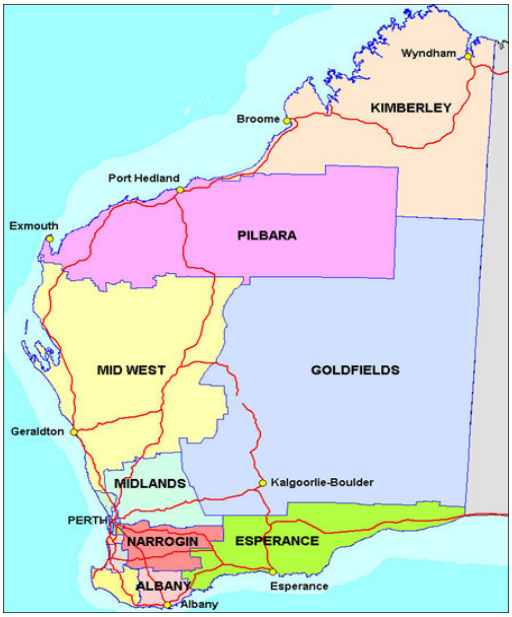
Marine Based Common Use Facilities: Northwest Western Australia



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1.0 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

1.1 Definitions

The following definitions are used within this report:

Common Use(r) Facility (CUF)	means an asset provided by a party that can be used by a range of entities from a broad range of industry sectors (building, housing, defence, Liquefied Natural Gas (LNG), resources, and oil and gas), or by contractors and/or service companies serving those sectors;
Strategic Industrial Estate (SIE)	means an industrial estate established by a party with the intent to attract Transformational Industries;
Transformational Industries	means industries established and/or attracted to the Region have the potential to have a substantial presence and support sustained Regional based employment.

1.2 Abbreviations and Acronyms

ADF	Australian Defence Force
AMC	Australian Marine Complex
ARRC	Australian Resources Research Centre
CU	Common Users
CUF	Common User Facility
DMSF	Dampier Marine Services Facility
DoT	WA Department of Transport
DPA	Dampier Port Authority
EOI	Expression of Interest
FIFO	Fly In, Fly Out
FPSO	Floating Production, Storage and Off-loading Vessel
FSO	Floating Storage and Off-loading Vessel
HHBSC	Hampton Harbour Boat and Sailing Club
LNG	Liquefied Natural Gas
MSB	Marine Supply Base
MDU	Mobile Drilling Units
O&G	Oil and Gas
PCO	Pilbara Cities Office
PHPA	Port Hedland Port Authority
PRPC	Pilbara Regional Planning Committee
RAN	Royal Australian Navy
R&D	Research and Development
RGC	Risavika Gas Centre (Norway)
Ro Ro	Roll On, Roll Off
SWOT	Strengths, Weaknesses, Options and Threats
WA:ERA	West Australian Energy Research Alliance

2.0 EXECUTIVE SUMMARY AND RECOMMENDATIONS

2.1 Summary

The Pilbara is one of Australia's most important economic zones, with Dampier and Port Hedland being the two highest export tonnage ports in Australia. Covering over 506,000 square kilometers and representing approximately 19.7% of Western Australia's total area, there are just a little over 45,000 people that live in the region (Pilbara Development Commission 2010). The Western Australian Government has recognised the need to further develop the economic base in the Pilbara. In order to further develop the economic base the State Government has a goal to encourage more people to live and settle in the Pilbara. The Premier, Mr Colin Barnett, announced that Karratha and Port Hedland would become major cities of the future (Pilbara Cities).

When launching the Pilbara Cities initiative, the Premier said the framework was now in place to transform the region by creating modern, higher density centres supported by all the services and facilities enjoyed in other Australian cities.

A critical element for a lively, functional and desirable city is a strong local economy that provides employment and wellbeing for its residents, which is connected regionally to enable external trade, thereby allowing opportunity for growth and exploration beyond the city boundaries.

An initiative to further develop the economic base on the Pilbara and to attract additional residents is the creation of a marine based common user facility in the northwest of the State. The State Government has experience in the creation of common use infrastructure to develop and grow industry sectors.

In 2003 the State Government established the Australian Marine Complex (AMC) Common User Facility (CUF) at Henderson WA. The AMC CUF has been an outstanding success, providing infrastructure and facilities for the oil and gas, defence, marine and resources sector on an 'as required' basis. In addition to providing cost competitive infrastructure and facilities for the Users[1], the CUF has provided the impetus for the establishment of a wide range of businesses on adjacent industrial precincts to service the targeted industry sectors. The CUF has benefited a broad range of industries servicing the sectors and has created significant economic benefit to the State. Since its opening in July 2003, the AMC has delivered more than 360 projects worth in excess of $660 million and generated more than 9900 jobs.

Establishing similar CUF infrastructure in the Pilbara will provide the basis to attract transformational businesses to service the marine, defence, commercial building, housing and growing gas and resources sectors. This will create employment opportunities and benefits to the community which will support the achievement of the Pilbara Cities initiative.

There is a significant current demand for CUF infrastructure in the Pilbara, with the need increasing as more of the massive resource projects become reality. The requirement for the CUF infrastructure is lead by the gas industry and resources sector. The infrastructure provided will be ideally suited to enhance the competitiveness of the building and housing industries and be a foundation for future defence and border protection needs.

[1] Users means companies or entities that use facilities at or within a CUF.

The Pilbara CUF would attract support industry creating sustainable employment in the Region particularly for the indigenous population. The type of industry that would use the CUF would create long term sustainable employment, with the potential for export of services in selected domains. Additional research will be required to further define the specific industry sub sectors, with businesses in the marine support, operations support, subsea support, emergency response, paramilitary/military and construction and logistics being standout opportunities.

Very strong interest in the concept of marine based CUF was received from a majority of industry sectors that were contacted in the preparation of this Report with potential users stressing the need and urgency for the infrastructure. It is evident business opportunities and the Pilbara based support for the next wave of construction contracts could be forgone should CUF infrastructure not be established within 18 months.

A particularly attractive aspect for a CUF is that the facilities could readily be incorporated into current and proposed planned Pilbara port and infrastructure developments therefore alleviating the need to create the CUF from a virgin environment. The proposed CUF could be established by ensuring that any Material Offloading Facility (MOF) (provided as temporary facilities for project construction phases) and/or wharfs are designed for long term CUF requirements, access ways, roadways and layouts suit CUF requirements and services installed to suit the potential CUF business.

Two alternative locations were identified for the proposed CUF, namely Port Hedland (Lumsden Point) and Anketell Port. Developments in each of these locations are in the planning phase and the CUF concept could readily be incorporated into these facilities. The location of the potential CUF is shown on the regional map provided in Appendix I.

The proposed Dampier Marine Services Facility (DMSF), which is expected to be constructed in the very near term, will alleviate some critical supply base and service facility needs, but the lack of industrial land near Dampier Port does not provide the environment for the creation of a CUF.

The planned Liquefied Natural Gas (LNG) hub and port development at North Ashburton may lend itself to a supply base and operational support facility, but lack of industrial support and a very small population base does not provide the basis for the establishment of a CUF of the scale offered at other locations.

There are a number of 'harbour' based developments at various locations along the coast, including Exmouth (potentially multiple developments), Beadon Creek (Onslow), Kaiser Marina (Hampton Harbour – Dampier), and Johns Creek (Point Samson) being considered, or in the planning phase. These developments are likely to occur in a shorter time frame than the provision of the CUF, and as such will reduce some of the demand on the over-utilised existing port facilities, but will not create the economic impetus that the CUF will create. These smaller harbour developments are seen as complimentary to the CUF and are very likely to create added value to the CUF.

Key business activities that could be provided within a proposed CUF include:

i. drill equipment servicing, repair, maintenance and storage;
ii. subsea equipment installation preparation, servicing, maintenance and upgrade;
iii. operational support services, including training facilities, warehousing, supply of water, provisions and fuel, waste disposal and supply of operational requirements such as cement and drilling muds;
iv. emergency response;

v. servicing the housing, building and construction industries;
vi. subsea pipe spool fabrication and pipeline fabrication for pipe reel vessels and towed pipelines;
vii. vessel slipping facilities for oil and gas supply vessels, paramilitary and military vessels for planned and unplanned repair and maintenance; and
viii. vessel berthing for supply and service vessels through to tankers, floating production offloading and storage facilities (FPSO's) and mobile drilling units (MDU).

Further research is required to further define and quantify the potential opportunities identified.

The facilities to be incorporated at the proposed CUF would include berthing, laydown areas, fabrication facilities, module and equipment assembly areas, warehousing and storage facilities, workshops, clean rooms, test facilities, offices, serviced lots and marine facilities including a vessel slipway.

Opportunities exist to incorporate future Defence requirements and capabilities into CUF assets development.

2.2 Recommendations

A number of recommendations have been made for the establishment of a CUF in the North West of Western Australia as follows:

i. As there is high, immediate demand for a CUF in the Region, decision making and planning for establishing a CUF should commence immediately such that facilities are available within a 3 year timeframe to capitalize on the next wave of construction contracts coming on stream from the resources industry.

ii. A Steering Committee should be formed with the participation of the Department of Regional Development and Lands, Department of Commerce, Department of State Development, LandCorp, Shire of Roebourne, Town of Port Hedland, Dampier Port Authority, Port Hedland Port Authority and other relevant stakeholders as may be required to plan and develop the CUF.

iii. Develop timelines for feasibility, front end engineering and design, construction & commissioning to ensure facilities are provided to coincide with User needs.

iv. Engage a consultant to select the preferred location of the CUF from the two short listed sites of Anketell Port and Lumsden Point (Port Hedland) and subsequently perform the pre-feasibility. The pre-feasibility to be performed in close liaison with consultants engaged by DPA and PHPA to ensure optimum overall development plan.
Scope of pre-feasibility to include preliminary site layouts, site facilities, wharf, building and office facilities, scope of work for development, development sequences and timeframes, budget costing, risks, interfaces and facility capability description.

v. Prepare an economic diversification plan which shall address the type of industries that would be attracted to the CUF, the benefits of securing those industries to the Region, and the flow on benefits of the industries in the Region. The diversification plan shall also address the marketing and engagement strategies required to secure the targeted

industries, CUF capability and features required to attract those industries, specific industry requirement on facilities and features of the CUF.

vi. Maintain ongoing dialogue with Defence about attracting Defence assets and Defence industry to the region with specific emphasis on the CUF.

vii. Ensure the design of a CUF has potential to incorporate future Federal Government defence requirements and capabilities into CUF assets development.

3.0 INTRODUCTION

3.1 Background

In the early 2000's the State and Federal Governments demonstrated vision by providing funding and leadership for the development of the Australian Marine Complex (AMC) Common User Facility (CUF) at Henderson WA. The AMC was developed to facilitate and enhance the clustering of sectors serving the marine, defence, oil and gas and resources industries. The facility was designed to attract new industry that creates sustainable long term jobs. The AMC CUF has been an outstanding success, providing infrastructure and facilities to Users servicing the oil and gas, defence, marine and resources sector on an as required basis.

The Henderson CUF has been used by over 100 different companies in over 350 contracts, from limited space short duration contracts through to multimillion dollar contracts over extended periods. The CUF Users comply with the pre-determined and published safety, environmental, security and industrial relations requirements which are managed by the facility manager - AMC Management (WA) Pty LTD. The demand for facilities has seen the type and size of common user assets increase. The addition of assets provided post site establishment has included workshops, wharfs, floating dock, heavy lift cranes, self propelled mobile transporters, offices and Ro Ro facilities. These additional assets are worth $200 million.

The CUF has been the incubator for a number of domestic and international companies to invest and create sustainable employment opportunities. A number of businesses established a temporary presence at the CUF prior to creating permanent presence in the adjacent industrial precinct. The breadth and depth of industries attracted to the area is far reaching, including:

- the largest, most technically advanced and automated fabrication facility in Australia;
- state of the art technology companies and manufacturers servicing targeted areas of the global deep water oil and gas industry;
- global companies servicing specialist aspects of the subsea market;
- world-class Defence companies; and
- a range of service contractors for cranage, transport etc.

The Department of Commerce and Department of Regional Development and Lands have now identified the potential requirement for similar marine based common user infrastructure in the northwest to provide a catalyst for industry development and employment generation. Such a facility would support current and future industrial development opportunities and diversification. It would ensure the State derives significant economic benefit from providing services to support existing and current projects being developed in the Pilbara.

3.2 Current Situation

The State is experiencing a step change in the level of business activity particularly in developing resource projects for the global market. The primary resource projects are gas and iron ore industry related, however, a significant number of projects are also being developed for other commodities. The increase in the level of business activity has stretched the capacity of existing marine based infrastructure in the Region[2]. Additional infrastructure is required in the Region to service the needs of the developers and to provide the platform for Australian

[2] The term Region is used through the document to refer to the Pilbara region of Western Australia.

industry to capture business opportunities and in turn create economic diversification and significant long term economic benefit for both the Region and the State.

To ensure the maximum value to the State, the study addressed not only the needs for the resource projects, but also needs for the housing, building, marine and defence industries.

3.3 Purpose and Objective

The Department of Commerce, in conjunction with the Department of Regional Development and Lands, requested a study to be carried out to determine the potential to develop a marine based CUF in the northwest of the State. The focus of the study was the identification of the CUF requirements/needs to support regional demand in various industry sectors, including the oil and gas, resources, defence, marine, housing and building industries[3] in the Pilbara and to be a foundation of economic diversification in the Region.

The study should also serve as the basis for the customer's policy positions and specific initiatives for the 2011/2016 period.

It was not intended that the study address the infrastructure needs for the resource projects, as such facilities have been assessed by the project developers. The study addressed the needs for the businesses that provide services to the projects, as well as the CUF requirements which may eventuate from the added demands created by the industries and communities that will be attracted to the northwest to service the projects.

To ensure that the State derives the maximum value from any investment in new common user infrastructure, other government and industry initiatives which may be under consideration for the Region were considered. One such example is the potential for the increase of the defence presence in the Region. It should be noted that there are a number of supply bases and other coastal infrastructure being considered or being planned in the area covered by this study. Such facilities may be referred to herein, but are not discussed in detail as the facilities are targeting the supply base service sector not the provision of a CUF.

[3] Housing and building – requirement is to establish facilities to enable transshipment and/or storage of pre-assembled housing

4.0 SCOPE OF WORK AND METHODOLOGY

4.1 Study Scope

The scope of the study was to determine the need for and characteristics of a CUF to support regional demand in various industry sectors, including the oil and gas, defence, marine, housing and building and construction industries. The focus was principally in the State's Pilbara region, however also included the Gascoyne and Kimberley.

The study addressed:

i. the type of facilities required in the Region to support current and future (5 year timeframe) needs, including fabrication and project support. The potential CUF considered the needs to support the housing and building industries, marine, oil and gas, resources, defence and the potential emerging business opportunities, such as a world class subsea support precinct, emergency response and other specialist support industries that were identified during the course of the study;
ii. the indicative locations of such facilities/infrastructure including the attributes and weaknesses for each location;
iii. key operational characteristics/parameters for each facility;
iv. size/capacity of facility;
v. overall timing and development issues for the various stages of each facility at each location, particularly in relation to potential User need timeframe, land acquisition, availability, planning native title, heritage and environmental approvals;
vi. characteristics for the management of facility operations;
vii. identification of companies, organisations and agencies involved in such facilities or potentially involved in such facilities;
viii. the level of local Government and Regional Agency interest in such a facility; and
ix. associated infrastructure support.[4]

4.2 Out of Scope

The following work was excluded from the scope of the study:

i. environmental aspects;
ii. design, construction & operating budgets;
iii. development schedules;
iv. Native Title;
v. reviewing or assessing facilities/infrastructure being considered and/or developed by project proponents;
vi. actual infrastructure needs to support the CUF identified; and
vii. actual business types.

4.3 Study Methodology

The study was undertaken using a qualitative research methodology and consisted of:

- a literature search of recent reports;

[4] Identify what other type of infrastructure (i.e. water, power and services) may be required to support the CUF's.

- interviews and discussions with potential stakeholders that may be impacted by the facilities (i.e. developers, operators, users, regional entities);
- identifying the types of business that may be attracted to the proposed facilities/infrastructure;
- identifying sector specific requirements (i.e. what may be required for subsea service capability, turbine service capability etc);
- interviews with stakeholders that may be impacted by the new business; and
- documenting key findings.

5.0 KEY FINDINGS

5.1 Introduction

The base case reference document for the study is the "Pilbara Planning and Infrastructure Framework March 2011". Stakeholder interviews and research were utilised to obtain background information. The stakeholder interviews (conducted on a 'one on one' basis) were targeted to obtain a broad overview of issues from a cross section of companies operating in the identified industry sectors, including:

i. builders and developers for both housing and larger projects, i.e. hotels and/or offices/high rise developments;
ii. Government departments including Department of Defence, Customs (maritime), Department of Transport, Regional Development Australia and local Government entities;
iii. defence stakeholders;
iv. mining and resource companies;
v. offshore oil and gas facility operators; and
vi. service companies and contractors servicing the sectors.

The options explored for a CUF in the Pilbara were focused around existing or planned port developments. A comparative analysis was undertaken of the port options and a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis was conducted for the various locations as detailed below.

5.2 Site Options

5.2.1 Dampier Port

The Dampier Port Authority (DPA) has expansions planned for the Dampier Port, the first being the creation of a Dampier Marine Services Facility (DMSF) by 2014, and subsequently, by 2016, a jetty extending from the DMSF. The DMSF will provide some 22 Ha of additional hardstand area plus 8 by 70m berths.

Even though the DPA is providing additional wharf and hard stand space, the Port is under capacity in terms of nearby industrial land for the establishment of a CUF with capabilities as described in section 5.4.2 below.

Complete information with regard to the Dampier Port development plans is contained in a document titled Port of Dampier Development Plan 2010 – 2020 and on the DPA web site www.dpa.com.au.

A SWOT analysis of Dampier Port as a site location for the CUF is provided below:

SWOT Dampier Port

Strengths • very successful operating facility • near to Karratha, Pilbara Cities focus city • the existing marine services support base • very well located with regard to offshore facilities • current expansion plans, with DMSF contact about to be awarded • published port development plan • nearby support services • industrial support base in Karratha	**Weaknesses** • current port congestion • limited land to expand	INTERNAL FACTORS
Opportunities • secure the near term work	**Threats** • existing long term leases may constrain expansion	EXTERNAL FACTORS

5.2.2 Port Hedland Port

The Port Hedland Port is a bulk materials loadout facility, but the Port Hedland Port Authority (PHPA) has plans for expansion which may provide container offloading, boat pens, lay down areas and wharf space. A key asset is the 140 Ha site (termed Area C[5]) created at Lumsden Point from the recovery of dredge spoil from the recent dredging activities for the bulk material loading facilities. Area C backs onto the Boodarie Industrial Estate and has direct harbour access. In addition, the Port Hedland airport is in close proximity, a new highway is being constructed to improve access and the Town of Port Hedland is proposing a logistics centre in the same vicinity.

The Lumsden Point site has the potential to be a site for the proposed CUF due to deepwater port access, the ports development plans for the site which include some 1.2km of land backed wharf, significant land and excellent logistical access.

In addition to Area C, a further area (Area B) is planned to be created from future dredging operations which will result in an additional 200 Ha site.

A key issue for the port expansion is potential congestion and the nature of the materials stored or used in the expanded port facility, such as fuel and/or explosives, which may have a material negative impact on the traditional port activities. Further details of the Port Hedland port development is provided on the PHPA web site www.phpa.com.au.

A SWOT analysis of the Port Hedland Port (Lumsden Point) as a site location for the CUF is provided below:

SWOT Port Hedland Port

Strengths • significant land area available (Lumsden Point) • additional land available (Area B) • adjacent to existing industrial estate • nearby to major airport • Town of Port Hedland planning a logistics centre nearby • port expansion plans being developed which include features very consistent with those required for the CUF and target industries which are the subject of this study • strong support from the city • proximity to the future Browse developments • within Port Hedland, Pilbara Cities focus city	**Weaknesses** • port is a bulk materials port and focus is on that significant market sector • current port congestion • heavy shipping movements at high tides • proximity to existing offshore facilities	**INTERNAL FACTORS**
Opportunities • readily incorporate CUF capability with port expansion plan • ideal location for defence and customs facilities	**Threats** • pressure from existing major port users to limit port expansion	**EXTERNAL FACTORS**

[5] see PHPA Port Development Plan

5.2.3 North Ashburton

North Ashburton is the proposed site for an LNG hub with the Chevron Wheatstone and BHPBilliton Macedon projects and possibly the Exxon/BHPBilliton Scarborough project set to have substantial developments at the site. A new port is planned to be developed to serve the LNG hub.

Due to confidentiality issues, there was limited opportunity to gain meaningful information for this Report particularly in regard to the port development in terms of facilities and space for users other than the gas customers. Development plans accessed have indicated 'supply base' facilities, boat pens and a MOF being available. Additional liaison will be required to get a greater appreciation for the aspirations for the site.

The North Ashburton LNG hub has a total area of some 8,000 Ha, with the principle facilities being LNG and gas processing plants. Site development plans indicate provision for an industrial estate, but currently limited information is available with regard to the types of industry that is intended to be attracted to the site. It should be noted that the North Ashburton LNG hub is remote from both a population base[6] with the closest industrial centre being Karratha some 300 km away.

A SWOT analysis of North Ashburton as a site location for the CUF is provided below:

SWOT North Ashburton

Strengths • in planning phase has the ability to incorporate CUF capability • extensive land available • very well positioned to access existing (and future) offshore facilities • MOF yet to be designed therefore can incorporate CUF capability • to be developed in the very near term to meet requirements of Chevron Wheatstone project and BHPBilliton Macedon	**Weaknesses** • limited information available during study timeframe due to confidentiality • current plans have limited inherent expansion capability • not near Pilbara Cities focus city • limited nearby support industry • limited nearby population base • limited nearby airport	**INTERNAL FACTORS**
Opportunities • develop a supply base to service the western North West Shelf	**Threats** • development may proceed quicker than decision making for the proposed CUF	**EXTERNAL FACTORS**

[6] nearest town is Onslow population ~600

5.2.4 Anketell Port

The Western Australian State Government announced in early March 2010 that Anketell Port shall be developed for a multi user deep water port with an adjacent strategic industrial estate. Anketell Port is located 12 km west of the existing Cape Lambert Port and 25 km east of Karratha.

Very preliminary development plans have been made available for the development, but what has been sighted indicates that the key focus is on bulk material loadout, with some capability for other industrial use. It was noted in the development plans sighted that there is land identified for a Strategic Industrial Estate (SIE). There has been preliminary dialogue with DPA, Department of State Development (DSD) and Preston Consultants[7] with regard to the incorporation of potential CUF capability into the port development plans.

The port is located in relative close proximity to Karratha which is a Pilbara Cities focus city. The Main Roads WA at the request of the Pilbara Regional Planning Committee (PRPC) and Pilbara Cities Office (PCO) is currently performing a feasibility study for the construction of a coastal link road between Karratha and Wickham which has the potential to open up site options to locate a CUF on the western side of the Anketell Port development, which was previously an unavailable site location.

A SWOT analysis of the Anketell Port as a site location for the CUF is provided below:

SWOT Anketell

Strengths • very well located re the offshore facilities • in planning phase therefore the ability to incorporate CUF capability • significant land available (potentially a future proof development) • very well positioned to access existing offshore oil and gas facilities • MOF and port yet to be designed therefore can incorporate CUF capability • MOF required for resource project development with limited use post project, MOF available as a basis for CUF • near to Karratha, Pilbara Cities focus city • to be developed in the near term for number of iron ore projects • good road and airport access • nearby support services • industrial support base in Karratha	**Weaknesses** • bulk material export facility, CUF may be pushed to a 'fit around' business • development time frame • dust, noise vibration may affect possible industries that may be attracted to the CUF • unlikely to start operations until 2015 • subject to funding & go-ahead of several major resources projects • planned multi-user port, but only for resources sector	**INTERNAL FACTORS**
Opportunities • to develop a CUF and specialist support industry • current study for the construction of the Karratha to Wickham coastal link which will open up access to a CUF at Anketell • could be an ideal location for future defence and/or customs facilities	**Threats** • port development may not be within time frame required for the CUF	**EXTERNAL FACTORS**

[7] acting for DPA

5.2.4 Other Planned Port Development Site Options

There are a number of other harbour developments being planned and/or considered in the area covered by the study. It is not envisaged that the harbour developments would be detrimental to a proposed CUF development, in fact there is a distinct possibility that the developments may even enhance the capability and viability of the proposed CUF.

The developments identified included:

Exmouth

There are four or more potential harbour developments being considered in the Exmouth region which are discussed herein:

Exmouth Boat Harbour, by Department of Transport
(http://www.transport.wa.gov.au/imarine/19450.asp)

- currently in the planning phase;
- two stage development;
- accommodate vessels to 35M, 3.5M draft; and
- supply base services, water, fuel, waste disposal, cements, muds etc.

Exmouth Limestone (Ezion)

- most advanced, has environmental approval, proponent indicated a 12 month development timeframe;
- 15 Ha supply base, full service, no fuel, causeway to 1Ha Island; and
- 120M wharf face.

MSA

- limited information has been made available but the entity has very strong relationships with the indigenous community;
- has 100 Ha site; and
- is in strong dialogue with a number of potential Users.

MG Kailis

- least advanced in planning, but the business has had marine and business operations in the area for over 50 years, knows the environment and the community very well;
- actively managing interest in the site;
- 24 Ha located some 20k south of Exmouth township, away from population base, surrounded by 100 Ha of Crown land, readily expandable.

A SWOT analysis for the Exmouth facilities is provided below:

SWOT Exmouth (4 potential facilities)

Strengths • plans for expansion of existing Exmouth harbour (site 1) in place and development proceeding • approvals in place for one of the proposed developments (site 2) therefore shorter development time frame • a number of sites (at least 4) available • additional land available to one of the potential sites (site 4) • proximity to offshore oil and gas facilities • currently used to service the oil and gas sector • substantial airport nearby • Native Title not seen as an issue	**Weaknesses** • several of the proposed sites have limited expansion capability • not near Pilbara Cities focus city • limited nearby support industry • limited nearby population base • water depth dictates 'causeways' to wharf , therefore limited at wharf capability (i.e. assembly works – chains, pipe spools, prefabricated components) • located in a 'tourist' precinct • Exmouth surrounded by marine parks and environmentally sensitive areas • the Exmouth boat harbour is in/adjacent to a canal based residential development	INTERNAL FACTORS
Opportunities • to develop a small support industry to service the western North West Shelf developments	**Threats** • developments delayed due to environmental pressures	EXTERNAL FACTORS

Onslow (Beadon Creek) (http://www.transport.wa.gov.au/imarine/20680.asp)

The Department of Transport (DoT) recently (mid 2010) issued an expression of interest (EOI) for the development of harbour based facilities at Onslow (Beadon Creek) maritime facility. An area of approximately 10Ha has been identified for Stage 1 development and a further 100Ha in Stage 2. It should be noted that Stage 2 is isolated from Onslow by Beadon Creek. Limited information is available about the proponent's proposals as the proposals are currently under evaluation. It is anticipated that developments shall include wharf facilities and dredging to 3.5 MWD offering general supply base capability.

A SWOT analysis for the Onslow (Beadon Creek) facility is provided below:

SWOT Onslow (Beadon Creek)

Strengths • in planning phase, EOI's issued mid 2010 for lease near water lots at Beadon Creek • close to offshore oil and gas facilities • additional land (100 Ha) available, but is isolated from Onslow by Beadon Creek • private developers currently pursuing the opportunity • supported by Department of Transport	**Weaknesses** • limited expansion capability on southern side (town side) of Beadon Creek • too small for consideration as a CUF in the context of this study • not near Pilbara Cities focus city • limited nearby support industry • limited nearby population base • limited water depth • limited nearby airport	INTERNAL FACTORS
Opportunities • to develop a limited supply base to service the nearby oil and gas facilities	**Threats**	EXTERNAL FACTORS

Kaiser Marina (Dampier Port- Hampton Harbour)

The Kaiser Marina is located in Hampton Harbour adjacent to the causeway to East Intercourse Island. It was developed in the 1960's and is essentially disused but is under lease to the Hampton Harbour Boat and Sailing Club (HHBSC). Private entities are pursuing the development of the site to be used as a limited support base, slipway for up to 500t vessels and a safe haven for vessels during a cyclone. This is a limited capability facility which would compliment facilities at the DMSF and other locations in the area.

A SWOT analysis for the Kaiser Marina (Hampton Harbour) facility is provided below:

SWOT Kaiser Marina (Hampton Harbour)

Strengths • very well located re the offshore facilities • being pursued by private company • located in the existing oil and gas marine support sector space • totally compliment a CUF and expansion plans at DMSW • near to Karratha, Pilbara Cities focus city • existing facility • can be fully operational within a very short time frame and alleviate issues facing the oil and gas service industry • good road and airport access • nearby support services • industrial support base in Karratha	**Weaknesses** • HHBSC has an existing lease on facility • too small for consideration as a CUF in the context of this study	**INTERNAL FACTORS**
Opportunities • in the very near term overcome the dire need for additional support facilities for the smaller vessel operators • develop a limited supply base to service the nearby oil and gas facilities and coast construction activities	**Threats** • existing facility owner may not lease facility to private entities • HHBSC may not relinquish lease over the facility • development approvals	**EXTERNAL FACTORS**

Johns Creek (Point Samson)

Initially developed as fishing and prawning harbour, Johns Creek has been used as a supply facility for construction and support vessels operating in the area. The limited wharf access facility has been saturated with marine equipment at various times during construction projects. The DoT has plans for the enhancement of Johns Creek to accommodate up to 60M vessels, 5 MWD, land backed wharf and up to 5 Ha of lay down area.

A SWOT analysis for the Johns Creek (Point Samson) facility is provided below:

SWOT Johns Creek (Point Samson)

Strengths • well located re offshore oil and gas facilities and coastal construction activities • DoT has conceptual plans prepared for expansion • totally compliment a CUF and expansion plans at DMSW • existing facility • could be developed in a short time frame • near to Karratha, Pilbara Cities focus city • some (~10Ha) laydown area available in close proximity • good road access • industrial support base in Karratha	**Weaknesses** • 'remote' from Karratha (~40 Km) • limited expansion capability • too small for consideration as a CUF in the context of this study	INTERNAL FACTORS
Opportunities • in the very near term overcome the dire need for additional support facilities for the smaller vessel operators • to develop a limited supply base to service the nearby oil and gas facilities and coast construction activities	**Threats** • community acceptance unknown • development approvals	EXTERNAL FACTORS

5.3 Potential CUF Users

5.3.1 Introduction

Discussions were held with a broad cross section of industries that may benefit, use or be impacted should a CUF be established. The intent of the interviews was to obtain direct input and/or feedback with regard to the type, nature, location and key attributes of potential CUF. The discussions were conducted on a subjective basis, with the intent of trying to obtain key industry base line input for consideration.

5.3.2 Building

The cost of establishing office or high rise apartment type buildings in the Pilbara may be 1.5 or more times the cost of establishing an equivalent building in Perth. The objective of holding discussions with building contractors was to determine what infrastructure could be provided at a CUF to lower the building cost.

Several potential opportunities were identified:

i. the establishment of a land asset whereby builders could construct construction worker short term housing for a particular project; or
ii. the establishment of common user building construction worker short term housing to eliminate the need to establish and demobilise temporary housing for each building project.

It should be noted that the subjects raised are being addressed within the Pilbara Cities initiative and are not further addressed within this Report. Nonetheless, ongoing discussions with builders and developers is warranted as the CUF project develops, to ensure that the

builders are conversant with the capability to be created and that any additional features that the builders identify may be incorporated as CUF plans mature.

5.3.3 Housing

The cost of building houses in the Pilbara may be 1.3 or more times the cost of establishing an equivalent building in Perth. The objective of holding discussions with building contractors was to determine what the CUF could provide to have more affordable housing.

Reports reviewed identified a number of contributing factors to the housing supply and affordability issue, including:

i. high cost of construction;
ii. inability to attract major/competitive developers to the region;
iii. lack of interest among developers to develop housing for middle to low income groups;
iv. lack of appropriate housing mix;
v. shortage of builders / tradespersons;
vi. resources companies subsidising workers and/or paying increasing prices to keep their workers;
vii. concentration of properties amongst a handful of market players; and
viii. lack of common user building construction worker short term housing, along the lines of the "service worker" housing, to reduce the cost of accommodating personnel during the house building phase.

In addition to the above, the following subjects were raised as impacting the affordability of Pilbara housing:

i. high cost of developing residential land driven by environment, cost of fill and cost of material supply;
ii. slow release of residential land for development;
iii. lack of an active land market in the Pilbara; and
iv. planning and delivery of residential land and housing.

A majority of the above subjects are not within the scope of this study, but there has been advice that the subjects have been or are being addressed through the Pilbara Cities initiative.

As noted in 5.3.2 above, ongoing dialogue with the housing sector should be maintained to ensure that any requirements identified by the sector are incorporated into CUF development plans.

5.3.4 Defence

Within the defence sector, the prime service that would use the proposed CUF would be the Royal Australian Navy (RAN). Marine assets of the Army could potentially utilise the CUF on occasions. Current defence planning has not identified facilities in the northwest as a requirement; in fact consolidation to facilities in other locations appears to be the priority.

Nevertheless, there remains the opportunity to influence the Federal Government about the importance to the nation of the North West of Australia. The 2009 Defence White (WP09) recognises the strategic importance of Western Australia's resources and their vulnerability.

"*Most of Australia's reserves of oil and gas are concentrated offshore in the northwest of Australia and the Timor Sea. Many of our key resource extraction facilities are remote and*

would be vulnerable to interference, disruption or attack. Some of our offshore territories would also be vulnerable to harassment or attack, and their loss or occupation by an adversary would represent a major strategic setback." (*p51*)

The Government requires Defence to revise and update contingency plans to establish air and sea superiority in the approaches to Australia, its offshore territories and resources. In addition, the Indian Ocean theatre is to be given increased focus:

"More than ever before, short of war, Australian defence planning will have to contemplate operational concepts for operating in the Indian Ocean region, including with regional partners with whom we share similar strategic interests." (p52)

The Study recommends that the State Government continues to promote the need for Defence to strengthen the forces and assets committed to Western Australia. The Department of Commerce should continue to promote the requirement for increased sustained support to Defence from Western Australian industry.

The CUF capability proposed to be developed to serve other industry sectors would be ideally suited for Naval access, for either emergency or un-planned work, or should the Navy have a future need, post a policy or strategic initiative change.

It should be noted that the Chief of Navy recently mentioned in a presentation to a Defence and Industry Forum[8] that there was a need for the maritime industry and Defence to partner in the delivery of capability to protect Australian interests. He stated that this included strategic assets and activities dotted around our coastline in some very remote locations.

The CUF capabilities identified by other marine users included sheltered harbour facilities, extensive land backed wharfs, wharf based craneage, wharf side services, slipways and potential vessel lifting capability, close proximity to industrial areas with mechanical, machining, marine, electrical, electronic and hydraulic capabilities. The CUF capabilities would be suitable and available for Navy use should the need arise.

Whilst discussions were held with the Department of Defence regarding naval requirements in the region, future requirements and capabilities for the Army and Air Force, as well as the Navy should be persuaded as part of a long term strategy to have elements of the Australian Defence Force (ADF) based in the north. Additional requirements from our allies (e.g. United States of America) should also be examined at this time.

5.3.5 Maritime

The maritime sector has the greatest need for CUF's to service both today's needs as well as the significant growth that is planned over the next 10 years. The majority of the marine based facilities identified are listed under oil and gas (5.3.8) below as the need was specifically identified by that sector. The only non oil and gas specific marine requirement was boat lifting capability to approximately 1,000 t capacity. This should be considered in light of the requirement for slip facilities identified below.

5.3.6 Resource Companies

The resource companies had limited specific requirements, with the needs identified being accommodated within the parameters as defined for the LNG and or maritime sectors. The

[8] Opening ceremony at the Pacific 2010 Congress and Exposition on 27 January 2010,

types of facilities required included module or pre-assembled unit load in capability with associated high wide load corridors to their site locations.

5.3.7 LNG Sector

The LNG sector identified capability requirements for the CUF for both the capital and operating phases of the projects. The types of capability that should be considered include:

i. gas turbine maintenance capability;
ii. valve and specialist equipment repair and maintenance capability;
iii. aero derivative[9] gas turbine facility. This subject is more an industry attraction and development opportunity rather than a CUF requirement, but was identified as a specific opportunity and has merit in pursuing; and
iv. module load in capability, but these were generally in place (Dampier), or under consideration at North Ashburton.

5.3.8 Offshore Oil and Gas Industry

The CUF requirements identified by the offshore oil and gas industry include:

i. traditional supply base services of fuel, water, provisions, cold storage, cement, muds, chemicals, gases, interim material storage and waste collection and disposal;
ii. unique common user (CU) capability such as FSO hose assembly and repair, large scale pipe spool fabrication facilities and areas, areas for anchor chain storage and assembly, training facilities, AQIS capability, subsea pipeline interim storage, subsea well and manifold storage and pre installation checking, module assembly and storage;
iii. wharf capacity to take high capacity crawler cranes and for multi-wheeled trailer loadouts;
iv. sink holes to accommodate very heavy transport vessels;
v. berth facility to take numerous supply vessels – potentially 10 plus at a time, a FPSO, or mobile drilling unit (MDU);
vi. slip facilities for both planned and emergency supply vessel repairs;
vii. pipe fabrication facility to fabricate pipelines to be reeled onto pipe reel vessels and or pre-assembled for pipe tows;
viii. support of subsea infra-structure, potentially a massive market. Such facilities include laydown areas, workshops, clean rooms, test pits, gas storage;
ix. drill string, tubular storage, repair and maintenance and cleaning facilities. Such facilities would need to incorporate waste (contaminated water) capture and retainment and treatment capacity;
x. concrete casting capability[10];and
xi. storage, handling and loadout facilities for pipeline stabilisation material.

5.4 Location and Infrastructure Requirements for Potential CUF Users

5.4.1 Location Requirements

The preferred location for a proposed CUF depends on the criteria of the identified business sectors. For example:

i. building and housing sector - in close proximity to the destination of use;

[9] GE trade name, but other manufacturers have similar,
[10] Not that this was identified by the building/housing sector, but there could be benefits for these industries as well as the oil and gas sector.

ii. Defence sector - none stated, if the CUF is in the appropriate location when a need arises it will be used;
iii. maritime and offshore oil & gas sector - the southern part of the Pilbara would be preferred to service the southern oil and gas fields; and
iv. more central oil and gas fields, flexibility in the Pilbara and Kimberly coast for Browse as the current competing facility is Darwin.

The Study identified two locations that are recommended for further assessment for the establishment of a CUF, namely:

i. Port Hedland - Point Lumsden; and
ii. Anketell Port.

5.4.2 Infrastructure Requirements

The types and characteristics of infrastructure requirements identified can be summarised as per below:

Building and Housing		• building and housing construction worker accommodation – size to be defined, or • CUF land for creation of as required building and housing construction worker accommodation - size to be defined
Defence		• what is provided for maritime and oil and gas, is likely to meet defence needs at present
Maritime	Wharf	• land backed, • 8 to 14 M draft, • capacity for 1,000t crawler crane, • capacity for high capacity mobile trailers (12t/M^2), • capacity to berth FPSO, • capacity to berth +/- 10 supply/construction vessels, • reticulated services.
	Facilities	• fuel; • water; • provisioning storage; • cold storage; • waste disposal; • security; • AQIS capability; • training facilities; • bulk materials (i.e. mud, cement); • storage for drill pipe, tubulars, pipe storage, anchor chain, construction materials, rock for pipeline and similar stabilisation, coated pipe storage and general lay down; • warehousing and secure storage; • interim workshops, clean rooms and test facilities for subsea service sector; and • interim workshops for as required fabrication requirements.

Other	• sink hole ~(250M by 250M by 45M deep) for offloading very heavy transportation vessels; • slipway for slipping vessels to 3,000t, 100M by 20M, either with slipway or adjacent FOS hose assembly repair capability; and • pipe spooling yard (water front, 30M wide by 2,500M long) for pipe fabrication for pipe reeling vessels and or pipe tow.

5.5 Competing Facilities

The competing facilities are primarily the Darwin existing and proposed developments as well as existing and proposed facilities in Indonesia, Singapore and Malaysia.

The South East Asian facilities have a long history as support bases for the maritime and oil and gas sectors. In addition, there are strong Government lead initiatives in these countries to ensure that they are well positioned to secure the demand being created and specifically the opportunity that is arising in Australian waters. Asian companies work from a far lower operating cost basis and have a deep history in supply and support, and as a consequence are a very attractive proposition for companies operating in the North West of Western Australia.

The key disadvantage with those facilities is the distance from Australia and the travel cost time. A northwest CUF could be very attractive to potential customers, should the appropriate facilities be established in a timely manner.

For additional information on the competing facilities see:

- Malaysia, Tanjong Agas Supply Base & Marine Services, - http://tgagas.com/
- Malaysia, The Kemaman Supply Base (KSB), - http://www.epicgroup.com.my
- Malaysia, Kuala Besar Supply Base - http://www.kbsb.com.my/
- Singapore, The Loyang base, – www.topsloyang.com/
- Singapore, Jurong Base, - http://www.jp.com.sg/
- Indonesia, PT. Sekupang Makmur Abadi – http://sekupanglogistics.com
- Australia, Darwin - http://newsroom.nt.gov.au/index.cfm?fuseaction=printRelease&ID=7688

6.0 BUSINESS OPPORTUNITIES

6.1 Introduction

The Pilbara Cities initiative will require a robust, diversified local economy that effectively services the current and future needs of local and regional industry. To deliver on the Government objectives there needs to be improved local business capability to service new industry sectors, which will provide additional local employment opportunities. Increased local business, industry and employment diversity will provide enhanced local business investment and job creation. The CUF concept, as proposed by the Department of Commerce and Department of Regional Development and Lands, will accelerate the achievement of these objectives.

A CUF in the region provides the foundation to attract new industries or provide the impetus for the development of existing industry. In addition to commercial industry a CUF located within a maritime setting could potentially host a range of Federal Government security, border protection and intelligence agencies, services and functions.

The discussion in this part does not address the benefits and outcomes from providing short term CUF infrastructure such as building construction worker housing, which should reduce the cost of providing buildings and houses, but primarily addresses the types of business that could benefit from providing the facility.

6.2 Increased Business Opportunities

A CUF will provide the basic infrastructure for a broad range of industries to establish a presence to service the rapidly growing resources sector. The businesses attracted shall initially service a market that is currently being filled by foreign companies operating from foreign locations. Once businesses establish a presence in the CUF, the capability created shall attract additional business and businesses due to the depth of service being provided.

The types of businesses that may be enhanced and/or created as a result of providing CUF include:

i. traditional supply base support operations, which may include, warehousing, storage, fuel, drilling muds, chemical, hardware, water, waste disposal and similar services;
ii. support operations such as pipeline storage, rock storage and load out, tubular and drill pipe handing, repair testing and storage;
iii. cleaning, wash down and material protection activities, including waste water processing treatment and disposal;
iv. pipe coating and/or coating repair;
v. pipe, pipe spool and pipe line fabrication, testing and protection;
vi. FSO and FPSO hose repair and/or assembly and testing;
vii. emergency response;
viii. training and skills enhancement;
ix. supply vessel repair and maintenance, repair, modification and/or upgrade of drill ships or other vessels transported via the very heavy lift vessels; and
x. FSO, FPSO, pipelay and/or construction vessel servicing, support and/or emergency repairs and/or modifications.

All of which will create associated logistics and supply services.

6.3 Transformational Business Opportunities

There are a number of 'transformational businesses' that could be attracted to the region with

The establishment of a CUF in the Region will create increased capability, which when combined the lower cost servicing due to the Pilbara Cities initiative, as well a the number and size of resource projects, there is the potential to attract a broad range of potentially transformational business to the Region. These are discussed below,

i. Subsea Facility Service Support Capability

Independent international reports identify North West of Australia as the potential largest user (globally) for subsea wellheads and subsea facilities by 2014 or shortly thereafter. The capital phase of these projects is being fulfilled by international suppliers from international sources.

For both the facility installation activity, as well as long term operations support there is a significant business opportunity. The major global service providers[11] have established or are establishing world class service facilities in Perth. Never the less, there is a support service need that could be fulfilled from the Regions and a CUF would be the ideal basis to attract those businesses. There is a very strong push by nearby countries to secure this business opportunity.

The type of capability and flow on benefits could be far reaching including 'clean room' services, electronics, hydraulics, machining, light fabrication, corrosion protection and specialist test facilities. Due to the nature of the work, there is the potential for advanced training facilities as well as specific R&D facilities in the CUF. The capability of the CUF required to capture this potential market is described in section 5.4.2 above.

ii. Emergency Response

Post the Montara incident in the Timor Sea and the Macondo incident in the Gulf of Mexico, there is the distinct possibility that a greater emergency response capability will be required within the Region. A proactive approach should be maintained to ensure the capability is developed is the Region. It is recommended that further research be undertaken on this opportunity.

iii. Technology Park

There is the potential to establish a CUF based technology precinct in the Region to support the subsea, gas and LNG sectors. These sectors are highly competitive global industries and with a majority of the global players having a significant investment in Australia, there is a solid basis to support a substantial R&D, technology and education precinct in the Region. There is the potential to establish a partnership between the West Australian Energy Research Alliance (WA:ERA) and other key education and industry stakeholders to establish a regional LNG technology centre at a CUF in the Pilbara. This centre would link to the Australian Resources Research Centre (ARRC) and bridge key scientists based in the region with those in the field. It could also host an expanded TAFE and service local needs.

[11] Companies include FMC Technologies, GE Oil and Gas, Cameron and Aker Kvaerner,

Currently WA:ERA has five core science capabilities focused on LNG:

i. LNG and Gas Processing;
ii. Unconventional Gas Production;
iii. Deep Water Engineering;
iv. Hydrates in Flow Assurance; and
v. Corrosion and Reliability Engineering.

Each of these areas has a regional reach and at least two have plans for R&D facilities/services in the Pilbara. For example, the corrosion capability has plans for a testing/sampling facility in Karratha. Similarly, WA:ERA has current discussion to develop a pipeline testing facility to allow in-situ testing of direct electrical heating technology (to assist flow assurance).

Other jurisdictions are investing heavily to secure research and development capability such as that established in WA by the government investment in WA:ERA. In November 2010, Singapore announced a $23 million commitment through the Agency for Science, Technology and Research to position Singapore as an innovation hub for the oil and gas equipment sector and strengthen Singapore's marine and offshore industry.

A state of the art R&D facility, Risavikagas, (RGC) has been established in Stavanger Norway. The RGC has facilities available for a range of different tests. The outdoor test areas are ideal for pilot plants; the indoor test areas are suited for a range of different equipment and with the R&D test areas specifically designed for experiments and pilot tests with access to a comprehensive and live infrastructure and availability of natural gas at high pressures, see
http://www.risavikagas.com/rg/public/openIndex?ARTICLE_ID=101

iv. Turbine Maintenance

The LNG, marine, defence, offshore oil and gas and power industries use a large number of gas turbine driven equipment. To date, very limited support has been provided in the Region. Due to the increase the number of and size of plant in the Region, the viability of establishing a world class turbine service capability, initially based at the CUF, to initiate the Regional capability warrants assessment.

Of specific focus should be the aero-derivative turbines proposed for the Wheatstone development. In addition this type of turbine is used in the defence (both marine and aero), power generation, marine and offshore oil and gas facilities to name a few applications. The aero-derivative turbines are proposed for a large number of the CSM projects on the East coast as well as in operation in the LNG plant in Darwin. Currently there are two specialist facilities globally – one in the Netherlands and the other Houston, there may well be a sound business case to attract a specialist turbine facility to the proposed CUF.

v. Other Maintenance

The industrial plants either established and/or being planned for the Regions are complex plants which have long term maintenance and upgrade requirements. For example the plants contain an extensive number of valves which are traditionally a very high maintenance component. There may be the potential to establish a capability in

the proposed CUF premised on valve maintenance as an industry incubator leading to the long establishment of a full service capability in the longer term.

6.4 Business Development

A long term structured approach should be adopted for the business development program with the initial goals and objectives and strategy developed as a priority such that the pursuit of a CUF has a clear business focus.

A Steering Committee should be convened to drive a stratified approach to economic development, and partnerships for coordination and implementation.

7.0 CONCLUSIONS

The study confirmed that there is a severe deficiency in marine based common use infrastructure in the North West of Western Australia to support existing and new industries. To provide the impetus for creating transformational businesses required for the development and long term growth of the Pilbara Cities a marine based CUF is required. Regional facility and infrastructure developments will provide substantial economic and social benefits to the State, which will include:

i. value adding industrial opportunities, facilitating and encouraging private sector investment to support the resource projects and the Pilbara Cities;
ii. attract investment into the Region and assist the development of export markets;
iii. provide substantial Regional employment opportunities and the foundation for population dispersal;
iv. develop local communities and required infrastructure and services and in turn improving lifestyles (reduce FIFO);
v. provide the foundation to attract businesses, which have the potential to provide long term sustainable employment and growth far beyond the capital phase of the resource projects;
vi. provide facilities such that businesses can capture international market opportunities (Asiatic Hub); and
vii. attract Commonwealth project funding for the common user facilities.

The key findings of the study are detailed below.

7.1 Businesses to Support Pilbara Cities Initiative

7.1.1 Introduction

The objective of the Pilbara Cities initiative is to create modern, well serviced communities to support a population of at least 50,000 residents in both Port Hedland and Karratha. A substantial employment base will be required in addition to that currently engaged in the region.

A CUF will provide the foundation infrastructure to create regional based transformational businesses to service both the capital and operations phases of the massive resource projects.

Instrumental to success, will be the identification and attraction the appropriate businesses and in turn the creation of infrastructure required to entice and secure those businesses in the Region.

7.1.2 Type of Businesses and Opportunities

It was not within the scope of the study to identify and quantify potential businesses that would be attracted by the CUFs, but a number of such businesses were identified. Such businesses may include;

i. logistics support for the subsea industry;
ii. maintenance and operations support for the subsea sector;

iii. emergency response capability (in response to the increased awareness post the Montara and Macondo {BP Horizon} incidents);
iv. maintenance and operations support for specific aspects both LNG projects and iron ore mining and material handling projects;
v. establishment of a gas based technology precinct; and
vi. Integration with future Federal Government/Department of Defence capabilities and assets – including the assets maintenance and support of such assets.

In addition, there were a number of specialist project service requirements which would create business opportunities. These included turbine maintenance, plant shutdown maintenance facilities, and marine equipment repair and upgrade capability, as well as specific fabrication and assembly activities.

7.1.3 Status of Understanding of the Opportunity

Whilst a number of companies or organisations that were contacted during the course of the study had a good understanding of the type of traditional work that could be attracted to and performed in the Regions, there was a gap with regard to the potential 'non traditional' business that may be able to be attracted. The Towns, Shires and Port Authorities were aware that there is a need for facilities and infrastructure to attract business and were very open to assistance with regard to how to identify, quantify and/or pursue the non traditional business, and incorporate the same into development plans. All welcomed interim feedback on opportunities and requesting ongoing feedback and input.

7.1.4 Materialising the Transformational Businesses

A concerted and sustained effort will be required to identify and quantify and then assist to develop business plans to secure the transformational business that will create long term sustainable growth. This work needs to be performed concurrent with pre-feasibility phases of assessing the requirements for a CUF to ensure that appropriate facilities are provided.

7.2 Type of Facilities Required

The study found that there was a broad capability required within the subject CUF, primarily to support the massive capital phase growth that is occurring in the gas and resources sectors, but also to provide for the business opportunities that will arise during the operations phase of the projects. It was found that the type of facilities provided for these sectors would also serve the other aspects of the oil and gas, resources, defence, maritime, housing and building sectors. It should be noted that in addition to the CUF, there is the potential for a number of traditional supply bases to be located along the northwest coast.

The type of facilities identified included:

7.2.1 Wharf Based Common User Facilities

A wharf front CUF is fundamental to secure the project support activities back to the Region from the operational facilities currently being used in South East Asia. The provision of a CUF will create a more competitive industry, more attractive to potential users, create the infrastructure for businesses and create long term sustainable employment opportunities in the Regions. The CUF facilities may contain:

i. land back wharfs to accommodate traditional supply base activities, pipe carriers, construction vessels, supply vessels, through to smaller support vessels;

ii. 'jumbo' ship offloading capability;
iii. lay down areas adjacent to wharf;
iv. storage areas near wharf, i.e. accessible via very wide load access;
v. serviced industrial land/facilities;
vi. slipping & repair facilities;
vii. common user support services i.e. offshore pipeline storage, chemicals, tubular, bulks storage, waste disposal and water supply and fuel supply; and
viii. heavy lift cranage at wharf face.

7.2.2 Capability Required in Support Precinct

A CUF within a support precinct in close proximity to the CUF wharf was identified, with capabilities including:

i. common user support services (i.e. water and provisioning supply, cold storage, fuel supply, waste disposal, offshore pipeline storage, chemicals, tubular and bulks storage);
ii. facilities and infrastructure to support the offshore drilling industry including drill pipe inspection, repair, maintenance, cleaning and storage;
iii. facilities and infrastructure to support the subsea service sector, such as service buildings, clean room, test pits, lay down and storage areas;
iv. training facilities; and
v. infrastructure to support emergency response.

7.2.3 Additional Capability at the Wharf

Features that are in addition to the basic requirements specified above, but if incorporated will provide economic benefit include:

i. container unloading/loading facilities;
ii. FPSO or MDU berthing capability; and
iii. slipway to 3,000 t vessels.

7.2.4 Additional Capability within the CUF Precinct

Additional facilities which have been identified as highly desirable capabilities include:

i. FSO vessel offloading hose make up and repair facility;
ii. pipe stringing yard for pipe reel vessels and possibly pipe pulls; and
iii. 'sink holes' to allow for offloading of heavy lift vessels.

7.2.5 New Generation CUF Capability

The marine transportation sector is rapidly changing, with bigger vessels being used and new concepts being evaluated for more efficient and flexible mega structure transportation. One such concept is the 'pan' (or plate) system which is being conceived and if adopted would require specific features within the CUF. Flexibility for known possible advancements together with future proofing should be incorporated into the development.

7.2.6 Non Marine Based CUF

The non marine based CUF were identified included:

i. technology precinct;

ii. training facilities;
iii. specialist maintenance capability;
iv. temporary non resource project construction worker housing; and or
v. land made available for developers to construct project specific non resource project construction worker housing.

7.3 The Locations

There was no strong preference expressed for particular locations by the potential Users. Location(s) near the southern and central Pilbara are required for the offshore operations in those two regions and in the Kimberly to support the Browse operations.

Due to land availability and current port features, various locations naturally lend themselves to various types of CUF and in turn, the business opportunities that will be derived in that particular location. For example:

- North Ashburton, has large land tracts available near but not adjacent to the wharf facilities and as such, would suit certain type of businesses. Limited land adjacent to the wharf lends itself to traditional supply base operations;
- Dampier is an established service centre but has limited land available for future development;
- Port Hedland has a very large reclaimed area that has the potential for a CUF, but its location is at the extremities for regular servicing operations, (supply boat transit time);
- Anketell Port well located to service the industry and plans are currently being formulated and therefore lend themselves to be enhanced to incorporate a CUF;
- there are a number of privately funded developments in the planning phase for the Exmouth peninsula. These developments are for a limited supply base and possible berthing facility, and the location is ideal for the southern oil and gas fields in the northwest;
- an enhancement at Onslow Beadon Creek is being planned with the potential for limited supply base and wharf facilities;
- private companies are assessing the viability of creating a limited berthing and supply base facility at Kaiser Marina, in Hampton Harbour (Dampier); and
- an enhancement at Johns Creek (Point Samson) wharf precinct is under consideration.

7.4 Attributes

The key attributes of each potential location for a CUF is documented in the below table.

Attributes are also provided for other marine facilities being considered by others for development, but are too small to be considered a CUF in the context of this report:

	Expandability[12]	Support Infrastructure[13]	Development Timeframe[14]	Comment
North Ashburton	Current layout limited, significant off precinct land	Very limited	Dictated by project requirements, possibly 2015	
Dampier	Limited	Good to very good	Current expansion by late 2013	

[12] ability for port/facility to be expanded to suit long term future potential business
[13] includes both existing industrial capability as well appetite to attract support industry and logistics
[14] indicative when facility would be available for 'common user' access,

Anketell	Should be ideal	Good to very good	Project driven 2014+	Development plan being formulated
Port Hedland	Extensive land available as well as additional land for future requirements. Key issue port congestion and bulk material shipping priority	Very good both industrial and logistics	PHPA indicates 2 to 3 years,	

Coastal marine facilities being considered:

	Expandability	Support Infrastructure	Development Timeframe	Comment
Exmouth Marina	Unknown, could be driven by Native title issues	Limited	Not known	Adjacent to residential development Expansion of existing Exmouth Marina
Exmouth Limestone	Unknown, could be driven by Native title issues	Limited	Developer advises within 12 months	Private development under consideration
Exmouth MSA	Approximately 100 Ha initially available	Limited	Preliminary planning	
Exmouth Kailis	Yes, additional land available	Limited	Existing operation, may readily be able to secure approvals,	Experienced in marine operations in the region for an extended period
Onslow	Yes, but on northern side of Beadon Creek, issues to be considered	Very limited	Not known	EOIs solicited mid 2010. Submissions being assessed
Kaiser Marina	Limited	Yes Dampier and Karratha	Duration for negotiations with current occupants unclear	Key is relinquishment of lease by HHBSC
Point Samson	Limited	Yes Karratha	Not known	

7.5 Recommended Locations for CUF

The recommended locations to be considered for further evaluation for a CUF are Lumsden Point (Port Hedland) and Anketell Port. The key criteria for recommending these locations are:

- additional land is available to make the facility 'future proof';
- nearby industrial support base;
- logistically appropriate in terms of proximity to offshore facilities, marine, air and road;
- both locations planning significant port developments; and
- at or nearby towns being developed under the Pilbara Cities initiative.

7.6 Key Facility Description and Operational Characteristics

The key features and operational characteristics that should be incorporated into a CUF are listed below. It should be noted that the characteristics listed are for the total facility operation (i.e. some of these features may be provided by traditional port 'supply base' operations whereas others would be provided on a CUF basis). More explicit design criteria and operational requirements shall be provided as an outcome to the pre-feasibility phase.

It is envisaged that the CUF will be developed in a number of stages, with the minimum practical infrastructure provided in stage 1, with subsequent stages being dictated by demand. The features for stage 1 are provided below and are segregated into 2 categories

i. at the wharf face – i.e. in direct proximity to the wharf; and
ii. nearby the wharf – i.e. readily accessible to the wharf via uninterrupted very high, very wide high capacity access corridor.

Comments with regard to features to be incorporated into subsequent stages are provided at the end of this section.

The access corridor should be:

- without cross- road or rail crossing;
- without overhead restriction;
- minimum 50M wide; and
- 5T/M^2 capacity with 12t/M^2 capacity laneways.

ASSET	ASPECT	GENERIC DESCRIPTION	COMMENT
AT WHARF FACE – STAGE 1			
Wharf	Length	1,000M	Accommodate 8 supply vessels, plus FPSO, or heavy lift ship, or pipe carrier
	Water depth	• 8M • 14M 'pockets'	For FPSO berthing
	Capacity	• 12T/M2 • 1000t crawler crane	For heavy transporters
	Services	• water • power • sewerage • gas • fiber	
Hardstand	Area – at wharf	10 Ha	Directly adjacent to wharf[15]
	Capacity	• 5t/M^2 • 12 t/M^2 corridors	
	Fully reticulated services	• water • power • sewerage • gas • fiber • storm water drainage	200 by 100M Grid
	Offices		infrastructure to accommodate "as required" offices
Wash down	Area	500 sq m	
	Features	concrete lined	
	Drainage	to sump	
	Sump		
	Water treatment		Including effluent quality measurement

[15] this is a minimum, premised on ease of access to nearby laydown and work areas,

ASSET	ASPECT	GENERIC DESCRIPTION	COMMENT
Slipway	Vessel berthing to PSV	100M long, 20M wide 3000t	Proximity to mechanical, electrical and service facilities
	FSO hose assembly	250M long (i.e. on land partially beyond slipway)	10 M wide area adjacent to or within slip way for assembly of FSO hoses, crane access
Pipe 'stringing' yard	Pipe stinging fabrication area	2,500M long 30M wide	Direct 'line of sight' to ship reeling berth & pipe pull launch
	Ship reeling berth	At Wharf	Mooring for stern berthing
	Pipe pull launch site	At or near wharf	
NEARBY FACILITY – STAGE 1			
CUF estate	Area	100 Ha	Indicatively shape not an important criteria
	Use	Light to medium industrial	Users will be performing work associated with: • electrical • electronics • hydraulics • clean room activity • machining • fabrication • manufacturing • repair and maintenance
	Roadways within estate	high capacity, very wide, without overhead restriction	
Common User site	Hardstand	40 Ha	General purpose use – short term medium term
	Fully reticulated services	• water • power • sewerage • gas • fiber • Storm water drainage	200 by 200M Grid
Buildings	Workshop	• 60M by 25M by 15M hook height (HH) • 20t overhead travelling crane (OHTC), extending workshop (WS) plus 20M • reticulated services • lighting • adjacent/internal offices • ablutions • extendable • external 200M by 100M laydown paved	General purpose fabrication/maintenance

ASSET	ASPECT	GENERIC DESCRIPTION	COMMENT
	Workshop	• 40M by 20M by 20M HH • 20t OHTC extending WS plus 10M • test pit • test room facilities • 40M by 20M by 8M HH • reticulated services • lighting • adjacent/internal offices • ablutions • extendable • external 60M by 50M laydown concrete • external 60M by 100M laydown paved	Subsea focus
	Workshop	• 50M by 20M by 10M HH • 10t OHTC, extending WS plus 10M • reticulated services • lighting • adjacent/internal offices • extendable • external 100M by 40M laydown paved	
	Warehouse	• 50M by 20M by 6M eave height (EH) • temperature controlled • segregated areas • shelving/racking • lighting • offices • services • security • extendable • external 100M by 50 M secure c/w external lighting	
	Offices	• 200 M^2 fully serviced walk in walk out (WIWO)	Plus infrastructure to accommodate "as required" offices
	Training Facility	• 200 M^2 fully serviced (WIWO),	
Wash down	Area	1,000 sq m	
	Features	Concrete lined	
	Drainage	To sump	
	Sump		
	Water treatment		Including effluent quality measurement

In addition to the above land based facilities, a CUF is required within the sheltered precinct of the harbour for the heavy lift vessel offloading. Known as 'sink holes' this facility would be:

- nearby but not in a shipping channel;
- in a protected area within the harbour;
- channel access WD of 14M WD; and
- sink hole 250M by 250M by 45M WD.

The stage 2 features for the CUF may include:

- additional wharf space;
- fixed cranes at the wharf; and
- additional buildings including workshops, warehouses and offices.

7.7 Development Timeframes

Virtually all interviewees stressed the need for CUF now, the lack of facilities results in:

i. project support work being performed at overseas (Indonesia, Singapore and Malaysian) facilities;
ii. dire need for facilities now to service current operations needs;
iii. dire need for facilities in 12 to 18 months to service imminent projects (i.e. Gorgon offshore installation);
iv. additional project support complexities and cost;
v. the loss of development of long term sustainable business in the Regions;
vi. the lack of awareness of the potential transformational businesses that could be created in the Regions;
vii. the Region is not even considered for potential new support businesses; and

Asian yards are actively marketing capability to current operators, posing a real threat to establishing transformational businesses in the Regions. Both the Singapore and Malaysian Governments have initiatives to establish world class technology, service and subsea support precincts in each country to target the operational needs for the industry for the region.

The Port Authorities have development plans in place or in progress, with varying levels of information available with regard to those plans.

i. DPA is in the final assessment phases for the establishment of the DMSF (22 Ha). The DMSF will provide infrastructure in terms of wharf face and land back wharf with associated hard stand. DPA also has plans for additional finger berths at Dampier;
ii. PHPA is in the planning phase for additional facilities at the port. The development timeframe is indicated to be 3 years plus;
iii. the time frame for North Ashburton is being dictated by resource project demands, expected to be available by 2015/16;
iii. a number of entities are in various stages of planning phases for supply bases at Exmouth, with development timeframes from 12 months to 3 years;
iv. an EOI for the development of a supply base at Beadon Creek, Onslow was issued in mid 2010, with project proponent submissions currently being assessed. Facilities could be in place within 1 to 2 years;
v. a private company is pursuing the development of the Kaiser Marina in Hampton Harbour, indication are that initial facilities could be in-place with 12 to 18 months;

vi. the DoT has conceptual expansion plans for Johns Creek, Point Samson. The timeframe for the development is not known; and
vii. a request for proposal for the marine supply base (MSB) adjacent to Darwin's East Arm Wharf has been issued to the three shortlisted consortiums. Quote "This is an important infrastructure development which means Darwin will capture increased benefits for local industry from offshore developments in the Timor Sea and the Browse Basin."

7.8 Facility Management

The type of facility management capacity required depends on the location:

Exmouth	provided by the facility owner operator.
North Ashburton	supply base operations managed by Port Authority, potential need for facility management depending on the capability developed at the port.
Dampier	supply base operations may be managed by Port Authority. There is potential need for facility to develop additional business profile and market the capability.
Anketell	supply base operations may be managed by Port Authority. There is the need for the facility to develop business profiles, create common users assets and market and manage the capability.
Port Hedland	supply base operations managed by Port Authority. There is the potential need for facility to develop business profile, create common users assets and market and manage the capability.

7.9 Local Government Interest

Significant local Government interest has been shown in the concept of providing a CUF and specifically the ability to attract the associated economic diversification. The strongest interest has been expressed by Town of Port Hedland, with interest shown from other jurisdictions as well.

Due to the number of agencies and entities involved or associated with this initiative it is recommended that a Steering Committee be formed to guide the next component of the project.

7.10 Associated Infrastructure Support[16]

Several key associated infrastructure requirements/services were repeatedly raised during the course of the study, including:

i. availability of fresh water (high volume) to ports for supply boats;
ii. fuel for marine operations; and
iii. very high wide load access, specifically from ports to housing and building and industrial areas.

The infrastructure required external to the CUF is likely to include:

[16] Identify what other type of infrastructure i.e. water, power and services may be required to support the CUF's. It should be noted that the study has not addressed associated infrastructure to support the actual Pilbara Cities initiative.

i. road access, very high wide and preferably unrestricted head height suitable for very heavy loads;
ii. water supply;
iii. power;
iv. gas; and
v. facilities for customs.

7.11 SWOT Analysis on CUF in North West Australia

Provided below is a SWOT analysis for the potential CUF to be located in the North West of Western Australia.

Strengths • support from a number of potential Users • land, facility and support services available in Anketell and Port Hedland • ports in the region have development plans which essentially suit the needs for the CUF's, i.e. current plans are aligned with CUF needs • political desire to achieve an outstanding outcome • management is committed and confident	**Weaknesses** • willingness of port authorities to reveal plans in a timely manner • financial commitment required by Government prior to contracted business to use the CUF's • ability to respond in time • detailed plans not available yet • timescales, deadlines and project pressures • need to drive project through Government processes to achieve a timely outcome • lack of cohesion between various Government agencies	**INTERNAL FACTORS**
Opportunities • economic diversification • transformational businesses identified • need to implement a structured development and marketing program to capture both of the above opportunities • transformation businesses that will create population dispersal • create businesses that go beyond the capital phase of the projects • provide the support infrastructure to achieve the Pilbara Cities 50,000 population vision • businesses with export potential • Regional companies becoming part of global companies global supply chains • a new international market • integrate future Defence assets requirements with new "Common User" assets • Federal Government funding for "Common User" assets that have a Defence capability	**Threats** • focus on the business opportunities by companies in SEA • SEA Government support provided to companies to target the business opportunity • cost competitiveness of SEA companies c/w companies in the Region • not maintaining momentum with the initiative • review and approval timeframes • rate of decision making by developers is at a pace faster than Government decision makers can respond • once initial opportunity is lost overseas, hard to recover similar opportunities for the Regions in the future • major oil & gas / resources companies doing their own thing	**EXTERNAL FACTORS**

8.0 RECOMMENDATIONS

This Report provides a number of recommendations below with regards to the suggested next steps for the establishment of a CUF in the North West of Western Australia.

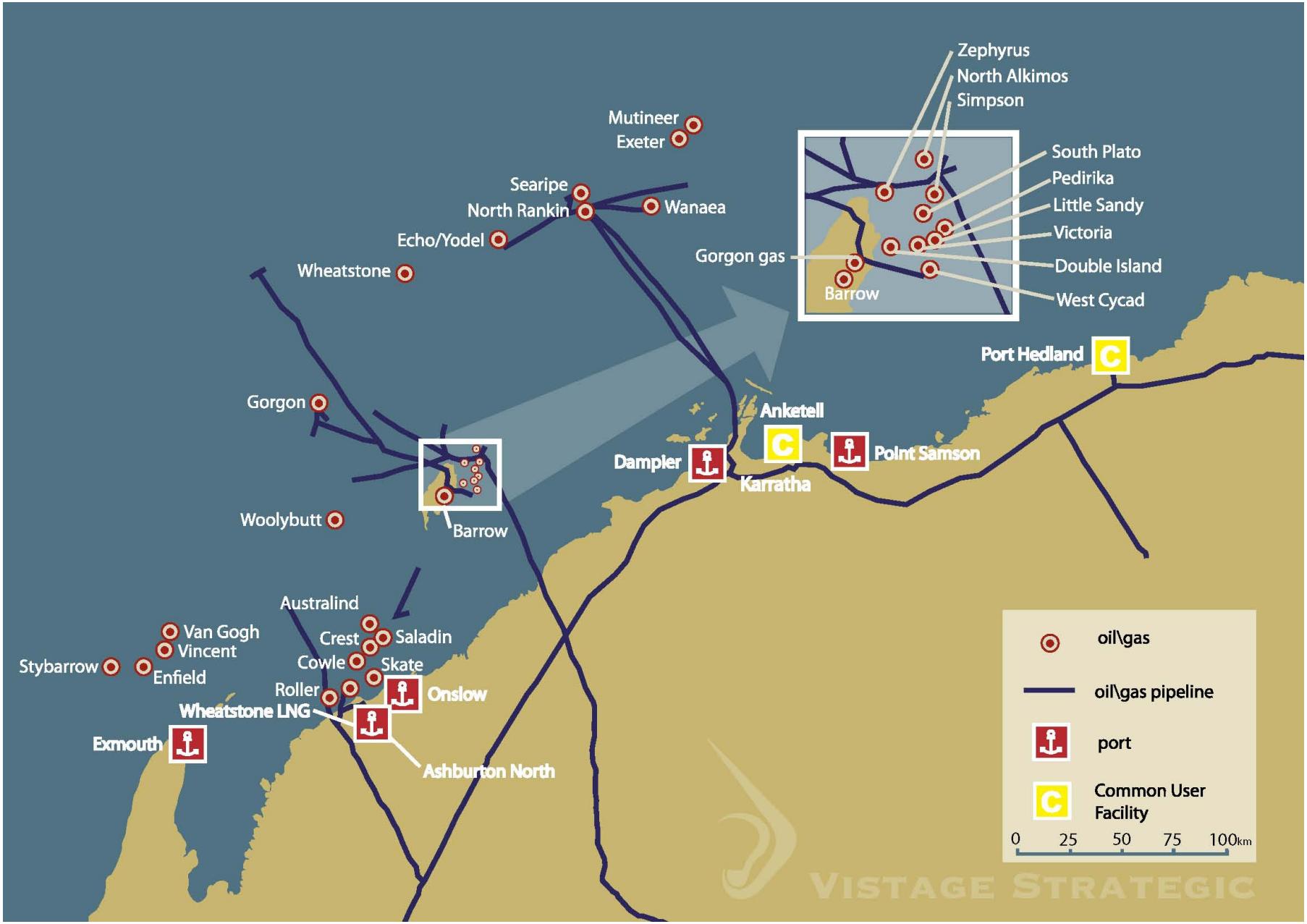
	RECOMMENDATIONS
1	As there is high, immediate demand for a CUF in the Region, decision making and planning for establishing a CUF should commence immediately such that facilities are available within a 3 year timeframe to capitalize on the next wave of construction contracts coming on stream from the resources industry.
2	A Steering Committee should be formed with the participation of the Department of Regional Development and Lands, Department of Commerce, Department of State Development, LandCorp, Shire of Roebourne, Town of Port Hedland, Dampier Port Authority, Port Hedland Port Authority and other relevant stakeholders as may be required to plan and develop the CUF.
3	Develop timelines for feasibility, front end engineering and design, construction & commissioning to ensure facilities are provided to coincide with User needs.
4	Engage a consultant to select the preferred location of the CUF from the two short listed sites of Anketell Port and Lumsden Point (Port Hedland) and subsequently perform site selection pre-feasibility. The pre-feasibility to be performed in close liaison with consultants engaged by DPA and PHPA to ensure optimum overall development plan. Scope of pre-feasibility to include preliminary site layouts, site facilities, wharf, building and office facilities, scope of work for development, development sequences and timeframes, budget costing, risks, interfaces and facility capability description.
5	Prepare an economic diversification plan which shall address the type of industries that would be attracted to the CUF, the benefits of securing those industries to the Region, and the flow on benefits of the industries in the Region. The diversification plan shall also address the marketing and engagement strategies required to secure the targeted industries, CUF capability and features required to attract those industries, specific industry requirement on facilities and features of the CUF.
6	Maintain ongoing dialogue with Defence about attracting Defence assets and Defence industry to the region with specific emphasis on the CUF.
7	Ensure the design of a CUF has potential to incorporate future Federal Government defence requirements and capabilities into CUF assets development.

9.0 APPENDICES

Appendices contain information that is too complex to include in the report.

I. Location Plan, and
II. Risk Assessment Worksheet

APPENDIX I
RESOURCES MAP



APPENDIX II
RISK ASSESSMENT WORKSHEET

Risk Analysis	
Consequence (C) of Result	
1	Insignificant
2	Minor
3	Moderate
4	Major
5	Catastrophic
Likelihood (L) of Occurrence	
1	Rare
2	Unlikely
3	Moderate
4	Likely
5	Almost Certain

Risk Level Matrix (R)

	Consequence 1	2	3	4	5
5	H	H	E	E	E
4	M	H	H	E	E
3	L	M	H	E	E
2	L	L	M	H	E
1	L	L	M	H	H

E = Extreme H = High
M = Moderate L = Low

Risk Assessment No.	AMC CUF – 001
Revision:	A
Activity:	AMC NW CUF
Approved By:	Ivan Bristow
Date Approved:	

Risk No.	Risk Description (Risks / Hazards)	Worst Foreseeable Outcome	Initial Risk Analysis			Management Controls
			L	C	R	
1	Lack of cohesion / cooperation between various Government agencies	Delays to continuation of project, loss of future business	5	4	E	Form Steering Committee with representation from relevant Agencies
2	Limited budget / finance to proceed with next phase(s) of project	CUF not provided in time to suit User needs	3	4	E	provide funding
3	Financial commitment required by Government prior to contracted business to use the CUF's	Increased design & construction costs	2	4	H	develop preliminary business case & financial model for the project
4	long term transformation business opportunities not considered in CUF plans	Restricted future expansion plans	4	4	E	Thoroughly assess potential transformational businesses, form a leadership group
5	Focus on the business opportunities by companies in SEA	Opportunity lost to overseas competition, difficult to recover	5	5	E	Government to provide leadership and impetus for CUF initiative
6	Facilities provided after User needs	Lost opportunities & loss of income	3	4	E	Initiate Pre-Feasibility now
7	Time consuming internal approvals could impact upon delivery time	Delays, increased cost, loss of revenue	3	3	H	Stakeholder Forums / Workshops to be initiated
8	Lack of timely marketing	Business committed elsewhere. Companies will commit to known facilities & services	2	4	H	Prepare Business Plan and develop business development and marketing program
9	Regulatory bodies & processes: Native Title, Environmental assessment, delays etc	Delays to continuation of project, loss of future business, loss of revenue	4	4	E	Stakeholder Forums / Workshops to be initiated
10	Land release / availability / size	Delays, inappropriate facilities provided	3	4	E	Discussions to be initiated with LandCorp etc to review availability & suitability of land available
11	Incorrect choice of Location for the CUF	Reduced opportunities	2	2	L	Initiate pre-feasibility and reduce number of options available

Risk Assessment Completed by (names): Ivan Bristow & John Payne	**Next Approval Date:**	**Next Review Date:**