimized as follows:

a) The SPV will comply with all relevant requirements of the *International Convention for the Prevention of Pollution form Ships* (MARPOL) and the implementing Australian law - the Commonwealth *Protection of the Sea (Prevention of Pollution from Ships) Act* and related Marine Orders (administered by the Australian Maritime Safety Authority - AMSA).
b) The SPV will not discharge bilge water when in Australian waters, and will comply with MARPOL Annex I requirements for oily-water separators and discharge standards when bilge water is discharged outside of Australian waters.
c) The SPV will not discharge sewage when in Australian waters (it will be kept on-board in holding tanks), and will comply with MARPOL Annex IV requirements for on-board sewage treatment systems and discharge standards when sewage is discharged outside of Australian waters.
d) The SPV will not discharge garbage when in Australian waters or place any garbage ashore in the Port of Wyndham or any other Australian port. All garbage will be kept on-board and managed in accordance with MARPOL Annex V, and discharged to approved port waste reception facilities at the sand destination port (Singapore).
e) The SPV will not undertake any bunkering (fuelling) in Australian waters – eliminating the risk of spills from this potential source (which global statistics indicate is the highest frequency cause of spills).
f) The risk of grounding or collision with another vessel will be addressed through strict compliance with navigational safety requirements of the International Maritime Organization (IMO), AMSA and Kimberley Ports Authority (KPA).
g) The risk of a grounding or collision actually resulting in release of pollution will be addressed in that the SPV will be designed, built and operated in full compliance with MARPOL, including relevant protection of fuel tanks to prevent puncturing.
h) As part of BKA's fleet decarbonisation program, the SPV will be designed for dual-fuel use, allowing adoption of alternative fuels such as methanol as they become viable in future.
i) The SPV will have an IMO- and AMSA-compliant Shipboard Oil Pollution Emergency Plan (SOPEP) and equipment for responding in the highly unlikely event of a spill.

Potential indirect impacts on BCH – introduced marine pests:

1. On each arrival in CG the SPV could potentially introduce marine pest species via ballast water or biofouling, which could potentially cause impacts on benthic communities (noting that there are no significant benthic communities in CG except for mangroves).
2. This risk will be avoided and minimized as the SPV will be equipped with an IMO-compliant ballast water treatment system as required by the Commonwealth *Biosecurity Act* ballast water regulations, and will implement a biofouling management plan with stringent biofouling prevention, management, mitigation and monitoring measures, consistent with the IMO biofouling guidelines and as required by the Commonwealth *Biosecurity Act* biofouling regulations.
3. This risk will be further minimized by the extreme environmental conditions in CG, which are not conducive to colonization by many marine species.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. There are four sequential levels in the WA EPA impact mitigation hierarchy:
    a) Avoid (prevent) impacts.
    b) Minimise (mitigate) impacts.
    c) Rehabilitate impacts.
    d) Offset impacts.

2. Detailed application of the mitigation hierarchy for BCH is presented in Referral Report No. 4 - *Impact Assessments* (BKA 2024d). This includes a detailed table presenting, for each potential impact category:

a) Measures to avoid (prevent) impacts.
b) Measures to minimise (mitigate) impacts.
c) Measures to rehabilitate impacts.
d) Measures to offset impacts.
e) Residual impacts.

3. As outlined above most potential impacts on BCH will be avoided due to:
   a) the lack of sensitive benthic communities in CG (except for mangroves, which will not be impacted),
   b) the nature of the operation with a lack of likely impact-causing mechanisms; and
   c) through the implementation of best-practice impact prevention and minimization measures (e.g. prohibition of discharges from the SPV in Australian waters, strict compliance of the SPV with the IMO and Australian regulatory requirements and standards).

4. Referral Report No. 4 assesses that there will not be any residual impacts on BCH that will require rehabilitation or offsets.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal are outlined in Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a), and also listed in Part C below. These include, *inter alia*:

   a) WA *Mining Act*. This includes the comprehensive environmental assessment and management framework under that Act, including the following DEMIRS requirements, standards and guidelines:
      - *Statutory Guidelines for Mining Proposals 2020.*
      - *Environmental Regulatory Strategy* 2021.
      - *Environmental Objectives Policy for Mining* 2020.
      - *Environmental Applications Administrative Procedures* 2021.
      - *Environmental Group Site (EGS) Details Form.*
      - *Mining Proposal Checklist*.
      - *Stakeholder Engagement activities and outcomes.*
      - *Baseline Environmental Data.*
      - *Environmental Risk Assessment (ERA).*
      - *Environmental Outcomes, Performance Criteria & Monitoring (EOPCM).*
      - *Environmental Management System (EMS).*
      - *Mine Closure Plan (MCP).*

      The ERA, EOPCM and EMS all include application of the impact mitigation hierarchy, as per the EPA priorities.

   b) Other State laws: The proposal is also subject to the WA *Aboriginal Heritage Act*, the *Biodiversity Conservation Act*, the *Conservation & Land Management Act*, the *Fish Resources Management Act*, the *Pollution of Waters by Oil & Noxious Substances Act* and others, all of which follow an impact mitigation hierarchy based on impact avoidance / prevention as the highest priority.

   c) IMO & AMSA regulatory regime: Because the proposal is a 100% marine-based operation that will utilize an international vessel, it is also subject to the international maritime regulatory regime, as administered by the International Maritime Organization (IMO) and implemented in Australia through the Australian Maritime Safety Authority (AMSA). This regime also adopts the impact mitigation hierarchy, prioritizing prevention followed by mitigation then response. In addition to regulatory oversight by AMSA during operations in Australian waters, the SPV will be subject to Flag State Control, Classification Society surveys and Boskalis' internal vessel QA/QC procedures to ensure compliance.

   d) Commonwealth Biosecurity Act: The SPV will be subject to this Act including the ballast water and biofouling regulations under this Act, which are based on the impact mitigation hierarchy. BKA will develop comprehensive biosecurity management plans to ensure compliance.

e) Commonwealth EPBC Act: While studies commissioned by BKA as presented in the supporting Referral Reports indicate that the proposal is unlikely to cause significant impacts on Matters of National Environmental Significance (MNES), in accordance with its stringent corporate environment and social policy, BKA has elected to self-refer the proposal under the EPBC Act, submitted in parallel with this State referral. It remains to be seen if the Commonwealth will designate the proposal as a controlled action under the EPBC Act.

5. Assessment and significance of residual impacts

1. The assessment presented in Referral Report No. 4 indicates that because there are unlikely to be any significant primary impacts on BCH, there are also unlikely to be any significant residual impacts.

6. Likely environmental outcomes

1. As outlined in Referral Report No. 4, the likely environmental outcomes with regard to BCH, both during and at the end of the 15-year project timeframe, are assessed as follows:

   a) There will be no impacts on benthic primary producer communities / sensitive benthic ecological communities in the form of coral communities, seagrass beds, sponge beds, macroalgae communities etc, as these communities are not present in or near CG.

   b) There will be no irreversible loss of benthic communities and habitats in or near CG.

   c) There will be no significant or measurable physical changes to benthic habitats in or near CG.

   d) There will be no significant or measurable changes to biological diversity and ecological integrity of benthic communities in or near CG.

   e) There will be no significant or measurable changes in composition, structure, function and processes of benthic communities in or near CG.

   f) The sand area within the proposed operational area will be on average <1m deeper than the pre-project seabed. It will still comprise sand with similar seabed morphology and thus the same habitat features as pre-project (dynamic sand waves formed and constantly moved by the prevailing tidal currents).

Environmental factor: Coastal Processes

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline - Coastal Processes.

2. Receiving environment

1. For detailed description of Coastal Processes in CG, including detailed description of the methods used to assess Coastal Processes - see Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 2024a, b & c).

2. The main influencing factors on coastal processes in CG are:

   a) The underlying geology and geomorphology of the coast and seabed.

   b) The input of sediments from the surrounding catchment via the various rivers that drain the catchment into CG (see below).

c) The prevailing meteorology, including a dry season from May to October with very little rainfall and prevailing easterly winds, a wet season from November to May with sometimes extreme rainfall and very high terrestrial runoff, more westerly but variable winds, frequent tropical squalls and occasional tropical cyclones.

d) The prevailing hydrodynamics, with CG being primarily a tidally-driven system with a large tidal range of 8 m and measured tidal currents of up to 4 knots (2.06 m/s), plus the effects of waves, including influences from the larger Joseph Bonaparte Gulf offshore from CG.

3. There are five main rivers that discharge sediments into the upstream parts of CG, upstream of Adolphus Island. These are the Durack, Forrest, King, Ord and Pentecost, along with a number of smaller tributaries. The small Helby, Lyne and Thompson Rivers are located on the west coast of the main body of CG. The total catchment area for CG is approximately 87,000 km^2 with 62% of this being the Ord River catchment (DataWA 2023).

4. Except for the Ord River, which has an overall length of 650 km, all of the rivers are quite small, but can have very high, acute, short-term flows during the tropical wet season. The wet season river discharges can vary by orders of magnitude year to year. There is also significant daily variability in river flows, with very high flows following tropical cyclones only lasting a matter of days (Wolanksi et al 2001). As outlined above the rivers all discharge sediment into CG. The supply of sediment varies significantly due to the high variability in river discharges. Peaks in sediment supply occur in the wet season, with limited sediment supply during the dry season (PCS 2024a & b).

5. The rivers supply a combination of sand and fine-grained silt and clay. The sediment deposited in CG is subject to regular reworking by the strong tidal currents, resulting in well-sorted sand which, over time is deposited to form extensive intertidal and subtidal sandbanks.

6. The building of two dams on the Ord River, one near Kununurra and one for the Ord River Irrigation Scheme, has interrupted the supply of sediment to CG from that source, but is also causing significant build-up of sediment in the lower Ord just south of Adolphus Island, due to the lack of wet-season flushing since building of the dams (Wolanksi et al 2001) (PCS 2024a).

7. Consistent with the EPA requirements, BKA assessed the most significant coastal ecosystems and values in CG that are influenced by coastal processes, and which could potentially be impacted by changes in coastal processes. These comprise the following:

    a) Mangroves: The mangrove communities around the entire coast of CG.
    b) Ramsar Wetland: The mangrove-lined tidal inlets and channels backed by extensive mud- and salt-flats that form the so-called 'False Mouths of the Ord' on the eastern side of CG. This area is part of the Ord River Floodplain Ramsar Wetland and is protected as part of the Ord River Nature Reserve.
    c) Flatback Turtle nesting sites.

8. These are described in detail in Referral Report No. 2 (BKA 2024b).

Likely environmental impacts

1. For detailed assessment of potential impacts on Coastal Processes - see Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 2024a, b & c).

2. Potential impacts on Coastal Processes are discussed further in Referral Report No. 4 - *Impact Assessments* (BKA 2024d). Referral Report No. 4 includes an assessment of potential impacts on Coastal Processes against the EPA significant impact criteria outlined in EPA's *Statement of Environmental Principles, Factors & Objectives* (EPA 2018).

3. Overall, it is assessed that it is unlikely that the proposal will cause significant, irreversible or even moderate or minor impacts on coastal processes, and in turn on the coastal ecosystems and values in CG that are influenced by coastal processes.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. Detailed application of the mitigation hierarchy for Coastal Processes and the three linked key coastal values of mangrove communities, the Ramsar wetland and turtle nesting areas is presented in Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. Potential impacts on coastal environmental values that are linked to coastal processes will be avoided and prevented because (PCS 2024a, b & c):
   a) the proposal is unlikely to change hydrodynamics or sediment transport to any degree that would in turn affect the coastal values,
   b) the main sediment supply for each of the three coastal values is not from the proposed operational area; and
   c) all three coastal values are naturally dynamic.

3. Impact minimization / mitigation is not required as impacts will be avoided / prevented.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal are the same as summarized under BCH above, listed in Part C below, and detailed in Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a).

5. Assessment and significance of residual impacts

1. The assessments in PCS (2024a, b & c) and BKA (2024d) indicate that because there are unlikely to be any significant primary impacts, there are also unlikely to be any significant residual impacts on coastal processes and the coastal environmental values that are linked to coastal processes.

6. Likely environmental outcomes

1. The likely environmental outcomes with regard to coastal processes both during and at the end of the 15-year project timeframe, are assessed as follows:
   a) The sand area within the proposed operational area will be on average <1m deeper than the pre-project seabed, and it will still comprise sand with similar seabed morphology and thus the same coastal process features (dynamic sand waves formed and constantly moved by the prevailing hydrodynamics).
   b) There are unlikely to be any significant or measurable changes to coastal processes in or near CG, including in relation to mangroves areas and sand beaches including turtle-nesting beaches, which are the most important environmental values that are supported by the coastal processes in the CG area.

Environmental factor: Marine Environmental Quality (MEQ)

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline - Marine Environmental Quality.
- EPA 2016, Technical Guidance - Protecting the Quality of Western Australia's Marine Environment.

2. Receiving environment

1. For detailed description of MEQ in the LAU, including detailed description of the methods used to assess and describe MEQ - see Referral Report No. 2 - *Proposal Setting & Existing Environment Descriptions* (BKA 2024b).

2. Additional data and description of MEQ is presented in Referral Report No. 5 - *Metocean & Sediment Dynamics* (PCS 2024a, b & C)).

3. Overall, the receiving environment in CG in terms of MEQ can be summarized as:

   a) free of chemical contaminants and pollutants, with no significant sources of potential contamination along the immediate coastline or in the broader catchment,

   b) normal sea temperature, salinity and pH, with expected variation between the dry- and wet-seasons,

   c) relatively low chlorophyll *a* concentrations, in both the dry- and wet-seasons,

   d) extremely high SSC and turbidity levels; and

   e) very low (zero or near zero) benthic light levels, throughout the year.

4. Referral Report No. 2 includes a description of the five environmental values that are linked to MEQ as outlined in the EPA technical guidance.

5. This shows that the main environmental value linked to MEQ in CG is ecosystem health, while the other four environmental values linked to MEQ (fishing & aquaculture, recreation & aesthetics, industrial water supply and cultural & spiritual) are not so relevant given the specific situation in CG, as described in Referral Report No. 2.

3. Likely environmental impacts

1. For detailed assessment of potential impacts on MEQ - see Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. Referral Report No. 4 includes an assessment of potential impacts on MEQ against the EPA significant impact criteria outlined in EPA's *Statement of Environmental Principles, Factors & Objectives* (EPA 2018).

3. Referral Report No. 4 also includes an assessment of potential impacts on the environmental values that are linked to MEQ as defined by the EPA (ecosystem health, fishing & aquaculture, recreation & aesthetics, industrial water supply and cultural & spiritual).

4. In summary, Referral Report No. 4 finds that the proposal is unlikely to cause significant impacts on MEQ or the environmental values that are linked to MEQ in CG.

5. The marine pollution avoidance and minimization measures outlined under BCH above are relevant and are not repeated here for reasons of economy.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. Detailed application of the mitigation hierarchy for MEQ and the linked environmental values is presented in Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. Potential impacts on MEQ and associated environmental values will be avoided and prevented as outlined in Referral Report No. 4, including *inter alia* via the marine pollution avoidance and minimization measures outlined under BCH above, which are not repeated here for reasons of economy.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal are the same as summarized under BCH above, listed in Part C below, and detailed in Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a).

5. Assessment and significance of residual impacts

1. The assessments in PCS (2024a, b & c) and BKA (2024d) indicate that because there are unlikely to be any significant primary impacts on MEQ, there are also unlikely to be any significant residual impacts on MEQ and the environmental values that are linked to MEQ.

6. Likely environmental outcomes

1. The likely environmental outcomes with regard to MEQ both during and at the end of the 15-year project timeframe, are assessed as follows:
   a) the proposed operation is unlikely to cause any changes in the level of contaminants in water, sediments or biota or any changes in the physical or chemical properties of waters and sediments relative to the natural state in CG; and
   b) the proposed operation is therefore unlikely to cause any significant impact on MEQ and the supported environmental values in CG.

Environmental factor: Marine Fauna

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline - Marine Fauna.

2. Receiving environment

1. For detailed description of Marine Fauna in the LAU, including detailed description of the methods used to assess and describe Marine Fauna - see Referral Report No. 2 - *Proposal Setting & Existing Environment Descriptions* (BKA 2024b). A brief summary of the Receiving Environment for Marine Fauna is outlined below.

2. Environmental conditions in CG are generally not hospitable to marine fauna, as manifested in the low diversity and abundance and of marine fauna described in Referral Report No. 2. These conditions include strong tidal currents, very high suspended sediment concentrations and associated turbidity, acute wet season inputs of freshwater and sediments, permanently aphotic benthic zone, highly mobile seabed sediments and exposure to tropical cyclone impacts.

3. The types of marine fauna found in CG are therefore species that are specifically adapted to extreme, highly dynamic and turbid conditions.

4. There is a globally important nesting beach for Flat Back Turtles *(Natator depressus)* on the seaward side of Cape Domett, and turtle nesting beaches with lesser numbers on a seaward beach west of Cape Dussejour, at Turtle Bay on Lacrosse Island and at Barnett Point inside CG. The Commonwealth has designated an inter-nesting 'buffer' Biologically Important Area (BIA) for Flatback turtles within a 60 km radius around Cape Domett and Lacrosse Island, which encompasses CG.

5. A small population of Australian Snubfin Dolphins *(Orvaella heinsohni)* inhabits CG and the Commonwealth has designated a breeding, calving, foraging and resting BIA for Snubfin Dolphins in CG. Australian Humpback Dolphins (*Sousa sahulensis*) have also been sighted in the area.

6. The upstream estuarine and riverine areas that discharge into CG provide habitat that is suitable for Sawfish *(Pristis*

spp), although sightings are not confirmed.

7. Juveniles of two River Shark species (*Glyphis glyphis* and *G. garricki)* have been recorded upstream of CG in the Lower Ord River.

8. Saltwater Crocodiles *(Crocodylus porosus)* are present throughout the area, with the largest numbers inhabiting the Lower Ord River.

9. The waters of CG overall and especially the mangrove-lined coast and inlets provide habitat for a range of fish species that are typically found in such areas, including Barramundi (*Lates calcarifer*) and Threadfin Salmon (*Eleutheronema tetradactylum*).

10. Environmental surveys and stakeholder consultations indicate that the proposed operational area does not provide suitable habitat for benthic or demersal fishes or support populations of such, due to the nature of the substrate (highly dynamic sand waves), strong tidal currents, lack of benthic light and lack of food sources for fishes.

11. The mangrove-lined coast and inlets around CG provide habitat for Mud Crabs *(Scylla spp)*, and provide nursery areas for red-legged banana prawns (*Penaeus indicus*) and white banana prawns (*P. merguiensis*).

3. Likely environmental impacts

1. For detailed assessment of potential impacts on Marine Fauna, see Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. Referral Report No. 4 includes an assessment of potential impacts on Marine Fauna against the 'significant impact criteria' for marine fauna outlined in EPA (2016) *Environmental Factor Guideline - Marine Fauna.*

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. Detailed application of the mitigation hierarchy for Marine Fauna is presented in Referral Report No. 4 - *Impact Assessments* (BKA 2024d). This includes a detailed table presenting, for each of the key marine fauna species:

    a) Measures to avoid (prevent) impacts.
    b) Measures to minimise (mitigate) impacts.
    c) Measures to rehabilitate impacts.
    d) Measures to offset impacts.
    e) Residual impacts.

2. Impact avoidance and minimization factors and measures include, *inter alia*:

    a) Low presence of the SPV in CG (zero presence 86% of time during project lifespan).
    b) Low presence of key marine fauna species in the proposed operational area.
    c) Naturally shy and elusive behaviour of key fauna species.
    d) Low operational speed of the SPV (<5 knots).
    e) Implementation of best-practice Marine Mega-fauna (MMF) observation and avoidance systems and procedures, in accordance with relevant guidelines.
    f) SPV will be permanently fitted with turtle safe lighting in accordance with the *National Light Pollution Guidelines for Wildlife* (Commonwealth of Australia, 2020).
    g) SPV drag-head will be permanently fitted with marine-fauna deterrent / deflector chains ('turtle ticklers').
    h) The SPV will be a 'newbuild' vessel and will incorporate relevant best practice noise reduction measures from the design-phase, as per the IMO 2023 Underwater Noise Guidelines (IMO 2023).

3. Overall, Referral Report No. 4 assesses that potential impacts on marine fauna will be effectively avoided / prevented and minimized / mitigated. Because the proposal is unlikely to cause significant primary impacts, there will not be any residual impacts.

4. Never-the-less, should the proposal be approved and proceed, BKA will seek to implement a comprehensive environmental and biodiversity research and monitoring program, in consultation and cooperation with relevant stakeholders as described in Referral Report No. 4. This would further assist protection and conservation of key marine fauna species both in CG and in other areas.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal are the same as summarized under BCH above, listed in Part C below, and detailed in Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a).

5. Assessment and significance of residual impacts

1. The assessment indicates that because there are unlikely to be any significant primary impacts on marine fauna, there are also unlikely to be any significant residual impacts on marine fauna.
2. Certain impact avoidance, minimization and mitigation measures as outlined above will be included as precautionary good practice.

6. Likely environmental outcomes

1. The likely environmental outcomes with regard to marine fauna both during and at the end of the 15-year project timeframe, are assessed as follows:
   a) There are unlikely to be any significant impacts on marine fauna in or near CG, including protected species and species of conservation significance.
   b) The protection, conservation and management of key marine fauna species in the CG area will be substantially strengthened and improved through BKA's support for research and monitoring of the biology, ecology and behaviour of these species, in close consultation and cooperation with relevant stakeholders.

Environmental factor: Air Quality

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline – Air Quality.

2. Receiving environment

1. For description of Air Quality in the LAU, see Referral Report No. 2 - *Proposal Setting & Existing Environment Descriptions* (BKA 2024b).

2. A brief summary of the Receiving Environment for Air Quality is as follows.

   a) The receiving environment is the atmosphere above CG, which has a hot, semi-dry climate. The annual average maximum temperature is 35.6 °C, one of the highest in Australia. The cooler, winter dry season runs from April to early November, with average maximum temperatures (measured at Wyndham) of 31° C and virtually no rainfall, and the hot, summer wet season runs from late November to March, with average maximum temperatures of 39.5° C. The wettest month is usually January with an average rainfall of 108 mm, although rainfall can be much higher during cyclones and tropical 'low' depressions (www.weather-atlas.com).

b) In general terms, the larger-scale winds along the Northwest Shelf are dominated by the seasonal monsoons. North-westerly winds generally blow during the Summer Monsoon centred on the months of January to March/April, followed by strong easterlies/south-easterlies over winter (the 'south-east trade winds') and then a gradual return to north-westerly conditions in spring at most sites. Immediately around Wyndham, in the narrow south-trending Cambridge Gulf, the spring and summer winds are almost due north-to-south and the winter regime effectively due westward (Pearce et al 2015). Average wind speeds tend to be strongest at between 20 and 40 km/hour from the east and south-east during winter and into spring , although highest (extreme) wind speeds occur during Tropical Cyclones in the summer wet season.

c) There is no urban, industrial or other development on the coast or in the immediate catchment of CG that could be potential sources of air pollution inputs to the receiving atmospheric environment.

d) Currently, the only potential source of air pollution in CG is the ships that transit through CG when entering and departing the Port of Wyndham.

e) Over the three-financial year period 2019/20 to 2022/23 there was an average of 1.3 commercial ship transits per week through CG (CGL 2024). These included small cruise ships, bulk carriers, petroleum tankers and general cargo ships, all of which have air emissions from their engines and machinery.

f) All such ships that enter Australian ports must comply with Annex VI (Air Pollution) of the *International Convention for the Prevention of Pollution form Ships* (MARPOL) and the implementing Australian regulations (AMSA Marine Order 97). Assuming that they comply, these ships should not cause negative impacts on air quality in the CG area.

3. Likely environmental impacts

1. For assessment of potential impacts on Air Quality, see Referral Report No. 4 - *Impact Assessments* (BKA 2024d).

2. The proposal does not involve the construction and operation of any shore-based facilities or infrastructure that could be sources of atmospheric emissions or contaminants.

3. The Sand Production Vessel (SPV) will generate routine air emissions from its engines and on-board machinery. The SPV will comply with Annex VI (Air Pollution) of the *International Convention for the Prevention of Pollution form Ships* (MARPOL) and the implementing Australian regulations (AMSA Marine Order 97).

4. These regulations set strict standards and limits on emissions of nitrous oxides (NOx), sulphur oxides (SOx) (including setting sulphur content limits for marine fuels), volatile organic compounds (VOCs), particulate matter, ozone depleting substances and greenhouse gases from ships.

5. As part of BKA's fleet decarbonisation program, the SPV will be designed for dual-fuel use, allowing adoption of alternative cleaner fuels such as methanol as they become viable in future. The vessel could also potentially be fitted with Rotor Sails which can cut fuel consumption and this emissions on large ships by up to 30%.

6. Through these measures the SPV will not cause negative impacts on human health and amenity or the broader environment through impacts on air quality in the CG area.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. As outlined above impacts on air quality will be avoided (prevented) and minimized through compliance with MARPOL Annex VI and AMSA Marine Order 97, and if viable and feasible, use of alternative fuels such as methanol and Rotor Sails.

2. It is assessed that there will not be any impacts that will require rehabilitation or offsets.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal, include regulatory oversight of the SPV by AMSA for compliance with MARPOL Annex VI and Marine Order 97, which may include Port State Control inspections, as well as the SPV's Flag State and classification inspections and surveys which also check for such compliance.

2. See also Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a), and Part C below.

5. Assessment and significance of residual impacts

1. The assessment indicates that because there are unlikely to be any significant primary impacts on air quality, there are also unlikely to be any significant residual impacts on air quality.

2. Compliance of the vessel with MARPOL Annex VI and AMSA Marine Order 97 will ensure that the SPV's air emissions meet the international and Australian standards and will not cause negative impacts on human health and amenity or the broader environment through impacts on air quality in the CG area.

6. Likely environmental outcomes

1. The likely environmental outcomes with regard to air quality both during and at the end of the 15-year project timeframe is that there will not be any negative impacts on human health and amenity or the broader environment through impacts on air quality in the CG area.

Environmental factor: Greenhouse Gas Emissions (GHG)

1. EPA policy and guidance

- EPA 2023, Environmental Factor Guideline - Greenhouse Gas Emissions.

2. Receiving environment

- The receiving environment is the atmosphere.

3. Likely environmental impacts

1. Referral Report No. 4 - *Impact Assessments* (BKA 2024d) includes an assessment of GHG emissions from the Sand Production Vessel (SPV). The proposal does not involve any shore-based or other operations that are sources of GHG emissions.

2. The GHG emissions while the vessel is operating in WA waters are calculated to be in the order of 13,000 metric tonnes/year of CO2-e, or 13% of the EPA trigger value of 100,000 tonnes per year. This Environmental Factor is therefore not relevant to the proposal in terms of the EP Act referral.

3. The SPV will comply with Annex VI (Air Pollution) of the *International Convention for the Prevention of Pollution form Ships* (MARPOL) and the implementing Australian regulations (AMSA Marine Order 97).

4. These regulations set strict standards and limits on emissions of GHG from ships, and require ships to implement a range of on-board energy efficiency and emissions reduction strategies and plans, including having an IMO-compliant ship-specific Energy Efficiency Design Index (EEDI) and Shipboard Energy Efficiency Management Plan (SEEMP).

5. As outlined under air- quality above, as part of BKA's fleet decarbonisation program, the SPV will be designed for dual-fuel use, allowing adoption of alternative cleaner fuels such as methanol as they become viable in future. The vessel could also potentially be fitted with Rotor Sails which can cut fuel consumption and this emissions on large ships by up to 30%.

6. Through these measures the SPV will emit the lowest GHG emissions that are feasible. The SPV will be a 'new-build' vessel and thus able to incorporate relevant best practice GHG reduction measures from the design-phase, as per MARPOL Annex VI requirements.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

Mitigation hierarchy:

1. As outlined above GHG emissions will be avoided (prevented) and minimized through compliance with MARPOL Annex VI and AMSA Marine Order 97, the implementation of a ship-specific EEDI and SEEMP, and if viable and feasible, use of alternative fuels such as methanol and Rotor Sails.

2. It is assessed that there will not be any impacts that will require rehabilitation or offsets.

Other statutory decision-making processes:

1. Other statutory decision-making processes that are applicable to the proposal, include regulatory oversight of the SPV by AMSA for compliance with MARPOL Annex VI and Marine Order 97, which may include Port State Control inspections, as well as the SPV's Flag State and classification inspections and surveys which also check for such compliance.

2. See also Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a), and Part C below.

5. Assessment and significance of residual impacts

1. The assessment indicates that because there are unlikely to be any significant primary impacts from GHG emissions, there are also unlikely to be any significant residual impacts from GHG emissions.
2. Compliance of the vessel with MARPOL Annex VI and AMSA Marine Order 97 will ensure that the SPV's GHG emissions meet the international and Australian standards.

6. Likely environmental outcomes

1. GHG emissions from the SPV will not pose a risk of environmental harm associated with climate change.

Environmental factor: Social Surroundings

1. EPA policy and guidance

- EPA 2016, Environmental Factor Guideline - Social Surroundings.

2. Receiving environment

NOTE: The definition of social surroundings under the WA EP Act requires that for social surroundings to be considered in an assessment, there must be a clear link between a proposal's impact on the physical or biological surroundings and any subsequent impact on peoples' aesthetic, cultural, economic or social surroundings.

1. For detailed description of Social Surroundings, see Referral Report No. 2 - *Proposal Setting & Existing Environment Descriptions* (BKA 2024b).

2. The receiving environment for social surroundings in CG can be summarized as follows:

   a) Lack of human habitation & activity:

      – The receiving environment for social surroundings in CG is strongly influenced by the fact that the area is completely uninhabited, with no road access and no built facilities or infrastructure at all, except for a navigation light on a hill on Lacrosse Island.

      – The closest human habitation is at Wyndham located 80 km upstream of CG.

      – Human presence in CG is restricted to vessel-based operations, including:
         – commercial vessels that transit through CG entering and departing the Port of Wyndham,
         – small private vessels from Wyndham used mainly for recreational fishing along the coast and up the inlets of CG; and
         – one commercial gillnet fisherman who is sometimes active in CG (and also along the adjacent coast outside CG).

   b) Aesthetic values:

      – CG has very high aesthetic values in the form of wild, untouched, natural scenery including rugged limestone cliffs along parts of the coast.

   c) Cultural values:

      – The cultural values of CG include significant Aboriginal cultural heritage sites on Lacrosse Island and on the adjacent mainland on both the western and eastern sides of the gulf. Consultation with the two relevant TO groups and site surveys have not identified Aboriginal cultural heritage in the marine area of CG.

      – No significant non-Aboriginal cultural heritage values have been identified in the proposed operational area – including historic shipwrecks.

   d) Economic activity:

      – Economic activity in CG currently comprises vessels that transit to and from the Port of Wyndham, recreational fishing and one commercial gillnet fisherman who is sometimes active in CG (and also along the adjacent coast outside CG).

3. Likely environmental impacts

1. For detailed assessment of potential impacts on Social Surroundings - see Referral Report No. 4 - *Impact Assessments* (BKA 2024d). In summary it is assessed that:

   a) The potential for significant impacts on social surroundings in CG is limited by the fact that the area is completely uninhabited, with no road access and no built facilities or infrastructure.

   b) Wyndham is too distant from the proposed operational area for social surroundings there to be affected. The proposal does not include any facilities or activities in Wyndham that could impact on social surroundings. The Sand Production Vessel (SPV) will not enter the Port of Wyndham as it will be too large to do so. A small vessel might be based in the Port of Wyndham to support environmental monitoring in CG and for occasional transfers to and from the SPV in CG if needed.

   c) The aesthetic values of CG will not be affected by the proposal as there will not be any alteration of the coastline or construction of any onshore or marine facilities or infrastructure, except perhaps a small, 10 m high meteorological mast in the Cape Dussejour area. This would be painted to blend with the environment.

   d) The SPV will only be present in CG for one to two days every two weeks, so there will be zero visual activity in CG for 86% of the time each year. As outlined above, over the last three financial years an average of 1.3 commercial ships transited through CG per week (CGL 2024).

   e) The Aboriginal cultural heritage sites on Lacrosse Island and on the adjacent mainland will not be impacted by the proposal, as there will not be any construction of onshore facilities or infrastructure or any land-based operations, except perhaps a small meteorological mast, which would have TO approval and cultural heritage clearance.

   f) The economic activity of commercial vessels that transit to and from the Port of Wyndham will not be impacted by the proposal as normal navigational safety laws and procedures will apply to the SPV, and BKA is consulting closely with relevant maritime authorities on this. The proposal will bring economic benefits to the Port of Wyndham as outlined below.

   g) Recreational and commercial fishing will not be affected by the proposal as neither are active in the proposed operational area and the proposed operation will not affect fish stocks in CG

   h) The proposal will generate the following economic benefits for Wyndham, Kununurra, the surrounding region and the state of WA:

      a) Payment of royalties per dry-tonne of sand to the State under the WA *Mining Act* over the 15-year life of the proposal.

      b) Payment of additional royalties to the two registered TO groups in the area (BAC and MG Corporation). This is not legally required but is being offered by BKA under MoUs being developed with each TO group. This may include establishing trust-fund mechanisms to support TO community development initiatives.

      c) Up to forty jobs for Australian crew on the SPV (alternating two-week swings of 20 crew each), with first priority given to local TOs, including training and career development.

      d) Offer of marine crew cadetships and training to local TOs on the Boskalis global fleet.

      e) Support to TOs to establish a small marine services business in Wyndham to support the operation in CG, for example transferring people, equipment and supplies when needed (bulk provisioning and refuelling of the SPV will be done at Asian sand delivery port as it will be too large to enter the Port of Wyndham).

f) Environmental monitoring contract for the 15-year life of the proposal, ideally with TO indigenous ranger groups, including training, vessel and equipment.

g) Funding for scientific research on key marine biodiversity and fisheries issues in the CG area, in consultation and cooperation with relevant partners.

h) Possible sponsorship of the Wyndham Volunteer Marine Rescue Group and other similar groups and community initiatives.

4. Application of the mitigation hierarchy, including other statutory decision-making processes

1. As outlined above there are unlikely to be any negative impacts from the proposal on peoples' aesthetic, cultural, economic or social surroundings – and thus the mitigation hierarchy is not triggered.
2. The proposal will generate significant socioeconomic benefits.
3. Other statutory decision-making process are described in the Tables attached to Part C of this Form, and are therefore not repeated here.

5. Assessment and significance of residual impacts

1. The proposal will generate positive socioeconomic benefits.

6. Likely environmental outcomes

1. The likely environmental outcomes with regard to social surroundings are positive as outlined above.

Holistic impact assessment

Outline the holistic impact assessment for the Proposal.

1. Referral Report No. 4 - *Impact Assessments* (BKA 2024d) provides the basis for holistic impact assessment for the proposal.
2. To develop a holistic impact assessment, it is necessary to consider linkages and interactions between relevant environmental factors. For example, if there are changes to coastal processes, could that in turn cause impacts on benthic communities and habitats, if there are changes to marine environmental quality, could that in turn cause impacts on marine fauna, or if there are changes to air quality, could that impact on the environmental values that rely in good air quality, etc.
3. The EPA Environmental Factor Guidelines high-light the links between various environmental factors and the environmental values that they support – and the assessment of each environmental factor presented in the sections above explicitly assessed these linkages, as part of holistic impact assessment.
4. Overall, the assessments presented in the Referral Report No. 4 find that because there are unlikely to be significant impacts on any one environmental factor and their supported environmental values, when combined as a whole, the holistic assessment is also that there are unlikely to be significant impacts overall.

Cumulative environmental impact assessment

Outline the relevant cumulative environmental impacts of the Proposal (based on scoping).

1. Referral Report No. 4 - *Impact Assessments* (BKA 2024d) provides the basis for cumulative impact assessment for the proposal.

2. There have been no previous developments in CG itself that provide a basis for the BKA proposal to cause cumulative impacts.
3. Upstream of CG, the building of two dams on the Ord River may provide a bases for triggering cumulative impacts. The Kununurra Diversion dam was built in 1963 near Kununurra located 120 km upstream from CG, and the Ord River Dam was built in 1973 for the Ord River Irrigation Scheme, located 150 km upstream from CG. Reportedly, the dams have interrupted the supply of sediment to the lower Ord River which drains into the East Arm of CG.

4. The dams have reportedly caused significant build-up of sand and silt in the lower Ord just south of Adolphus Island, due to the lack of wet season flushing since building of the dams, and inflow of sediment from the West Arm of CG. This has also caused an expansion of mangroves in the lower Ord (Wolanksi et al 2001).

5. At August 2024 PCS is undertaking modelling simulations for BKA, assessing the end of the 15 years of proposed sand sourcing compared to pre-European conditions, to show the 'cumulative' impacts of the Ord River dams and the proposed sand sourcing. This will be reported and submitted to EPA in a supplementary Referral report.

Consultation

Outline the stakeholder identification and consultation process, and outcomes of consultation on the Proposal and its likely environmental effects.

1. Referral Report No. 6 - *Stakeholder Engagement & Consultation* (BKA 2024e) contains details of BKA's consultation program and outcomes to August 2024 (noting that BKA sees consultation as an ongoing process, including should the proposal go ahead).

2. The report includes a Stakeholder Analysis, which identified 26 key stakeholder organizations and eight key individuals (regional marine users).

3. Formal consultations with stakeholders were commenced in October 2022 and since then BKA implemented an ongoing program to consult with the key stakeholders as identified by the Stakeholder Analysis. The consultation outcomes and main issues raised and BKA's response to these are presented in Referral Report No. 6, including minutes of consultation meetings attached as Annexes. In summary the major points include, *inter alia*:

    a) Traditional Owners: The two Traditional Owner groups in the area (BAC and MG Corp) support the proposal so long as they are fully and closely consulted and it does not impact negatively on their interests, including Native Title and Aboriginal cultural heritage. BKA's studies and reports address potential risks to indigenous values and interests thoroughly – and no negative impacts are predicted. Both groups are working with BKA to develop MoUs, which include benefits sharing packages, and both groups have issued letters of support for the proposal as contained in Annexes to Referral Report No. 3 - *Traditional Owner Matters* (BKA 2024c).

    b) Other support for the proposal: Several stakeholders consulted expressed support for the proposal so long as due process is followed and it does not cause significant negative impacts, including SWEK, KDC, KPA and CGL.

    c) No objections to the proposal: While not stating explicit support for the proposal, several stakeholders stated that they have no objections in terms of their mandates or interests, including WA DoT-Maritime, Recfishwest and Wyndham-based commercial fisherman.

    d) Marine biodiversity: Several stakeholders including WA DWER, DBCA, DPIRD Fisheries, the Commonwealth DCCEEW and the Northern Prawn Fishery Industry identified potential impacts on inshore dolphin species, marine turtles, sawfish and river sharks as issues that needsto be addressed. BKA's studies and reports address potential risks to these species thoroughly – and significant impacts are not predicted (see Referral Report No. 4). If the proposal proceeds, BKA will look to support research and monitoring of relevant biodiversity issues in the CG area, in coordination with relevant biodiversity stakeholders.

    e) Marine biosecurity: WA DWER and Commonwealth DCCEEW identified the potential introduction of marine pests via ballast water and hull fouling as a main issue that needs to be addressed. BKA's studies and reports address potential risks to these species thoroughly – and no significant risks are predicted. The SPV will be fitted with IMO-compliant ballast water treatment system, and will comply with the Biofouling Regulation under the Commonwealth Biosecurity Act, including having an approved Biofouling Management Plan with very stringent biofouling prevention, management, mitigation and monitoring measures (refer Referral Report No. 4).

f) Turbidity: WA DWER stated that while natural turbidity levels might be high in CG, potential turbidity impacts of the operation will still need to be thoroughly addressed, as per the WA EPA EIA guidelines – this should include the cumulative impacts of any additional turbidity caused by the operation over and above natural background levels. BKA's studies and reports address the turbidity issue thoroughly – and significant impacts are not predicted (refer Referral Report No. 4).

g) Underwater noise: WA DWER stated that potential impacts of underwater noise from the SPV is a key issue that needs to be addressed (see Referral Report No. 4).

h) Commercial fisheries: Several stakeholder groups, including DPIRD Fisheries, AFMA, WAFIC and NPF Industry are interested to ensure that the proposal does not cause negative impacts on fisheries resources, commercial fisheries and fish species, including the gillnet fishery (mainly barramundi and threadfin salmon), the mud-crab fishery and the Northern Prawn Fishery (NPF). While there is an extremely low level of commercial fishing activity in CG (one gillnet operator only – who also fishes elsewhere along the coast outside of CG), fisheries stakeholders highlighted the need to consider the potential role of CG as a nursery area. BKA's studies and reports address potential risks to fish and fisheries – and no significant impacts are predicted (see Referral Report No. 4). If the proposal proceeds, BKA will look to support research and monitoring of relevant fisheries issues in the CG area, in close coordination with relevant fisheries stakeholders.

i) Recreational fisheries Issues: No objections to the proposal were raised by this sector as recreational fishing in the general area targets upstream and coastal areas and does not overlap with the proposed operational area. The proposal is unlikely to have negative impacts on recreational fishing (refer Referral Report No. 4). Should the proposal be approved and proceed to operational phase, BKA will consider sponsoring WVMR, which will have safety benefits for the recreational fishing sector.

j) Port, navigation & maritime issues: The WA DoT Maritime, KPA and CGL did not raise concerns about potential impacts on safety of navigation and port operations and KPA and CGL welcomed benefits for the Port of Wyndham (refer Referral Report No. 4).

k) Broader socioeconomic & community development: The EKCCI, KDC and SWEK support the project so long as there are no negative impacts and there are benefits for local socioeconomics, business and the community and for the shire and region overall. The proposal will have positive socioeconomic, business and the community impacts (refer Referral Report No. 4). BKA will continue to keep these bodies informed and seek to work with them to optimize benefits.

l) Environmental NGOs: The CCWA made two major points, 1) does BKA intend to self-refer the proposal to the State under the WA EP Act and Cmwlth EPBC Act?, and 2) are there marine nursery areas in CG that need to be protected? BKA is self-referring the proposal under the WA EP Act and Cmwlth EPBC Act. BKA recognizes that all of the mangrove and estuarine inlets around CG have nursery values, and has assessed this issue thoroughly. The proposal will not impact directly or indirectly on these areas (refer Referral Report No. 4). Environs Kimberley, an NGO based in Broome, did not respond to consultation invitations via email and phone.

Supporting documents

Provide a list of the supporting documents:

Please see Table 2 attached.

Has the referrer provided survey information according to the *Instructions and Form: IBSA Data Packages* and/or the *Instructions and form: IMSA Data Packages*	☐ Yes ✓ Not yet – data package is extremely large covering a wide range of different parameters and is still being assembled and catalogued in accordance with IMSA metadata requirements – will be submitted.

Conclusion

Do you consider the proposal may have a significant effect on the environment?

No – as summarized above and outlined in the supporting Referral Reports as listed in Table 2 attached.

PART B: ASSESSMENT OF ENVIRONMENTAL IMPACTS FOR SIGNIFICANT AMENDMENTS ONLY N/A	
Type of significant amendment N/a	☐ significant amendment to the approved proposal ☐ significant amendment to the implementation conditions ☐ significant amendment to both the proposal and the implementation conditions
Information of the approved proposal	N/a
Combined effects of the approved proposal and significant amendment	N/a
Analysis of existing implementation conditions	N/a
Previous changes to the Proposal and or implementation conditions	N/a
Compliance	N/a
Environmental Performance	N/a
Control of implementation of significant amendment	N/a

PART B: ASSESSMENT OF ENVIRONMENTAL IMPACTS FOR A PROPOSAL UNDER AN ASSESSED SCHEME ONLY N/A	
What new environmental issues are raised by the proposal that were not assessed during the assessment of the planning scheme?	N/a
How does the proposal not comply with the assessed scheme and/or the environmental conditions in the assessed planning scheme?	N/a

PART B: ASSESSMENT OF ENVIRONMENTAL IMPACTS FOR DERIVED PROPOSALS ONLY N/A	
Demonstrate how the proposal will meet the environmental outcomes defined through the assessment of the strategic proposal	N/a
Provide an analysis of the existing implementation conditions of the related strategic proposal in relation to the derived proposal	N/a

PART C: OTHER APPROVALS AND REGULATION	
Decision-making authorities and their approvals	
Provide a table list of the decision-making authorities, associated legislation or agreement regulating the activity and the specific approval required. (Example table at the end of form)	Pls see Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a). Referral Report No. 1 describes all relevant State, Commonwealth and International environmental, natural resources, marine and related regulatory regimes that apply to the proposal.
Provide a summary of the statutory decision-making processes you consider can mitigate the potential impacts of the proposal on the environment. (Note: this should be a summary of the information provided in Part B section 2.4). (Example table at the end of form)	The proposal is subject to, *inter alia:* WA *Mining Act*. This includes the comprehensive environmental assessment and management framework under that Act, including the following DEMIRS requirements, standards and guidelines: – *Statutory Guidelines for Mining Proposals 2020.* – *Environmental Regulatory Strategy* 2021. – *Environmental Objectives Policy for Mining* 2020. – *Environmental Applications Administrative Procedures* 2021. – *Environmental Group Site (EGS) Details Form.* – *Mining Proposal Checklist*. – *Stakeholder Engagement activities and outcomes.* – *Baseline Environmental Data.* – *Environmental Risk Assessment (ERA).* – *Environmental Outcomes, Performance Criteria & Monitoring (EOPCM).* – *Environmental Management System (EMS).* – *Mine Closure Plan (MCP).* The ERA, EOPCM and EMS all include application of the impact mitigation hierarchy, as per the EPA priorities. Other State laws: The proposal is also subject to the WA *Aboriginal Heritage Act*, the *Biodiversity Conservation Act*, the *Conservation & Land Management Act*, the *Fish Resources Management Act*, the *Pollution of Waters by Oil & Noxious Substances Act* and others, all of which follow an impact mitigation hierarchy based on impact avoidance / prevention as the highest priority. IMO & AMSA regulatory regime: Because the proposal is a 100% marine-based operation that will utilize an international vessel, it is also subject to the international maritime regulatory regime, as administered by the International Maritime Organization (IMO) and implemented in Australia through the Australian Maritime Safety Authority (AMSA). This regime also adopts the impact mitigation hierarchy, prioritizing prevention followed by mitigation then response. In addition to regulatory oversight by AMSA during operations in Australian waters, the SPV will be subject to Flag State Control, Classification Society surveys and Boskalis' internal vessel

	QA/QC procedures to ensure compliance. Commonwealth Biosecurity Act: The SPV will be subject to this Act including the ballast water and biofouling regulations under this Act, which are based on the impact mitigation hierarchy. BKA will develop comprehensive biosecurity management plans to ensure compliance. Commonwealth EPBC Act: While studies commissioned by BKA as presented in the supporting Referral Reports indicate that the proposal is unlikely to cause significant impacts on Matters of National Environmental Significance (MNES), in accordance with its stringent corporate environment and social policy, BKA has elected to self-refer the proposal under the EPBC Act, submitted in parallel with this State referral. It remains to be seen if the Commonwealth will designate the proposal as a controlled action under the EPBC Act.
Tenure and Local Government approvals	
Location of proposal: a) street address, lot number, suburb, and nearest road intersection; or b) if remote, the nearest town and distance and direction from that town to the proposal site.	As outlined in Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a) the proposal is located in the Internal Waters of WA. BKA holds two Exploration Tenements in CG issued by DMIRS (E80/5655 & E80/6009). At an appropriate time, subject to the environmental referral process, BKA intends to apply to DEMIRS for a mining tenement over the western half of E80/5655 (as no sand was found in the eastern half) and over all of E80/6009 – the 'proposed operational area' (refer Figure 1 attached). The nearest town is Wyndham located approx. 80km upstream of CG.
Name of the Local Government Authority in which the proposal is located.	Shire of Wyndham & East Kimberley (SWEK).
Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.	☐ Yes ☐ **No**
What is the current land use on the property, and the extent (area in hectares) of the property?	**N/a** – marine waters (Internal State Waters). The proposed operational area (proposed mining tenement) covers approx. 100 km^2 (refer Figure 1 attached).
Does the proponent have the legal access required for the implementation of all aspects of the proposal? ***If yes**, provide details of legal access authorisations / agreements / tenure.* ***If no**, what authorisations / agreements / tenure is required and from whom?*	☐ Yes ☐ **No** BKA holds two Exploration Tenements in CG issued by DMIRS (E80/5655 & E80/6009). At an appropriate time, subject to the environmental referral process, BKA intends to apply to DEMIRS for a mining tenement over the western half of E80/5655 (as no sand was found in the eastern half) and over all of E80/6009 – the 'proposed operational area' (refer Figure 1 attached).

Commonwealth Government approvals	
Does the proposal involve an action that may be or is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)?	☐ Yes ✓ **No** (but see below) • **See Referral Report No. 7 - *Commonwealth Protected Matters* (BKA 2024f)** which assesses MNES and other matters under the EPBC Act. • The studies commissioned by BKA as presented in the supporting Referral Reports indicate that the proposal is unlikely to cause significant impacts on Matters of National Environmental Significance (MNES) as defined under the Commonwealth EPBC Act, and therefore may not be a controlled action under that Act. • However, in accordance with its stringent corporate environment and social policy, BKA has elected to self-refer the proposal under the EPBC Act, submitted in parallel with this referral under the WA EP Act. • It remains to be seen if the Commonwealth decides whether or not to designate the proposal as a controlled action under the EPBC Act.
Has the proposed action been referred? If yes, when was it referred and what is the reference number (EPBC No.)?	☐ Yes ☐ No [Not yet – will be] Date: Immediately after State referral. EPBC No.: To be advised.
If referred, has a decision been made on whether the proposed action is a controlled action? If 'yes', check the appropriate box and provide the decision in an attachment.	☐ Yes ✓ **No** - Submitted in parallel with this referral under the WA EP Act. ☐ Decision – controlled action ☐ Decision – not a controlled action
If the proposal is determined to be a controlled action, do you request that this proposal be assessed under a Bilateral Agreement or as an accredited assessment?	☐ Yes - Bilateral ☐ No ✓ **Yes** - Accredited
Is approval required from other Commonwealth Government/s for any part of the proposal? *If yes, describe.*	☐ Yes ✓ **No** (but see below) Approval: • As an international vessel the Sand Production Vessel (SPV) will comply in full with all Commonwealth maritime laws as administered by the Australian Maritime Safety Authority (AMSA), which implement the international maritime conventions of the International Maritime Organization (IMO). • The SPV will also comply in full with the Commonwealth *Biosecurity Act* including the Ballast Water Regulation and Biofouling Regulation under that Act.
Decision-making authority referrals ONLY	
What approval/s, under your authority, are required for this proposal? *Please provide details.*	

Table: Other Approvals

Please see Referral Report No. 1 - *Environmental Regulatory Framework* (BKA 2024a), which describes all relevant State, Commonwealth and International environmental, natural resources, marine and related regulatory regimes that apply to the proposal

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and specify which proposal element the approval is related to)
WA DEMIRS	• WA *Mining Act* including the comprehensive environmental assessment framework under that Act, which include the following DMIRS requirements, standards and guidelines: • *Statutory Guidelines for Mining Proposals 2020.* • *Environmental Regulatory Strategy* 2021. • *Environmental Objectives Policy for Mining* 2020. • *Environmental Applications Administrative Procedures* 2021. • *Environmental Group Site (EGS) Details Form.* • *Mining Proposal Checklist*. • *Stakeholder Engagement activities and outcomes.* • *Baseline Environmental Data.* • *Environmental Risk Assessment (ERA).* • *Environmental Outcomes, Performance Criteria & Monitoring (addressing relevant DMIRS Environmental Factors).* • *Environmental Management System (EMS).* • *Mine Closure Plan (MCP).*	Mining Tenement / Mining Licence. Applies to all aspects of the proposal as they will all be part of the mining operation.
WA DBCA	*WA Biodiversity Conservation Act* WA *Conservation & Land Management Act*	Specific approvals may not be required but BKA must ensure that the operation complies with these two Acts re. potential impacts om biodiversity and protected species and on the State Marine Park.

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and specify which proposal element the approval is related to)
WA DPIRD Fisheries	WA *Fish Resources Management Act*	Specific approvals may not be required but BKA must ensure that the operation complies with this Act re. potential impacts on fish and fisheries.
WA DPIRD Agriculture	WA *Biosecurity & Agriculture Management Act*	Specific approvals may not be required but BKA must ensure that the operation complies with this Act re. potential impacts on biosecurity (State level).
WA DPLH	WA *Aboriginal Cultural Heritage Act*	Specific approvals may not be required but BKA as the proposal should not impact on ACH, but BKA must ensure that the operation complies with this Act.
Commonwealth DCCEEW	Commonwealth *EPBC Act*	See Referral Report No. 7 - *Commonwealth Protected Matters* (BKA 2024f) which assesses MNES and other matters under the EPBC Act. The studies commissioned by BKA as presented in the supporting Referral Reports indicate that the proposal is unlikely to cause significant impacts on Matters of National Environmental Significance (MNES) as defined under the Commonwealth EPBC Act, and therefore may not be a controlled action under that Act. However, in accordance with its stringent corporate environment and social policy, BKA has elected to self-refer the proposal under the EPBC Act, submitted in parallel with this referral under the WA EP Act. It remains to be seen if the Commonwealth decides whether or not to designate the proposal as a controlled action under the EPBC Act. If it is triggered BKA seeks an accredited assessment by the State.
AMSA	*Full range of maritime and prevention of pollution from ships laws that implement the IMO regime.*	Regulatory oversight of the SPV by AMSA for compliance with full range of maritime and prevention of pollution from ships laws that implement the IMO regime, which may include Port State Control inspections, as well as the SPV's Flag State and classification inspections and surveys which also check for such compliance.
Commonwealth DAFF	Commonwealth *Biosecurity Act & Regulations*	Approval of the SPV's ballast water treatment system and Biofouling Management Plan.

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and specify which proposal element the approval is related to)
		Regulatory oversight of the SPV or compliance with *Biosecurity Act & Regulations*, which may include Port State Control inspections, as well as the SPV's Flag State and classification inspections and surveys which also check for such compliance
Commonwealth DCCEEW	Commonwealth *Underwater Heritage Act*	Specific approvals may not be required but BKA as the proposal should not impact on UCH, but BKA must ensure that the operation complies with this Act.

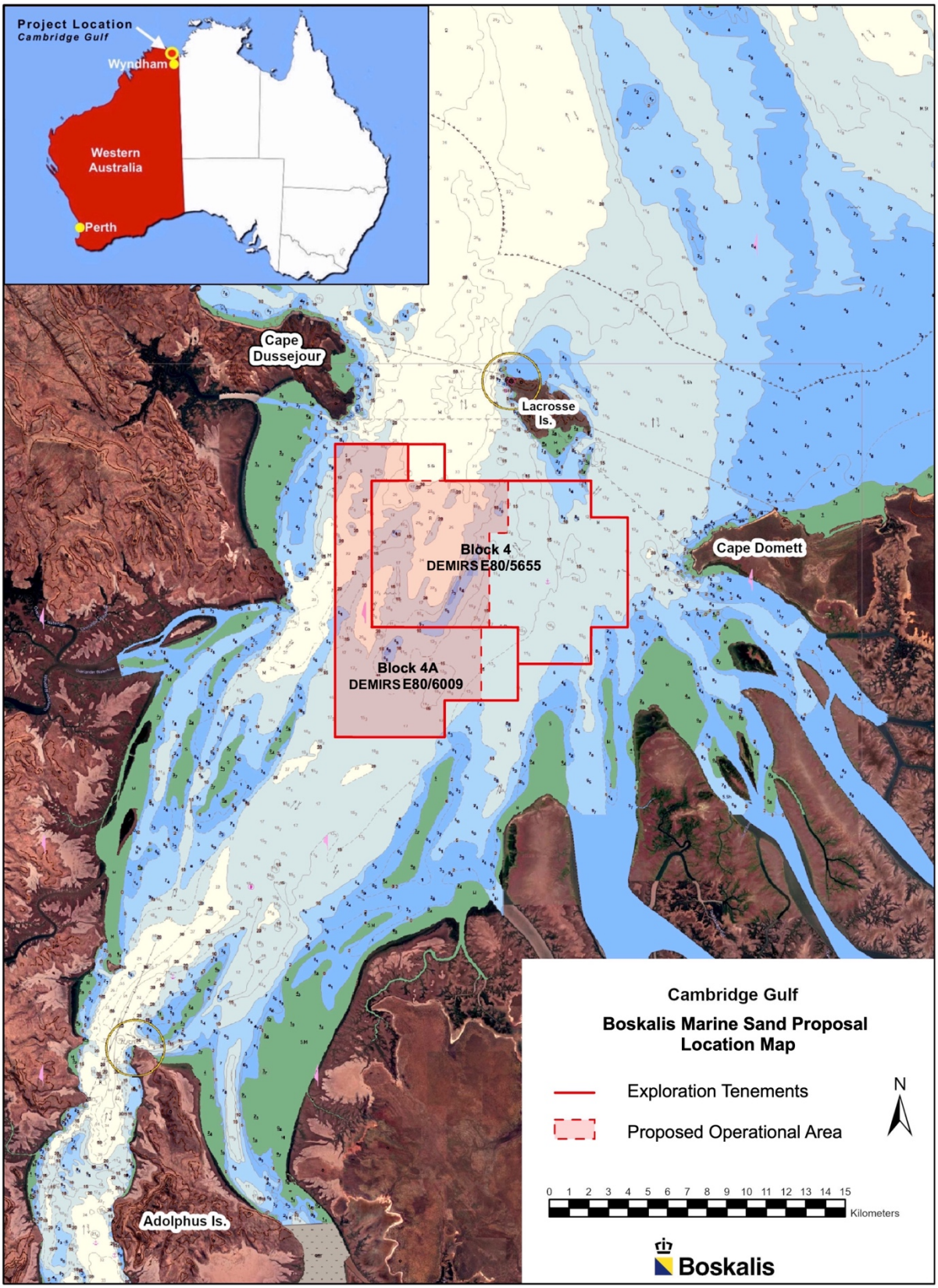

FIGURE 1: *Location of the proposal in Cambridge Gulf near Wyndham in the northeast of Western Australia.*

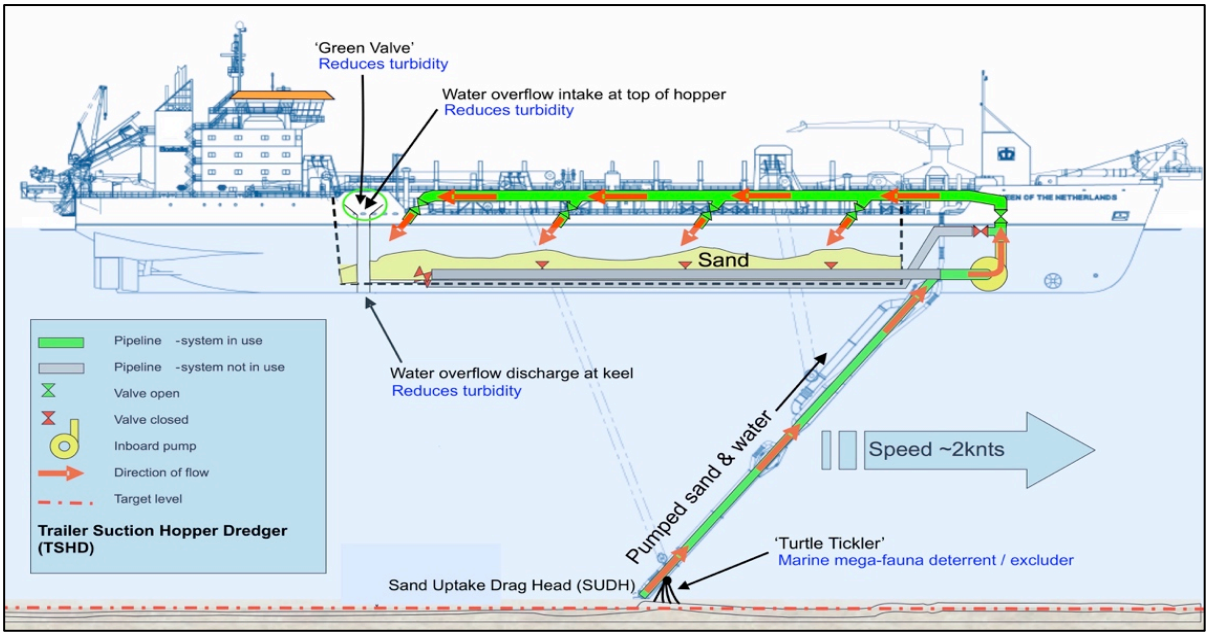

FIGURE 2: *The proposed operation will involve a single Sand Production Vessel (SPV) based generally on the design principles of a large Trailer Suction Hopper Dredger (TSHD) shown here – but designed and built specifically for the proposal.*

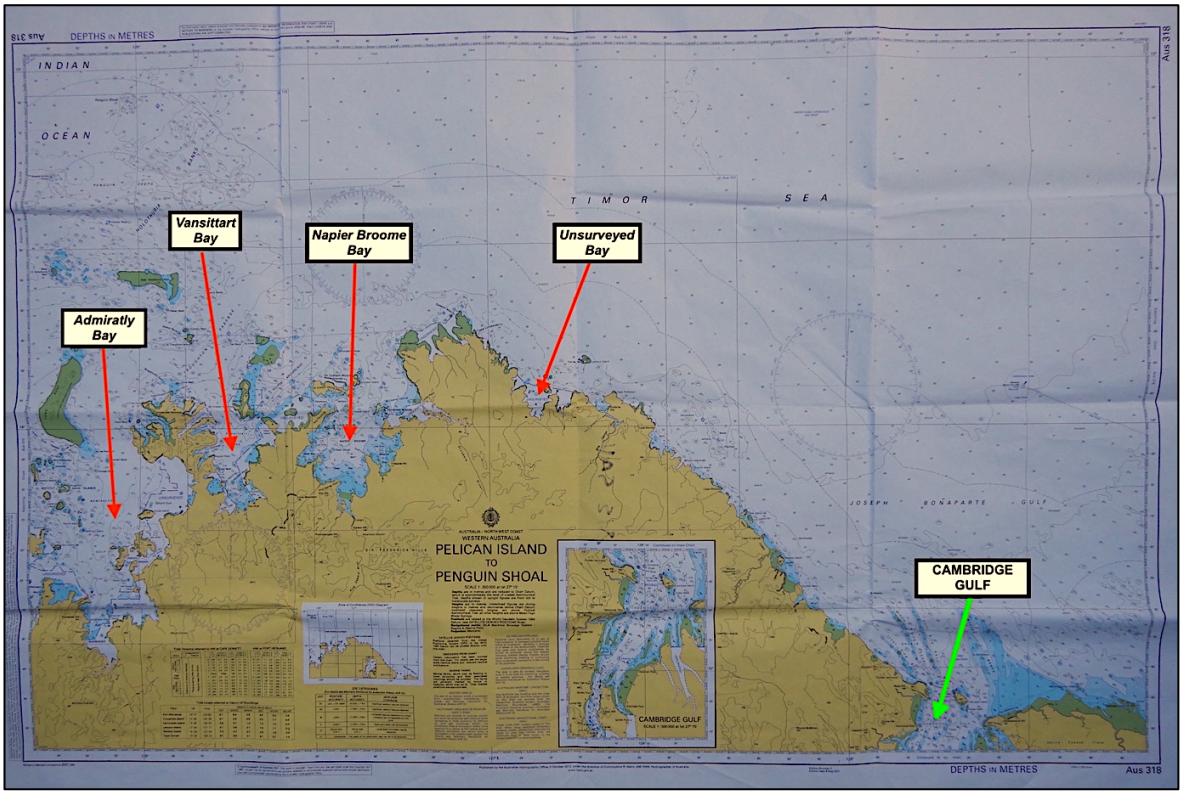

FIGURE 3: *Potential alternative sand source areas across the north of WA to the west of CG. These were screened out as the have clearer water and more significant environmental values including coral and seagrass communities, which are not present in CG (Chart AUS 318).*

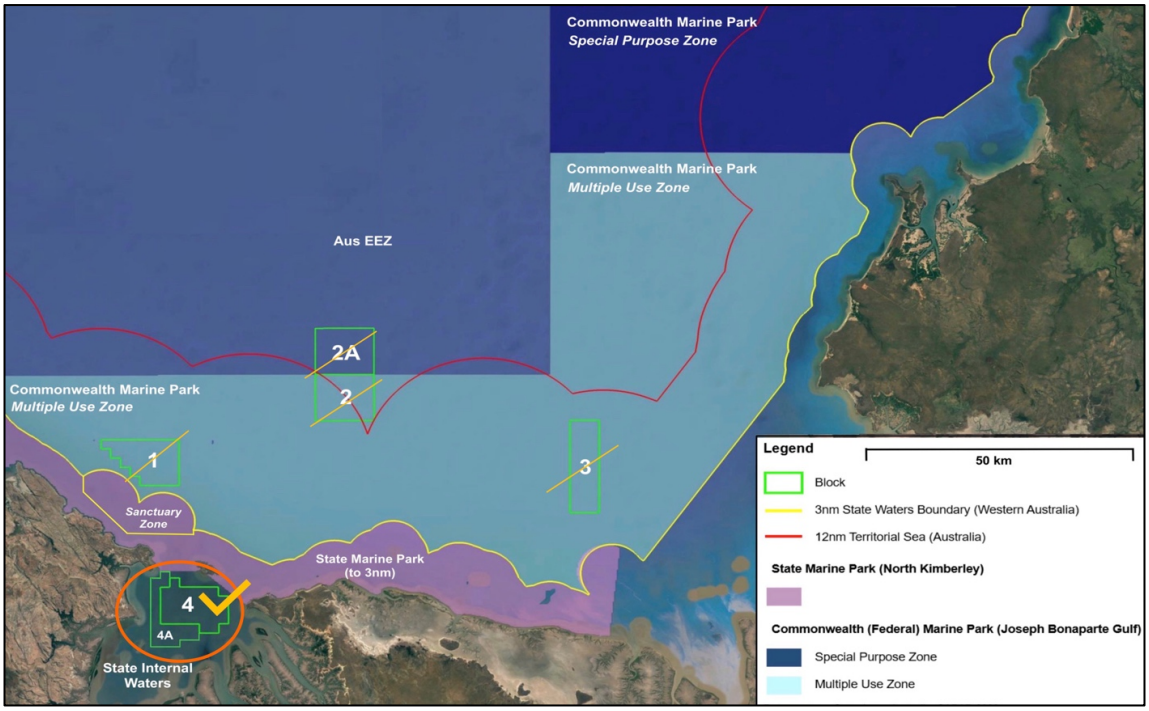

FIGURE 4: *Potential alternative sand source areas offshore from CG – Blocks 1, 2, 2A and 3.*

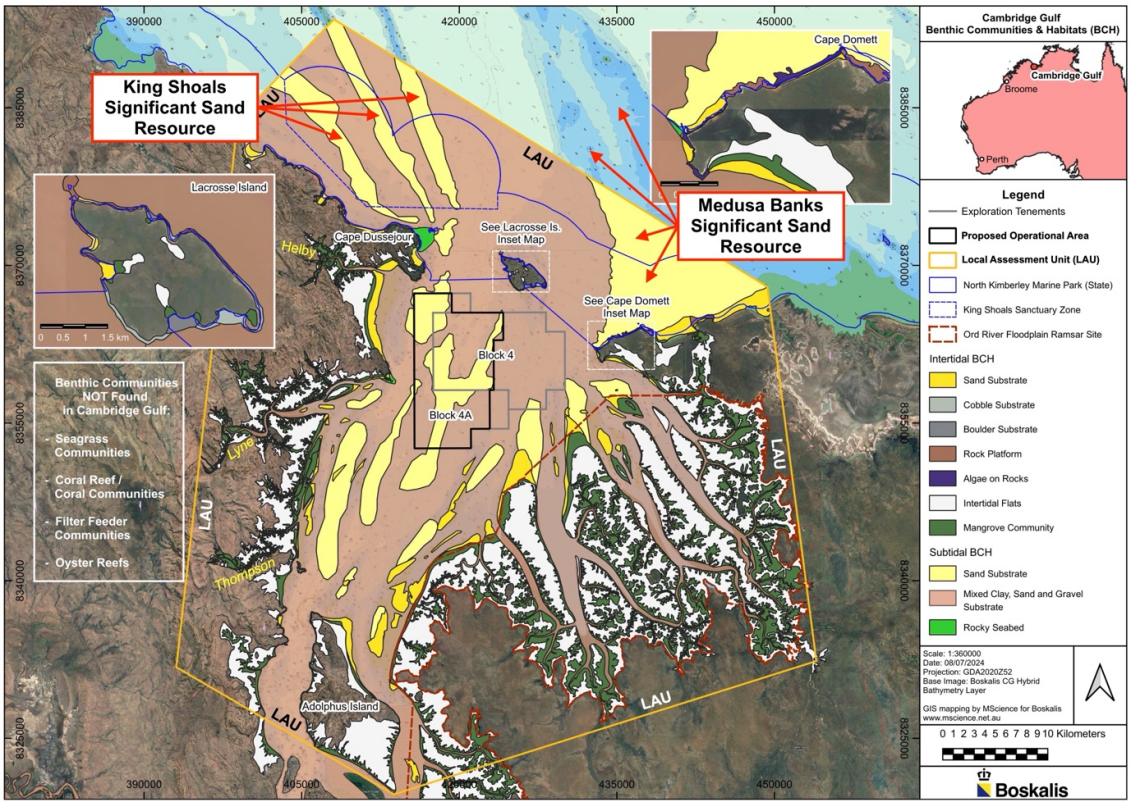

FIGURE 5: *Two potential alternative sand sources in the immediate vicinity of CG - King Shoals on the western side and Medusa Banks on the eastern side to seaward of CG.*

TABLE 1: *Eight steps for assessing BCH from EPA 2016 Technical Guidance - Protection of BCH.*

Step	Assessment
1. What is the LAU?	Refer Figure 5 above.
2. What is there now? What is the current area of each benthic community type and associated habitat within the LAU?	– Coral, seagrass, sponge communities, macro-algae communities etc: Zero km^2 – Mangroves: 350 km^2 – Intertidal salt- & mud-flats: 602.24 km^2 – Rocky shores & rock platforms (some with turf algae on rocks): 5.1 km^2 – Intertidal Cobble & Boulder Substrate: 0.57 km^2 – Intertidal Sand Substrate: 73.03 km^2 – Subtidal Sand Substrate: 356.35 km^2 – Subtidal mixed Clay, Silt, Sand & Gravel Substrate: 1462.56 km^2 – Subtidal rocky Seabed: 3.51 km^2
3. Do any of the benthic communities have any particular tenure or conservation, ecological or social values that should be considered?	The King Shoals sand bank habitat is within a Sanctuary Zone of the North Kimberley Marine Park (State). Mangroves and salt- and mud-flat habitat on the eastern side of CG (known as the False Mouths of the Ord) are part of the Ord River Floodplain Ramsar wetland, which is protected as the State-designated Ord River Nature Reserve. Neither of these areas will be directly or indirectly affected by the proposal (see Referral Report No. 4 - *Impact Assessments* (BKA 2024d)).
4. What area of each community and habitat was originally present in the LAU? (baseline).	The same as listed against Step 2 as there has been no previous development in CG.
5. What % of the original area of each benthic community and its habitat is present now?	100% as there has been no previous development in CG.
6. How much more will be impacted and lost if this proposal was implemented?	There will be temporary impacts from the removal of an average of <1m depth of sand from within the proposed operational area of up to 75.3 km^2 over up to 15 years, with each two-day sand loading cycle every two-weeks covering approx. 0.5 km^2. Horizontal sand migration into and through the area is very rapid under the influence of tidal currents, and seabed morphology will restore rapidly (within weeks to months) under natural sand dynamics. The sand grab samples from within the proposed operational area returned no biota or only a few small individual organisms (amphipods, isopods small crabs etc) after sieving to 500 microns. This is most likely due to the lack of benthic light and constant movement and reworking of the sand under the influence of strong tidal currents, which inhibits colonization and survival. The sand areas do not host any significant benthic communities. Within the proposed operational area there are gullies between the sand-waves where the seabed sediment comprises mixed gravel, sand and clay, with small hydroids and other small encrusting and motile benthic organisms attached to small rocks. These areas will not be targeted as they do not contain sand. The area of sand is approx. 75 km^2 and these other areas approx. 25 km^2 of the proposed operational area No other benthic areas will be impacted or lost.
7. How much would be lost in total if the proposal proceeds?	As per 6.
8. What will be the consequences for biological diversity and ecological integrity if the proposal proceeds?	There will be no significant or measurable permanent or irreversible changes to biological diversity and ecological integrity of benthic communities in or near CG.

TABLE 2: *Supporting WA EP Act Referral Reports – Boskalis Cambridge Gulf Marine Sand Proposal*

Documents submitted as part of this Referral package (August 2024):	
Short Title	**Full citation**
EPA Form: *Referral of a Proposal under s38 of EP Act.*	EPA Form (2024): Referral of a Proposal under s38 of EP Act - Boskalis Cambridge Gulf Marine Sand Proposal.
EPA Template: *Proposal Content Document.*	EPA Template (2024): Proposal Content Document - Boskalis Cambridge Gulf Marine Sand Proposal.
Referral Report No. 1: *Environmental Regulatory Framework.*	Boskalis Australia (BKA) (2024a), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 1: *Environmental Regulatory Framework.*
Referral Report No. 2: *Proposal Setting & Existing Environment Descriptions.*	Boskalis Australia (BKA) (2024b), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 2: *Proposal Setting & Existing Environment Descriptions.* Annexes include: – Sand resource assessment report - Boskalis. – BCH mapping methods statement - MScience – Coastal LiDAR report - Sensorem. – Sediment contamination assessment report. – eDNA report - University of Canberra. – Turtle nesting report - EcoStrategic / DBCA.
Referral Report No. 3: *Traditional Owner Matters.*	Boskalis Australia (BKA) (2024c), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 3: *Traditional Owners, Native Title & Aboriginal Cultural Heritage*. Annexes include: – Letters of support from the two TO groups.
Referral Report No. 4: *Impact Assessments.*	Boskalis Australia (BKA) (2024d), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 *Referral Report No. 4: Impact Assessments of Key Environmental Factors.*
Referral Report No. 5: *Metcocean & Sediment Dynamics.*	Port & Coastal Solutions (PCS) (2024a), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 5: *Metcocean & Sediment Dynamics - System Understanding, Conceptual Model & Initial Modelling.* – Annex 1: PCS (2024b) Supplementary Technical Note. – Annex 2: PCS (2024c) Factual Data Report.
Referral Report No. 6: *Consultation Report.*	Boskalis Australia (BKA) (2024e), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 6: *Stakeholder Engagement & Consultation Report.*
Referral Report No. 7: *Commonwealth Matters.*	Boskalis Australia (BKA) (2024f), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 7: *Commonwealth Protected Matters.*
Documents still being developed (to be submitted later).	
Referral Report No. 8: *Metcocean & Sediment Dynamics Full Modelling.*	Port & Coastal Solutions (PCS) (2024d), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 8: *Hydrodynamic, Coastal Processes & Sediment Plume Modelling.*
Referral Report No. 9: *IMSA Package.*	Boskalis Australia (BKA) (2024g), Cambridge Gulf Marine Sand Proposal - WA EP Act s38 Referral Report No. 9: *IMSA Metadata Package Statement.*