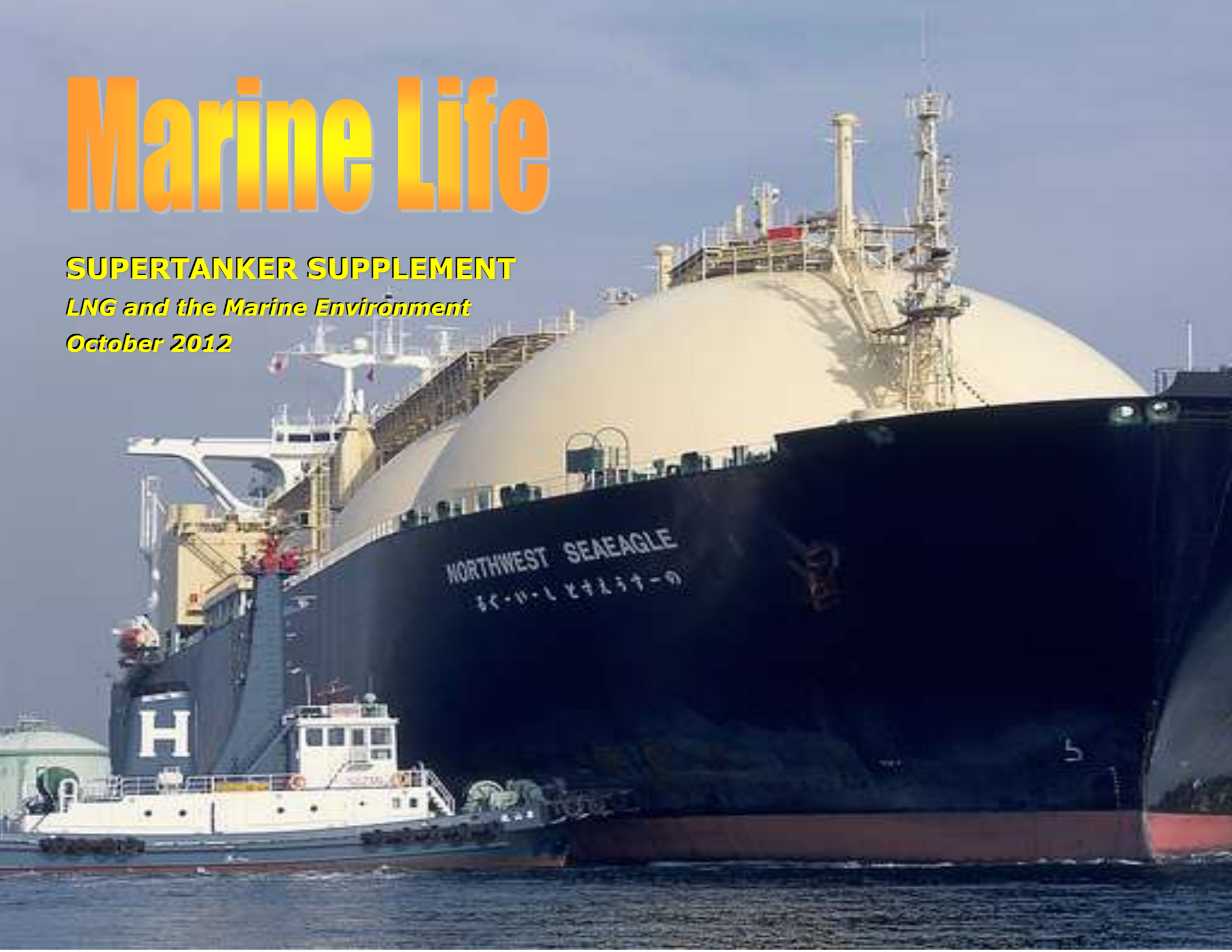


# Marine Life

## **SUPERTANKER SUPPLEMENT**

*LNG and the Marine Environment*

*October 2012*



# Marine Life Magazine

## *Our Goal*

To educate, inform, have fun and share our enjoyment of the marine world with like-minded people.

## *Our Editorial Staff*

*(and the zen bits, grasshopper)*

**Emma Flukes, Co-Editor**, Shallow understanding from people of good will is more frustrating than absolute misunderstanding from people of ill will.

**Michael Jacques, Co-Editor**, In the practice of tolerance, one's enemy is the best teacher.

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**Disclaimer:** The views expressed in this publication are not necessarily the views the editorial staff. We make no promise that any of this will make sense.

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*Cover Photo ; Friendly Beaches Tas,  
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## LNG, why you should care?

It might have slipped by many of us in the south, but Australia wants to become the Saudi Arabia of LNG. The energy sector promises massive profits and huge royalties to government. This wealth will underwrite a lot of our social infrastructure into the future. However, like all industrial development it has impacts and it hasn't escaped controversy.

LNG developments are the subject of significant protests, particularly in relation to the dredging of Gladstone Harbour and the Browse facility at James Price Pt in the Kimberley. Creating LNG by coal seam gas fracture has also been very controversial in the Eastern States, but the inland impacts of this industry are outside the scope of this magazine. There are potential LNG impacts on nearly every State in Australia.

Having covered Gladstone dredging somewhat in previous editions, Mick and Mike are going to concentrate on one of Australia's most controversial developments, the Browse development in the Kimberley, slap bang in the middle of an unspoiled area of tropical Australia.

By way of contrast, Mike will also provide some commentary on one of Australia's most uncontroversial LNG developments, the little understood Ichthys plant, located in one of Australia's most environmentally intact metropolitan environments, Darwin Harbour.

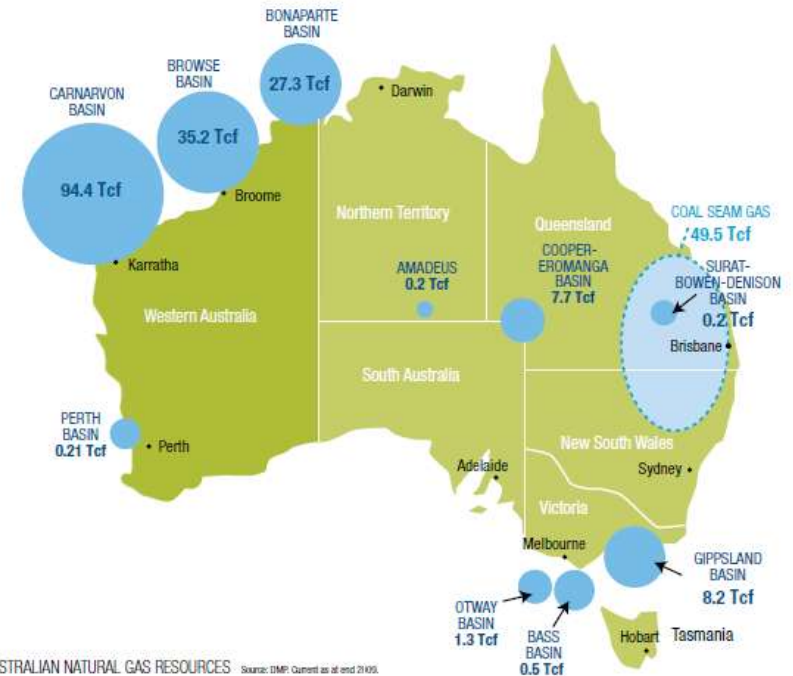
## Lets have a look at LNG

*by Mick Lee and Mike Jacques*

The Australian petroleum industry is aiming to make this country the world's largest or second largest LNG exporter by 2020. The industry is targeting production of at least 60 million

tonnes per annum (mtpa) by 2020, more than tripling current production.

Australia is the 4th largest LNG producer globally, exporting 18.9 million tonnes to the value of \$11.1 billion. The investment pipeline that is growing off this is significant that creates employment, economic stability and of course government



revenue. That is a lot of money for heating and cooking your eggs right. But what is LNG?

Liquefied Natural Gas is basically methane gas that has been chilled (-162 celsius) to make it easier and safer to transport. The gas is drawn from beneath the ground (from natural gas pools or coal seams) and then pumped to processing plants where impurities are removed, like CO2 (carbon dioxide),

sulphur, mercury and water. From there it is pumped into a big fridge chilled and shipped to client's countries. The majority of LNG from Western Australia is destined for overseas markets such as Japan, China and India. A portion is pumped down to Perth and Bunbury for use domestically and in various industries. Check this link from [Shell](#) out to see a cool animation.

This is BIG business in every sense. The lust for energy across the world is at an all time high, especially cheap fuels and to some extent cleaner than oil or coal. LNG is not a perfect solution for cleaner greener fuel, but it is better than coal or oil.

Currently, there are three operating LNG processing plants in Australia, the North West Shelf LNG Project in Western Australia (16.3 million tonnes per annum (mtpa)), the Darwin LNG plant (3.6 mtpa) and recently the Pluto project (4.3 mtpa).

There are several other LNG projects in development with the massive Gorgon Project (15mtpa), the Wheatstone project (8.9 mtpa), and the Ichthys project (8.4 mtpa). The Prelude project (3.5 mtpa), will use Floating LNG technology (a big barge rather than an onshore processing plant) which is suitable for smaller remote offshore gas fields. Shell Development Australia will use a ship that will be the largest floating structure ever built.

Other potential LNG projects that are yet to receive a final investment decision are the Browse LNG project, Equus LNG, Pluto trains two and three, Sunrise LNG, Bonaparte LNG, Scarborough, and Cash-Maple Floating LNG.

The Queensland Curtis LNG, Gladstone LNG and Australia-Pacific LNG projects are currently under construction in Gladstone will create the world's first coal seam gas plants.

*According to Deutsche Bank, there are 13 new Australian LNG projects at various stages of development, with a total cost of over \$220bn, scheduled to start producing by 2018.*

*They have a combined capacity of 90 million tonnes a year of LNG. ([reference](#)).*

This in itself is expected to generate approximately \$29bn in revenue for government coffers. So you can see why governments both state and federal and keen to keep this ride going. But at what cost?

## THE BROWSE LNG PROJECT

### Showdown in the Kimberly

by Mick Lee

Not to be out done by our Tasmanian friends, Western Australia also has its own environmental debate raging. In keeping many current debates the politics and emotions have reached fever pitch. Both sides are polarised with a few sitting back on the fence.

Before I start I should declare a possible conflict of interest. I am currently employed by Dampier Bunbury Pipeline as the Training and Development Advisor. DBP pumps natural gas for the North West down to Perth and Bunbury for use domestically and in various industries. The object of this article is provide a snapshot of what is occurring up north and background to some of the controversies. The main aim is to try and provide a summary of the issues in one location so you can have read, research some more, and then make your own decisions.

So what is going on in the far north west of Australia? Unless you have been living in a cave for the past 25 years Western Australia is a mining mecca. Iron ore is being shipped out to hungry foundries in ships that beggar belief, nickel, gold, diamonds and soon to include uranium. But it's the vast reserves of natural gas that is the latest addition to the boom. For 25 years the North West Shelf has been giving up its gassy



deposits. This gas has been pumped from under the sea floor and then transported to the Burrup Peninsula, Dampier, where it is either liquified and sent to overseas markets, or piped down to the Bunbury via Australia's longest pipeline.

This venture is nothing small with over \$25 billion invested in the largest resource development in Australia's history. But the end is nigh for hydrocarbon reserves off the Burrup. The venture partners including Woodside and Shell to name a few, have been looking further afield and the timing is right for the next big thing, Browse LNG.

It is not just the marine and terrestrial environment at stake here the implications of a project of this size are large and if done wrong with devastating results. The Kimberley region of Western Australia is one of the last great wildernesses in the world. The size of this area is boggles the mind, then add thousand years of culture and eons of environmental heritage and it's Mother Nature's wonderland.

For one I am not against mining, drilling or progress, how else do we raise revenue, provide employment or sustain a way of life we are accustomed to? Like it or not the resource industry is here to stay so why can't we just all work and live together. This is of course part of the confusion that reigns supreme the more you dig into the Browse LNG Project.

Do try to find a path through some of this confusion, Mike and I will review the materials that are out there in the public domain and try to highlight the major pros and cons of this significant project.



## What are they actually doing at James Price Point?

By Mike Jacques

The proposed Browse LNG Development is a joint venture by Woodside, BHP Billiton, BP and Shell. As operator, Woodside is responsible for the planning and day-to-day operations.

The proposed Development seeks to process gas from three gas fields located in the Browse Basin, approximately 400km north of Broome. The offshore facilities and infrastructure includes three offshore recovery platforms and subsea wells which will collect the natural gas for processing.

The offshore gas will be piped ashore for processing. Woodside is seeking approval to produce 12 million tonnes of LNG per annum, with the potential to expand to 25 million tonnes per annum in the future.



The processing and shipping infrastructure is located within the State-owned LNG Precinct located at James Price Point, 60km north of Broome. The government will try to attract further LNG developers to the new port.

The Precinct will occupy 2500 hectares of land which will be fenced. There will be two buffer zones around the fenced area. The Precinct area also includes 1040 hectares of adjacent sea, which will be closed to public access.

The main features of Woodside's downstream component, within the Precinct, include:

- Onshore processing facilities;
- LNG and condensate storage;
- Pipeline corridor;
- Port facilities including a jetty;
- Worker's Accommodation. It will include shops, medical and dentist facilities along with sporting and entertainment facilities.
- 20 to 22 ships a month will be filled at the marine facility.

The Browse LNG Development is expected to have a peak construction workforce of about 6000 workers onshore and 1500-2000 workers offshore (including workers at the accommodation camp).

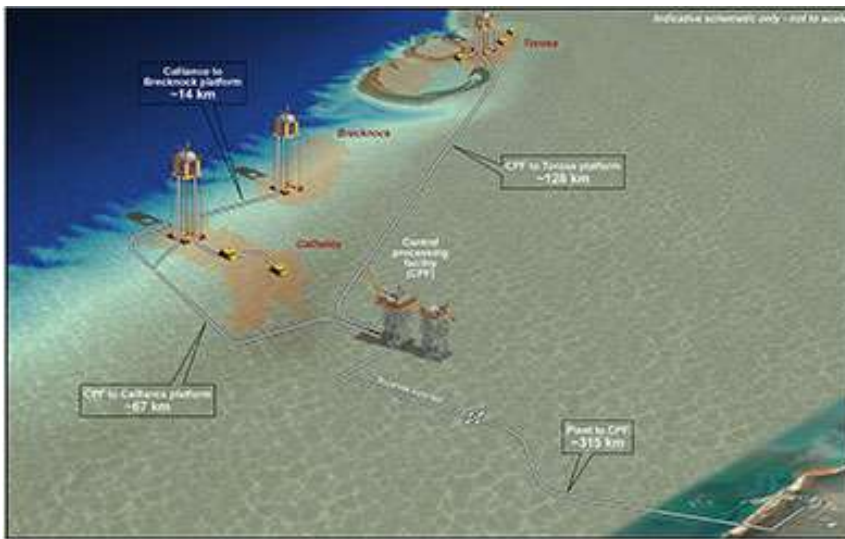
The majority of the workers will be fly in-fly out (FIFO) with the exception of those workers who already live in Broome. The operational workforce will be approximately 400-600 onshore and offshore workers. Whilst these may predominately be

specialist staff at commencement, it is planned over time to gradually fill these positions with locally trained personnel.

The State Government has entered into an agreement with the Commonwealth Government to undertake a Strategic Assessment of the LNG Precinct. The technical reports from this Strategic Assessment form the basis of this summary.

Since then Woodside has already spent \$80 million on environmental surveys and plans to spend more than \$100 million by the time they are done. Love or hate the development, one of the side effects has been a significant leap in our understanding of the environment of the Kimberley.

A Native Title Agreement provides a \$A1.5 billion package of employment, training, business opportunities and other benefits for Kimberley indigenous people.



The Browse LNG Development is expected to generate \$A50 billion in additional GDP for Australia's economy, and \$A7.5 billion in taxation revenue for Australian Governments.

## What the Government pamphlets say about Browse

*"The LNG Precinct will only proceed once it is demonstrated that environmental impacts can be managed in accordance with stringent standards."*



### Site selection

James Price Point was chosen after considering more than 40 different sites in the Kimberley and alternatives such as off shore processing and piping the gas to the Pilbara. Eleven sites were subjected to more detailed examination and four were short listed. Issues taken into account included:

- technical, environmental and Indigenous heritage constraints;
- proximity to the gas fields and existing infrastructure;
- impacts on existing communities and uses.

Independent Environmental Protection Authority (EPA) advice concluded that the James Price Point area was relatively unconstrained and impacts were likely to be manageable.

The location offers:

- flexibility in locating operations to meet heritage and environmental requirements;
- ease of expansion for more LNG operators;
- no people living within 10 kilometres

### Approvals required

The studies concluded that James Price Point was most likely to work for the Kimberley community, for the environment, for industry and for Western Australia's future economic development.

However, there are substantial Aboriginal title and heritage, environmental, social and economic impacts, including on pearling leases, and engineering issues that will need to be addressed.

There are also significant technical challenges. James Price Point is subject to large tidal movements and cyclonic winds and rainfall. The area is covered in Pindan - a red, clayey sand up to 10 – 20 metres deep, over limestone formations, with distances from the coastline to deep water between 5.2 and 9.5 km.

The location for the precinct must be able to safely accommodate major facilities and offer reasonable access to deep water. Impacts on the local ecology of excavation, dredging and construction need to be carefully managed.



## Studies

A large number of environmental baseline studies have been completed in the past few years, including:

- terrestrial vegetation, flora and fauna
- marine habitat and fauna
- palaeontology
- air quality
- greenhouse gases.

The EPA concluded that the environmental impacts were likely to be most manageable at James Price Point. The area features pindan sandplain with narrow bands of sand dunes and pindan cliffs along its coastal fringe. Vegetation at the site is generally similar to the Dampier Peninsula, with mainly pindan shrubland and open woodland. The site also has narrow bands of relatively uncommon monsoon vine thicket. The fauna at James Price Point is generally typical of that found along the Dampier Peninsula.

During the Precinct's construction and operation, there will be a focus on minimising disturbance and ensuring the terrestrial flora and fauna habitat in the project area is not significantly affected.



There will be a range of other measures to help reduce impacts, such as improved bushfire management.

Clearing the site and developing the Precinct infrastructure will result in physical and ecological changes to the local terrestrial

environment, but will not result in any significant changes in a regional context.

## Marine

### *Fish*

Fish in the waters around James Price Point are typical of the wider Canning marine bioregion. Surveys of the coastal area have not found any threatened fish species using the seabed habitat.

### *Marine mammals*

Humpback whales and calves migrate past James Price Point. They usually travel between 15 to 30 kilometres offshore, beyond the area where the marine impacts of



the LNG Precinct will be concentrated. The area has not been identified as a significant calving or resting ground.

### *Marine turtles*

Of the six marine turtle species in Australian waters, the green and flatback turtles nest in significant numbers in certain parts of the Kimberley region. Surveys show the area around James Price Point is not a significant nesting site for turtles.

### *Palaeontology*

There have been no significant dinosaur tracks or fossils found during surveys of sandstone areas in the intertidal zone at James Price Point. More surveys will be carried out before any construction disturbs the Broome Sandstone. If it is necessary to

disturb any paleontological resources, the appropriate action to take will be determined in consultation with the Traditional Owners and the Western Australian Museum.

#### *Air quality*

Dust emissions are likely to be the dominant concern during the construction of the Precinct. Dust will be controlled through standard measures to minimise off-site emissions.

During the Precinct's operation, the main atmospheric emissions will be generated from the combustion of fuel gas for energy generation and flaring, as well as fugitive emissions associated with the LNG processing facilities.

On a local and regional scale, the Precinct's contribution to the predicted concentrations of all other pollutants will be low. This means the risk of potential air quality impacts from the Precinct is also low. Air Quality Management Plans will be developed and implemented to manage emissions from the Precinct.

#### *Greenhouse gases*

The most significant sources of emissions to atmosphere from large LNG projects are those from the reservoir and the combustion of natural gas for the purposes of energy generation to operate the plant. The indicative emissions for the Precinct's development scenarios represent between 2.0 and 6.5 per cent of Australia's domestic emissions. LNG proponents in the Precinct will have to submit a Greenhouse Abatement Plan that will be referred to the EPA for approval. This will include demonstration of best practice measures to minimise emissions, establishment of offsets and investigations of the feasibility of geosequestration options.

## **Wilderness society - reasons why the Browse LNG development should not go on the Kimberley coast**



The WA Liberal government and some Federal Labor Ministers are working with fossil fuel corporations to impose a major LNG gas processing industry on the Kimberley coast at James Price Point, just north of Broome. There are many reasons why this is a bad idea.

1 The Kimberley's coastal waters are a world class marine wonderland - with amazing coral reefs, sea grass meadows, sponge gardens and mangroves supporting the world's largest population of humpback whales, as well as rare and threatened snubfin dolphins, sawfish, turtles, dugongs and a vast array of fish species – and so much more that has never been studied.

2 The value of an unspoiled Kimberley far outweighs the benefits of short term industrialisation - The Kimberley is one of

the world's last great wild places and has one of the least impacted coastlines in the world, comparable only to the Arctic and Antarctic.

In the 1970's Australia said 'No' to oil and gas mining on the Great Barrier Reef and went on to put in place one of the world's largest marine parks. The park now contributes \$6.9 billion dollars annually to the Australian economy from sustainable industries such as tourism. The Kimberley is equally significant and has the potential to be a similar international icon. Incredibly, none of the Kimberley's coastal waters are protected in any form of marine park. There are currently over 500 Indigenous people working in the Kimberley tourism industry and 24 Indigenous-owned tourism operations. This is a major growth industry for Indigenous communities employing far more people than are ever likely to be employed in the LNG industry.

3 Serious and irreversible impacts - If this Liquefied Natural Gas (LNG) industrial precinct were to go ahead the environmental impacts would be far reaching and very damaging to the natural and cultural values of the Kimberley. For example, the project would require blasting and dredging of reefs and the clearing of significant pindan woodlands and sensitive vine thicket communities. This development would be the 'thin edge of the wedge' opening the door for other damaging industries such as strip mining for bauxite on the unique and fragile Mitchell Plateau.

4 Whales and other marine life will be threatened - by noise, pollution, dredging, blasting, port development and maintenance, greatly increased shipping traffic including LNG super-tankers and the risk of toxic spills or other accidents. These impacts will damage marine life over large areas and interrupt Humpback whale migration, calving and breeding patterns.

5 LNG development would cause ongoing air and marine pollution - and profoundly alter the world famous nature of the Kimberley. This is not a 'clean' industry: Gas industry pollutants deplete the environment's ozone layer, contribute to global warming, and have a serious impact on health.

The massive greenhouse gas emissions from this project would contribute to global warming and make meeting WA's and Australia's greenhouse gas reduction targets impossible.



6 Significant cultural impacts - the proposed LNG precinct would cut off a well documented Indigenous songline and heritage trail and the huge influx of construction workers will impact heavily on Broome and its surrounding coastal and marine environment.

7 Indigenous Consent - In the face of threats of compulsory land acquisition repeatedly made by WA Premier Barnett (and



described by the Kimberley Land Council (KLC) as “like negotiating with a gun to your head”), some Traditional Owners represented by the KLC have signed an ‘in principle agreement’ regarding the James Price Point site. While this agreement ensured that, “Traditional Owners will continue to be part of the process for deciding the development that takes place on their land”, recent public statements by some Traditional Owners make it clear they have not approved the project. Any final agreement is subject to numerous studies and further decisions, including: Detailed heritage assessments on the land around James Price Point carried out by the KLC and Traditional Owners; the outcomes of environmental assessments under WA and Commonwealth environment legislation; and the development and signing of an Indigenous land use agreement (ILUA).

8 Economic benefits are not tied to location - The much touted economic benefits to Kimberley Indigenous communities can be achieved regardless of where the LNG development takes place – it only requires Commonwealth and State governments to commit to allocating a proportion of their royalty and other income from the Browse gasfield to those communities. The WA government’s ‘Royalties for Regions’ program is an example of how this could happen. The jobs and economic benefits would be the same for WA and Australia, regardless of the location of LNG processing.

9 There are other options - For example, Browse gas could be processed via less environmentally damaging floating LNG technology currently under development.

Alternatively, processing gas at established industrial sites outside the Kimberley such as Port Hedland with its existing infrastructure such as ports, power, accommodation, roads and rail is likely to be less environmentally damaging and cheaper. The Port Hedland council has publicly stated it wants the development, while the Broome shire council has voted against

it. Floating LNG is already the preferred option for the wholly controlled gas resource of at least one Browse Basin corporation – Shell.

10. Risks to corporations - Because of the many serious environmental issues and community concerns, the likelihood of protracted assessments and ultimately non approval are high. Large scale opposition to this ill-considered proposal is growing in the Kimberley, around Australia and across the world. The costs to companies in terms of reputation and ‘social license to operate’ could be huge.



## Assessing the Strategic Assessment

### Environmental Impacts

By Mick Lee

There is no doubt the WA State Government and Woodside has spent some money on producing impact reports that relate to the environment. In fact the monolithic Strategic Assessment Report (SAR) is proof that they had a look around. But issues have been raised about this report, and more importantly, the way the Environmental Protection Agency signed off on the project. **Three of the board members had to step aside due to conflicts of interest (having shares on Woodside or BP). This only left one person to give the tick. The state government changed the legislation so this could happen.**

### Whales

By Mick Lee

Humpback and other whales love the Kimberly and why not. Lovely clear warm waters and heaps of food to give birth and raise their young. Get them big and strong before heading down to Antarctica and gorge themselves in some kind of krill infused feeding orgy. All while dodging Japanese science vessels and the latest creation from "Sea Shepherd" to stop them.

Whales are known to frequent the James Price Point and surrounding area hugging the coastline as they migrate north and south. The State Government and Woodside engaged the RPS Group to undertake some baseline whale and other mega fauna survey's between July and October 2009 ([read it here](#)).

The survey was conducted by plane and marine vessels over a vast area known as the James Price Point Migration Corridor - 6,500 sq km.



In total 13, 115 whales were sighted in the survey period. The majority of which the report states "Humpback whales were widespread in the area surveyed. The majority follow the coastline closely between Broome and Pender Bay, particularly on the northbound migration" (page iii).



Now here is an issue that causes some confusion in the general public. The questions have been asked time and time again about the whales and migration route. It is clear that a majority of the whales pass through the James Price Point area, but the answer from the State Government has always been there are not enough whales in the area and most will just adapt. If 13,000 whales is just a few I would actually love to see what a lot looks like.

Everyone knows whales are big lovable creatures that just cruise about eat a bit of krill, jump and of the water for boat loads of tourists and just generally mind their own business. This is made even better now we are not trying to shoot an explosive charge in their head so we can make some soap and perfume. But now we, the same country that has fought and politically lobbied to save the whales, want to put a supertanker highway in the middle of their migration route.

Whales are creatures of habit and this habit is passed down from mother to calf. Mother gives birth and trains the calf in all aspects of life including navigation. They don't just change their route via a Tom Tom.

All of this at the same time the State Government has just announced the 7,000 sq km Camden Sound Marine Park. This park is whale nirvana where they can rest, feed and breed in the lovely warm Kimberly waters. Now this is a good thing, but how good is it when the same government is making harder for the whales to get there. These whales will be required to dodge dredging, drilling, seismic testing and then hundreds of dirty great big ships every year to get to nirvana.



*pic taken from web Annabella Sandes*

## Coastal Fauna

By Mick Lee

In the wet season of 2009 Biota Environmental Services Pty Ltd was tasked by the State Government to conduct a survey of fauna in and around the James Price Point area (some 10,000 sq km). This [survey](#) was conducted from the 5th to 31st of March 2009 with 15 trapping sites used. These were spread across a wide area and types of vegetation.

First off this is a massive area of land, but it is also just a pin prick when you look at the size of the Kimberly region. Given the arid landscape it would be difficult work for the research teams.

Whilst the report is quite conclusive it does make note of six species of conservation significance that were confirmed to be present,

- Peregrine Falcon (*Falco peregrinus*) (State: Schedule 4);
- Dampierland Burrowing Snake (*Simoselaps minimus*) (State: Priority 2);
- Bush Stone-curlew (*Burhinus grallarius*) (State Priority 4);
- Dampierland Plain spider *Lerista separanda* (State Priority 4);
- Rainbow Bee-eater (*Merops ornatus*) (Commonwealth: Migratory); and
- White-bellied Sea Eagle (*Haliaeetus leucogaster*) (Commonwealth: Migratory).

Also the report mentioned a further five species of conservation significance whose habitat was noted, but none

were trapped. Could one of these be the rare and protected Greater Bilby *Macrotis lagotis*?

In a report by Malcom Lindsay from The University of Melbourne ([HERE](#)) prepared by the Goolarabooloo and Broome No Gas Community has proven they are. The report shows evidence of old and current Bilby burrows and tracks with motion detection cameras picking up mothers and young and many individual Bilby's in the Gas Hub area.



In fact even Woodside have admitted to the presence of the cute furry little creature has defied all odds and is still here for us to enjoy. But they have said their drilling, construction and bulldozers won't harm Bilby habitat ([mmmm HERE](#)).

Once again there are obviously conflicting reports and findings. The facts are that all sides admit to Bilby's and other species of conservation significance in the area, but for the sake of a Super Duper Gas Hub we seem to be told 'let's just file this one'.

## James Price Point – Coastal Impacts

By Mike Jacques



James Price Point is one of those places off the beaten track. Even four-wheel drive tourists tend to keep going to the Aboriginal communities on the North East side of the Dampier Peninsula.

The road to James Price is a road to nowhere in particular and has been rough and overgrown prior to this project. It peters out almost completely slightly further north at Coulomb Point where there is quite a nice and leafy coastal reserve.

Along this coast, the patient traveller is rewarded by sandy/mud tidal flat backed by iron-stained "pindan" red cliffs. Four small headlands, less than 0.5km in length, outcrop between Coulomb Point and Quondong Point. The area to the north is known as a great spot for an inter-tidal ramble, with a mixed sandy/rocky shore.

The government reports try not to say that they basically picked James Price Point because it is in the middle of nowhere, and surely no-one would care about it. The trouble is that there is a lot less "nowhere" every day, even undeveloped parts of remote places like the Kimberley are changing rapidly. So they now seem to have found out that there is almost no pristine spot that people DON'T care about.

### ***What would the LNG plant do to the nearshore area?***

Obviously, the 'middle of nowhere' feel will go forever but that wasn't mentioned much in the technical reports as that idea is hardly a term of technical art. More effort was spent on more 'tangible' physical concepts.

### *Silting*

The gas infrastructure in the sea has the potential to impact upon local coastal processes. Changes to the tides and current flow could change things like sand movement. That change is expected to be minor except where the sand is trapped by the onshore structures themselves. Sand might smother life in some spots and be excavating in other areas. The facility will most likely move sediment from the beaches in front of the nearby cliffs to the dune fields to the north in the vicinity of the proposed marine offloading facility and pipeline crossing [*Ooops, where turtle breeding sites were later discovered*].

In the Canning Bioregion where James Price Point is located, the sand really gets moving and the amount of sediment suspended in the water column varies a lot between spring and neap tides. A conservative estimate is that in a 150m section of sandy beach, between 2,700m<sup>3</sup> and 6,750m<sup>3</sup> of sediments will move over a strong spring tide event (~5 days). The significance of the impacts on marine life due to the LNG plant is not likely to be much more than what happens during natural events anyway.

## Intertidal Areas



The James Price Point Coastal Area is typical of the broader North West Marine Region. It is dominated by flat, sandy areas with relatively sparse and intermittent rocks and reef platforms. The majority of the intertidal zone consists of bare rock and sand. The large tides and high

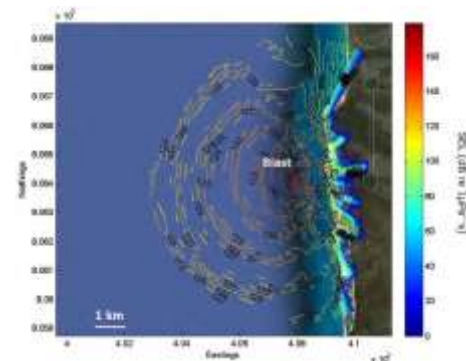
evaporation rates means that the mid to upper intertidal zone is inhospitable for many animals. Reefs exposed for long periods during low tide or covered in sediments have few animals or plants. The mid to lower areas of James Price Point, often include sheltered rock pools and gutters supporting a greater diversity of organisms. Hardy fauna that can withstand such stresses include barnacles, sea snails, chitons and limpets. Crabs and snails seek refuge in the crevices. They emerge at low tide to feed at the surface. The life is typical of the local bioregion.

## Marine Discharges

Fish experience complex effects from sub-lethal levels of pollutants. Fish perform prolonged exercise to forage and migrate. Decreased swimming speeds are caused by pollutants such as dissolved metals, ammonia and various other toxic chemicals and effluents. Potential effects from trace metals and residual hydrocarbons include cellular/physiological damage that can be either temporary or permanent, depending on the

concentration and duration of exposure. This has been a big issue in Gladstone during the dredging operations, although no-one has agreed so far on the extent to which dredging caused the problem.

The Browse tech reports focus mainly on what is coming from the outlet pipe at the plant. Water quality is likely to be altered beyond background conditions within a small (e.g. 50m) mixing zone surrounding marine outfalls. Beyond this mixing zone, water quality is expected to fall within background levels. The potential for significant water quality decline is assessed as low given the dynamic nature of the flushing of nearshore waters by the strong tidal movement. There is, however, a "low probability" that a limited number of small fish may swim through the mixing zone of the discharge area. It is expected that potential impacts can be successfully mitigated. Proponents will be required to achieve appropriate water quality guidelines. The significance of the residual impact for routine discharges on fish is assessed to be low.



## Noise

The significance of the residual impact on fish from underwater noise generation during the construction and operation of the BLNG Precinct is assessed to be low. That seems like a pretty flat way of describing the effects of blasting. Hard to sell that activity as a 'no big deal' thing for marine animals and even the graph is a bit scary looking. The conclusion only works as a low impact thing, if the rest of the surveys were right in that there was little going on in the main blast area, but some of those surveys [eg, turtles] haven't been right.

### *Oil Spills*

Non-routine events, such as collisions, a rupture of an LNG/condensate tanker or catastrophic failure of a production pipeline could result in the rapid release of a large volume of hydrocarbons. Such non-routine spills and leaks can have a significant direct effect on fish fauna because of the toxicity of the compounds, however, the probability of such an event is considered to be very low. "Implementation of effective waste treatment/management and industry standard feedstock and product handling processes is expected to significantly reduce the potential impact (type, volume and frequency of unplanned emission) to the marine environment".

Any oil spill tends to break up or evaporate rapidly we are told. "The vast majority of spilled hydrocarbon which is not salvaged during clean up operations would evaporate. Hydrocarbon weathering by-products, which fall out of the water column to marine sediments, would be dispersed over larger areas and are unlikely to pose any risk to the quality of subtidal sediments". High tides will apparently sweep away the effects of most spills. The technical report put it on the proponent to do further oil spill modelling and make a Hydrocarbon and Chemical Spill Contingency Plan.

Routine or non-routine discharges are unlikely to result in population level effects and the significance of the residual impact was assessed as being low.

While the reports view a major spill (vessel collision or pipeline rupture) as extremely unlikely, "the consequence may be severe if appropriate response measures are not effectively implemented". Apparently, the Broome Port Authority has oil spill response equipment and an Emergency Management Plan. Additional equipment is stockpiled in the Fremantle and Dampier ports. I am not reassured by a recent criticism I have seen of a

small oil spill at Port Bonython where equipment had to be drawn in from far and wide with the resultant lengthy delays. Mmmm, little oil spill risk from a busy port and LNG production facility? Sounds like maybe that one is maybe in the she'll be right/too hard basket for now? I think what they are saying is that it's a hydrocarbon plant. It comes with a one in 100 year risk of a big incident and they reckon they can handle anything smaller.

### *Invasive Marine Species*

The introduction of marine pests could have an adverse impact. The severity of potential impacts will be dependent on the introduced species characteristics. Once established, eradication of IMS populations is often impossible.

"It is generally considered unlikely that an IMS would successfully establish and have an impact on fish given the resilience of the fauna within the study area". The lack of pests across northern Australia suggests that the marine ecosystem is relatively resistant. It is expected that potential impacts can be successfully mitigated by measures, such as inspection requirements.

Well actually, we do get pest infestation in the tropics and we have had trouble in harbours like Darwin boat locks where the conditions are artificially suitable for pests. Yes, you will need inspections especially of areas that create artificially stable surfaces, like the slow-moving hulls of dredges and any areas sheltered by breakwaters and the like.



## Assessing the Strategic Assessment

### Dolphins, Dugongs and Turtles

By Mike Jacques

#### Dolphins



The North-west Marine Region provides significant habitat for a large diversity of fish, reptile and marine mammal species.

Surveys were undertaken during July to mid-October 2009 with a focus on James Price Point but

extending along the west Kimberley coast. Dolphins were commonly sighted and included bottlenose, spinner, Indo-Pacific humpback and snubfin species. Bottlenose dolphins were the most common.

#### Turtles

Within the Dampier Peninsula numerous turtles were observed during aerial surveys, 2.9 turtles/km<sup>2</sup> being observed around the Lacepede Island Group. Smaller aggregations of turtles (2.4 turtles/km<sup>2</sup>) were recorded 13km offshore between Coulomb Point and Quondong Point (includes James Price Point) and 20km offshore from Willie Creek (3.2 turtles/km<sup>2</sup>). Turtle surveys during the 2009 – 2010 along the coastline adjacent to

the James Price Point and other suitable beaches in the region found very limited flatback turtle activity, only 3 tracks and 1 potential nest. Although JPP does not support significant numbers of nesting turtles, it does contain marine turtle foraging grounds in offshore waters, and supports adult and juvenile turtles and migrating turtles from southern rookeries. All six turtle species may utilise the waters offshore of JPP coastal area. The benthic flora and fauna (invertebrates, macroalgae, *Halophila* sp, and seapens) at James Price Point provide a food source for flatback and green turtles. Adult loggerhead and hawksbill turtles, when foraging amongst filter feeders and algae during migration, may also derive part of their food source from the James Price Point coastal waters.

The presence of turtle densities to the north and south of James Price Point during both July and September 2009 surveys indicates that relatively high numbers may pass offshore. Green, loggerhead, hawksbill and flatback turtles were found in waters off the JPP coastal area during the non-breeding period. Leatherback turtles and olive ridley turtles were not observed. Loggerhead turtles were widely distributed across the area but were not recorded in water less than 20m deep. Juvenile turtles were sighted within 50m of the shore at James Price Point beach and Quondong South beach during the 2009 – 2010 nesting season and numbers appeared to be associated with tidal movements with higher numbers observed when the high tide covered the rocky intertidal areas.



Despite this, the summaries curiously reported that “a limited number of areas along the Dampier Peninsula may support marine turtles, these include Coulomb Point

Nature Reserve, located 15km north of James Price Point”.

Since then, studies were commissioned by traditional owners and conducted by the University of Melbourne. They relied on local indigenous knowledge and did find turtle breeding sites. 14 nests and 38 false crawls were found from Flatback, Hawksbill and Green turtles, with all nests and most false crawls occurring in a 6 km strip at James Price Point. Density of the nests in the 6 km nesting area are lower than the average nest density from two monitored beaches near Broome, however, the study area is unique for occurrence of Hawksbill nests, a species thought to rarely nest in the Kimberley. They also found a rare Hawksbill hybrid. The 14 nests and 38 false crawls greatly differs from the 1 nest and 3 false crawls previously found in the same area as part of the environmental impact assessment for the Browse LNG Precinct. “The difference in results is most probably due to variations in study design”. The nesting area is right in the middle of the construction precinct in the area of highest impact. Although it appears to be an odd spot to nest, up to 42% of the eggs appear to survive inundation by the tide, and for some reason the turtles prefer this area to the wider beaches to the north.

This is all bad news for the developers as it occurs inside their own admitted high impact zone.



### *Dugongs*

Dugongs are known to occur throughout the North West Marine Region. The largest single global population, 10 000, occurs in Shark Bay but that is 1250km south of the Dampier Peninsula. Resident populations are thought to occur at Beagle Bay and the Montgomery Islands and large numbers of dugongs have also now been recorded in Roebuck Bay.



While dugong surveys have been undertaken within the Canning Bioregion there is a lack of data on dugong numbers in the broader Kimberley region. The turbid water that is typical of the Kimberley region can make aerial surveys difficult. Surveys along the Dampier Peninsula between Cape Leveque and Cape Bossut estimated a population of between 930 to 1,700 dugongs. In April, July and October of 1985, strip transect surveys along the Dampier Peninsula recorded a total of only 27 individual dugongs with sightings concentrated around the Point Coulomb and Cape Leveque areas. The number of dugongs in the Dampier Peninsula varies throughout the year, suggesting a more transient population. The areas inshore of the Lacepede Islands, Carnot Bay and Roebuck Bay, are important feeding areas for dugongs. Survey results suggested that the James Price Point coastal area did not appear to be particularly important for dugongs. However, the area between Coulomb Point and Cape Bertholet is potentially important for dugongs, given the

regular sightings of dugongs and proximity to mapped seagrass beds. This is supported by relatively high densities of dugongs between Carnot Bay and Coulomb Point in the 2009 surveys.

Dugongs are long-lived with a low reproductive rate, long (12 to 15 month) gestation period. Dugongs are aged using growth rings on their tusks, and the oldest dugong on record was estimated at 73 years of age. Dugongs can have extremely strong site fidelity and disturbance within these territories may affect the population. Dugongs are slow breeders, with females bearing their first calf between 6 and 17 years of age. Calves suckle for up to 18 months. Important breeding areas in Western Australia occur in Shark Bay; Ningaloo Marine Park and Exmouth Gulf; Pilbara coastal and offshore regions (Exmouth Gulf in Western Australia to Grey River); and Eighty Mile Beach and the Kimberley coast region. A dugong population is unlikely to increase at more than 5% per year. A slight reduction in adult survivorship as a result of habitat loss, disease, hunting or incidental drowning in nets, can cause a chronic decline.

Dugongs in the region are primarily found in shallow coastal waters, mainly in water shallower than 20m deep and often below 10m. The daily local movements of dugongs are dictated by tides. Large-scale movements of dugongs are likely to occur as a result of loss of seagrass from events such as cyclones, floods and outbreaks of toxic algae. Tropical cyclones are the major regional disturbance factor affecting the quality of dugong habitat along the Kimberley coast.

#### *Productive seas*

The Commonwealth waters adjacent to nearby Quondong Point have been identified as one of the 14 key ecological features of the North West Marine Region. "These waters are considered to be an area that possibly supports enhanced biological productivity, which may support larger numbers of baitfish that

in turn, may attract aggregations of seabirds and other marine life such as large predatory fish”.

### Summary

It seems to me that James Price Pt isn't an especially rich area by Kimberley standards. In a region that is largely pristine and abounds with a huge number of whales, dugongs, dolphins, fish and turtles, James Price Point only has a plentiful supply. It appears to be damned with faint praise for only having maybe ten times the life of the Swan River, while superficially being just as turbid and uninviting to look at.

I don't doubt that we can mitigate many of the impacts. In an area where huge volumes of water get flushed up and down the coast twice a day and the bottom moves about a lot naturally, there are worse places to start dredging and blasting. There could be worse places to clear and build an industrial plant, like just a relatively short distance up the coast at Coulomb Point Reserve. Except for the turtle breeding sites, the worries may be more about the surrounding area, than the point itself. James Price Point may well be the most lifeless place on the Kimberley Coast, but oh boy, just look at the life.



## Breaking News

### Welcome change for Kimberley marine research

*[commentary by Mike Jacques]*

Just in case you were wondering about all the rapid development activity occurring in northern Australian waters, the WA Minister for Science and Innovation has announced \$6 million in new funding. This will cover new moored buoys, ocean gliders and acoustic listening stations to measure water temperature, salinity, currents and water quality.

Envirom Kimberley's Martin Pritchard says at the moment little is known about the region's marine system and has welcomed the decision. "We're talking about a really remote area where it's hard to get to, it's expensive to work in and therefore there hasn't been much research undertaken in the past," he said.

"We say there needs to be a lot more knowledge of places like this before large-scale proposals are allowed to go ahead. At the moment, the level of scientific knowledge is very low but what we do know is that it's a very important marine wonderland that needs protecting and needs a lot more understanding before any work is carried out there."

I also have to say thanks for the cash, but it isn't anywhere near enough. The WA government is sitting on a pile of Kimberley royalty money. Six million dollars, you have to be kidding? Perth really will suffer without that monster amount.

We need a long-term funding commitment for a broad range of monitoring and ecosystem studies. Mining company EIS studies take 'snapshots' of the issues, and can't cover all the 'big picture' stuff.

## Assessing the Strategic Assessment

### Bottom dwelling Marine Life near James Price Pt

**"The marine benthic biota within the Kimberley region are largely unknown"**



In comparison to other regions of Western Australia, such as Ningaloo Reef and the Dampier Archipelago, coral communities in the Kimberley region have not been extensively studied. The majority of information on hard coral is about offshore coral reef systems, like those found

at Ashmore and Cartier Islands, where studies have shown very diverse coral reefs.

Other studies into the nearshore parts of the Kimberley region have identified that the number and diversity of coral colonies present is low, with habitats generally dominated by seaweeds and algae.

Seabed communities and habitats in the Kimberley region are a complex arrangement of hard coral and soft coral, with filter feeding ascidians, sponges and algae. Seagrass beds in the region are poorly documented. Macroalgae (big seaweed) communities are common.

To address this lack of knowledge, in 2008 a CSIRO study was commissioned to assess 4 possible spots for the LNG plant. In 2010, an SKM study, paid by Woodside, further narrowed their

focus to James Price Point. I actually found the SKM report gave a better layperson's description. Being a more focussed study, it also gave more relevant detail on the area around the proposed LNG plant. This SKM survey was confined to north of Coulomb Point to Cape Boileau in the south (the LNG plant area).

The 2008 study did a video survey of 800 sites. The SKM report in 2010 mapped the high productivity habitat. Towed video survey was also undertaken.

Both studies seemed to show that the sexier stuff was further north adjacent to Coulomb Point. The area in the vicinity of James Price Point itself was found to be relatively less productive.



Thousands of heart urchins are found in some areas

The survey showed the area is a relatively high energy marine environment with considerable currents and seafloor stress (it gets turned over a lot by storms and tides). The most common seabed type was sand; with between 50 and 70% coverage.

Although the shallows made it difficult to survey well, the inshore bottom of less than 10 metres deep was a patchwork of hard corals, algae, soft corals, seagrass and fixed invertebrates.

#### *Hard reef and corals*

Hard coral communities are small and not well developed in the James Price Point coastal area, unlike the offshore islands of the Kimberley. This suggests the coast is pretty exposed to storms.





Typical low reef dusted in fine sand

“Whilst the broader Kimberley Bioregion may be considered one of the most coral diverse regions in WA, the study area is relatively similar in coral diversity to other nearshore areas

located further south, such as Port Hedland,

Cape Lambert and Mermaid Sound”. “However, these areas to the south typically support coral cover up to 20-30%, whereas the James Price Point study area is dominated by Algae and Sessile Invertebrates with a lower cover of Hard Coral (~10%).”

A thin collection of hard coral colonies are mixed up with algae, invertebrates and soft coral. The bottom also often has a thin covering of sediment, not exactly great for pretty corals, but creating additional habitat for certain types of animal.

North of James Price Point the reef platform is larger and extends further offshore (to approximately 2 km) providing a sheltered lagoon and intertidal platform with pools and crevices supporting a variety of animals. Limited tracts of low relief reef are present in shallow waters in the south.

### Seagrass and algae

Seagrasses like *Halophila* spp. were found growing amongst hard coral in inter-reef sand patches. Seagrass in the region appeared to be patchy and varies with the seasons. Patches of *Halophila* were found just south of Coulomb Point, within 5–10 m water depth. Seagrass does not feature widely in the vicinity of James Price Point itself.

Algal communities were well represented, including canopy plants and smaller algae, and distributed throughout the study area and across the broader Kimberley region. They were not considered to be unique to the James Price Point region.

Seaweeds were extensive in the north adjacent to Coulomb Point, with big patches of *Sargassum* sp. Algal cover represented more than 50% of the biota identified within the 2008 transects off Coulomb Point. Coverage decreased near James Price Point.



where the hard bottom is found

### Invertebrate gardens

More common on the sandy soft-bottom were invertebrates like sponges, sea whips, gorgonians, ascidians, sea pens and soft corals. These invertebrate communities, “although highly diverse, were very patchy in distribution within the vicinity of James Price Point itself”. The most extensive areas of sessile (fixed to the bottom) invertebrates were to the north and in deeper waters to the south, offshore from Quondong Point and Cape Boileau.

One large, shallow, nearshore band of soft corals adjoins the coast from James Price Point to Quondong Point. Due to depth restrictions this couldn't be surveyed very effectively.

### **Commentary**

In general, the most interesting life was in the nearshore areas that had a complex topography. These were more common north or south of James Price Point. The LNG site was pretty sandy, cloudy, tidal, and it's not exactly a hotspot of biodiversity. The area has some nice shallow foreshore reef and spots of rich urchins and sea lilies in patches. If you wanted to protect some indicative Kimberley inshore sea bottom, you should be worried more about the impacts on Coulomb Point or Packer Island further to the north, or go a lot further south. This doesn't mean that these more noted areas wouldn't be affected by development James Price Point, e.g., by oil spills from shipping accidents.

The report isn't claiming that they did a detailed search to look for rare marine species, but James Price Point does seem an unlikely place to look. They also couldn't get their boat close enough inshore to assess shallower than 10 metres.

The government hasn't talked much about this study. The environmental NGOs talk generally about marine life being threatened by pollution. I have to assume then, that they are largely agreed that the sea bottom is nothing much to write home about.

The SKM study concluded,

*"The habitats observed and mapped within the study area were indicative of the benthic habitats found across the wider region and they do not show any unique or local examples of difference."*

*Sources: Benthic habitat surveys of potential LNG hub locations in the Kimberley region, CSIRO and AIMS, Fry G; Heyward A; Wassenberg T; Taranto T; Stieglitz T and Colquhoun J 2008*

*Browse Kimberley LNG Precinct Nearshore Benthic Habitat Modelling And Mapping, James Price Point, SKM 2010*

## Threatened Sharks and the Kimberley

Summation by Mike Jacques



"The coastal waters of the northern Pilbara and the western Kimberley are a global hotspot for sawfish (*Pristidae*) diversity".

This area is soon to be subject to an LNG project at James Price Point, but the issues for sawfish aren't limited to one development.

NW Western Australia hold four of the world's seven species and these 4 species are all of the known Australian species.

It's hard not to notice a sawfish as they have a blade like snout armed with teeth like a hedge trimmer. They are harmless to human swimmers. Their funny teeth just look cool, but they also get really, really, tangled in nets. Gill net fisheries have the highest percent of saw fish by-catch (80.2%), followed by trawling (16.6%), line (9.2%) and recreational gear (0.3%). Because they have cool teeth, they are also often killed for souvenirs. We are also bulldozing, draining and polluting their habitat right around the world.

Since we can't catch them in commercial quantities, and they sometimes live in murky remote estuaries full of crocs, it's no surprise to me that we know almost nothing about

them, "...much of this information is restricted to grey literature or as unpublished work in progress. There is limited (or no) information on the size of the remaining populations, but many of the world's sawfish populations are thought to survive in small fragmented areas".

Our sawfish populations appear to be largely genetically subdivided across northern Australia. Gene flow is negligible between regions, so the loss of a population from one area is not being made good by immigration from the other locations.

We do know that the Pilbara coast and West Kimberley are an important area for Freshwater Sawfish (*Pristis microdon*), Dwarf Sawfish (*Pristis clavata*), Green Sawfish (*Pristis zijsron*) and the Narrow Sawfish (*Anoxypristis cuspidata*). The first three of these species are listed as *Vulnerable*, all are protected species under other Acts.

In addition to sawfish, the area also has other endangered sharks, including the Northern River Shark (*Glyphis garricki*), only discovered in Western Australia in 2002.

### **Freshwater Sawfish (*Pristis microdon*)**

There is uncertainty about distribution but they may be present in major river systems in Indonesia and New Guinea, and also possibly in India. Within Australia the Freshwater sawfish has been found from Cape Naturaliste in the south west, to the Ord River. However, most are recorded from the west Kimberley, and arguably the most important known nursery site is the Fitzroy River. New recruits live in very shallow waters of less than 1 metre, with big fish sitting in river pools usually no deeper than 7M. They then appear to head out to sea when they mature. The females are thought to return to their home river to breed, so it is likely that the sawfish seen on the nearby open coast, will migrate back to the Fitzroy River mouth to give birth.

It is also likely that many juveniles will migrate past the James Price Point region on their migration south.

This species is thought to have been completely eliminated in some areas throughout its range, particularly in south eastern Asia and the east coast of Australia. Northern Australia appears to be one of the last regions with viable populations. It may even be declining in Fitzroy River as recent netting surveys show a population decline, but this may also be due to natural fluctuations in recruitment.



### **Green Saw fish**

The Green Saw fish is widely distributed in the Indian Ocean, Indonesia and Australia. The Australian distribution extends from Sydney north to Coral Bay near Exmouth, with a single record off South Australia.

In W.A. the majority of capture locations are between Karratha and One Arm Point. They mostly live inshore, but have been trawled occasionally in up to 200M depth. Unlike some other sawfish, they can breed in ocean waters.

With a big range and the ability to breed in the ocean, they should be OK, but that isn't the case. They are virtually extinct throughout SE Asia. It is estimated that there has been a large decline in the Australian population within the last 15-20 years. They haven't been seen at Sydney since 1960 and are very rare on the entire east coast of Australia. Netting for Queensland's Beach Control Program between 1969 and 2003 provides

evidence of a major decline. The remote places of northern Australia probably have the last viable populations.

### **Dwarf Sawfish**



This species is restricted to northern Australia from Cairns to 80 Mile Beach, and it is now rare in Queensland. The species was probably once more widespread in the Indo Pacific near Australia.

In Western Australia the majority of capture locations are within King Sound. They like shallow, tidal waters and mangrove channels, although they occasionally they come up in deep water trawls.

### **Northern River Shark**

In Western Australia the majority of capture locations are in King Sound in the west Kimberley however, recent collections have also occurred in the Ord River mouth and Joseph Bonaparte Gulf. They seem to like cloudy and mangrove channels and mudflats. It eats catfish, salmon and crabs.

The report hedged on any conclusions with a lot of unknowns about this species, which is only recently discovered in W.A. and



has probably been confused with other shark species in the past.



### **The James Price Point LNG Development**

Despite a lack of data it is likely that the three threatened sawfish *species* utilise the area. Freshwater sawfish appear to pup in the tributaries of King Sound, with the juveniles spending a number of years in the freshwaters of the larger river. As soon as they start migrating it is very likely that their southward migratory path passes the point, likewise, when adult females are returning to breed.

Both mature and immature Green Sawfish have been recorded from the Dampier Peninsula and it is likely to act as nursery, feeding and breeding ground.

The Dwarf Sawfish has not been recorded on the Dampier Peninsula but they have been recorded on coastal habitats at each extreme end of the peninsula, i.e. Roebuck Bay and throughout King Sound. King Sound appears to be an important nursery for the species.

As the brief was to test for federally protected species, the study didn't comment on the Narrow Sawfish, other than to say that it was likely to be similar to the other sawfish species.

### **Commentary – Mike Jacques**

It would be easy to rip into this report whether you are a pro or anti-LNG campaigner. With limited data, time and resources, it's basically been a literature review. It shows most clearly how little we know about aspects of the marine world that aren't commercially important.

What comes out loud and clear is that as soon as humans develop the tropical estuaries, especially if netting increases, these species will do what they have done in the south, die out.

As for the arguments, Environmental NGO handouts only deal with the issue indirectly and emphasise more iconic species like whales, "Whales and other marine life will be threatened - by noise, pollution, dredging, blasting, port development and maintenance, greatly increased shipping traffic including LNG super-tankers and the risk of toxic spills or other accidents".

The government states in a fact sheet that "Surveys of the coastal area have not found any threatened fish species using the seabed habitat". That is an entirely misleading statement in the case of sawfish. I can only assume they didn't read this report, or fudged around it due to the lack of an actual collected specimen at the remote point.

What isn't so clear is whether there is a direct link to the LNG project and likely effects on sawfish. Yes, sawfish will be in the area and might need to migrate past James Price Pt, but is the dredging and shipping activity actually going to be enough to materially disrupt their behaviour and chances of survival as a population? That needs a whole new kind of study and this issue will remain an unknown. Either side can only argue that that is or isn't enough of a risk to warrant holding up the development.

I think it that it would be easier to point to a clear impact if it was going to affect a major nursery area like the Fitzroy River/King Sound.

What comes across to me is not so much of an industrial development link, but a real and urgent issue with fisheries by-catch. I can only conceive of this being dealt with by netting bans in these sensitive areas, but I forgot, we don't do that as it will upset someone.

*Source: DL Morgan, JM Whitty & NM Phillips*

*Centre for Fish & Fisheries Research, Murdoch University, Report to Woodside Energy Ltd.*

### Other Fishlife near James Price Point



**Scientists basically baited a video camera in depths from 6-25 metres to count what came by to investigate.**

Over seven thousand fish from 116 species came by to check out the smell of the bait. These fish tended to be species common to the Indo-Pacific with only 2 fish being endemic to WA. Some potentially vulnerable species like Grey Nurse and slow breeding sharks and rays were also seen.

About 45% of the species or 25% of the numbers were species that could be commercially fished. The fish seemed to be thicker out deeper and also concentrated around patches of more productive sediment bottom. Different species inhabited the

weedy shallows compared to the deep sandy sections, which is not unusual.

Considering how few corals there are and the flatness of the shallow sandy bottom, there was an abundance of fish compared to similar areas. The species understandably lacked the species that normally like muddy bottoms or big coral reefs.

There were a lot of baitfish predators, due perhaps to nutrient flows reaching here from the Indonesia throughflow current, and the stirring up of the bottom caused by local tides.

It is also highly likely that this area is simply a 'virgin' fishing ground that hasn't been changed by fishing.

In that case, the issue might not be so much about the LNG plant, but whether or not it opens up the area for more fishing. This might not be such a problem if other similar nearshore areas in the Kimberley are included in fishing sanctuary zones, but I forgot, we don't do 'no take' fishing zones.



*Source "Surveys of fish-habitat associations in the region offshore from James Price Point using baited remote underwater video stations (BRUVS) 2010 Cappo, Syms, Stowar, Johansson and Cooper.*

## Recent News

### Offshore dredging severely impacts coral reefs



**RESEARCH by the Australian Institute of Marine Science has discovered that proposed dredging works along the WA coast could severely impact certain coral species found in local waters.**

The study found that sediment accumulation on coral tissue was a “strong and consistent cause of tissue mortality” and resulted in the death of whole coral fragments over prolonged periods.

Scientists from the Institute along with the Australian Research Centre of Excellence conducted laboratory tests to develop lethal and sub-lethal benchmarks for coral exposed to dredging-generated sediments related to offshore developments.

The researchers tested two species of coral found in offshore locations to six levels of total suspended solids for 16 weeks, including a four week recovery period.

They tested the horizontal foliaceous species *Montipora Aequituberculata* and the upright branching species *Acropora Millepora*, both of which are found along WA’s coast.

*Montipora Aequituberculata* proved to be more susceptible as after 12 weeks all coral tissue under the sediment had died, exposing white coral skeleton.

Australian Institute of Marine Science senior principal research scientist Ross Jones says the sediment can affect coral by impacting their ability to feed as well as settling on the coral’s surface, causing it to expend energy cleaning itself.

“It can also attenuate light—light attenuation is a key thing because a lot of these habitats are primary producer habitats so the corals and sea life need light to photosynthesise and light is attenuated by the sediments,” Dr Jones says.

“It is like having permanently cloudy weather all the time, so it has the potential to have an effect on the marine environment.”

The study found that sediment accumulation on coral tissue was a “strong and consistent cause of tissue mortality” and resulted in the death of whole coral fragments over prolonged periods.

“What the study showed was that one species which was generally a flat plate-like coral was affected more so that the branching *Acropora* species because the sediment began to pile up on the coral,” Dr Jones says.

“That happened to an extent and rate at which it couldn’t clear itself, so it gradually became buried because the sedimentation rate was faster than its ability to clear itself.”

Dr Jones says Woodside commissioned the study because it was investigating the effects of dredging at Browse.

“This study was initially commissioned by Woodside to try and come up with some numbers to build an environmental assessment of the project,” Dr Jones says.

He says this report is only a small amount of the research that will be conducted in the next few years into what sediment does to corals and other marine life in response to the proposed dredging.

## BROWSE PROTEST TIMELINE

2006 - Inpex investigates possible Kimberley sites for its Browse Basin (Ichthys) LNG plant (later moved to Darwin)

2007 - WA Labor Government establishes Northern Development Taskforce (NDT) to investigate potential LNG processing precinct sites in the Kimberley. Save the Kimberley formed

2008 - Strategic Assessment Agreement signed by WA and Australian Federal Governments. First protest in Broome. Colin Barnett elected Premier and announces North Head (Pender Bay) as his preferred site but NDT announces James Price Point as its recommended site.

2009 - April - "a meeting of Traditional Owners voted with a significant majority to enter into an Agreement allowing an LNG facility at Prices Point. Federal Resources Minister Martin Ferguson makes onshore LNG processing on the Kimberley Coast a condition of the Joint Venture partners (Shell, BP, BHP Billiton and Chevron) keeping their gas field retention leases.

2010 - First meeting of Broome Community No Gas Campaign. Broome Community No Gas March and Rally attracts an estimated 1,800 to Town Beach, up from 450 people a few months before. November -drilling convoy turned back at Quandong by protesters. LNG Precinct Strategic Assessment Report released.

2011- April - Shire of Broome approves construction of a "temporary" workers' camp for 600 workers near 12 Mile

May - Woodside convoy of road drilling equipment stopped. Traditional Owners vote to accept the State Government and Woodside proposal.

June -The start of the Manari Road blockade. Australian Heritage Council recommends inclusion of James Price Point coastline on the National Heritage Register.

July - After police Riot Squad intervention land clearing for geotechnical surveys commences. We Love Broome family concert at Cable Beach, attracts a crowd estimated between 7,500 and 10,000 people.

August -Environment Minister Tony Burke announces National Heritage Listing for the dinosaur trackways off James Price Point.

September - Wikileaks reports BHP and Chevron complained to US Ambassador about being forced to accept the location of an LNG processing plant at James Price Point. Official launch of The Wilderness Society Kimberley Campaign

October - large numbers of East Coast activists arrive.

December - WA Supreme Court finds that compulsory acquisition notices issued are invalid. Woodside request Final Investment Decision delay to "first half of 2013"

2012 - Announcements that rare Gouldian Finches, breeding turtles and Bilbies have been positively identified on the Dampier Peninsula. Woodside confirms it wants to sell some of its equity in Browse Basin.

Aug - The Browse project is now being jointly developed by five companies; Woodside, Shell, BHP Billiton and Mitsui-Mitsubishi. The partners remain split over whether to process the gas at James Price Point or pipe it down to existing facilities at Karratha. Bob Brown and 'Sea Shepherd' join in.

Sept - Protesters temporarily stop. State Government allegedly withdraws advice about breaches of Aboriginal heritage laws. Environment Minister will not make any approval decision at the federal level until all the State issues are investigated.



## Wilderness Society critique of the Assessment Process

summary by Mike Jacques

*The claim is made that the Strategic Assessment Report (SAR) produced by the proponent is incomplete, inaccurate and fails to adequately address key environmental, social and economic issues, including cumulative impacts.*

Studies funded by the proponents are claimed to have exposed major flaws in the consultants studies relied on by the WA Department of State Development (DSD). Studies and information relied on by the proponent but clearly inadequate (lack of time and data, poor design, etc) include those relating to cetaceans (whales and dolphins), sawfish, turtles, dugongs, birds, monsoon vine thickets, bilbies, dredging, coastal processes modelling, marine wastewater discharge, hydrogeology and hydrology, and social and economic impacts.

Conflicts of interest claims were also made in relation to roadworks and bilbies, and dinosaur trackways.

Despite the proponent (DSD) agreeing that a comprehensive scientific peer review process was required, it has been criticised for failing to create such a review body or process. A number of leading scientists commented (in their submission or in personal communications) on the poor science and lack of peer review in the SAR.

Some of the claims were,

### *Dolphins disregarded by SAR*

The SAR has incorrectly dismissed all of the Kimberley coast's species of dolphin as one species and has failed to conduct targeted studies to determine the presence of, and likely impact to, each of the various dolphin species.

### *Turtles*

The turtle work carried out for the SAR has been strongly criticised by marine scientists. Surveys were conducted at the wrong time or in the wrong area and were not peer reviewed. The SAR included misleading claims as to the significance of the JPP/Dampier Peninsula area relative to other turtle habitats, and important information on turtle tracking and turtle foraging was omitted.

A peer reviewed community-led survey at the right time of year and in the highest impact zone of the proposed development found:

- the work carried out for the SAR surveyed only 12 per cent of the coastline most threatened by the precinct, and mostly overlooked the 6km strip which will be the most impacted area;
- a nest of a critically endangered hawksbill turtle (ICUN listing) was present within the proposed development area;
- evidence of Western Australia's first possible hawksbill hybrid was present; and
- many more turtle nesting sites than were reported in the SAR.

The SAR has failed to take into account the cumulative impacts of development on turtles from the impact of nesting sites at Barrow Island, plus the possible impacts which could occur at Quondong Point and the Lacedpede Islands.

### *Sawfish*

Leading sawfish experts are strongly critical of the work done by DSD for the SAR, highlighting the lack of adequate studies and the downplaying of significance of this coast to three endangered sawfish species: "The Dampier Peninsula coast is likely to be a key migratory route and habitat for sawfish species...Nobody knows what the impact on sawfish migration will be if a gas hub and port and breakwater are built because

there have been no studies...one major threat will be increased mortality due to increased fishing pressure."

Without any meaningful studies and data a decision on whether this proposal is likely to have a significant impact on sawfish and the northern river shark cannot be made.

### *Whales*

Independent experts have strongly criticised the work presented by DSD and the SAR on whales and dolphins, stating:

"In general, we find the report lacks the referencing of peer-reviewed, readily available scientific papers that deal with impacts of human activity on cetaceans and dugongs. This shortcoming means we have very little confidence in the scientific integrity of the report and this is evidenced by the unfounded conclusions reached within."

It is important to note that not one peer reviewed study has been completed on Kimberley populations of this endemic Australian dolphin species, and no new work on this species has been done by DSD for the SAR. As such, statements in the SAR that, "It is considered that activities associated with the development and operation of the precinct are not likely to impact these [marine mammal] species"...are without scientific credibility. A recent community survey conducted near to James Price Point<sup>26</sup> over the course of the 2011 humpback whale migration recorded high levels of use of the area by humpbacks with calves. Crucially, the survey found a strong negative correlation between the presence of humpbacks and the presence of Woodside's jack-up barges or seismic vessels.

### *Dugongs*

Independent scientists have strongly criticised DSD's cetacean and Dugong studies and conclusions in the SAR, highlighting incorrect and misleading statements in relation to dugong behaviour and the impacts of seagrass loss, dredging, oil spills

and increased boat activity. In relation to the Dugong work in the SAR they state, "The background information provided in this report is poorly reviewed and refers mostly to reports and websites rather than peer reviewed articles that are widely accessible. There are some statements within the background information that are not supported by the existing literature, and as such, some of the information provided is misleading. The review does highlight the paucity in data about the seagrass in the region, and little has been done to address this issue." Dugongs occur throughout this area and, like the above species, migrate up and down the Dampier Peninsula coast for feeding and/or breeding.

### *Fish*

Scientists have confirmed the significance of the high marine productivity location off the James Price Point coast which gives rise to an exceptional abundance of fish which in turn supports an abundance of seabirds and other predators.

In the Cappo et al scientific study, the fish communities at James Price Point were described as "remarkable" because of their high density of bait fish and large pelagic predators such as trevally and mackerel. There were more baitfish off James Price Point than on the Great Barrier Reef. The narrow continental shelf at James Price Point has underwater thermocline waves formed by tidal surges up to 60m high. These thermoclines stimulate productivity through upwellings. The regional significance of this key ecological attribute has been largely ignored or downplayed in the SAR.

### *Dredging*

There is a serious failure in addressing potential impacts to this high productivity habitat caused cumulatively by dredging and dredge spoil dumping; 'routine marine discharge' (30 billion litres per annum of polluted water, brine, etc); shipping ballast water dumping, and possible oil spills.

The proponent has failed to adequately describe the full scale and impacts of the dredging program, including cumulative impacts, for the lifetime of the proposed LNG precinct, as required under the Terms of Reference for the SAR.

Not only has the proponent failed to provide sufficient detail of the proposed lifetime dredging program and its impacts, it has gone to great lengths to try to conceal dredging impacts. For example, it is only by calculations based on a low resolution figure provided in the SAR that the public can ascertain that the LNG precinct would create a 52 square kilometre marine 'dead zone' off James Price Point.(SAR Part 3, Figure 2.4-1). The significance of this is not addressed in the SAR.

A report commissioned by SEWPaC to review the dredging work of the SAR concluded that the proponent relied on too little data for full model calibration, and the calibration carried out was based on the results from only one Acoustic Wave and Current Meter (AWAC) recording station giving wave and current information immediately offshore from the site in 18m water depth.

The proponent's modelling is largely uncalibrated because it has relied on data from deep water site only. This means that the proponent's modelling may bare very little resemblance to what would actually happen.

It is not possible to quantify the likely impacts which dredging and the creation of a deep water port will have until there is far more study, better data and further peer review of this crucial issue.

#### *Breakwater design and construction*

The proponent has been very evasive on issue of the length, location and design of the massive breakwater and associated shipping channel dredging:

The breakwater, possibly extending for up to 7 kilometres out to sea from James Price Point, will potentially have serious impacts both in its construction and as a block to many marine species migrating up and down the Dampier Peninsula coast including endangered turtles and sawfish, and dugong. It is unacceptable that the proponent fails to spell out in detail what is planned and its impacts.

Proponent's typical baseless assurance: "It is expected that potential impacts to coastal processes from physical presence of infrastructure can be successfully mitigated by the application of best practice management and mitigation measures such as the requirement for derived proponents to demonstrate the minimization of impacts on coastal processes from onshore and near shore marine infrastructure." Marine Site Disturbance and Excavation (SAR Part 2.1.3.1.)

#### *Oil Spills*

First, the Broome Port Authority has little if any of the resources, expertise or experience required to deal with a significant oil spill The risk of a major spill is a tangible risk – even with the best operator.

## Meanwhile at the Gas Hub

By Mike Lee

So with whales, flora and fauna counted. The Environmental Protection Agency pulled all of this together into the Strategic Assessment Report ([Its HERE and huge](#)). The EPA board is made up of five members who all vote on these reports - except this one. The SAR for James Price Point was only approved by one person, being the EPA Chairman Paul Vogel. How can this happen you may ask? Well before this report was finished four of the board members had to step aside due to conflicts of interest. Normally this would cause a problem, but State Premier Colin Barnett explained this as a 'coincidence' ([here](#)). Legislation was changed a year previously, so things like this could happen.

Now for the Browse partners. Since the SAR, Chevron have pulled out of the venture, citing other priorities. However, it was well known they did not actually want to pump to James Price Point, but to the existing facilities on the Burrup Peninsula. The only player that actually wants the LNG plant to be built at James Price Point are the State Government and Woodside. Even the Wilderness Society has provided options that the other joint venture partners want to proceed with ([read this](#))[\[bad link\]](#)

The first and most logical option is to pump the gas to the existing infrastructure at the Burrup Peninsula. Woodside owns this infrastructure and with processing and shipping in place it just makes sense. Sure it will be a decent sized pipeline under the sea, but the damage will be significantly less compared to building a new hub at James Price Point.

Strangely this option has not been considered viable by either Woodside or the State Government.

Shell has proposed another option, a floating gas processing plant. Just think of a very big ship that processes gas. This is massive but provides a safe platform to process the gas and then ship it off. This is all done offshore and needs no gas hub, the other benefit is when the gas runs out the ship moves on also decommissioning a ship is easier and cleaner than pulling down a gas hub.

The Prelude is the vessel that Shell believes will revolutionise the way LNG is processed across the world. Floating Liquefied natural Gas (FLNG) is new and the design and the technology of The Prelude is ([check it out here](#)) is exciting and offers a safer and more environmentally friendly way of processing LNG. In effect The Prelude will anchor off the gas field and have the gas pumped the short distance to it, the ships pull up along side get loaded and away they go. No carving up the land to construct massive gas hubs. When the field runs dry it just picks up anchor and moves off.



Once again the State Government and Woodside have dismissed this option as well. Stating amongst other reasons,



it is only experimental and could not process gas quickly enough. However, just north of Browse, Woodside are actively looking at FLNG at the Sunrise field in the Timor Sea. The Timor Leste Government (who share the field) want a gas hub on their land. But if they did this profits would also flow to the Timor Leste Government and being one of the newest and poorest countries in the world they really need the money, jobs or infrastructure.

## Conclusions

In a nutshell the James Price Point LNG development is a basket case that could be seen by some as purely egotistical decision made by Colin Barnett. He has taken control of the land and dictated that if there is no gas hub built here, there will be no Browse production.

The environmental studies are not conclusive. They don't say that a gas hub at James Price Point can be built in an environmental and economically sustainable fashion. When you consider the viable options that are currently available, there are options that are cheaper and safer to build and will still pump gas for us to sell overseas. The Browse partners want this, the locals want this and even the greens want this. The question that remains is, why James Price Point?

What I have not covered and this is a subject that is as complex as it sounds, that is the social impacts of the gas hub. Sure jobs will be created but most of these will be Fly In Fly Out (FIFO). They will fly into Broome and move straight to a camp near site. It is likely that some will live in Broome and this could cause massive housing and cost of living increases for a town that thrives on the tourism industry. If the hub moves in what will happen when no one can afford to stay there?

The other 'cherry' being passed out to local indigenous native land owners is job offers. But what is there on offer for the long term. Sure in the construction phase there is a high chance of an apprenticeship or non trade role with a high wage. Then what once the work finishes? The decision will be to stay in your own town (that you can't afford to live anymore), or go elsewhere away from your traditional homeland to live and work.

How about this for an option for Browse? Either pump the gas to the Burrup or use the FLNG option. Don't build on James Price Point. The money saved can then get put into the creation of a National Park for the Dampier Peninsula. Imagine a massive national park that will create an eco-tourism mecca. Almost (they have started some construction already - without sign off) untouched areas with rare or endangered wildlife and plant life. Use the money to train the local indigenous people to get involved as the rangers and guides for their own country and heritage. This park then flows out into the Camden Sound Marine Park.

The world is all about finding that balance. There is a need to protect the environment just as much as there is a need to continue searching for resources (until we all become renewable). But these can be done hand in hand.

Woodside had been asked to provide comment and where given notice of intention of this article but at the time of writing still no reply. If we receive any pats on the back from them and the State Government we of course will pass on the feedback.

## Why Not?

*By Derpy Derpina*

Mick Lee has come out strongly of the view that there are better options for the company and the environment than James Price Point, and Mike Jacques sounds like a pathetic fencesitter. No captain of industry, or bureaucrat, seems to have the balls to tell it how it is, so the limp editors of this magazine have unmuzzled me. My usual preference is to bite every hand, but this time I'll try to focus on the reasons why the development might be able to go ahead, if only everyone would just act their age.

Many people (the coherent ones anyway) are of the view that the Browse LNG field should be developed. The macro-economic benefits aren't in dispute. LNG is even relatively carbon friendly as a replacement for oil and coal.

The only real disagreement is about where to put the infrastructure. We could put it out to sea, but it is generally recognized that floating LNG only works for fields that are way smaller than Browse [\[see here\]](#). Regardless of how much you WANT something to be true, two and two still make four. The engineering sums don't add up, so the only viable option is a land based solution.

The site selection that led to James Price Point was painstaking, screening more than 40 Kimberley coastal sites. "The evaluation was largely based on technical feasibility and examined issues such as marine bathymetry and currents, land area, slope and proximity to gas fields. A number of sites which had environmental or socio-economic constraints but were considered to be technically viable were rejected at this stage".

We could lock up everything in a huge national park, but workers in Broome might also want some of the benefits of resources money. Not everyone can, or wants to work just in tourism. For the Dampier Peninsula to become a 'tourist mecca'

you need to create infrastructure. That means roads, pests, rifles, fires, litter and the loss of solitude that is one of the natural values of the area. If you want any development in the Dampier Peninsula, the LNG Precinct at least focuses the impacts in one area and leaves the rest undisturbed.

Aboriginal people may also want to earn more tangible material benefits from their land. The majority have signed up to a settlement package. It's not surprising with an offer of \$1.5 billion in benefits for people doing it tough. The fact that a minority object to the settlement isn't unusual in any political community. We don't get unanimous votes in the national Parliament.

As for the environment, James Price Point seems to be a relatively less biodiverse area by Kimberley standards. There is no doubt that the offshore islands, King Sound, Camden and Broome and even nearby Coulomb Point are rich in life. The LNG Precinct isn't being built in these areas. It is being built in a confined footprint along a section of coast that is routinely disturbed as much or more, by natural events such as strong tides and storms.

There is little point in trying to pretend that there are no whales, rare sharks, bilbies, turtles or dugongs using the coast. It is a transiting point between more productive areas to the north and south. The SAR is only saying that animals are not breeding there, or otherwise present in numbers where losses would affect their population viability. Impacts on the small numbers of bilbies and turtles that do breed in the vicinity can be managed. Where impacts can't be managed we can establish programs to mitigate the effects. A breeding program, or clearing a small area of feral animals, would compensate for any losses. Let's do something real for sawfish and control recreational fishing.

People seem to focus unduly on iconic species like whales. I am SO sick of hearing about whales and dolphins, there are millions

of worthy species out there you know. The facts are that only a minority of whales take the inland migration route inshore near James Price Point. As far as the LNG site goes, there is more blubber at James Price Point in the hysterical rantings of eco-extremists. What is known as the "James Price Pt Migration Corridor" isn't actually all about James Price Point. It covers a massive area of open ocean. The vast majority of whales migrate more than 90 kms out to sea off James Price Point and don't go near the LNG Precinct. Of eight tagged female humpback whales with calves tracked between Pender Bay (80km north of James Price Point) and Eighty Mile Beach (south of Broome) during their southern migration, seven migrated westward around the Lacepede Islands. Only one cow calf pair migrated southwards between the coastline and the Lacepede Islands and continued following closely to the Dampier Peninsula coast. Some of the cow calf pairs were tracked travelling up to 200km out to sea before turning south and re-connecting with the coast near Eighty Mile Beach. Seeing a few whales near James Price Point does not mean that the migration is under threat. Whales are often found near man-made structures, and no-one can show that the jetties and other structures will actually be a material impediment to these animal movements. In fact, despite all the shipping and resources activity already located in the tropical NW of Western Australia, whale numbers keep growing every year at a pretty regular rate.

The investors have acted in good faith and spent \$80 million on environmental studies already, more than making up for the State Government's pathetic indifference when it comes to research money for the environment of the resources regions. The science is good and has been carried out by reputable scientists. Extensive scrutiny will always reveal additional risks or areas of doubt, but the supplementary private reports have provided only relatively minor additional data.

Just shouting loudly about implied conspiracies don't make them true. Complaints about process irregularities haven't suggested that, even if an optimal process was followed, the decision could have been different. Bureaucracies cock up all the time, it doesn't mean they are crooks.

Conspiracy blather seems to follow every environmental fight around like a bad smell, because the troops like to think they are the guys in white hats fighting the guys in black hats. In reality we are talking about a few penpushers with leather sleeve patches cheating on their flexsheets, not the cast of "Underbelly". Let's grow up and give away childish finger pointing, the argument is about whether or not there is some evidence of broad-scale unmanageable environmental impacts at the LNG Precinct.

Protesters have largely pointed to low impacts or impacts that can be mitigated with additional conditions on the development approval. In that instance it is no surprise that the State Government wants to forge ahead, and send a clear signal that good proposals will not be constantly derailed by last minute protests from groups that base their arguments on emotive rather than practical concerns.

OK, ENGOs wait for it, wait for it, I am about to bite the government too. What is going on between Woodside and the State Government? I have a real concern about the way the Government seems to be directing the investment decisions of Woodside in a way that doesn't sound much like supporting the most rational strategy, encouraging investment, or letting market forces decide. Instead they seem to have blown millions of Woodside's money trying to play politics with commerce.

What are the reasons for making a landfall near Broome in the first instance? There might be good reasons, but what are they? It seems to be to assist the Broome economy, but I perhaps wrongly assumed that Broome was a sensible place to put it

anyway. Instead the original siting decision seems a bit like 'put a plant in a marginal electorate'. I don't really know, because no-one is really trying to much defend that decision.

If we did make decisions without being commercially prudent, that is an odd way to run a risky investment project that will cost tens of billions of dollars. Left to their own devices it is possible that Woodside wouldn't be building at James Price Point anyway, so why would you accept an environmental impact, no matter how low, if it wasn't a commercially desirable spot?

BHP and Chevron (partners of Woodside) are privately saying that the Karratha pipeline alternative option would shave as much as \$15 billion (other sources say \$10 billion) from the cost of processing Browse gas at James Price Point. [\[see article here\]](#). This is pretty significant as the project costs are blowing out and putting the whole development at risk. The alternative option of piping to the Pilbara relies in part upon there being free capacity to take up the Browse output in expectation of dwindling North West Shelf supplies. It may also be dependant on the WA Government's attitude to Browse being connected to the State domestic gas grid, even though they don't need to under current agreements. A new domestic pipeline to James Price Pt would add dramatically to the costs, making it clearly cheaper to pipe the field's gas directly to a landfall at Karratha where there is an existing connection.

We shouldn't presume, that other land-based alternatives are better. We haven't done the assessments yet, there could be even more sensitive sites along the new pipeline route, but it's cheaper and that means it's worth exploring.

I am assuming without knowing, that there is a broader plan for the development of the Kimberley and Browse is only one of the industries the WA Government is planning to bring to Broome, with Woodside being set up to take the actual and political costs of establishing the site. This might explain the strongarming of

Woodside (a bit of an achievement in itself, they are a pretty tough bunch). Perhaps James Price is a new resources hub, not just an LNG plant, The EPA documentation says "once established...the site is likely to attract further large proposals in the future". If it's going to be radically expanded, that may well change an assessment of the impacts.

What is all that about? Before handsome young Derpy starts bashing ENGOs any more, or tries to fill the vacuum with his own conspiracy theories, I'd like to hear a coherent explanation as to why we are having this debate in the first place? What is the master plan. If it's a political idea, give me some of that "vision" thing, you remember...the stuff you talked about before you went into parliament.

I can find reams of material on James Price Point, but it all presumes the Kimberley was always 'the' spot. Finding anything more than a page of government media spin explaining why Sydney's unemployed teenagers are now draped over drill rigs in the Kimberley is a hard task.

It might be my false impression, but we seem to have a government (and a developer for that matter) that wants to be a 'small target'. A bit like a kid under a blanket hoping that the monsters will go away if they only shut their eyes and stay silent.

That's not good enough, the government seems to have given up on dialogue. In 2013, I suspect that in a falling commodities market, Woodside's partners will kill the whole project. Maybe we can just develop the gas field later, but by then the few people who have that kind of cash may have decided they can do business more easily in some other place, rather than putting hundreds of millions at risk for nothing.



## Ichthys and Darwin

### Growth and lifestyle change for the N.T.

***Darwin is after oil and gas, not every project, but just enough to kick off resources growth.***

ConocoPhillips' existing Darwin LNG plant will soon be joined by the multi-billion dollar Ichthys plant at Blaydin Point in Darwin Harbour. You have to give the Ichthys developers a big tick, they saw storm clouds in W.A. and paid for an option that gave better certainty.

It may have been encouraged by the NT Government's *Territory 2030 Plan* to turn Darwin into the gas industry alternative to a W.A. landfall. Darwin won't ever compete with Gladstone or Onslow, but then again it doesn't have to, in order to supercharge such a small city. You have to admit that having an air conditioned Darwin coffee lounge nearby is a way more enticing prospect for a skilled worker with a family, than a half-built dusty mining centre in the Kimberley. The skilled labour supply is as much a determining factor for a plant location as the location of the natural resource itself.



Just to prove that they are serious, the N.T. government has opened the North Australian Centre for Oil and Gas at Charles Darwin University, in partnership with Robert Gordon University in Aberdeen (you

know, the North Sea oil people), in an effort to eclipse the reputation of W.A. as the "natural" natural gas centre of Australia. "It's going to be transformative", a gas industry spokesman said. "It will change Darwin from being a pretty quiet sort of a place generally – always with a lot of potential – to becoming one of the key economic drivers of the nation. The Chief Minister continually says that northern Australia's time has now come. "The economic investment up here will shift the focus in Australia from the east coast to the north".



Really!, millions living in a city with road and water infrastructure for 100,000? They are saying that the current population figure may double within 10 years, which I suspect is logic defying spin, as I doubt there is even enough labour to make that practical.

Well we have tried big industry down in the under-developed south and in the sleeper bits like Hobart, it seems like people have decided they enjoy it sleepy. Here it's called a lifestyle, and you might sometimes be excused for thinking we now use it as a replacement for a functioning economy. You wouldn't get a gas plant down here even if we had the resources, not while industry had a viable alternative landfall. If there weren't protests about the impacts (often justified with many forms of 'black' industry), it would change the landscape we are used to and that would mean more protests. For better or worse, we

want low-key 'smart' industries rather than big attention-grabbing industrial era complexes.

They don't think that way in the N.T. and no-one much complained about the large new gas complexes planned for Darwin harbour. "Darwin provided a certainty that nowhere else could match in terms of land access and high-level government and community support. It's a progressive town. We've done phone opinion polls around our environmental approvals process last year that showed about 85% of respondents in favour of the project coming to Darwin". That is an imaginative industry statistic, but this time it seems to reflect the general mood.



Darwin has obviously enjoyed way too much lifestyle already and is now so threadbare that the thought of having Australia's most pristine urban coastal environment, with lots of fish and mangroves, is just taken for granted and isn't a decisive

factor in people's willingness to accept heavy industry. They probably won't miss it until their 80% pristine catchment vegetation coverage drops to 15% and years of unattainable house prices and traffic jams take the shine off the social benefits of an economy in a constant state of overload.

So far, only a few small groups like the Australian Marine Conservation Society (AMCS) have raised any kind of protest. Although the plant is near an existing developed landscape,

there ARE a few potential issues. Although the project proponents are trying to find alternatives, at one point underwater explosives were to be used three times a day for a whole year in Darwin Harbour to build a new shipping channel. They will also dredge 16 million cubic metres of sediment to make the shipping channel, which could potentially destroy important mangrove habitats, seagrass meadows and maybe even nearby wartime wrecks. There are also plans to clear sensitive coastal forests including 66 hectares of monsoonal rainforest and 83 hectares of mangrove forests to build the plant itself. However, the issues most talked about are how to manage urban growth. It small by Browse standards, but a big project for Darwin harbor.



"We're heading to incontrovertible change at a rate of knots. The key is managing the challenges of growth and building the proper protections in around the unique lifestyle here in the Top End – ensuring that people continue to see this as a great place to work and live. This means managing urban design and planning so the rapid growth in population does not cause congestion". To manage this change, the NT Government has committed to building a new satellite city - Weddell, 20 km



*Blimey ACMS, that must have been an exceptional day of visibility in the harbour, but the suggested impact is real.*

beyond Palmerston. The rental vacancy rate in Darwin is already as low as 2.5% and dropping. Rental price gouging is already predicted.

If the development is well-managed perhaps it can avoid many of the predicted social and environmental pitfalls. The people of the N.T. have experienced long periods of weak growth, with a lot of inter-generational poverty, especially among indigenous people. Development will create opportunities for those with the initiative to break out of that cycle. Change of itself isn't a bad thing.

However, this level of development will affect the coastal environment of Darwin Harbour, and that is as important as urban design to the 'Top End lifestyle'. Rather than opposing this particular LNG project, my concern is more about the low level of public interest shown in it generally. The Environmental Impact Statement (EIS) was one of the few detailed studies done on the harbour with heaps of great new information that should have been of compelling interest to every thinking top ender. The developer's scientific staff freely 'fessed up' to some negative aspects and offered ideas to address it, but this aspect seems to have attracted little media interest. I'd forgive them for not trying so hard next time.

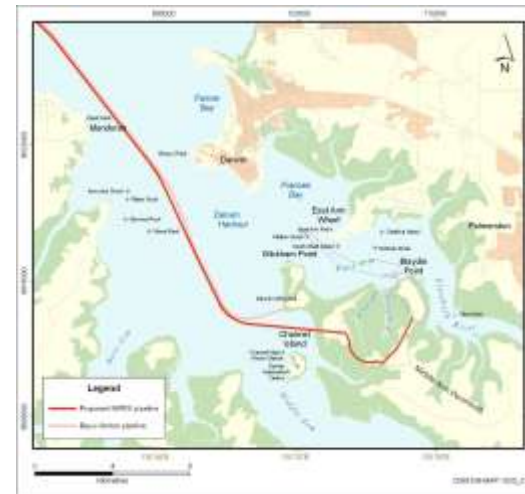
With knowledge and vigilance we can enjoy the benefits of development and still keep a healthy marine environment. It sounds like the vigilance task isn't going to be done by the media, the ordinary Johns and Janes who care about the ocean will have to step up.

There is a different kind of social dialogue we can have about these developments, something more than distracted indifference and less than uninformed hysteria. Get Reading.

## Snapshot of the Darwin Inpex/Ichthys LNG development impacts

By Mike Jacques

### Some conclusions from the EIS



"Although the likely impacts of the Project have been identified and are relatively well understood, there remains a high level of uncertainty in terms of the precise nature and extent of impacts and changes, particularly to the ecology of Darwin Harbour and the region. This uncertainty is largely due to the gaps in data informing the environmental

impact assessment process. Consequently, the proponent, government and community will be reliant on intensive, post-assessment monitoring to determine the significance of, and appropriate responses to, key impacts."

"...despite efforts to mitigate impact, residual environmental detriment is anticipated, such as the loss of monsoon vine forest and the cumulative effects of the Project on significant marine biota in Darwin Harbour. The proponent will be expected to implement appropriate offsets to reduce this..."

"The key potential impacts associated with construction of nearshore infrastructure include: direct and indirect effects on

habitat from increased turbidity and sedimentation; loss of habitat; potential acid sulphate sediments; disturbance of maritime heritage; waste generation and spills; restrictions to recreational use of the Harbour; underwater noise from piling; and increased marine traffic.”

*What will be built?*

- a pipeline shore crossing on the western side of Middle Arm Peninsula south of the Darwin LNG pipeline crossing then 27km of subsea gas export pipeline from Darwin Harbour to the gasfield;
- a construction materials offloading facility on Blaydin Point;
- a product loading jetty on the north-western end of Blaydin Point;
- a shipping channel for tankers; and
- a dredge spoil disposal ground (16.9Mm3 of material), 12km north-west of Lee Point.
- clearing of approximately 133ha of Eucalyptus woodland, 61ha of monsoon vine forest, 73ha of melaleuca, and 95ha of mangroves and high-intertidal communities.

*The Dredging*

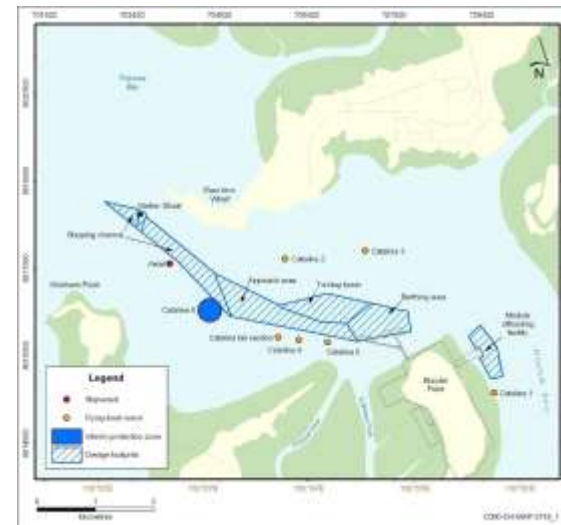
A number of dredging vessels are required and these would operate for 24 hours a day and 7 days a week during specified periods. Walker Shoal will have to be removed as the top of the Shoal rises to 4m depth. INPEX explored options to realign the shipping channel in order to avoid the Shoal, but claim that the constraints posed by the heritage-listed wreck of the coal hulk *Kelat*, the hazards posed to shipping navigation in the future and the proximity of the East Arm Wharf facilities prevent any realignment. It is “thought” blasting is no longer required, but there was to be a daily program of underwater blasting with

unknown effects on local wildlife (obviously not likely to be good for fish and sea mammals)

*Offshore sediment dumping*

The dredging needed for the new LNG plant will be dumped in an area of soft sediment in 14-15 metres of water about 20km offshore of Darwin harbour. The bottom in the dumping zone is soft sediment that is already highly mobile during storms and strong tides. It has also been assessed as an area of low species richness, unlikely to be much affected by the dumping.

Modelling shows that the coarse sediments are unlikely to reach the shore, but will be drawn towards the east well offshore. The site selection is a compromise between the expense of cartage and finding the right spot in water deeper than 12 metres, where the swell is less likely to wash the sediment ashore. Outside of a line between Cox and Shoal Bay Peninsulas, the currents run alongshore and are unlikely to bring sediments back into the harbour.



*Hey a new artificial reef!*

Rock-armouring will be put in place over the top of the pipeline once it has been constructed on the seabed. Approximately 850 000t of rock, will be transported by road to East Arm Wharf

where specialised rock-dumping vessels will take it offshore for dumping directly over the pipeline.

*What about historic wrecks?*

The dredging is right next to a number of significant sites and it would have to be very controlled to avoid hitting three of the six East Arm Catalina wrecks, or the coal hulk "Kelat". How much spoil would then drift onto the wrecks was not assessed, but I wouldn't be surprised to find either the wrecks, or their marine life, are smothered. I regret I've never dived them, but the photos suggest they are draped in corals and have plenty of fish at present although vis is low.

The *SS Ellengowan*, which is the oldest known shipwreck in Darwin Harbour and is one of the earliest examples of shipping associated with European settlement in the area, is located south of the proposed pipeline shore crossing.

These sites are protected under the *Heritage Conservation Act* and / or the *Historic Shipwrecks Act*. An archaeologist is planning to supervise the works.