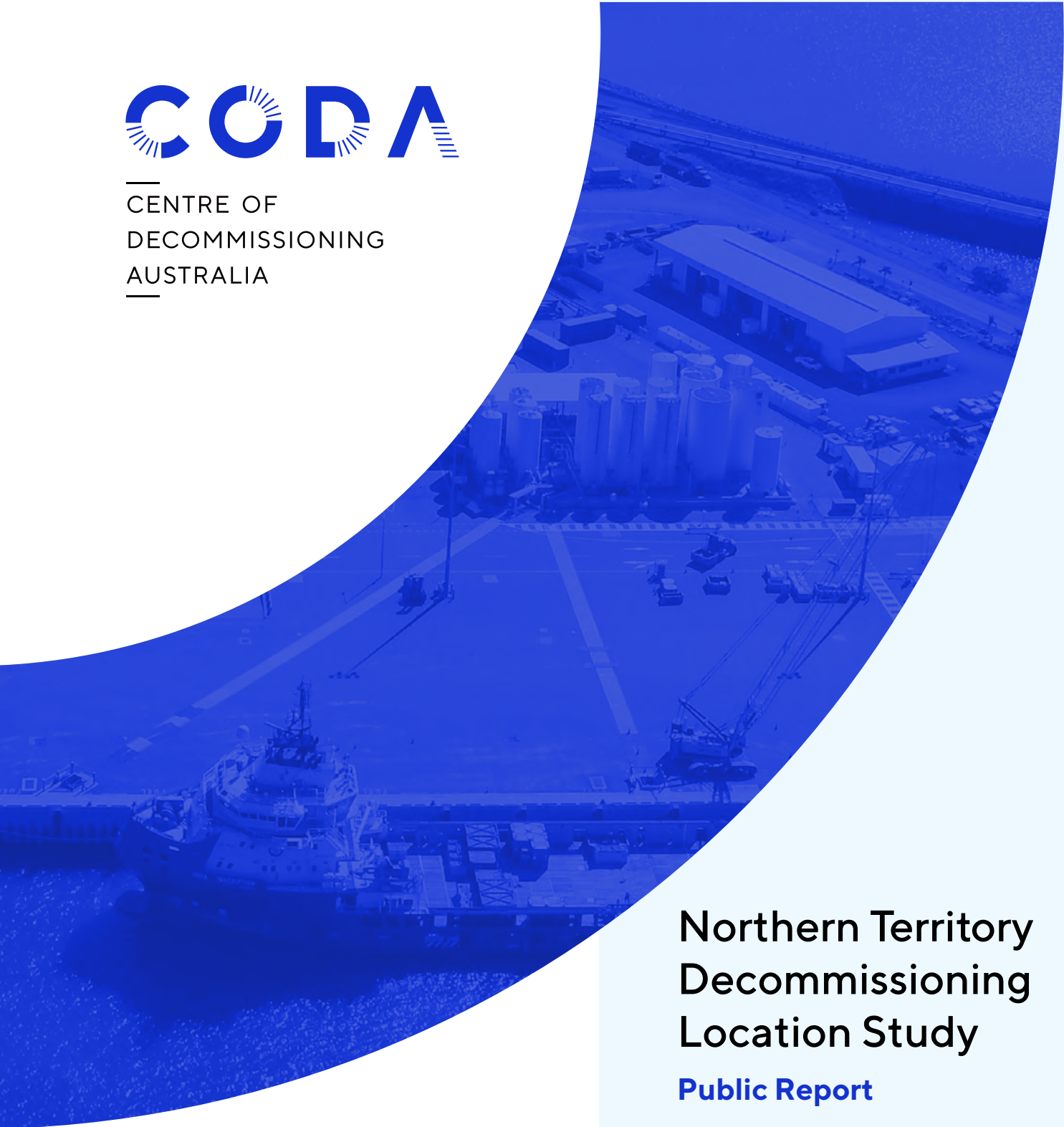




CENTRE OF
DECOMMISSIONING
AUSTRALIA



Northern Territory Decommissioning Location Study

Public Report

July 2025



Acknowledgements

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Executive summary

This abridged report has summarised the evaluation of ports and supporting industries in the Northern Territory that could support the receipt, dismantling, recycling, and disposal of offshore oil and gas assets as part of the decommissioning process. The study has concluded that:

1. Offshore oil and gas facilities currently operating in the Browse and Bonaparte basins will be decommissioned over the next 40 years and will likely be recovered to ports either in the Northern Territory or Western Australia.
 - a. A significant portion of offshore oil & gas infrastructure in these basins could be received in the NT due to its proximity to the fields. However, certain offshore infrastructure types would represent a unique project for the NT but be relatively common in WA, and consequently it would be expected that these cargos would be sent the greater distance to specialist facilities at WA ports.
 - b. Forecast cessation of production dates indicate three distinct peaks in activity interspersed with 10 – 15-year periods where there will be no or negligible offshore oil and gas decommissioning works. Defence decommissioning will supplement this, but it is insufficient to establish a continual decommissioning industry.
 2. The historical and ongoing investment in port facilities within the Darwin Harbour gives decommissioning projects multiple credible options for receipt locations:
 - a. The existing East Arm Wharf and Marine Supply Base which have supported the oil & gas industry since establishment have suitable facilities to receive a significant portion of existing infrastructure.
 - b. The Darwin Ship Lift and Marine Industry Park offer an alternative to the established facilities above. In addition, the ship lift could be utilised to load-in floating structures (e.g., the Montara Venture FPSO turret, or the Blacktip CALM buoy) if the removal contractor opts to wet tow them from the field (thereby removing the need to contract a crane vessel).
 - c. A common-user Module Offloading Facility (MOF) proposed as part of the Middle Arm Sustainable Development Precinct could complement the other facilities for large structures (i.e., fixed platforms) or for high volumes of materials (e.g., subsea equipment from the large LNG developments).
 3. Uncertainty around regulatory requirements (both Northern Territory and Federal) and the availability of waste treatment, recycling, and disposal facilities are key risks to the execution of decommissioning projects in the NT. Specifically, there are currently limited treatment and recycling solutions for listed wastes, and disposal options are restricted to the composite lined Shoal Bay Waste Management Facility which is constrained with what can be received. However, there are several factors that lend to a favourable outcome for decommissioning in the NT:
 - a. Multiple waste management specialists operate in the region and have the ability to leverage their national and international expertise and capability as required. Indeed, the network into other facilities in WA, SA, QLD, and VIC is developed and readily accessible for all parties. Furthermore, some waste generators use the NT facilities for their waste treatment, this is particularly for speciality waste treatment options like glycol, waste oil, amines, and lube oils.
 - b. Over the long term, the rail upgrades associated with the Regional Logistics Hubs will be a key enabler for utilising the Chandler geological repository (listed waste disposal) and Whyalla Electric Arc Furnaces (steel recycling) if they come online in 5 – 10 years.
 4. Regional facilities (Port Melville, Gove Port, Alyangula Port, Bing Bong Loading Facility) have one or more limitations that are likely to prevent them being used for decommissioning activities. These include:
 - a. Proximity to oil and gas infrastructure. Compared with Darwin Port, it is at least twice the distance from the offshore oil and gas infrastructure to Gove Port, Alyangula Port or Bing Bong Loading Facility.
 - b. Availability of waste management services. Listed wastes are not able to be treated or disposed of at regional locations and must be brought back to Darwin. This is a similar case for recyclables (i.e., scrap steel) as the volumes being presented would be insufficient for direct export from the regional port and rather, they would need to be consolidated with scrap from Darwin.
 - c. Port infrastructure is suitable for receiving some, but not all, types of assets as there are limitations associated with approach depths or quayside configuration which prevent them from being loaded in.
- These conclusions are supported by a number of specific, actionable recommendations for further work which are presented in Table 5.1.

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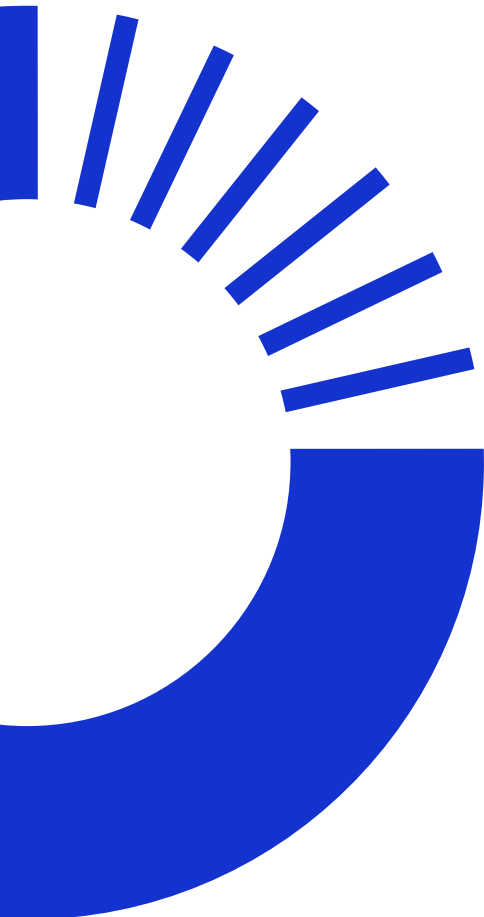
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Abbreviations

ABBREVIATION	DEFINITION
CALM	Catenary Anchor Leg Mooring
CCS	Carbon Capture & Storage
CODA	Centre of Decommissioning Australia
CSV	Construction Support Vessel
EAF	Electric Arc Furnace
EPA	Environmental Protection Agency
FPSO	Floating Production Storage and Offloading (facility)
GIS	Geographic Information System
ha	Hectare
HLV	Heavy Lift Vessel
LNG	Liquefied Natural Gas
LOA	Length Overall
MOF	Module Offloading Facility
MSB	Marine Supply Base
NORM	Naturally Occurring Radioactive Material
NT	Northern Territory
OSV	Operations Support Vessel
P&A	Plug & Abandonment (wells)
QLD	Queensland
SA	South Australia
SPMT	Self-Propelled Modular Trailer
SURF	Subsea Umbilical, Risers, & Flowlines
SWOT	Strengths - Weaknesses - Opportunities - Threats (Analysis)
t	Tonnes
tpa	Tonnes per annum
UK	United Kingdom
USD	United States Dollar
WA	Western Australia
WBS	Work Breakdown Structure



1.0 Introduction

The objective of this study was to undertake a comprehensive evaluation of ports and the waste management supply chain in the Northern Territory for their suitability to receive offshore oil and gas decommissioning cargos.

The outcome of the present study is a recommendation to CODA as to the most suitable location(s) and recommended actions for growing the capability and capacity within the Northern Territory to support offshore oil and gas, and other, decommissioning.

The present study, completed in Q3 2024, draws upon material and insights from the equivalent study for Western Australia which was performed in 2023 [1]. Additionally, it aligns with Action 2.3 in the Northern Territory Maritime Industry Development Plan, released in July 2024 [2].

Figure 1.1 presents the overall sequence of the study. Each of the steps in the study have been documented in the subsequent sections of this document.

- The review included all current ports within the NT as defined by the Northern Territory Government [3].
- Consideration was given to all Australian offshore infrastructure in the Bonaparte and Browse basins. International infrastructure was not considered explicitly in this study, however pursuant to the international Basel Convention [4] and Australian Federal Hazardous Waste (Regulation of Exports and Imports) Act 1989 [5] (for international infrastructure), NT ports may be able to service other markets, specifically Timor-Leste. Timor-Leste assets (i.e., Bayu-Undan) have been included as a sensitivity.

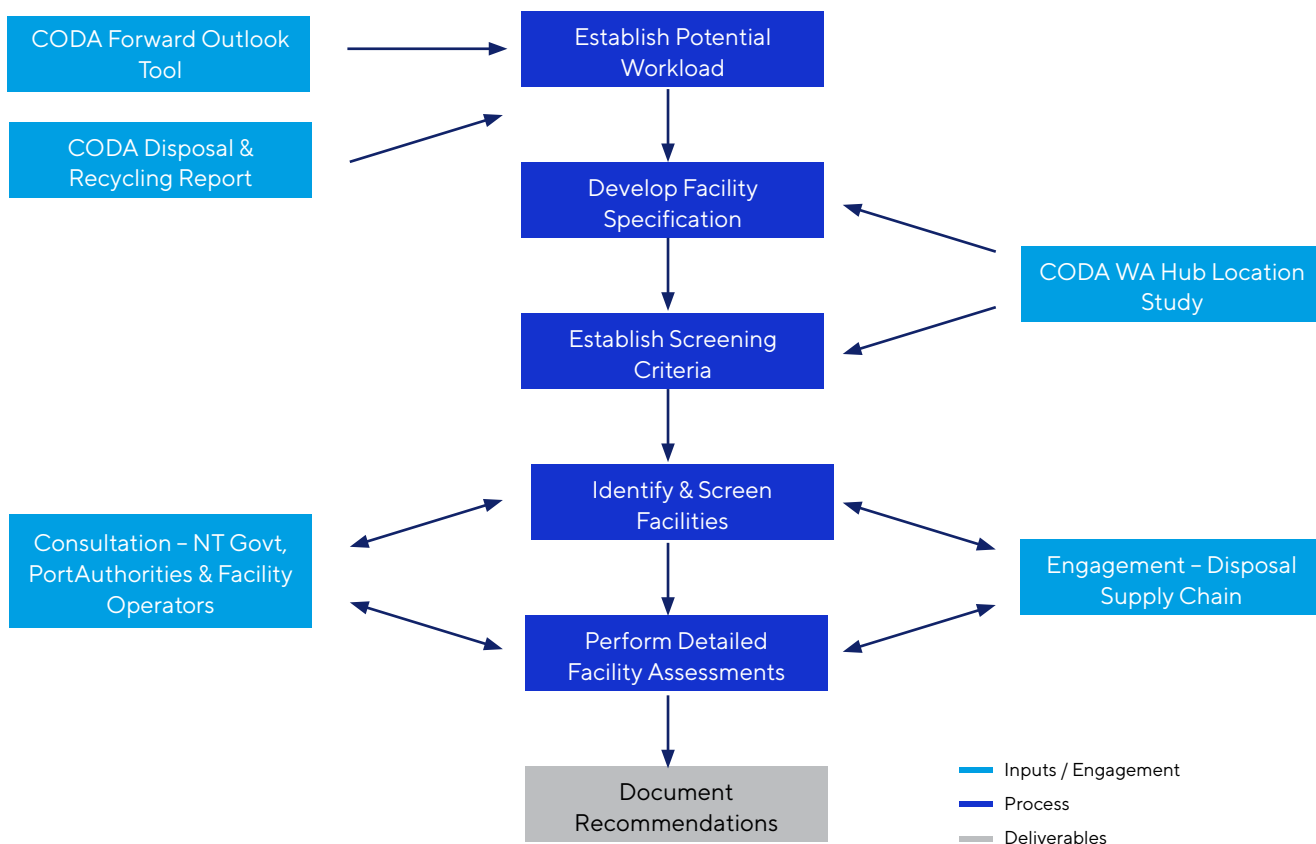


Figure 1.1 | Study Sequence

2.0

Potential Facility Demand

CODA estimated that there is a USD\$40.5b decommissioning liability for the full removal of all equipment installed offshore of Australia [6, 7]. Of this liability, 59% is associated with the decommissioning of Fixed, Floating, Subsea and Pipelines Facilities; Well Plugging & Abandonment comprises the balance. 20% of the liability is related to assets located in the Browse and Bonaparte basins. Using norms from the UK [8], approximately 12% of the facility decommissioning liability can be attributed to the onshore disposal¹. Therefore, there is the potential for at least USD\$600m of spend to be located onshore due to the removal of Australian offshore oil & gas assets in the Browse and Bonaparte basins.

From the review of available demand information, including the CODA Decommissioning Forward Outlook tool [9] and previously completed CODA studies [6, 7], the following observations were made for the anticipated throughput of offshore decommissioning works in the Northern Territory: The first stage of the study established the potential workload (tonnage) for the onshore facility utilising the CODA Decommissioning Forward Outlook tool [9] and previously completed CODA studies [6, 7]. The output of this was:

- Based on the estimated decommissioning dates, there does not appear to be significant overlaps in the decommissioning windows of the various developments. Lack of overlap means that each decommissioning campaign will need to be established separately – including leases on land, and mobilisation of a workforce and equipment.
- The nature of the demand from Defence industry does not adequately cover the gaps in offshore decommissioning demand. Indeed, it is also intermittent, and the potential volumes are smaller than oil & gas decommissioning.
- Overall, between the Defence and offshore oil & gas industries, there is unlikely to be the demand to sustain a continuous decommissioning workforce especially compared with other jurisdictions such as WA. Given decommissioning requires specialist capability, this will result in a short-term or “project” based workforce.
- It is not deemed credible for large fixed facilities (i.e., non-wellhead platforms) or floating facilities to be decommissioned in the Northern Territory.

From a planning perspective, the following are the most credible oil & gas decommissioning opportunities in the Northern Territory:

- Subsea infrastructure and mooring systems associated with the Northern Endeavour, coming ashore from 2025.
- Subsea infrastructure, mooring systems and a wellhead platform associated with Montara, coming ashore between 2032 and 2036.
- Subsea infrastructure, mooring systems (CALM buoy) and a wellhead platform associated with Blacktip, coming ashore from 2038.
- Subsea infrastructure and mooring systems associated with the Prelude and Crux developments, coming ashore between 2047 and 2052.
- Subsea infrastructure, mooring systems and a wellhead platform associated with the Barossa and possibly the Bayu Undan developments, coming ashore between 2050 and 2055.
- Subsea infrastructure and mooring systems associated with Ichthys, coming ashore from 2058 and 2063.



¹ Within OEUK's Decommissioning Insight Report 2022 [6], Onshore Disposal (Element 8 of OEUK Cost Estimate WBS [138]) accounts for 12.4% of the total fixed facility decommissioning costs (Elements 4 – 8). The 12.4% excludes the costs associated with load-in and also includes an offset for the value of the rebate of recyclable material. Therefore, the USD\$600m of spend supporting the disposal of infrastructure is likely to be at the lower end of the potential. Finally, it has been assumed that the offshore-onshore cost split for floating, subsea, and pipeline facilities is the same as for fixed facilities.

At present, the pipelines associated with each of the developments are subject to more uncertainty due to the absence of a precedent for their full removal (although this is the base case under existing legislation), and potential opportunity to reuse for CCS developments. The profile associated with the aforementioned opportunities is intermittent and exhibits 3 increasing peaks in activity:

1. From 2025, the subsea and mooring infrastructure will be recovered from Laminaria-Corallina (Northern Endeavour).
2. In the mid and late 2030’s, the Montara and Blacktip assets are expected to be removed resulting in recovered volumes 5x greater than Laminaria-Corallina.

3. From the late 2040’s and 2050’s, the major LNG producers of Prelude, Crux, Barossa, and Ichthys will reach CoP and require removal. These facilities comprise 97% of the total tonnage within the basins, most of which is associated with export pipelines.

This profile is presented in Figure 2.1 and the total recovered mass is 2,162,000 tonnes. Defence demand, based on the assumptions listed in Section 2.3, has been provided in the background of the image. Notably, this demand is relatively low (averaging 1,000t over a 5-year period); the demand for decommissioning services from oil & gas is significantly greater (peaks of 10,000t).

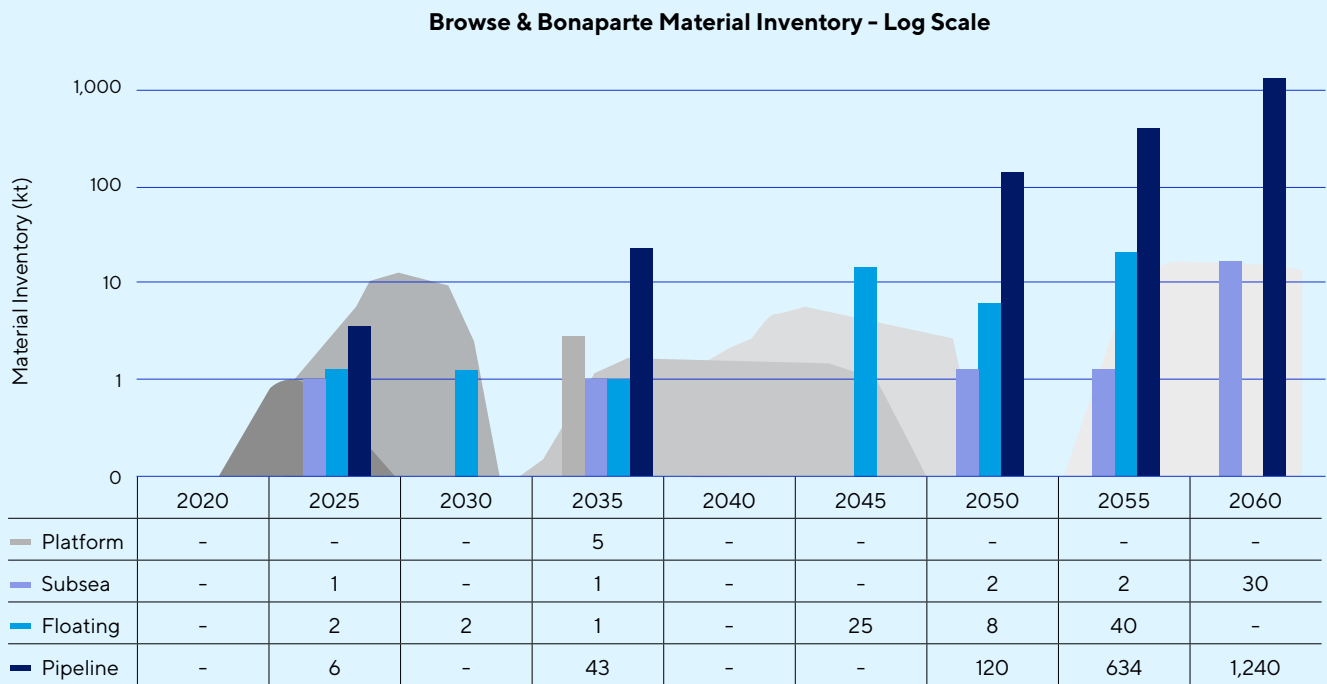


Figure 2.1 | Browse & Bonaparte Material Inventory [Defence Infrastructure in Grey]

3.0

Facility Specification

There is a wide range of infrastructure types that can come ashore as part of the offshore industry's decommissioning activities however the focus of this section is the requirements for facilities that can receive and dismantle credible oil & gas infrastructure. Research on international decommissioning facilities, conducted as part of the WA Decommissioning Hub Location Study [1], forms the basis of this specification.

The following specifications are recommended for prospective NT sites to support dismantling activities of offshore assets:

1. Tidal range: Less than 5m preferred if barge load-ins are anticipated, but more can be acceptable noting the operability limitations.
2. Vessel access:
 - a. Land-backed quayside to allow Construction Support Vessels (CSVs), Offshore Support Vessels (OSVs), and barges to dock:
 - i. Length (LOA) >110m
 - ii. Draft >6m
 - b. Ability for SPMT transfers from barges (i.e., a Module Offloading Facility), or quayside to allow monohull crane vessels to dock:
 - i. Length (LOA) >210m
 - ii. Draft >10m
3. Air draft: No restrictions
4. Quayside laydown area:
 - a. 2020's: 5,000m² of quayside laydown area available based on the minimum land available to pragmatically load-in and process the materials.
 - b. 2030's: 15,000m² of quayside laydown area available based on total demand of 10,000t associated with the Montara recovery.
 - c. 2050's: 50,000m² of quayside laydown area available based on total demand of 30,000 – 60,000t/year.
5. 10t/m² bearing capacity (ideal). Lower capacity is acceptable, but will require load spreading.
6. Impermeable (i.e., membrane) dismantling area with on-site water treatment. Temporary controls can be established on a project-by-project basis.
7. Located within established industrial areas.
8. In close proximity to waste management facilities.
9. Hold licences for dangerous goods and NORMs.

4.0

Facility Summary & Assessments

For the purposes of the study, all current and proposed port facilities within the NT have been identified and appraised against the established screening criteria. Table 4.1 lists these facilities and provides a summary of the conclusions from the review. Table 4.2 summarises the outcomes of a SWOT analysis (Strengths - Weaknesses - Opportunities - Threats) of Darwin Port. A complete discussion for each facility, including detailed assessments of the main common user facilities within Darwin Port and waste management capacity is included in the full report.

All ports are graphically presented in Figure 4.1 and Figure 4.2.

Facility	Study Conclusion
Darwin Port	
Fort Hill Wharf	Industrial cargos are not offloaded at this quayside and use for decommissioning would not be appropriate or practicable.
East Arm Wharf	<p>Project cargos primarily come through Berth 1 due to the proximity to the laydown areas which are allocated according to requirement.</p> <p>The East Arm Wharf is currently the most suitable port in Darwin to receive fixed offshore oil & gas facilities due to its ability to offload the structures via barges or monohull crane vessels. Floating facilities, if wet towed from the offshore location, and Subsea Structures, Pipelines, SURF & Mooring Systems can be received, however alternative quaysides (i.e., Marine Supply Base or Marine Industry Park) may be better aligned with these infrastructure types.</p> <p>Longer term, if the Middle Arm Module Offloading Facility is developed this facility may be more suitable than the East Arm Wharf.</p> <p>Laydown areas either within the East Arm Wharf bounds, within the Marine Supply Base operational area, or future reclaimed areas may be suitable for downsizing works if temporary ground improvements are made.</p>
Marine Supply Base	<p>The Marine Supply Base is adjacent to the East Arm Wharf and was developed to support the offshore oil and gas industry. Depth limitations may prevent larger vessels from delivering structures for load-in, however it is highly suitable for smaller offshore infrastructure such as Subsea Structures, Pipelines, SURF & Mooring Systems. Wet towed floating structures, such as mooring buoys, may also be suitable for load-in via cranes due to the higher capacity crane pads compared with the East Arm Wharf.</p> <p>Potential dismantling locations will be similar to the East Arm Wharf.</p>
Marine Industry Park & Darwin Ship Lift	<p>The Marine Industry Park and Darwin Ship Lift, expected to be completed in 2025 / 2026, will provide further options beyond the East Arm Wharf and Marine Supply Base. As it is intended to support maintenance and sustainment works for the maritime and defence industries, the usage will be aligned with offshore oil & gas decommissioning.</p> <p>The wet berths, pending final configuration and potential removal of any floating pontoons, may be suitable to receive offshore infrastructure loaded-in via barges. Furthermore, the ship lift may be utilised to load-in floating structures such as mooring buoys if they've been wet towed from the offshore location. Depth limitations in the berth pockets may prevent other infrastructure from being loaded in from OSV's or CSV's depending on the exact vessel parameters.</p> <p>Dismantling works may be completed within the Darwin Ship Lift quayside area or the adjacent Marine Industry Park common user hard stand.</p>

Facility	Study Conclusion
Middle Arm Module Offloading Facility	The proposed MOF would be suitable to support decommissioning works provided the project proceeds and is maintained through life to allow it to link to a common user laydown area. Based on the current conceptual design, it would be suitable to support all types of decommissioning activities and most vessels. Given it is a project cargo orientated quayside it is potentially better suited for decommissioning cargos compared with other quaysides which support commodity import / exports and marine operations.
Regional Port Facilities	
Port Melville	Despite the port being in closer proximity to offshore assets than the Darwin Port, it does not have the infrastructure to support offshore decommissioning activities. Specifically, the floating dock's bridge limits the ability to transfer moderate-sized cargos to shore and the lack of supporting industry and disposal facilities means all waste and recyclables will need to be transhipped off the island.
Gove Port (Melville Bay)	Although the industrial nature of Nhulunbuy is favourable to support offshore decommissioning works, especially given the current demolition works at the alumina refinery, Gove offers no compelling argument to service the offshore decommissioning industry compared with Darwin. Specifically: <ol style="list-style-type: none"> 1. Gove is significantly further from all offshore infrastructure compared with Darwin. 2. The intermittent nature of the offshore decommissioning profile does not lend itself to be an industry that could be used to permanently diversify the Nhulunbuy economy. 3. Listed waste will need to be transhipped and processed in Darwin.
Alyangula Port (Milner Bay, Groote Eylandt)	Notwithstanding the significant distances between offshore oil & gas infrastructure and Groote Eylandt and private operation of the facility, the port infrastructure and waste management facilities are not suitable or practicable for offshore decommissioning works to be undertaken at Alyangula Port.
Bing Bong Loading Facility	Bing Bong is the furthest port from the offshore oil & gas infrastructure and has minimal infrastructure. It is not suitable to support offshore decommissioning works.
Northern Territory Waste Management Facilities	
Treatment Facilities	The presence of competent licenced contractors in the territory such as Cleanaway, Contract Resources, Rusca Environmental Solutions, and Veolia is a strength of Darwin. However, they are limited by the available processing facilities that is a result of limited historical demand which may not necessarily change in future. To that end, they rely on their interstate network to fully treat wastes that are consolidated at their Darwin facilities. Positively, Global Resource Recovery do have a facility available locally to recycle, reclaim, and regenerate hydrocarbon, synthetic oils, glycol, amines, solvents, and pigging wastes.
Disposal Facilities	Darwin, and the NT in general, currently only has one landfill that is licenced to receive Listed Wastes as all other landfills are unlined. Waste from Darwin relies on the facilities across Australia for processing capability. The proposed Chandler geological repository, if it proceeds as per its current concept, and improvements to the rail network would be a major enabler for offshore oil & gas asset decommissioning.

Table 4.1 | List of NT Ports Facilities (Operating and Proposed)

Strengths

- Multiple quaysides in close geographical proximity offer several options for loading in offshore decommissioning cargos.
- Access to Darwin labour market, including Defence and contractors supporting the LNG plants and offshore facilities.
- The quaysides available to receive decommissioning cargos are remote from residential or commercial users.

Opportunities

- Undeveloped land is available both at the existing East Arm facility and at Middle Arm. Longer term, further reclamation at East Arm is possible with dredge spoil.
- Alignment with other regional (i.e., Chandler) and South Australia developments (i.e., EAF at Whyalla) may offer a compelling integrated recycling and disposal strategy. This is already being unlocked with the additional rail capacity gained from the Regional Logistics Hubs strategy.

Weaknesses

- The level of importance of offshore decommissioning is significantly lower than other waste management and economic initiatives.
- Availability of treatment and disposal solutions is limited compared with other Australian jurisdictions.

Threats

- Limited long-term demand for offshore decommissioning cargos.
- Intermittent and uncertain demand from Defence industry does not adequately cover the gaps in offshore decommissioning demand.
- Proximity of the basins to WA ports. Large volumes of offshore infrastructure are expected to go through WA ports due to proximity to the Carnarvon Basin infrastructure. Disposal pathways into WA are expected to be established and mature in advance of the demand from the Browse and Bonaparte Basin infrastructure. If risk associated with regulatory uncertainty or suitability of infrastructure in NT is perceived to be too high, operators may prefer to de-risk execution and opt to take decommissioning cargos into WA, despite the longer transit time.

Table 4.2 | Darwin Port SWOT Analysis



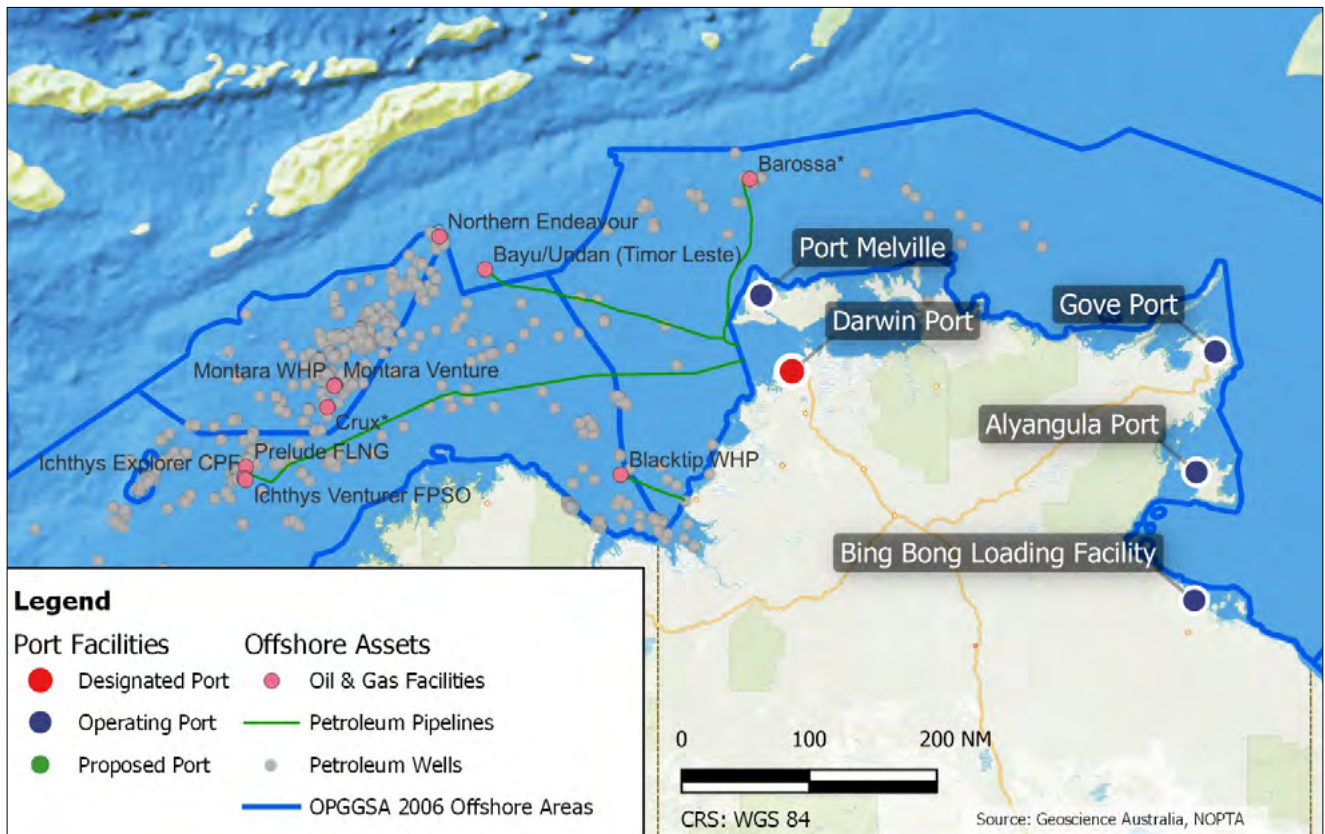


Figure 4.1 | Northern Territory Ports & Offshore Facilities

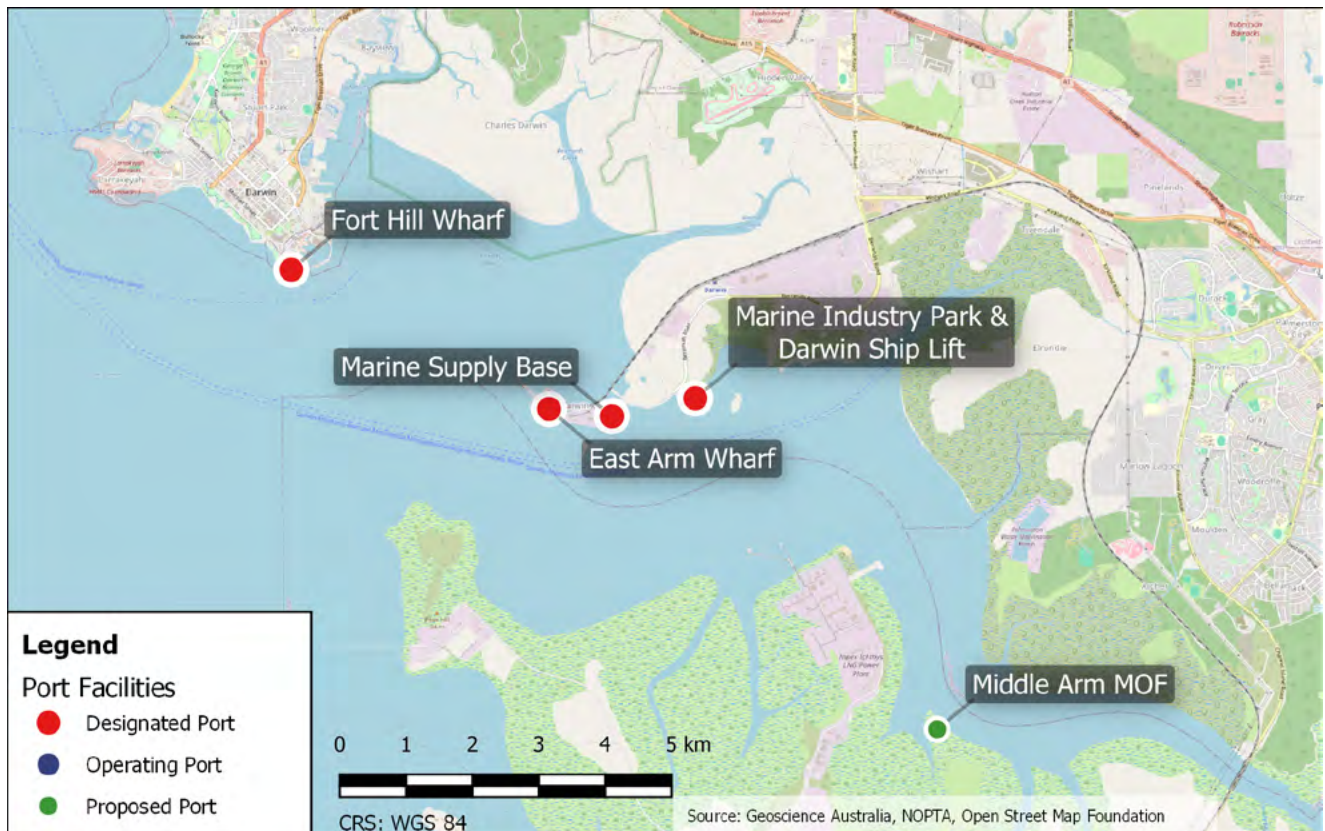


Figure 4.2 | Darwin Port

5.0 Recommendations

Table 5.1 presents a list of recommendations for further work as an outcome of the present study. Most are recommendations focussed on actionable items for the federal government, state government, or CODA which are grouped as follows:

- Potential Workload (refined volumes/tonnages and timing).
- Decommissioning Facility Specification.
- Regulatory.
- Infrastructure and Planning.

The urgency and impact of recommendation has been considered and is presented in Figure 5.1. The overall importance (impact + urgency) of each item has also been highlighted in Table 5.1.

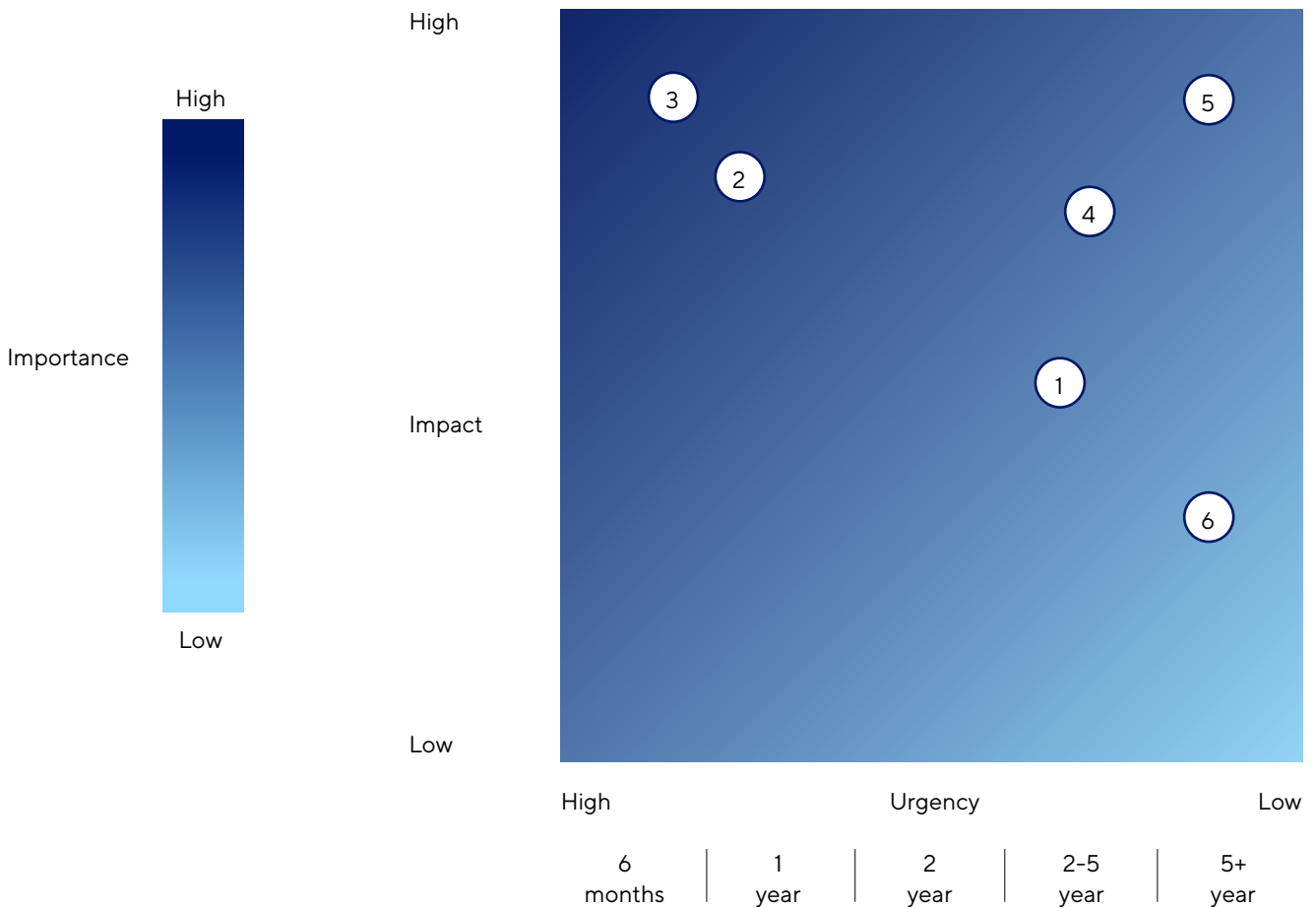


Figure 5.1 | Recommendations - Urgency / Impact Mapping

#	Recommendation	Impact	Urgency	Comment
Potential Workload				
1	<p>Decommissioning Database & Strategy- Defence Infrastructure</p> <p>Defence infrastructure will supplement the decommissioning volumes from other industries and may support business cases to develop further decommissioning capabilities. This is especially the case for the Northern Territory given the recent investment in the Darwin Ship Lift and Marine Industry Park and future investment in northern bases through the Integrated Investment Program.</p> <p>Between state, territory, and federal government Defence departments, it is recommended that a decommissioning strategy is developed to:</p> <ul style="list-style-type: none"> Identify the timeframes for the current and future fleet of vessels to reach end of life. This may be based on the planned design life or the target dates for investments in new vessels. Quantify the demand for decommissioning services (quayside specification, dismantling requirements, repurposing or recycling opportunities, listed waste disposal, etc). Identify prospective facilities and any necessary maintenance or capital improvements. Consideration should be given to any simultaneous construction or sustainment works which may preclude certain locations from executing the decommissioning works. 	Medium	Medium 2 - 5 years	
Facility Specification				
	Facility Specification I No specific recommendations.			
Regulatory				
2	<p>Multi-Agency Working Group for Decommissioning Regulations</p> <p>It is recommended that a multi-agency working group is established to expedite improvements to regulations, policies, and guidelines associated with the onshore aspects of oil & gas decommissioning. This may include federal and state government agencies with potential input from affected local cities and/or shires.</p>	High 6 - 12 months	High	This recommendation is reproduced from and aligned with the WA Decommissioning Hubs Study. It has been reproduced for the present study as the Northern Territory should partake in a Working Group if possible to share and receive learnings with Western Australia, Victoria, and the Commonwealth.

#	Recommendation	Impact	Urgency	Comment
3	<p>Regulatory Workflow for Onshore Disposal Activities</p> <p>To date, operationally generated waste from existing facilities and cleaning waste from the Northern Endeavour FPSO have come ashore to Darwin Port. In the short term (1 – 3 years), the volume of waste will increase due to the P&A of the Laminaria & Corallina wells and the associated subsea infrastructure.</p> <p>The volume of waste and relatively small number of suppliers involved is unlikely to necessitate the development of specific guidelines, in contrast with recommendations for other jurisdictions. However, due to the activities spanning the remit of multiple departments and often not specifically sitting within one category it is recommended that a regulatory workflow is prepared to simplify the process for:</p> <ul style="list-style-type: none"> Receiving waste generated offshore at the quayside, the most likely location for the transfer of responsibility from the offshore contractor to a logistics or waste management contractor. Transporting, treating, or storing waste that falls within both categories of low-level radioactive waste (i.e., NT Health) and listed waste (NT EPA). 	High	High 6 – 12 months	
Infrastructure Strategy & Planning				
4	<p>Transport Infrastructure Availability (Rail Network)</p> <p>In a similar manner to recommendation #3, it is recommended to develop a regulatory workflow to streamline the process for moving listed waste on the rail network to the future Chandler geological repository and scrap metal to South Australia’s smelters.</p> <p>Streamlining this process would de-risk the execution of bringing cargo into Darwin and fully utilise improvements to the transport network. It offers a compelling benefit over WA (which relies on marine or road transport to reach end disposal facilities).</p>	Medium	Low 2 – 5 years	
Facility Specific				
5	<p>Darwin Port – East Arm Wharf & MSB</p> <p>Development of the 4,000m² land between the Marine Supply Base and the main East Arm wharfs offers a valuable project cargo or decommissioning laydown area.</p> <p>Additionally, longer term additional land reclamation further east of the existing port footprint could be valuable for off-site storage, stockpiling, or dismantling.</p> <p>These opportunities could be included in the Port Master Plan noting potential demand from the mid-2030’s for offshore decommissioning cargos.</p>	High	Low 5+ years	
Maritime Industry Park No specific recommendations.				
6	<p>Middle Arm MOF [Development]</p> <p>Monitor development timeline and concept for the site.</p> <p>The proposed specification of the quayside would be suitable for offloading decommissioning cargos from barges or direct from monohull crane vessels. However, attention should be paid to eliminating potential limitations with the development as it is only likely to be required for decommissioning from the late 2030’s:</p> <ul style="list-style-type: none"> Any common user haul road (SPMT corridor) on Middle Arm should not be blocked by other developments and be allowed to terminate adjacent to undeveloped land or a common user area which could be used for dismantling. If the MOF is commissioned for one or more projects and is subsequently mothballed due to lack of demand, consideration should be given to any sustaining inspection and maintenance works to enable it to be readily recommissioned. A cost-benefit analysis may be a suitable technique for determining the optimal investment. This is a lesson learned from another regional MOF. 	Medium	Low 5+ years	

Table 5.1 | Study Recommendations

6.0

Conclusion

This report documents the evaluation of ports and supporting industries in the Northern Territory that could support the receipt, dismantling, recycling, and disposal of offshore oil and gas assets as part of the decommissioning process.

The NT has many favourable aspects which will support the future decommissioning of offshore oil and gas infrastructure in the Browse and Bonaparte basins. However, the key challenge is that the demand for these services is not continuous and the intermittent and uncertain demand from the Defence industry does not adequately cover these gaps. Thus, it is not possible to establish a permanent dedicated workforce and facilities; rather they must be shared with other industries.

The main threat to the success of this potential decommissioning industry model in the NT is the proximity of the Browse and Bonaparte Basins to WA ports. Large volumes of offshore infrastructure are expected to go through WA ports due to proximity to the Carnarvon Basin infrastructure. Disposal pathways into WA are expected to be established and mature in advance of the peak demand from the Browse and Bonaparte Basin infrastructure. If the risk associated with regulatory uncertainty or suitability of infrastructure in NT is perceived to be too high, operators may prefer to de-risk execution and opt to take decommissioning cargoes into WA, despite the longer transit time.

To mitigate the risk of actual, or perceived, regulatory uncertainty one of the key recommendations is for the NT Government to provide clarity to operators and waste management contractors. The volume of waste and relatively small number of suppliers involved is unlikely to necessitate the development of specific guidelines in contrast with the need for this in other jurisdictions. However, due to the activities spanning the remit of multiple departments and often not specifically sitting within one category it is recommended that a regulatory workflow is prepared to simplify the process for:

- Receiving waste generated offshore at the quayside, the most likely location for the transfer of responsibility from the offshore contractor to a logistics or waste management contractor.
- Transporting, treating, or storing waste with that falls within both categories of low-level radioactive waste (i.e., NT Health) and listed waste (i.e., NT EPA).
- Transporting listed waste on the rail network to the future Chandler geological repository and scrap metal to South Australia's smelters.

Streamlining this process would increase the likelihood of operators choosing to bring cargoes into Darwin and allow them to fully utilise improvements to the transport network. It offers a compelling benefit over WA (which relies on marine or road transport to reach end disposal facilities).

From a planning perspective, the following are the most credible oil & gas decommissioning opportunities in the Northern Territory:

- Subsea infrastructure and mooring systems associated with the Northern Endeavour, coming ashore from 2025.
- Subsea infrastructure, mooring systems and a wellhead platform associated with Montara, coming ashore between 2032 and 2036.
- Subsea infrastructure, mooring systems (CALM buoy) and a wellhead platform associated with Blacktip, coming ashore from 2038.
- Subsea infrastructure and mooring systems associated with the Prelude and Crux developments, coming ashore between 2047 and 2052.
- Subsea infrastructure, mooring systems and a wellhead platform associated with the Barossa and possibly the Bayu Undan developments, coming ashore between 2050 and 2055.
- Subsea infrastructure and mooring systems associated with Ichthys, coming ashore from 2058 and 2063.

At present, the pipelines associated with each of the developments are subject to more uncertainty due to the absence of a precedent for their full removal (although this is the base case under existing legislation), and potential opportunity to reuse for CCS developments. Furthermore, it is not deemed credible for large fixed facilities (i.e., non-wellhead platforms) or floating facilities to be decommissioned in the Northern Territory.

The study has reached the following high-level conclusions:

1. Offshore oil and gas facilities currently operating in the Browse and Bonaparte basins will be decommissioned over the next 40 years and will likely be recovered to ports either in the Northern Territory or Western Australia.
 - a. A significant portion of offshore oil & gas infrastructure in these basins could be received in the NT due to its proximity to the fields. However, certain offshore infrastructure types would represent a unique project for the NT but be relatively common in WA, and consequently it would be expected that these cargos would be sent the greater distance to specialist facilities at WA ports.
 - b. Forecast cessation of production dates indicate three distinct peaks in activity interspersed with 10 – 15-year periods where there will be no or negligible offshore oil and gas decommissioning works. Defence decommissioning will supplement this, but it is insufficient to establish a continual decommissioning industry.
2. The historical and ongoing investment in port facilities within the Darwin Harbour gives decommissioning projects multiple credible options for receival locations:
 - a. The existing East Arm Wharf and Marine Supply Base which have supported the oil & gas industry since establishment have suitable facilities to receive a significant portion of existing infrastructure.
 - b. The Darwin Ship Lift and Marine Industry Park offer an alternative to the established facilities above. In addition, the ship lift could be utilised to load-in floating structures (e.g., the Montara Venture FPSO turret, or the Blacktip CALM buoy) if the removal contractor opts to wet tow them from the field (thereby removing the need to contract a crane vessel).
 - c. A common-user Module Offloading Facility (MOF) proposed as part of the Middle Arm Sustainable Development Precinct could complement the other facilities for large structures (i.e., fixed platforms) or for high volumes of materials (e.g., subsea equipment from the large LNG developments).
3. Key risks to the execution of decommissioning projects in the NT are:
 - a. Availability of waste treatment, recycling, and disposal facilities. Specifically, there are currently limited treatment and recycling solutions for listed wastes, and disposal options are restricted to the composite lined Shoal Bay Waste Management Facility which is constrained with what can be received. However, there are several factors that lend to a favourable outcome for decommissioning in the NT:
 - i. Multiple waste management specialists operate in the region and have the ability to leverage their national and international expertise and capability as required. Indeed, the network into other facilities in WA, SA, QLD, and VIC is developed and readily accessible for all parties. Furthermore, some waste generators use the NT facilities for their waste treatment, this is particularly for speciality waste treatment options like glycol, waste oil, amines, and lube oils.
 - ii. Over the long term, the rail upgrades associated with the Regional Logistics Hubs will be a key enabler for utilising the Chandler geological repository (listed waste disposal) and Whyalla Electric Arc Furnaces (steel recycling) if they come online in 5 – 10 years.
 - b. Uncertainty around regulatory requirements (both Northern Territory and Federal):
 - i. Some parcels of listed waste recovered from decommissioning activities spans the remit of multiple regulations and regulators. Consistent guidance on applicability is not available.
 - ii. Operators have experienced differing requirements for listed waste generated during the “operations” phase of developments compared with those generated during the “decommissioning” phase.
4. Regional facilities (Port Melville, Gove Port, Alyangula Port, Bing Bong Loading Facility) have one or more limitations that are likely to prevent them being used for decommissioning activities. These include:
 - a. Proximity to oil and gas infrastructure. Compared with Darwin Port, it is at least twice the distance from the offshore oil and gas infrastructure to Gove Port, Alyangula Port or Bing Bong Loading Facility.
 - b. Availability of waste management services. Listed wastes are not able to be treated or disposed of at regional locations and must be brought back to Darwin. This is a similar case for recyclables (i.e., scrap steel) as the volumes being presented would be insufficient for direct export from the regional port and rather, they would need to be consolidated with scrap from Darwin.
 - c. Port infrastructure is suitable for receiving some, but not all, types of assets as there are limitations associated with approach depths or quayside configuration which prevent them from being loaded in.

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