

Factor	New Information	DSD response
Marine Fauna		
Dolphins	<p><i>Murdoch University Cetacean Research Unit (MUCRU)</i></p> <p>New scientific papers were provided that gave information on dolphin populations. Some of the key issues in these papers are:</p> <ol style="list-style-type: none"> 1. Australian humpback and Indo-Pacific bottlenose dolphins occur in waters adjacent to each north-west Australian urban centre and, in the majority of these areas, there is no baseline information or population abundance estimates for these and other protected species of dolphins upon which to make informed management decisions. 2. In 2014, it was recognised that the species of humpback dolphin found across northern Australia is distinct from those of south-east Asia and the other species of humpback dolphins, thereby necessitating a higher level of rigour when assessing potential impacts at the population level. 3. New genetic data on Australian humpback and snubfin dolphins from populations north (Cygnet Bay) and south (Roebuck Bay) of James Price Point indicate north-western Australian populations exist as meta-populations of small, largely isolated population fragments and that the maintenance of connectivity between 	<p>The Department of State Development (DSD) acknowledges that new scientific papers have provided further details of the presence of Australian humpback and snubfin dolphins and the Indo-Pacific bottlenose dolphins. It has particularly detailed their occurrence within coastal embayments and waters adjacent to a number of north-western Australian regional centres. (Allen et.al. 2012 & Brown et.al. 2014a). Research has also suggested that the populations of Australian humpback and snubfin dolphins in north-west Australia exist as small and genetically isolated populations (Brown et.al. 2014b).</p> <p>These papers include the following:</p> <ul style="list-style-type: none"> • Allen, S.J, Cagnazzi, D.D, Hodgson, A.J, Loneragan, N.R and Bejder, L. (2012). Tropical inshore dolphins of north-western Australia: Unknown populations in a rapidly changing region [online]. <i>Pacific Conservation Biology</i>, Vol. 18, No. 1, 2012: 56-63. • Bejder, L, Hodgson, A, Loneragan, N, Allen, S. Coastal dolphins in north-western Australia: The need for re-evaluation of species listings and short-coming in the Environmental Impact Assessment process. Forum essay. <i>Pacific Conservation Biology</i>, Vol. 18, 2012: 22-25. • Brown, A.M., Bejder, L., Pollock, K.H. & Allen, S.J. (2014a). Abundance of coastal dolphins in Roebuck Bay, Western Australia. Report to WWF-Australia. Murdoch University Cetacean Research Unit, Murdoch University, Western Australia, 25pp. • Brown A.M, Kopps A.M, Allen S.J, Bejder L, Littleford-Colquhoun B, et al. (2014b). Population Differentiation and Hybridisation of Australian Snubfin (<i>Orcaella heinsohni</i>) and Indo-Pacific Humpback (<i>Sousa chinensis</i>) Dolphins in North-Western Australia. <i>PLoS ONE</i> 9(7): e101427. doi:10.1371/journal.pone.0101427. • Jefferson, T.A.; Rosenbaum, H.C. (2014). Taxonomic revision of the

Factor	New Information	DSD response
	<p>populations is highly important for population viability.</p> <p>It was MUCRU's main concern with the original Strategic Assessment Report (SAR) that the judgements by the EPA relating to acceptable levels of impact on marine mammals from the Browse LNG development were not founded on sufficient scientific data. While this was a problem across several taxa, this was particularly a problem for coastal dolphins. Currently, no population estimates exist for any dolphin species occurring around James Price Point, and few even exist for the wider geographic area. Most of the dolphin sightings reported within the SAR were not even identified to species level. This makes it impossible for the EPA to reliably and justifiably determine that the level of impact from the Browse development on coastal dolphins would be acceptable or manageable. The new information that we have provided highlights the overwhelming need to undertake a more scientifically and quantitatively rigorous approach when assessing the potential impacts of such developments on coastal dolphins.</p> <p><i>Department of Parks and Wildlife (DPaW)</i> A recent paper in the journal <i>Marine Mammal Science</i> identifies the humpback dolphin found in Australia, and known to occur in coastal waters off the Cape Leveque Peninsula, as a separate species to the Indo-</p>	<p>humpback dolphins (<i>Sousa spp.</i>), and description of a new species from Australia. <i>Marine Mammal Science</i>. 30(4).</p> <p>This new information does not however, indicate any significant new, or previously unrecognised populations of these species within the James Price Point coastal area and does not affect the conclusions drawn in the Browse LNG Precinct Strategic Assessment Report (SAR) or Response to Submissions – Summary Report (Response to Submissions).</p> <p>The SAR (Part 3, Section 2.6) reported widespread sightings of numerous dolphins and, despite not conducting rigorous population level assessment of individual species, the assessment of potential for impacts within the SAR was still based on the wide distribution of significant numbers of dolphins across the region and within the project area. The new information provided does not substantiate the assertion that the impact assessment process is flawed by the lack of population abundance estimates for individual species.</p> <p>The Dolphin Review of information (RPS 2012) collated information collected over three years, which included vessel and aerial based surveys to inform impact assessment conclusions in the SAR and Response to Submissions. This review clearly acknowledges that, although the survey techniques did not identify many of the sightings to species level, the unidentified dolphin records still provide valuable information on the general distribution and abundance of dolphins across the survey area. Dolphins were widely distributed across the West Kimberley survey area and were more abundant in offshore waters with only occasional larger groups observed inshore of 3 nautical miles of the coast. Whilst the taxonomic identity of the unidentified dolphins could not be determined by the survey technique employed, the higher densities in the offshore zone suggests that the regional dolphin assemblage is dominated by oceanic species.</p> <p>The SAR (Part 3, Section 1.4.4.4) and the Response to Submissions (Section 4.5.1), acknowledged the potential presence of the Australian humpback and snubfin dolphins and the Indo-Pacific bottlenose dolphin as well as several other</p>

Factor	New Information	DSD response
	<p>Pacific Humpback dolphin (Jefferson and Rosenbaum. 2014). This new species does not currently have a threatened or priority conservation ranking.</p>	<p>dolphin species within the James Price Point coastal area.</p> <p>Recent research at Roebuck Bay (Brown et.al. 2014b) has identified a relatively large population of the Australian snubfin dolphin within the bay, which serves to further strengthen the conclusions drawn from results of previous research on the habitat preferences of snubfin dolphins discussed within the Response to Submissions and the SAR. The habitat preferences of Australian snubfin dolphins are for protected shallow waters close to the coast, river and creek mouths and are strongly linked to mangrove systems (Parra, 2006; Parra et.al. 2006a and 2006b). It should be noted that the James Price Point coastal area is not a sheltered coastal embayment and has no mangroves and as such, is unlikely to support significant populations of snubfin or humpback dolphins. The closest comparable habitat to the James Price Point coastal area is at Barred Creek (approximately 20km south of James Price Point).</p> <p>It is further acknowledged within the Response to Submissions that individuals may travel between more preferential foraging grounds and therefore, may occasionally occur within the coastal waters adjacent to James Price Point. However, it is highly unlikely that they utilise the waters offshore from James Price Point for feeding or breeding, given nearby preferential habitats at Roebuck Bay, Barred Creek and Willie Creek (RPS 2010; SAR Appendix C-10). As such, it is considered that the activities associated with the Precinct development and operations are not likely to significantly impact on snubfin dolphins.</p> <p>Indirect impacts, such as the potential increase in recreational boating within Roebuck Bay, have the potential to be of greater concern to snubfin dolphins than activities associated with the Browse LNG Precinct development itself. Research within Roebuck Bay has demonstrated impacts from fishing gear and vessel strikes which were predominantly attributed to fast moving vessels in shallow waters (Thiele 2010). Nevertheless, the management measures proposed in the SAR (SAR Part 3, Environmental Assessment, Table 2.6-11) to mitigate potential impacts on other marine mammals more relevant to the Browse LNG Precinct project area (such as managing navigation and vessel</p>

Factor	New Information	DSD response
		<p>movements in the Port area, developing and implementing the Environmental Management Plan, Dredging and Dredge Spoil Disposal Management Plan and development of a marine fauna and vessel interaction management and monitoring strategy) will also benefit the snubfin species and other dolphins to reduce the risk of impacts and achieve acceptable outcomes.</p> <p>The DSD acknowledges recent research which has recognised that the species of humpback dolphin found across northern Australia and known to occur in coastal waters off the Cape Leveque Peninsula, is a separate species to the Indo-Pacific Humpback dolphin (Jefferson and Rosenbaum, 2014) and that this new species does not currently have a threatened or priority conservation ranking (refer to comment from DPaW).</p> <p>This reclassification along with the genetic research by Brown et.al. (2014b) suggested that the populations of Australian humpback and snubfin dolphins from populations north and south of James Price Point indicate north-western Australian populations exist as small and genetically isolated populations. Whilst this new information strengthens the need for conservation of these species, it does not indicate significant new, or previously unrecognised, populations of these species within the James Price Point coastal area. It is further acknowledged that connectivity between isolated populations is of importance for population viability and that individuals of these species may travel between areas and therefore, may occasionally occur within the coastal waters adjacent to James Price Point. It should however, be pointed out that activities associated with the development do not pose a permanent or long term risk of disruption to connectivity between isolated populations and furthermore, do not pose significant risk to the transit of individual dolphins through the region and between isolated populations.</p>
Turtles	<p><i>Turtle Island Restoration Network</i> New satellite tracking data and research conducted in and around James Price Point/Walmadany and the Kimberley coast and W.A. over the past five years provides stronger and stronger evidence that the</p>	<p>DSD's response has included an evaluation of the additional information provided by the Turtle Island Restoration Network (TIRN) and a review based on the baseline setting and conclusions presented in the SAR in relation to key behaviours of marine turtles including nesting, foraging and migration.</p>

Factor	New Information	DSD response
	<p>coastal region provides critical breeding, foraging and migratory habitat for endangered and protected marine sea turtles and other marine species. Newly published science confirms what the conservation community has been saying for years: The Kimberley and W. A. coast is a "marine highway" for sea turtles and other marine wildlife.</p> <p>Satellite tracking and tag-recapture data shows that marine turtles throughout Western Australian (and even from the Northern Territory) rely on the marine habitat at James Price Point/Walmdany for foraging and migration. The data also shows that marine turtles demonstrate strong site fidelity to foraging and migration areas, much as they do for nesting beaches. This indicates that marine turtles displaced by construction and operations of oil and gas development cannot easily change their life cycles in response to major disruption.</p> <p>Over the past two years, new marine turtle science relevant to the Browse project and other oil and gas developments have been presented at two West Australian Sea Turtle Symposiums. For your review and reference, I am attaching the proceeds from the 2012 Sea Turtle Symposium which contains extended abstracts of the science. This science reinforces the fact that the EPA and the SAR overlooked important turtle research</p>	<p>In order to inform the original Strategic Assessment Report (SAR) (DSD 2010) impact assessment and to provide supplementary information (RPS 2012), a series of detailed turtle surveys were conducted between 2009 and 2011 which included:</p> <ul style="list-style-type: none"> • aerial surveys (nearshore, regional and offshore) • vessel surveys • beach studies (track counts, nearshore surveys and sand temperature analysis) • satellite tracking (inter-nesting and post-nesting migration) surveys. <p>The surveys produced a robust baseline which provided a sound understanding of the marine turtles around the Dampier Peninsula with an impact assessment and subsequent management measures focussed on this baseline setting.</p> <p>Foraging</p> <p>The Wild Futures 2014 research provided by TIRN indicates Eco Beach turtle populations may travel northwards to areas further up the Kimberley coastline, with a likelihood of foraging in the vicinity of James Price Point.</p> <p>The SAR (Part 3 Section 1.4.4.1) recognises this occurrence and states the following:</p> <ul style="list-style-type: none"> • <i>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.</i> <p>The SAR (and Appendix C-2) and Supplementary Information (RPS 2012) also discusses details of abundant foraging turtle populations between Cape Bossut and Cape Leveque recorded during vessel and aerial surveys along Dampier Peninsula with the following conclusions being drawn:</p>

Factor	New Information	DSD response
	<p>available from the Department of Conservation (now retitled), independent researchers and oil and gas industry consultants when making its determination that the project would not threaten marine turtle populations in the region.</p> <p>Researchers from Deakin University and Pendoley Environmental suggested protecting marine turtle migratory corridors by adding them to the existing marine reserve system. Their research also discovered that whales, sharks and turtles share a common migration corridor along the Kimberley and W.A. coast, which was previously unknown.</p> <p>In another significant new marine turtle finding in W.A., researchers working at EcoBeach south of Broome, (but well within the influence of the Browse project) found that flatback turtles nesting there comprise a distinct genetic unit. The Conservation Volunteers Australia EcoBeach 2013 report stated that: <i>Dr Nancy FitzSimmons was able to isolate this Eco Beach population as a separate and new genetic management unit of Natator depressus in Western Australia.</i></p> <p>This science counters the inaccurate findings in the Browse SAR that dismisses the importance of small populations of sea turtles nesting in the James Price Point/Walmadany region. The Browse SAR argued that any losses experienced by the small population</p>	<p>SAR and Appendix C-2</p> <ul style="list-style-type: none"> • <i>Turtles were widely distributed throughout all nearshore survey areas with no large aggregations of any species of turtle along the Dampier Peninsula.</i> • <i>The majority of turtles in the water were observed within 20 km of the shore and within the 20 m isobath.</i> • <i>All six turtle species may utilise the waters offshore of James Price Point (JPP) coastal area during movements and migrations and possibly also as foraging habitat. This is evidenced by the broad distribution of turtles throughout the waters of the Dampier Peninsula.</i> • <i>The benthic flora and fauna (invertebrates, macroalgae, Halophila sp, and seapens) at James Price Point, like other regional nearshore coastal waters, provide a food source for flatback and green turtles.</i> • <i>James Price Point also has similarities to known sub-adult green turtle habitat (for example shallow subtidal and intertidal limestone platforms are frequently used by green turtles on the Dampier Peninsula) (Pendoley pers. comm., 2009 as cited in RPS, 2010b).</i> • <i>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.</i> <p>Supplement Report (RPS 2012)</p> <ul style="list-style-type: none"> • <i>Turtles are distributed through the aerial survey area with areas of higher densities north of Coulomb Point and offshore from James Price Point.</i> • <i>The nearshore waters (<14km from shore) between Coulomb Point and Cape Carnot are recognised as aggregation areas during the winter months.</i> <p>The Waayers <i>et al</i> 2011 paper provided by the TIRN presents a publicly accessible synopsis of many of the turtle studies undertaken to support the SAR which are summarised in Part 3 s1.4.4.1 and Appendix C-2 of the SAR. This data was utilised in the development of the SAR in order to provide an</p>

Factor	New Information	DSD response
	<p>would be "offset" by larger sea turtle populations, such as on the Lacepede Islands. However, negative impacts to a genetically distinct population cannot be "offset" by a distant and unrelated population.</p> <p>New studies on light impacts on marine turtles in Australia have also been published as well as the first studies of the impacts on marine turtle eggs and nests from pile driving.</p> <p>The life cycles of long-lived marine turtles require that their entire range of habitat be protected from oil and gas development, construction and operations. It is essential that the EPA look beyond the impacts to marine habitat in the immediate vicinity of the Browse project. The Kimberley coast and Western Australia is essentially a marine highway and the cumulative impacts of numerous oil and gas projects that intersect this marine highway must be assessed and avoided. Ultimately, oceans and the global community will benefit most from permanently protecting the Kimberley and large areas of the Western Australia coastline from oil and gas and other industrial development. It is one of the few areas of ocean and coastal habitats still relatively intact.</p>	<p>understanding of key habitat, behaviour and significant areas for turtle populations. The data provides a clear indication of the behaviour of interesting and foraging turtles focussed on the Lacepede Islands 65 km north of James Price Point which has significant green and flatback turtle rookeries.</p> <p>Nesting</p> <p>The TIRN response cites evidence associated with the coastal region as providing critical breeding habitat for marine turtles.</p> <p>The research presented by Dr Nancy FitzSimmons (Wild Futures 2014) indicates the value of nesting habitat for the genetic management unit of turtles that nest in the vicinity of Eco Beach. This location however, is over 80 km to the south of James Price Point.</p> <p>Given the significant distance between the Eco Beach nesting activity and the Precinct, it is considered highly unlikely that construction and operation of the Precinct would result in impacts to nesting behaviour for this genetic management unit.</p> <p>The TIRN also provided the Western Australian Marine Turtle Symposium (Department of Parks and Wildlife 2012) proceedings which contain details of a community survey conducted in the vicinity of James Price Point (Goddard <i>et al</i> 2012 in Department of Parks and Wildlife 2012). DSD believes this survey lacks robust, scientific rigour on which to augment existing understanding of nesting activity in the vicinity of James Price Point.</p> <p>Goddard <i>et al</i> 2012 fails to present information on the methods employed and only provides limited results encountered. There is a lack of detail on the specific survey season, locations and timing of nesting activity, track count appearance, nest temperature etc. in reporting 14 nests and 38 false crawls in undisclosed locations in a 6 km section of beach (believed to be north of James Price Point).</p> <p>Whilst DSD welcomes the intent and interest of community groups in legitimately understanding turtle science, it does not support the statement made in Goddard</p>

Factor	New Information	DSD response
		<p><i>et al</i> 2012 with respect to the inadequate nature of surveys undertaken to support the Environmental Impact Assessment. Notwithstanding this view the results do not indicate a significant breeding colony near the precinct.</p> <p>The surveys conducted for the SAR to understand turtle nesting comprised beach surveys of the James Price Point area (between Quondong Point and Coulomb Point) and in the Lacepede Island Group.</p> <p>The nesting focussed studies to support the SAR and supplement report (RPS 2012) were conducted throughout an entire breeding seasons for green and flatback turtles (between 2009 and 2011) and comprised:</p> <ul style="list-style-type: none"> • preliminary habitat assessments • track counts and analysis (to establish the species of turtle nesting in the study area and determine their spatial distribution and abundance at various rookeries) • nearshore surveys • sand temperature measurement • inter-nesting and satellite tracking of tags on nesting female turtles. <p>The statement in Goddard <i>et al</i> 2012 that the high impact area coincides with prime nesting habitat is not supported by key SAR and supplement report conclusions; as outlined below:</p> <ul style="list-style-type: none"> • <i>Beach surveys have identified the beaches to the immediate north and south of James Price Point are considered unsuitable for nesting. These beaches are subject to tidal inundation and have rocky shore lines which are not favourable for nesting conditions (RPS, 2010b; Appendix C-2).</i> • <i>James Price Point beach, starts at the end of the rocky shoreline approximately 200m south of James Price Point and is approximately 720m long (Figure 1-43). It comprises an extensive sandy beach area with a well-developed vegetated foredune. The foredune is set back and gradually slopes to a primary dune. There are rocky outcrops on the</i>

Factor	New Information	DSD response
		<p><i>shore line at the northern and southern extent of the beach. The northern beach area above the high tide comprises a rocky platform covered with a thin veneer of sand (~ 20cm). This section of beach is considered unlikely to be suitable for nesting. Beach surveys did not identify any significant nesting areas on James Price Point beach (RPS, 2010b; Appendix C-2).</i></p> <ul style="list-style-type: none"> • <i>very low levels of nesting were recorded (3 tracks and 1 potential nest over the entire nesting season – cited from Appendix C-2.</i> • <i>Beaches between James Price Point Beach (Main) and Jajal Beach support very low nesting activity throughout the year, with no nesting activity recorded in the James Price Point area between December 2010 and June 2011 (RPS 2012).</i> <p>Goddard <i>et al</i> 2012 also cites the importance of areas in the vicinity of James Price Point for hawksbill turtle nesting. There are several references available which detail the key rookeries for hawksbill turtles e.g. Lowendal Islands, Montebello Islands, Dampier Peninsula, Scott Reef and Ashmore Reef (DoE 2014, Limpus 2009, DEC 2009, Guinea 2009) with isolated breeding recorded at Cape Leveque (D. Oades pers. comm. 2009) and the Lacepede Islands Group (Prince 1994). In view of this, it is not considered that the James Price Point coastal area comprises significant hawksbill nesting areas.</p> <p>Given the lack of demonstrable and scientifically robust evidence of significant turtle nesting activity recorded in the vicinity of James Price Point, it is considered that the papers discussing the impacts of pile driving and lighting provided by the TIRN (Ripcke 2010 and Kamrowski 2012) are not directly relevant to consideration of the Browse LNG Precinct.</p> <p>Section 2.7 of the SAR clearly discusses the potential impacts of turtles resulting from marine noise and vibration and light emissions. This impact assessment is however, focussed on the understanding of the baseline setting of the low turtle nesting activity in the vicinity of James Price Point.</p>

Factor	New Information	DSD response
		<p>Migration</p> <p>The State and Commonwealth governments have committed to, and are, developing a network of Marine Parks in the Kimberley region focussed on protecting areas of habitat or aggregation areas for key species. This recent process did not specifically identify the need for protection of migration corridors or ‘marine highways’ for turtles, but will realise significant benefits for turtle populations in the Kimberley Region, as noted in http://phys.org/news/2014-04-important-migratory-corridor-endangered-marine.html This article recognises that <i>much of the flatback turtle's transit passage – between its breeding colonies and foraging grounds – falls within the newly established Commonwealth Marine Reserve network</i>. These conclusions are also reiterated in Pendoley <i>et al</i> 2014.</p> <p>This recognition of migration pathways and use of the Kimberley coastline was addressed in Part 3 Section 1.4.4.1 of the SAR and in the supplement report (RPS 2012), with this additional detail (Pendoley <i>et al</i> 2014) now providing further granularity to the understanding of green and flatback turtle nesting. The potential impacts on turtles (which may be migrating in the vicinity of James Price Point) as a result of the construction and operation of the Precinct was addressed in Part 3 Section 2.7.</p> <p>Summary</p> <p>The likely impacts associated with construction and operations of the Precinct recognised this baseline setting of turtle activity in the vicinity of James Price Point with Part 3 Section 2.7 of the SAR detailing the potential impacts on these populations with regard to a range of aspects including:</p> <ul style="list-style-type: none"> • marine noise and vibration • marine site disturbance and excavations – including loss or disturbance to foraging habitat • sediment deposition and turbidity – including loss or disturbance to foraging habitat • marine discharges

Factor	New Information	DSD response
		<ul style="list-style-type: none"> • light emissions; and • vessel movements. <p>These impacts are not considered to result in widespread mortality in turtles or in significant long term disruption to turtle behaviour. Localised loss and disruption to foraging habitat will occur for a period of time during construction activities and potential individual impacts are likely on occasions.</p> <p>Of additional note is that the initial site selection for the Precinct included a focus on avoidance of peak aggregation areas for nesting, interesting and foraging habitat for turtles and other species such as the Lacepede Islands. The premise behind the establishment of a multi user Precinct was to avoid or reduce the impacts of numerous cumulative oil and gas developments along the Kimberley coastline; in line with the objectives by the TIRN.</p> <p>In summary, whilst some of the additional information cited by TIRN augments the baseline knowledge of marine turtle populations and behaviour in the vicinity of James Price Point, it does not provide any data which changes the overall conclusions presented in the SAR from a baseline or impact assessment perspective.</p>
Marine environmental quality		
Disposal of dredge spoil	<p><i>Public submission</i></p> <p>Reference to new information based on research in Queensland that showed that the impacts of dredging and dumping of dredge spoil are greater than previously predicted including:</p> <p>http://theconversation.com/mounting-evidence-shows-dredge-spoil-threat-to-the-great-barrier-reef-29773</p> <p>http://gladstoneconservationcouncil.com.au/w</p>	<p>The link provided by D'Alton refers to an article by Terry Hughes in The Conversation, dated 18 August 2014. In that article, he states that "Recent studies have shown that dredge spoil blooms travel further". That statement was drawn from a recent modelling study by SKM & APASA (2013), commissioned by the Great Barrier Reef Marine Park Authority:</p> <ul style="list-style-type: none"> • SKM and APASA, 2013. Improved dredge material management for the Great Barrier Reef Region. Sinclair Knight Merz Pty Ltd and Asia-Pacific Applied Science Associates, Technical Report (+ 6 Appendices), prepared for the Great Barrier Reef Marine Park Authority, Townsville.

Factor	New Information	DSD response
	<p>eb/sediment-and-turbidity-associated-with-offshore-dredging-increase-coral-disease-prevalence-on-nearby-reefs/</p>	<p>Since the release of that study, the Great Barrier Reef Marine Park Authority (GBRMPA) has issued an interpretative statement (see: http://www.gbrmpa.gov.au/data/assets/pdf_file/0004/97159/Interpretive-Statement-draft-20131028web.pdf) for the purpose of informing the readers of these reports — be they members of the public, scientists or agency staff — on their findings and limitations.</p> <p>On page 6 of this interpretative statement, GBRMPA states:</p> <p>“Due to budget and timeframe constraints, and the technical challenges posed by the large spatial coverage and the extended period for simulation, it was necessary to make a number of simplifying assumptions. Some of these assumptions (for example, no consolidation of material, all placed material is resuspended, and no resuspension of sediments in shallow water) do not reflect real conditions, leading to a lack of alignment with existing field measurements. These assumptions resulted in the model overestimating the dispersion of dredged material from placement sites in both the amount and distances travelled. Consequently, the sediment plume and transport maps provided in this report do not represent actual sedimentation rates or the specific extent of dredge material dispersion and migration. In some cases, the amount of sediment deposition mapped is so small that it could not be measured. The approach adopted in the modelling study was purely to emphasise the comparison between sites and does not provide guidance on the actual impacts likely in the regions shown on the maps. As such, the maps cannot be used to determine the ecological relevance of impacts.”</p> <p>It therefore appears that some statements in the media and grey literature (including the above mentioned article in The Conversation), having taken certain findings from the modelling study out of context without consideration of the interpretative statement on the modelling study issued by GBRMPA, are inaccurate.</p> <p>This opinion is supported by a recent Expert Panel Synthesis Study of the effects of dredging in the Great Barrier Reef Region, commissioned by GBRMPA</p>

Factor	New Information	DSD response
		<p>and AIMS (see: http://www.gbrmpa.gov.au/managing-the-reef/how-the-reefs-managed/expanding-knowledge-of-dredging), which also emphasized the need for tailor-made, case- and site-specific modelling assessments for specific dredging projects proposed in the GBR rather than to rely on generalisations derived from a GBR-wide modelling approach that was developed for a different purpose and which has not been validated.</p> <p>Moreover, environmental monitoring data collected during dredging projects in Western Australia over the past decade suggest that most model predictions appear to have over-estimated (rather than under-estimated) the extent of dredging plumes due to their precautionary approach and conservative assumptions (Hanley, 2011).</p> <p>The second link provided by D’Alton refers to an entry on the webpage of the Gladstone Conservation Council with a link to a recent study on coral disease at Barrow Island by Raymundo et al. (2008):</p> <ul style="list-style-type: none"> • Raymundo, L., Couch, C., and Harvell, C. (Eds). 2008. Coral Disease Handbook: Guidelines for Assessment, Monitoring and Management. Currie Communications, Melbourne, Australia, 121 pp. <p>The fact that corals display obvious signs of health decline when stressed significantly for a sustained period of time (whatever the stress factor may be, including exposure to dredging plumes), is well-documented. Such indicators of stress may include excessive mucus production, bleaching, tissue necrosis and partial- or whole-colony mortality, and (as this new study has demonstrated), symptoms of disease.</p> <p>Coral disease can often cause the death of coral that has been weakened from other disturbances such as bleaching, flood plumes, cyclones, toxic chemicals, dramatic nutrient imbalance or excessive UV radiation (Raymundo et al., 2008). This new study appears to have added ‘dredging’ to that list of disturbances.</p>

Factor	New Information	DSD response
		<p>The relevance of these findings to the proposed Browse LNG development, however, is limited.</p> <p>The Strategic Assessment Report (SAR) included a detailed assessment of the existing marine environment, including intertidal and nearshore benthic habitats at James Price Point. The survey results indicate that hard corals are not well developed throughout the James Price Point area, being scattered, dominated by faviids, and in generally low to very low densities, covering only 0.2% of BPPH in the area (see: SAR Part 3, Section 1.4.2.4 and Section 2.4.1.2; SAR Part 7, Section 3; and SAR Appendix C-5). Most corals were typically small, suggesting that they are frequently subjected to natural disturbances and manage to recover through regular recruitment. On a regional scale, the abundance, diversity and significance of corals within the James Price Point area is considered to be low compared to other locations throughout the North West Marine Region (including Barrow island, where the coral disease study by Raymundo et al. (2008) was carried out) (see: SAR Response to Submissions, Appendix A: Questions and Answers, page 172 (Generic Question ID: 349 Sub ID [34, 235] Raised by [S34 Q313]).</p> <p>Notwithstanding, impacts to benthic habitats (incl. corals) have been fully assessed in the strategic assessment, which included predicted mortality of hard corals within the zone of high impact and footprint of the proposed development. It is less relevant whether this mortality will occur directly through sediment disturbance from dredging or indirectly through dredging-induced coral disease. A range of management measures have been proposed in the SAR to manage and monitor potential impacts on benthic habitats, incl. corals (see SAR Part 3, Section 2.4.4 'Management Measures' for a complete summary).</p>
Coastal processes		
Coastal vulnerability	<p><i>Department of Transport</i></p> <p>The Department of Transport indicated that the Shire of Broome were undertaking a coastal vulnerability study for the Broome region's broader coast.</p>	<p>The Department is aware that coastal vulnerability studies are underway in the region as it has provided a consultant access to met-ocean data collected as part of the studies associated with the Precinct. While it appears that these coastal vulnerability studies are not yet complete it is considered that the analysis of coastal processes conducted for the SAR (see Part 7 Section 5) is</p>

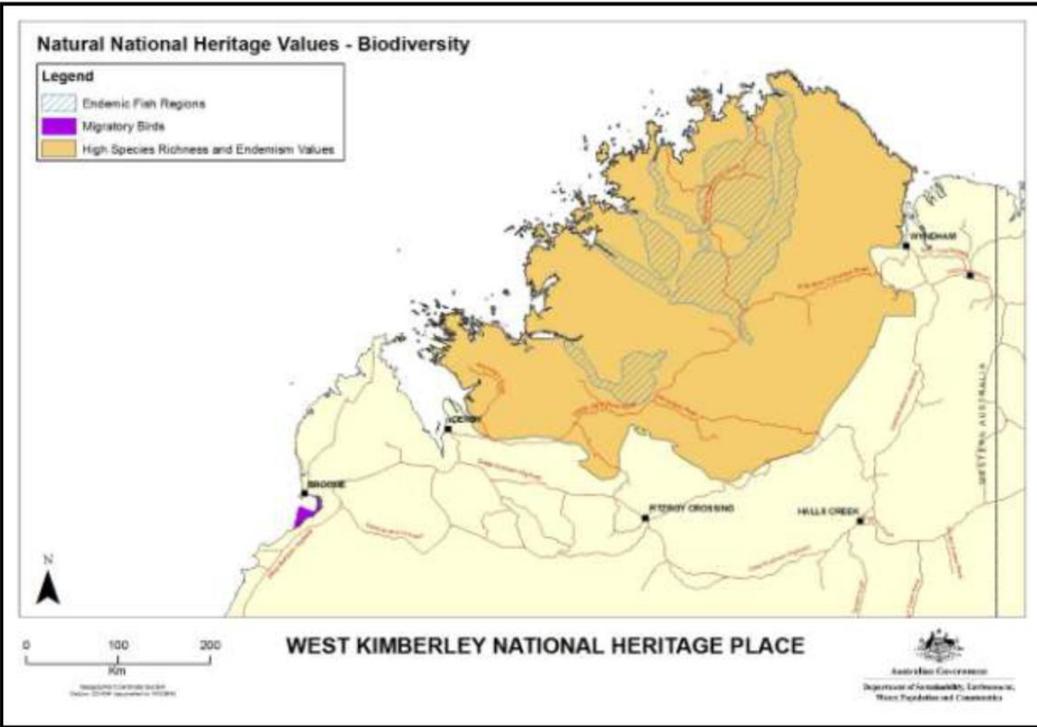
Factor	New Information	DSD response
		<p>more likely to be accurate at the local scale necessary for impact assessment. It is also considered that the necessary engineering analysis that will go into the design processes will be more comprehensive than these more general studies. Any new relevant information that becomes available will also be reviewed as part of the Derived Proposal process.</p>
Benthic communities and habitat		
<p>Benthic flora and fauna</p>	<p><i>WA Museum</i> The Museum provided the following paper for consideration:</p> <p>Keesing, J.K., Irvine, T.R., Alderslade, P., Clapin, G., Fromont, J., Hosie, A.M., Huisman, J.M., Phillips, J.C., Naughton, K.M., Marsh, L.M., Slack-Smith, S.M., Thomson, D.P. and Watson, J.E. (2011). <i>Marine benthic flora and fauna of Gourdon Bay and the Dampier Peninsula in the Kimberley region of north-western Australia</i>. Journal of the Royal Society of Western Australia, 94(2): 285 - 301.</p>	<p>The published paper by Keesing <i>et al</i> (2011) is a report that synthesises much of the benthic habitat survey information produced as a result of studies undertaken as part of the site selection process for the Browse LNG Precinct. This information is largely reported in the SAR Part 3 1.4.2. Additional and more location specific studies of the project area were also undertaken to supplement this information and are incorporated into the SAR Part 3 and Part 7.</p>
Flora and vegetation		
<p>Monsoon Vine Thickets</p>	<p><i>Department of Parks and Wildlife</i></p> <p>Monsoon Vine Thickets of the Dampier Peninsula were listed as an endangered Threatened <i>Ecological Community (TEC)</i> under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) on 27 February 2013.</p> <p>In 2013, the Broome Botanical Society developed a report entitled <i>Valuable and Endangered; Working Together to</i></p>	<p><i>Listing of the monsoon vine thickets as a Threatened Ecological Community under the EPBC Act</i></p> <p>The Department of State Development (DSD) acknowledges that the 'Monsoon Vine Thickets of the Dampier Peninsula' are now formally listed as an endangered TEC under the EPBC Act. Although not formally listed at the time of submission of the Browse Strategic Assessment Report (SAR), the monsoon vine thicket community was recognised as being of high regional conservation significance (refer Part 4, Section 2.4.1.2). The importance of this community was considered in the optimisation of layout and design of the Precinct (including set-back of the majority of the infrastructure behind the coastal fringe)</p>

Factor	New Information	DSD response
	<p><i>Understand and Manage Threats to Monsoon Vine Thickets of the Dampier Peninsula.</i> The report contains key findings relating to aspects of fire and biological diversity in the TEC.</p> <p>Since 2010, a few small additional occurrences of the TEC have been located and mapped. The current summary data on the Parks and Wildlife corporate TEC database is as follows:</p> <ul style="list-style-type: none"> • There are a total of 81 occurrences of the TEC, covering a total area of approximately 2770ha. All occurrences are confined to the Dampier Peninsula. • The largest occurrence covers approximately 507ha at James Price Point, followed by approximately 154ha occurrence at Cape Borda. 110km north-east of James Price Point. <p><i>Public submission</i> National heritage listing has occurred in relation to monsoon vine thickets.</p> <p><i>Public submission</i> Monsoonal vine thickets listing under EPBC Act</p>	<p>to minimise disturbance) and in the range of proposed measures to manage impacts to achieve acceptable outcomes, recognising that the monsoon vine thicket is subject to existing pressures (including fires, weeds and terrestrial introduced pests) (see discussion provided below for further detail).</p> <p>While the formalisation of listing of the monsoon vine thickets as a TEC under the EPBC Act represents new information, the conservation significance of this community was fully incorporated in the SAR and therefore does not materially change the overall conclusion of risk or predicted environmental outcome associated with the Browse LNG (BLNG) Precinct. The proposed management measures remain appropriate given the conservation value of this habitat.</p> <p><i>Broome Botanical Society report (2013)</i></p> <p>It should be noted that the report referenced in the Department of Parks and Wildlife (DPaW) submission was actually published by Environs Kimberley, with the full title being '<i>Valuable and Endangered: Working Together to Understand and Manage Threats to Monsoon Vine Thickets of the Dampier Peninsula, A Summary of Key Findings, Environs Kimberley West Kimberley Nature Project 2011-2013</i>'. The Broome Botanical Society publication is titled '<i>Valuable and Threatened: Monsoon Vine Thickets of the Dampier Peninsula, A Summary of Key Findings from the Broome Botanical Society</i>'. While the Environs Kimberley report draws on some information presented in the Broome Botanical Society report (mainly fire related impacts), it is more focused on outlining the Environs Kimberley West Kimberley Nature Project, specifically in relation to fire management.</p> <p>The information presented in the 2013 Broome Botanical Society report is based on survey information collected by the society during their 2000-2002 surveys and presented within their detailed scientific report titled '<i>A Comprehensive Survey of the Flora, Extent and Condition of Vine Thickets on Coastal Sand Dunes of Dampier Peninsula, West Kimberley 2000-2002</i>', which was published in 2010. Therefore, in relation to the current occurrence and extent of the monsoon vine thicket on the Dampier Peninsula, the DPaW TEC database is considered to provide a more current and accurate representation of the</p>

Factor	New Information	DSD response
		<p>community.</p> <p>DSD acknowledges the key findings of the Broome Botanical Society report in relation to threats to the monsoon vine thicket, specifically the direct impacts of fire and indirect impacts to biological diversity. This information is consistent with the assessment of threats to the monsoon vine thicket (both direct and indirect impacts) as presented in the SAR. The SAR identifies sources of potential indirect impacts to the monsoon vine thicket as including altered surface and groundwater flows and quality, fragmentation and edge effects, weed invasion and altered fire regimes (refer Part 4, Section 2.7.4). In relation to fire, the SAR acknowledges that the current frequent fire regime on the Dampier Peninsula is considered to be having a negative impact on all vegetation types, including monsoon vine thicket (refer Part 4, Section 1.4.11.5).</p> <p>To manage potential impacts to monsoon vine thicket, the SAR confirms that the Proponent will commit to minimise indirect impacts throughout the development and will work with proponents of derived proposals to achieve this through all phases of project development as far as practicable. The introduction of a fire management strategy, in conjunction with other management strategies and plans (Part 4, Section 2.4.4, Table 2.4-6), is likely to result in a reduction of frequent high intensity fires and has the potential to result in improvements to the condition of vegetation communities, such as monsoon vine thicket. Implementation of a vegetation management and monitoring strategy (for medium to high conservation significant vegetation) (Part 4, Section 2.4.4, Table 2.4-6), to be developed in consultation with the Department of Environment and Conservation (DEC) (now DPaW), will also provide an adaptive management framework for proponents of derived proposals. Annual reporting on the effectiveness and success of this program is to be made publicly available, providing transparency of the process.</p> <p><i>Additional mapping of monsoon vine thickets</i></p> <p>The additional information provided by DPaW is acknowledged, and provides further definition of the monsoon vine thicket community present within the James Price Point coastal area and broader Dampier Peninsula.</p>

Factor	New Information	DSD response
		<p>The SAR reported that approximately 572 ha of monsoon vine thicket was mapped in the James Price Point coastal area, with 2,710 ha (using 2010 studies undertaken by the then DEC (now DPaW)) known to occur on the Dampier Peninsula (Part 4, Section 2.4.3.1, Table 2.4-5). The SAR noted that the discontinuous belts of monsoon vine thicket behind the coastal dunes were particularly well-developed at James Price Point and Cape Borda. Monsoon vine thicket occurring between James Price Point and Quondong Point was considered in the SAR to represent the second largest occurrence of this community on the Dampier Peninsula, with the largest occurrence of vine thickets considered to be those lying between Cape Borda and Packer Island (at the northernmost end of the peninsula) (Part 4, Section 1.4.2.5.1). Note the monsoon vine thicket mapped in the James Price coastal area considered the extent of the community from Cape Boileau (20 km south of James Price Point) to Coulomb Point (15 km north of James Price Point), and therefore encompassed the large patch at James Price Point (507 ha) reported by DPaW.</p> <p>Clearing of the monsoon vine thicket for the BLNG Precinct (132.4 ha) was calculated in the SAR to represent up to 23.2% of this community's distribution within the James Price Point coastal area and up to 4.9% of the estimated extent of the monsoon vine thickets on the Dampier Peninsula (Section 2.4.3.1, Table 2.4-5). It was considered that this clearing would not represent a significant impact or detrimentally affect the viability and representation of this community on the Dampier Peninsula as more than 90% of the known extent of monsoon vine thickets will remain.</p> <p>Based on the new occurrence information provided by DPaW, clearing of the monsoon vine thicket for the BLNG Precinct as presented in the SAR will equate to 4.8% of the estimated extent of the monsoon vine thickets on the Dampier Peninsula. Following submission of the SAR, DSD have further reviewed the BLNG Precinct footprint to optimise design and layout and are progressing with a Section 43A approval, for which clearing of the monsoon vine thicket is intended to be further reduced to an area of 110 ha. Subject to the outcome of the Section 43A approval, clearing of monsoon vine thicket may equate to 4% of the estimated extent of the monsoon vine thickets on the Dampier Peninsula and</p>

Factor	New Information	DSD response
		<p>19.2% within the James Price Point coastal area.</p> <p>While information in DPaW's TEC database provides additional context of monsoon vine thicket occurrence on the Dampier Peninsula, it does not materially change the risk assessment or findings of the SAR. However, the benefit of new additional mapped data exchanged with DPaW and other agencies can help with informing and framing detailed management strategies going forward that are based on latest available scientific data.</p> <p><i>National heritage listing in relation to vine thickets</i></p> <p>The West Kimberley site (place ID: 106063), which covers an area of approximately 19,200,000 ha, was listed on the National Heritage List on 31 August 2011. The listing of the West Kimberley site took into consideration a number of factors, including ecology, biological diversity (particularly of the Kimberley Plateau, northern coastline and rivers), geological features, fossil evidence, Indigenous and European heritage, and cultural history (e.g. pastoral and pearling).</p> <p>Vine thickets are referenced in the listing of the site in relation to criterion A '<i>The place has outstanding heritage value to the nation because of the place's importance in the course, or pattern of Australia's natural and cultural history</i>':</p> <p style="padding-left: 40px;"><i>"Vine thickets of the northern Kimberley coast and islands and the Kimberley Plateau, and the Devonian reefs of the west Kimberley, are of outstanding heritage value to the nation under criterion (a) for their evolutionary refugial role that has resulted in high invertebrate richness and endemism."</i></p> <p>The vine thickets referred to in the listing of the West Kimberley site are predominantly in the northern parts of the Kimberley. The '<i>West Kimberley National Heritage Place: A draft guide for landholders</i>', published by the Department of Sustainability, Environment, Water, Population and Communities (now the Department of the Environment) in 2012, includes a figure (Figure 2, as provided below) showing the area of the West Kimberley site which has specific biodiversity value. The area does not encompass the James Price Point coastal</p>

Factor	New Information	DSD response
		<p>area.</p>  <p>It should be noted that the West Kimberley site boundary in the James Price Point coastal area only comprises the intertidal areas between the highest and lowest astronomical tides. Therefore, it does not encompass the monsoon vine thicket which is found in the coastal sand dunes inland of the highest astronomical tide (Part 4, Section 1.4.2.3, Figure 1-12). The intertidal area is included in the West Kimberley site to capture the Dampier Coast dinosaur trackways.</p> <p>The Broome Botanical Society report, as referred to above, also notes that the monsoon vine thicket on the Dampier Peninsula is characterised by a different</p>

Factor	New Information	DSD response
		<p>composition of flora when compared to the other Kimberley and Northern Australian monsoon vine thickets and is uniquely found behind and within the swales of coastal sand dunes.</p> <p>In summary, the clearing of the monsoon vine thicket in the James Price Point coastal area required as a result of the Precinct proposal will not impact on the National Heritage values of the West Kimberley site as gazetted.</p>
Groundwater Dependent Ecosystems	<p><i>Department of Water (DoW)</i></p> <p>The DoW is undertaking a project to identify potential groundwater dependent ecosystems. The work is being undertaken at 15 sites that includes wetlands, creeks, vine thickets and springs. The surveying of these sites is continuing at the end of the current dry season and the results will be available once they have been analysed.</p>	<p>The investigations on groundwater dependent ecosystems are noted. It is presumed that the outcome of these investigations will be useful for the development of environmental management plans required to guide construction and operation of the facility. These investigations are also likely to guide the analysis of, and conditions on, any licences that may be required by proponents under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act), and additionally be reviewed to enable any relevant information to be considered as part of the Derived Proposal process.</p>
Hydrological Processes		
Water investigations	<p><i>DoW</i></p> <p>The DoW advised that it is 3 years into a 4 year groundwater investigation program on the Dampier Peninsula. The DoW advised that much of the information gathered is still in a preliminary stage of interpretation and that further analysis is required before any conclusions can be made.</p> <p>The SAR indicates that the nearest permanent surface water body to James Price Point is 20 kilometres away at Coulomb Point. However discussions with DoW in regards to their ongoing investigations indicate that Wonganut Springs and Flow Dam are waterbodies that are closer to 12 kilometres away from James Price Point. This</p>	<p>The investigations on groundwater on the Dampier Peninsula are noted. It is presumed that the outcome of these investigations will be useful for the development of environmental management plans required to guide construction and operation of the facility. These investigations are also likely to guide the analysis and conditions on any licences that may be required by proponents under the RIWI Act.</p> <p>The presence of permanent water bodies within the 13 km radius identified as providing for infrastructure (including a potential borefield) and service corridors is noted. This provision in the Key Characteristics is designed to allow a high level of flexibility for where activities will actually take place within the 13 km radius so that sensitive areas can be avoided. Given this and the requirement for any borefield to require licencing from the Department of Water under the RIWI Act will ensure potential impacts are understood and appropriately managed. Additionally this information will be part of considerations of the development of</p>

Factor	New Information	DSD response
	<p>is within the 13 kilometre radius identified in the updated key characteristics table as being the area considered for a borefield and therefore these waterbodies have the potential to be impacted by water abstraction for the proposal.</p>	<p>any Derived Proposals.</p>
Heritage		
<p>Dinosaur Footprints</p>	<p><i>WA Museum</i></p> <p>One relevant paper has been published on the dinosaur footprints since 2010: Thulborn, T. (2012). <i>Impact of Sauropod Dinosaurs on Lagoonal Substrates in the Broome Sandstone (Lower Cretaceous), Western Australia</i>. PLoS ONE, 7(5): e36208. It should be noted that there are some differences of opinion between the conclusions of this paper and work carried out by others, including the Museum.</p> <p><i>Public submission</i> National heritage listing has occurred in relation to dinosaur footprints</p> <p><i>Public submission</i> Dinosaur footprints listing as National Heritage</p>	<p>The paper by Thulborn (2012) has been reviewed to determine if it provides any additional understanding of potential impacts that may arise from the Browse LNG Precinct proposal. While this work does contribute to the understanding of the characteristics of dinosaur tracks that occur in the Broome sandstone it provides little guidance on the location of tracks discussed other than general place name identifiers. It is therefore of limited value for the assessment of impacts.</p> <p>Notwithstanding this the most relevant of these in terms of interpreting the location of sites identified in the report are references to photographs taken James Price Point (Figures 24 to 28). These images generally show a large expanse of exposed reef platform which is a characteristic of the area immediately seaward of James Price Point itself. This area was included in surveys commissioned by DSD (McCrea et al 2011) and Figure 10 of Appendix 4 of that reference shows the presence of numerous tracks in that locality. For this reason an area immediately south of James Price Point which was identified in the SAR as being part of the shore crossing impact area is now (subject to S43A approval) not available for any construction activity (identified as “Area H” in precinct layout information provided to Delegates).</p> <p>The National Heritage listing advised by two stakeholders is acknowledged and includes the intertidal zone along the coastline at the Precinct. This listing occurred prior to the survey (see Page 81, Appendix 2 of McCrea et al 2011) and informed survey design and the recommendation to avoid the area near James Price Point noted above.</p>

Factor	New Information	DSD response
Heritage Agreements	<p data-bbox="392 268 629 300"><i>Public submission</i></p> <p data-bbox="392 336 990 603">The native title claim group that entered into the HPA and various other agreements with the State of Western Australia and Woodside Energy Ltd in 2009 and 2011 no longer exist. There are now two registered native title claims over the area which includes the proposed LNG Precinct – Goolarabooloo (WAD374/13) and Jabirr Jabirr (WAD357/13).</p> <p data-bbox="392 676 990 938">The compensation package promised to the native title claim group will not be delivered unless another gas company wanting to process gas from the Browse Basin in an onshore facility is found – and that company must pick up all of Woodside Energy Ltd’s commitments under the package, or seek to renegotiate them.</p>	<p data-bbox="1014 336 2065 635">It should be noted that contrary to the assertion in this submission, no native title party ever was, or is, a party to the Heritage Protection Agreement (HPA). The HPA remains an agreement to which Woodside Energy Ltd (WEL), the State of Western Australia and the Kimberley Land Council (KLC) remain parties. In the HPA, the KLC have a warranty to represent the Traditional Owners of the BLNG Precinct area. The status of native title claims in the BLNG Precinct is irrelevant to the operation of the HPA. The HPA was specifically drafted to accommodate precisely these situations where the status of native title applications might change.</p> <p data-bbox="1014 676 2065 874">Presumably, in referring to ‘various other agreements’, this submission is referring the Browse Land Agreement, the Precinct Project Agreement and Regional Benefits Agreement? These agreements were drafted with specific clauses that ensured that the great bulk of benefits were always contingent on WEL, or further proponents, making a Final Investment Decision and commencing production.</p> <p data-bbox="1014 916 2065 1145">Notwithstanding this, in accordance with the Browse Land Agreement, the Browse LNG Precinct Project Agreement and the Browse LNG Precinct Regional Benefits Agreement, the acquisition of native title rights and interests in the BLNG Precinct area by the State involved a payment of a \$10 million economic development fund and a \$20 million indigenous housing fund. These monies are now held in trust pending settlement of the native title claims over the area.</p>
Sites of significance	<p data-bbox="392 1251 629 1283"><i>Public submission</i></p> <p data-bbox="392 1319 990 1382">Goolarabooloo and local community have been undertaking ongoing surveys, of</p>	<p data-bbox="1014 1319 2065 1382">Extensive Aboriginal heritage surveys have been carried out in the proposed BLNG Precinct, pursuant to the HPA. The HPA also commits to the</p>

Factor	New Information	DSD response
	<p>particular importance are the Aboriginal Burial Sites (research in dunes of James Price Point by Dr Carsten Wergin around 2012-2013).</p> <p>The breadth of records held by the State of Western Australia in relation to the Aboriginal cultural significance of the Browse LNG Precinct is now better understood, and more completely able to be put to the delegates. There are now considerable records stretching over more than 20 years to attest to the immense value of the landscape and the places of Aboriginal cultural significance that are known to lie within the Browse LNG Precinct.</p> <p>Many, and perhaps all, of the key premises of DSD's 2010 proposal have collapsed.</p> <p>Additional research that has been prepared since 2010 includes the report by Dr Scott Cane dated 16 July 2012 and entitled <i>James Price Point, [Mr Roe] and the Northern Tradition</i>, commissioned by the Department of Indigenous Affairs to assess the different accounts being given for the Aboriginal cultural heritage values of the Browse LNG Precinct. The Browse Delegates should note that Dr Cane found the Aboriginal heritage records prepared by Goolarabooloo over more than 20 years to be detailed and accurate. DSD does not take these records into account at all in the SAR. The Browse</p>	<p>development of Cultural Heritage Management Plans in the BLNG Precinct and immediately surrounding areas that are designed to protect the Aboriginal heritage identified and described in the studies arising from the HPA. Additionally, the HPA sets out clear requirements for the formal notification of any proposed activities within the BLNG Precinct and immediate surrounds that trigger approvals processes under the AHA.</p> <p>Ongoing measures to protect Aboriginal heritage, and to avoid, manage and mitigate, as much as is practicable, negative impacts on Aboriginal heritage, are contained within Part 5 (section 3.5.5) of the <i>Browse Liquefied Natural Gas Precinct – Strategic Assessment Report</i>, which confirms that all actions under the HPA must be compliant with the AHA. Each proponent seeking to conduct activities or establish a project within the Precinct is required to develop and oversee a CHMP that enables and resources the monitoring, management, and protection of Aboriginal heritage during both construction and operational phases.</p> <p>It should also be noted that in 2013, Section 18 approval under the <i>Aboriginal Heritage Act 1972</i> has been given in relation to WEL's proposal to:</p> <ul style="list-style-type: none"> • use vehicles, machinery, plant equipment as is reasonably necessary for the purpose of constructing, operating and maintaining the Browse Liquefied Natural Gas Development and associated facilities within the Browse LNG Precinct and workers accommodation site (approved by the Minister of Aboriginal Affairs on 10 July 2013) <p>This Section 18 approval was granted after consideration by the Aboriginal Cultural Material Committee (reporting to the Minister for Indigenous Affairs), and the Minister of Indigenous Affairs, of all relevant material. Any future approval sought under the AHA is required to consider all relevant information, both in terms of Aboriginal heritage values and the proposed works and activities that could impact on them. Any reports or data that has become available since 10 July 2013 would be a necessary component of this consideration.</p>

Factor	New Information	DSD response
	<p>Delegates should request DIA (now known as DAA) to provide it with a copy of Dr Cane's report.</p>	<p>Reference is made to the availability of new research that has been conducted by Dr Carsten Wergin or others that potentially identifies sites of Aboriginal heritage significance. Given that this was undertaken with apparent authority from Goolarabooloo traditional owners we assume it was provided to DAA as part of consultations on the S18 application noted above. The advice of DAA should be sought in relation to this information. It is also noted that there is a duty under the AHA to report information that may have a bearing on whether a location is considered to be of Aboriginal Heritage significance as per the AHA.</p> <p>Dr Cane's report was fully considered in the Section 18 approval described above. It is recommended that the Delegates seek a copy of this report from DAA if it considered necessary.</p>
Miscellaneous		
<p>Land planning matters</p>	<p><i>Shire of Broome</i></p> <p>Shire of Broome adopted local planning scheme No. 6 in November 2013, which has been endorsed by the Western Australian Planning Commission. The Minister of Planning has requested minor changes to the scheme prior to granting of approval and gazettal which is expected final quarter of 2014.</p> <p><i>Department of Planning (DoP)</i></p> <p>The DoP has prepared the Kimberley Regional Planning and Infrastructure Framework and the Dampier Peninsula Planning Strategy.</p> <p>The Shire of Broome's Local Planning Strategy and Local Planning Scheme No. 6 were endorsed by the Western Australian Planning Commission (WAPC) in July 2014</p>	<p>Shire of Broome Local Planning Scheme No. 6, Kimberley Regional Planning and Infrastructure Framework and Dampier Peninsula Planning Strategy are all consistent with the Browse LNG Precinct SAR.</p> <p>The EPA referral of the Improvement Scheme was withdrawn in consultation with DSD and will be resubmitted subsequent to any approval of the strategic proposal granted under the <i>Environmental Protection Act 1986</i> to ensure consistency with that approval and any associated conditions.</p> <p>Once formally gazetted, Local Planning Scheme No.6 will apply to the entire Shire of Broome area including the Precinct, which is currently zoned Cultural and Natural Resource Use. However, the Improvement Scheme (once introduced) will override the Local Planning scheme No. 6 and the WAPC will become the responsible development control authority over the area.</p>

Factor	New Information	DSD response
	<p>and the scheme has been approved by the Minister for Planning subject to modifications.</p> <p>An Improvement Plan for the Browse LNG Precinct was gazetted on 29 January 2013. An Improvement Scheme for the Browse LNG Precinct was initiated by the WAPC on 12 February 2013 and referred to the EPA. The referral was withdrawn following the Supreme Court decision that declared the EPA's assessment invalid.</p>	

References (dolphins)

Allen, S.J, Cagnazzi, D.D, Hodgson, A.J, Loneragan, N.R and Bejder, L. (2012). Tropical inshore dolphins of north-western Australia: Unknown populations in a rapidly changing region [online]. *Pacific Conservation Biology*, Vol. 18, No. 1, 2012: 56-63.

Bejder, L, Hodgson, A, Loneragan, N, Allen, S. Coastal dolphins in north-western Australia: The need for re-evaluation of species listings and short-coming in the Environmental Impact Assessment process. Forum essay. *Pacific Conservation Biology*, Vol. 18, 2012: 22-25

Brown, A.M., Bejder, L., Pollock, K.H. & Allen, S.J. (2014a). Abundance of coastal dolphins in Roebuck Bay, Western Australia. Report to WWF-Australia. Murdoch University Cetacean Research Unit, Murdoch University, Western Australia, 25pp.

Brown A.M, Kopps A.M, Allen S.J, Bejder L, Littleford-Colquhoun B, et al. (2014b). Population Differentiation and Hybridisation of Australian Snubfin (*Orcaella heinsohni*) and Indo-Pacific Humpback (*Sousa chinensis*) Dolphins in North-Western Australia. *PLoS ONE* 9(7): e101427. doi:10.1371/journal.pone.0101427

Browse LNG Precinct SAR and the Response to Submissions - Summary Report

Jefferson, T.A.; Rosenbaum, H.C. (2014). Taxonomic revision of the humpback dolphins (*Sousa* spp.), and description of a new species from Australia. *Marine Mammal Science*. 30(4).

Parra, G. J. (2006). Resource partitioning in sympatric delphinids: Space use and habitat preferences of Australian snubfin and Indo-Pacific humpback dolphins. *Journal of Animal*, 75, 862–874.

Parra, G. J., Corkeron, P. J., & Marsh, H. (2006a). Population sizes, site fidelity and residence patterns of Australian snubfin and Indo-Pacific humpback dolphins: Implications for conservation. *Biological Conservation*, 129, 167-180.

Parra, G. J., Schick, R., Corkeron, P. J., & Marsh, H. (2006b). Spatial distribution and environmental correlated of Australian snubfin and Indo-Pacific humpback dolphins. *Ecography*, 29, 396-406.

RPS (2010); SAR Appendix C-10

RPS (2012) Dolphin Review, Browse LNG Development. Report prepared for Woodside Energy Ltd.

Thiele, D. (2010). Collision Course, Snubfin dolphin injuries in Roebuck Bay. Report prepared for the WWF-Australia.

References (Turtles)

Department of Environment 2014 *Eretmochelys imbricata* — Hawksbill Turtle. Accessed on 15th October 2014 from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1766

Department of Environment and Conservation (DEC). 2009. Draft Marine Turtle

Recovery Plan for Western Australia 2009 – 2016. Wildlife Management Program No. 45.

Department of Parks and Wildlife 2012. Proceedings of the First Western Australian Marine Turtle Symposium. 28-29th August 2012.

Department of State Development 2010. Browse Liquefied Natural Gas Precinct. Strategic Assessment Report (SAR) (draft for Public Comment). Part 3. Environmental Assessment – Marine Impacts.

Guinea, M.L. 2009. Long Term Monitoring of the Marine Turtles of Scott Reef.

Unpublished report to Sinclair Knight Merz, April 2009.

Limpus, C.J. 2009. A Biological Review of Australian Marine Turtles. Report for the Environmental Protection Agency Queensland.

Kamrowski, R.J., Limpus, C. Moloney, J and Hamann, M. 2012. Coastal light pollution and marine turtles: assessing the magnitude of the problem. *Endangered Species Research*. Vol 19: 85-98.

Pendoley, K.L, Schofield, G, Whittock, P.A. 2014. Protected species use of a coastal marine migratory corridor connecting marine protected areas. *Marine Biology*.

Prince, R.I.T. 1994. Status of the Western Australian marine turtle populations: The Western Australian Marine Turtle Project 1986–1990. pp. 1–14 in *Proceedings of the Australian Marine Turtle Conservation Workshop*, Gold Coast, 14–17 November 1990.

Ripke, M.A. The effects of pile driving induced vibrations on sea turtle embryogenesis. Thesis – Charles Darwin University. November 2010.

RPS. 2010b. Woodside Browse Turtle Technical Report, Ecology of Marine Turtles of the Dampier Peninsula and the Lacepede Island Group 2009 – 2010. Prepared for Woodside Energy Ltd. [Appendix C-2 of the SAR].

RPS 2012. 2011 Supplement Report. Woodside Browse Turtle Studies. Prepared for Woodside Browse. January 2012.

Waayers, D.A, Smith, L.A, Malseed, B.E 2011. Inter-nesting distribution of green *Chelonia mydas* and flatback turtles *Natator depressus* at the Lacepede Islands, Western Australia. *Journal of the Royal Society of Western Australia* 94: 000-000.

Wild Futures 2014. Eco Beach Sea Turtle Monitoring Program. Report of 2013 nesting activity for the flatback turtle (*Natator depressus*) at Eco Beach, Western Australia. Conservation Volunteers.

References (dredging)

Hanley, J.R., 2011. Environmental monitoring programs on recent capital dredging projects in the Pilbara (2003–10): a review. *APPEA Journal* 2011, 273–294.