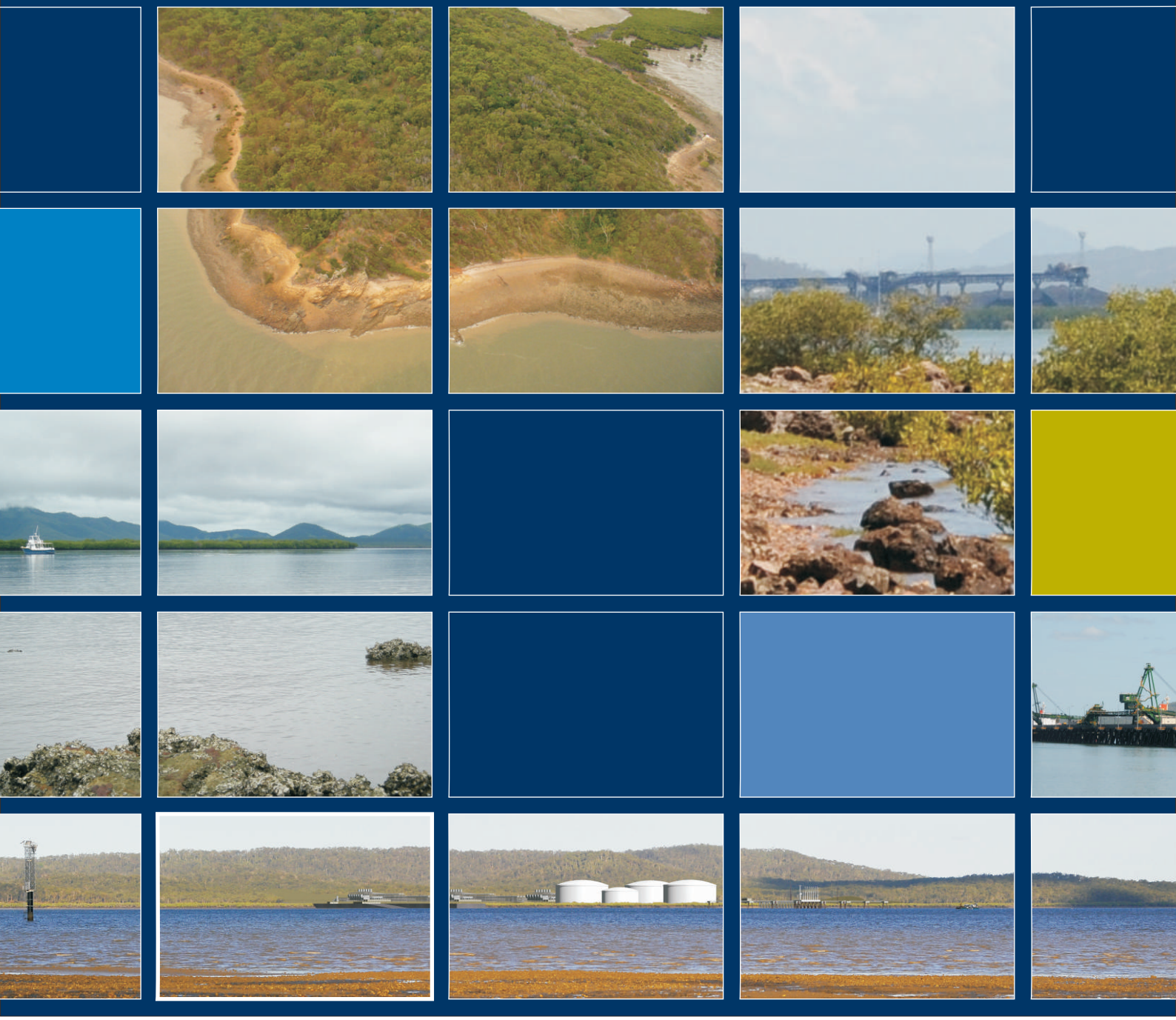

Queensland Curtis LNG Project: LNG Facility and Associated Infrastructure

Supplementary Landscape and Visual Impact Assessment

for

Queensland Gas Company Limited (QGC)

January 2010

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FINAL REPORT

Queensland Curtis LNG Project: LNG Facility and Associated Infrastructure

Supplementary Landscape and Visual Impact Assessment

For: Queensland Gas Company Limited

January 2010

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FINAL REPORT

Queensland Curtis LNG Project: LNG Facility and Associated Infrastructure

Supplementary Landscape and Visual Impact Assessment

January 2010

Reference: 0086165 Version 1.2

For and on behalf of
Environmental Resources Management Australia

Approved by: David Pope

Signed:

Position: Partner

Date: January 2010

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ANNEXURES

EXECUTIVE SUMMARY

The scope of this Supplementary Landscape and Visual Impact Assessment (LVIA) report is to assess additional information and amendments to the Project and update information provided in the Draft Environmental Impact Statement (Draft EIS) for the Liquefied Natural Gas (LNG) processing and export facility on Curtis Island.

Additions and amendments to the Project assessed as part of this report include the following:

- *Amendments to the LNG Facility layout;*
- *Removal of the bridge and road from the Project scope;*
- *Lighting impacts associated with alternative marine transport routes for construction of the LNG Facility and proposed night-time construction activities;*
- *Updated cumulative impacts resulting from construction and operation of multiple LNG facilities, and other proposed industrial developments, within the Gladstone State Development Area; and*
- *Updated management and mitigation measures.*

Key changes to the LNG Facility layout include the following:

- *Relocation of LNG Facility 100 - 150 metres inland from shoreline;*
- *LNG/LPG Loading berth and jetty relocated south of current position;*
- *Minor reduction in footprint of the LNG Facility through consolidation of construction lay-down areas;*
- *LPG tank no longer required and removed from the Project;*
- *Reconfiguration of the Material Off-loading Facilities (MOF); and*
- *Addition of a Construction Dock to the south of the loading berth.*

Key Findings resulting from a comparative assessment against the Draft EIS scheme are as follows:

- *Reconfiguration of the main LNG Facility and relocation 100 - 150 metres inland from the shoreline was found to result in improved outcomes for landscape and visual impacts of the Project in comparison to the Draft EIS scheme;*
- *Relocation of the LNG/LPG loading berth and jetty to an area with minimal mangrove vegetation reduces the extent of disturbance and provides a greater visual continuity of the natural shoreline;*
- *Reconfiguration of the LNG Facility was found to reduce the visual impacts of the Project when viewed from The Narrows looking south towards the Project site including a reduction in adverse impacts identified for the Draft EIS scheme;*

- *Reduction of the footprint of the LNG Facility results in a slight reduction in impacts of the Project, although not sufficient enough to alter the significance rating;*

- *Reconfiguration of the Material Off-loading Facility and the addition of the Construction Dock found no significant changes to the landscape and visual impact of the Project resulting from these amendments;*

- *Significant alteration in landform associated with the Construction camp and access roads through the northern and north eastern areas will impact on the landscape character and visual amenity of this section of the site when viewed from adjoining waterways, although not sufficient enough to alter the significance rating;*

- *Removal of the LPG storage tank and subsequent reduction in the number of tanks from 4 to 3 tanks would result in an improvement to the visual impacts of the Project by reducing the visual bulk of the tanks;*

- *Removal of the bridge and road from the scope of the assessment negate landscape and visual impacts resulting from these elements, in particular views from Targinie foreshore and The Narrows previously identified as major adverse significance in the Draft EIS scheme would no longer be impacted by the amended Project;*

- *The introduction of artificial lighting during construction night-shift work are unlikely to significantly increase lighting impacts identified in the Draft EIS;*

- *Additional marine activity associated with the proposed alternative construction and operational routes for the LNG Facility will not significantly alter the findings of the Draft EIS, which identified fixed and constant lighting as generally having a greater visual impact than that generated by marine traffic; and*

- *The cumulative impacts of the QCLNG Project in combination with other planned future development within the GSDA is expected to be most significant in relation to the proposed industrial projects on Curtis Island and Fisherman's Landing. Additional information available for these projects built on previous findings detailed in the Draft EIS, assessment of this additional information however, results in no significance changes to the findings of the Draft EIS.*

Comparative assessment of the amended QCLNG Project against the results of the Draft EIS scheme found:

- *Impacts to the natural 'wilderness' area of The Narrows passage landscape as recognised at International, National and State level will be reduced in significance by the amended Project as a result of removal of the bridge from the scope of work and the relocation of the LNG Facility inland;*

- *Impacts of the Project on the landscape values of Curtis Island are unlikely to be altered as a result of the supplementary amendments, slight improvements are achieved over the Draft EIS scheme, however these are no sufficient to alter the significance rating; and*

- *Impacts of the Project on the Great Barrier Reef World Heritage Area are reduced by the amended Project in relation to The Narrows landscape but remain for the Curtis Island landscape, however, Curtis Island impacts are consistent with the designated land use and general expansion of industry around the Port of Gladstone.*

The amended Project results in improved performance outcomes for protection of the landscape values of Curtis Island and The Narrows. Such improvement largely results from relocation of the Facility outside the highly sensitive intertidal shoreline areas. In order to achieve these performance outcomes, management and mitigation of this highly sensitive area will be required as part of the Project's Environmental Management Plan.

1 INTRODUCTION

This supplementary Landscape and Visual Impact Assessment (LVIA) report has been prepared by Environmental Resources Management Australia Pty Ltd (ERM) on behalf of the proponent Queensland Gas Company (QGC). The scope of the supplementary LVIA includes updated information to the Draft Environmental Impact Statement (Draft EIS) for the Liquefied Natural Gas (LNG) processing and export facility on Curtis Island, refer to *Queensland Curtis LNG Project: LNG Landscape and Visual Impact Assessment July 2009*. The impact assessment terminology and methodology used in the Draft EIS LVIA report applies to this supplementary report. The supplementary LVIA report is one component of a number of updated technical impact assessments reports that forms part of the Supplementary Environmental Impact Statement for the Queensland Curtis LNG Project.

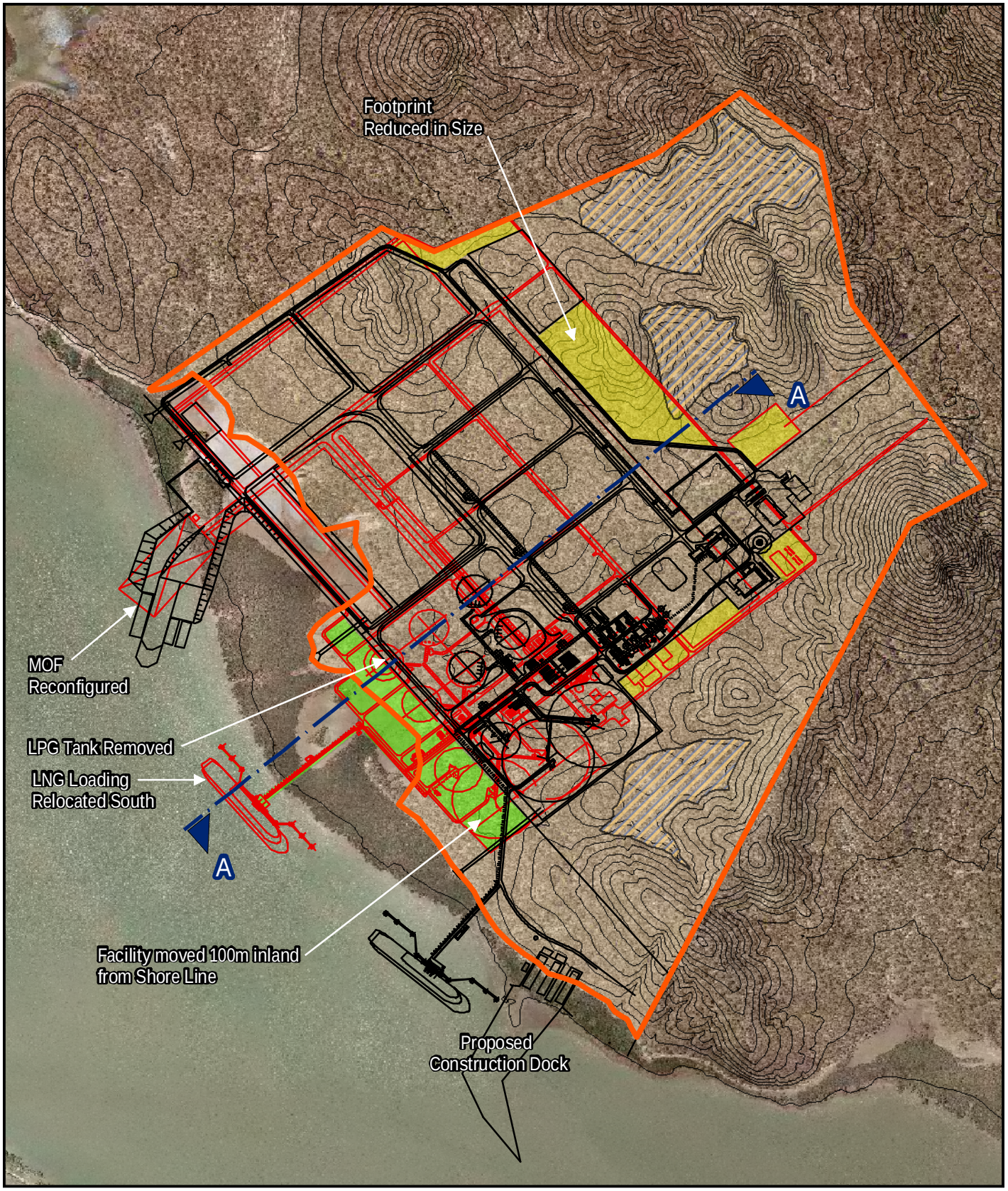
1.1 SCOPE OF ASSESSMENT

The scope of this supplementary LVIA report includes the following:

- Updated assessment of potential landscape and visual impacts arising from amendments to the LNG Facility layout;
- Updated assessment of potential landscape and visual impacts resulting from removal of the bridge and road from the Project scope;
- Assessment of lighting impacts associated with alternative marine transport routes for construction of the LNG Facility and proposed night-time construction activities;
- Updated assessment of the potential cumulative landscape and visual impacts resulting from construction and operation of multiple LNG facilities, and other proposed industrial developments, within the Gladstone State Development Area; and
- Updated management and mitigation measures to reduce or eliminate landscape and visual impacts, and lighting impacts, during construction and operation phases.

1.2 KEY CHANGES TO THE LNG FACILITY LAYOUT

The LNG Facility on Curtis Island comprises the development, construction and operation of an LNG processing plant, export terminal and associated infrastructure. The main amendments to the LNG Facility layout considered in this supplementary report are shown in Figure 1.1, 1.2 & 1.3, and outlined below:



Legend

- Proposed QCLNG Site Boundary
- Amended QCLNG Plant Layout
- Previous (Draft EIS) QCLNG Plant Layout
- Spoil Disposal Area
- Relocated Section
- Reduction in Facility Footprint

Source Note:

Aerial Photo - Department of Infrastructure and Planning for QCLNG Project

Projection: UTM MGA Zone 56 Datum: GDA 94

0 100 200 400 m

N

QUEENSLAND CURTIS LNG A BG Group business	Project	Queensland Curtis LNG Project	Title: Amended QCLNG Plant Layout
	Client	QGC - A BG Group business	
ERM Environmental Resources Management Australia Pty Ltd	Drawn JB	**Figure 1.1**	Disclaimer: Maps and Figures contained in this Report may be based on Third Party Data, may not to be to scale and are intended as Guides only. ERM does not warrant the accuracy of any such Maps and Figures.
	Approved SC	File No: 0086165b_sEIS_VA_GIS001	
	Date 19.11.09	Revision 0	

- Minor reduction in footprint of the LNG Facility through consolidation of construction lay-down areas along the north eastern boundary;
- Relocation of LNG Facility 100 - 150 metres inland from shoreline;
- LPG tank no longer required and removed from the Project;
- LNG/LPG Loading berth and jetty relocated south of current position;
- Reconfiguration of the Material Off-loading Facilities (MOF); and
- Addition of a Construction Dock to the south of the loading berth.

The overall site grading and benching plan for the Project has also been refined and amended refer Figure 1.4 , and includes the following changes:

- Minor increase in bench height supporting LNG trains by 2.75 metres to RL 13.75 and subsequent increase in LNG train stack height from RL 40.00 to RL 42.75;
- Reconfiguration of construction camp benching from two to three platforms and amended bench levels in this area; and
- Reduction in estimated vegetation clearing area.

Key visual components of the LNG Facility; the LNG tanks and flare stacks remain at the same height.

The above changes do not affect the extent of the study area identified in the Draft EIS, Zones of Visual Influence, or the Seen Area Analysis for the LNG Facility.

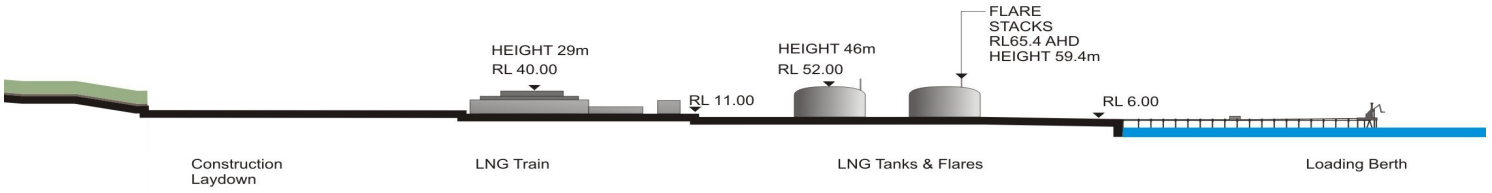


Figure 1.2 Section through LNG Facility as detailed in Draft EIS

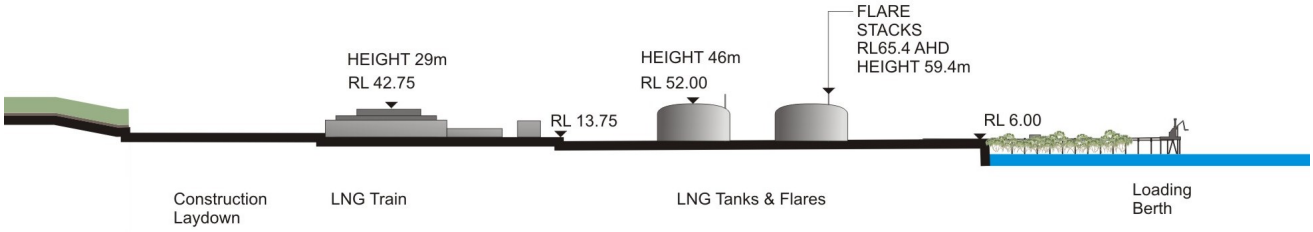
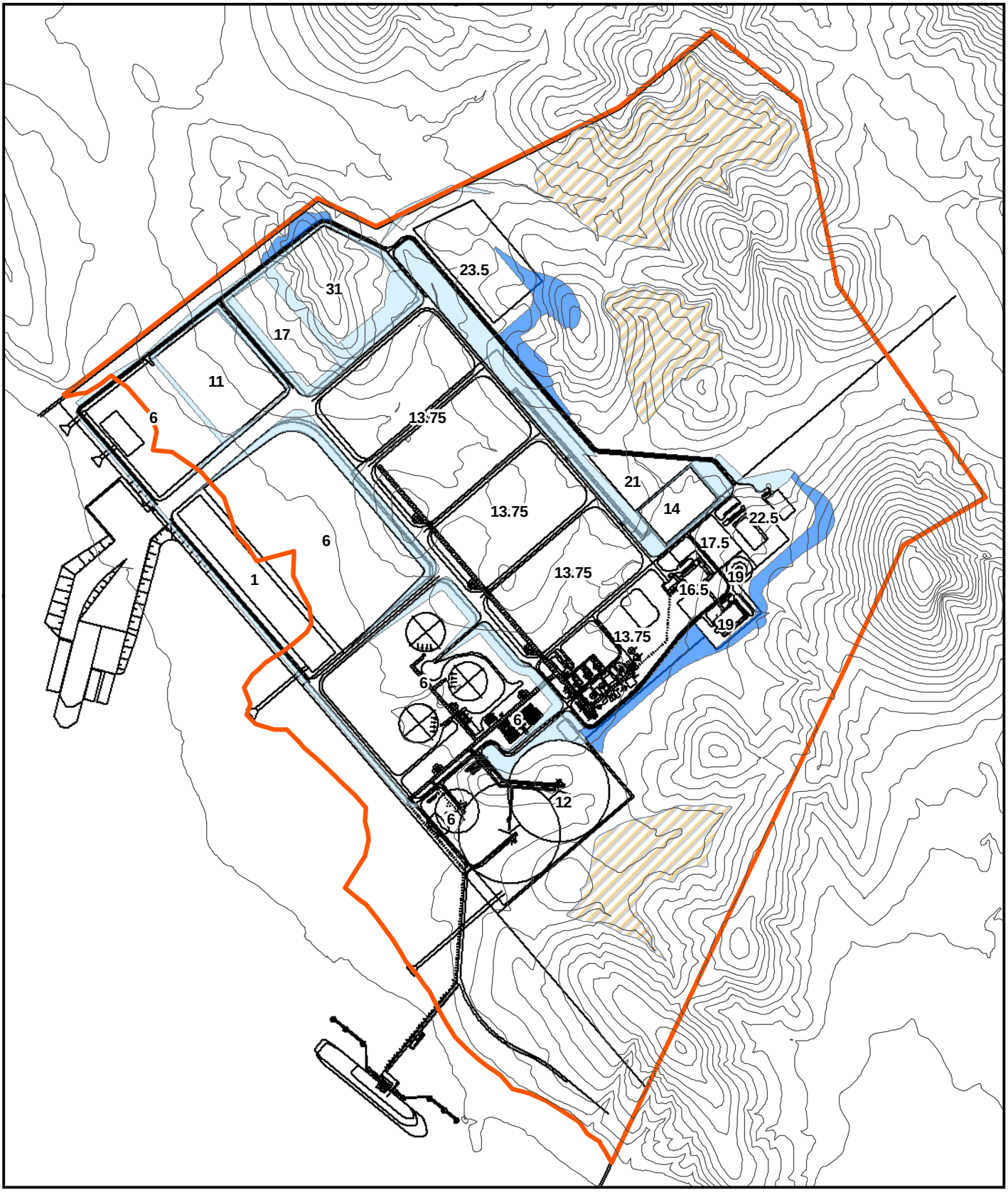


Figure 1.3 Section through amended LNG Facility showing relocation of main facilities 100- 150 metres inland and increased height of LNG trains.



Legend

- Proposed QCLNG Site Boundary
- QCLNG Footprint Plant Layout
- 5m Contours
- Cut Faces
- Retaining Walls
- Proposed Spoil Disposal Area

Source Note:

Cut Faces and Retaining Walls based on Bechtel Benching Plan Dwg CG-0000-00009, R00A

Projection: UTM MGA Zone 56 Datum: GDA 94

0 90 180 360 m

N

QUEENSLAND CURTIS LNG A BG Group business	Project	Queensland Curtis LNG Project	Title: Overal Site Grade Benching Plan
	Client	QGC - A BG Group business	
ERM Environmental Resources Management Australia Pty Ltd	Drawn JB	**Figure 1.4**	Disclaimer: Maps and Figures contained in this Report may be based on Third Party Data, may not to be to scale and are intended as Guides only. ERM does not warrant he accuracy of any such Maps and Figures.
	Approved SC	File No: 0086165b_sEIS_VA_GIS002	
	Date 19.11.09	Revision 0	

1.3 *REMOVAL OF THE PROPOSED BRIDGE AND ROAD*

The mainland bridge connection has been removed from the Project in lieu of marine-based transport routes, as detailed below. Key changes to the LVIA arising from removal of the bridge and road from the scope of the assessment have been considered including reassessment of the visual impact of the Project from publically accessible viewpoints and views from adjoining waterways as detailed in the Draft EIS report (refer sections 3 & 4)

1.4 *PROPOSED MARINE-BASED CONSTRUCTION AND OPERATIONAL ROUTES*

This supplementary report assesses the potential impacts of alternative marine-based transport routes required for construction and operation of the Project. In particular, the assessment examines the potential light impacts of increased vehicle and marine based traffic as required by the Terms of Reference. The Terms of Reference also requires potential impacts associated with increased rail traffic to be addressed. However rail transportation is not currently under consideration for the Project. The following is a brief outline of the proposed marine based transportation routes, refer Figure 1.5 for location of up-loading and off-loading facilities:

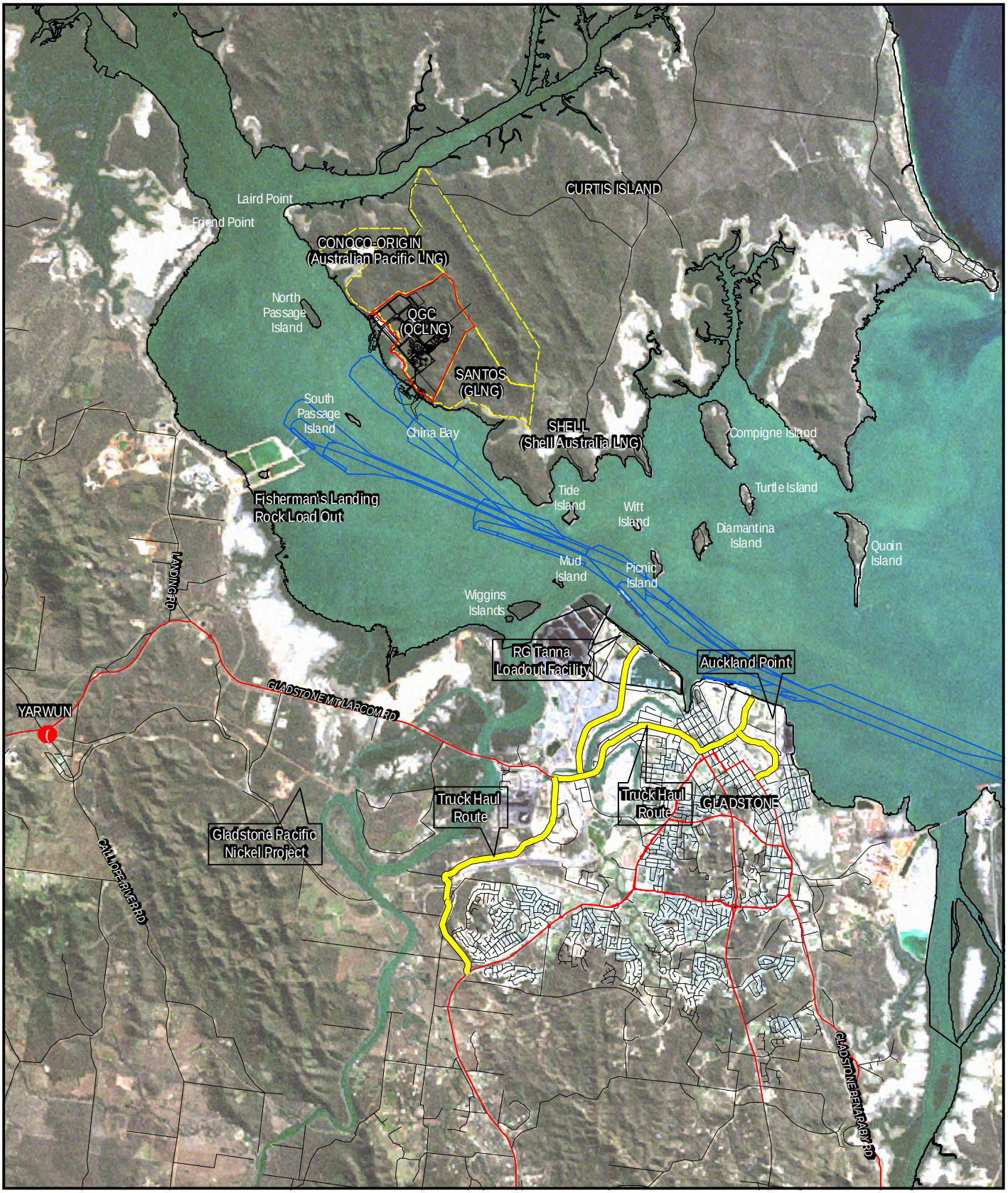
- The initial construction stage, approximately 6 months, will include transportation of bulk materials to the QCLNG Project site via barges uploading from Fisherman's Landing. Once the load-out facility at RG Tanna is constructed, bulk materials will be transported to the LNG Facility site via barge from this location. Movement of bulk materials is anticipated to be undertaken on a 24 hour per day basis.

- Auckland Point will also be utilised for transferring plant, equipment and consumables to the LNG Facility site via barges and ferries. It is assumed that trucks will transit Auckland Point in non-peak daylight periods, although some night-time movement may be undertaken. During peak periods approximately 40 trucks per day are anticipated.

- Vehicle access to and from Auckland Point will utilise existing B-Double routes including Don Young Drive and Port Access Road.

- In addition to the above, approximately 260 km of export pipeline will be imported into Gladstone and loaded onto trucks at Auckland Point. Trucking will be undertaken over an approximate 12 month period and on a 24 hour per day basis.

- Salvaged timber may also be removed from Curtis Island via barge to Auckland Point.



Legend

- Proposed QCLNG Site Boundary
- QCLNG Footprint Plant Layout
- Swing Basin and Shipping Channel
- Main Roads
- Local Roads
- Truck Haul Routes

Source Note:
StreetPro Australia - Pitney Bowes MapInfo
Cadastral Currency: August 2008,
Department of natural Resources and Water
Indicative LOT Boundaries: SP225924 (Preliminary)
Indicative Shell Australia LNG: Shell Australia LNG IAS, Figure 4.3

Projection: UTM MGA Zone 56 Datum: GDA 94

0 0.75 1.5 3 km

N

QUEENSLAND CURTIS LNG
A BG Group business

Project	Queensland Curtis LNG Project
Client	QGC - A BG Group business

Title: Location of Proposed Loading and Off Loading Facilities

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Environmental Resources Management Australia Pty Ltd

Drawn	JB	**Figure 1.5**	
Approved	SC	File No:	0086165b_sEIS_GIS005_R0
Date	19.11.09	Revision	0

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2 POTENTIAL IMPACTS ARISING FROM THE AMENDED LNG FACILITY LAYOUT

Amendments to the LNG Facility layout resulting from further refinement of the engineering design have been assessed based on a comparative analysis against the Draft EIS scheme. Amendments include both reconfiguration of existing components of the LNG Facility and additional elements arising from design development of the Project.

2.1 PROPOSED AMENDMENTS TO THE LNG FACILITY LAYOUT

Key features of the amended LNG Facility design are indicated in Figure 2.1 and detailed below:

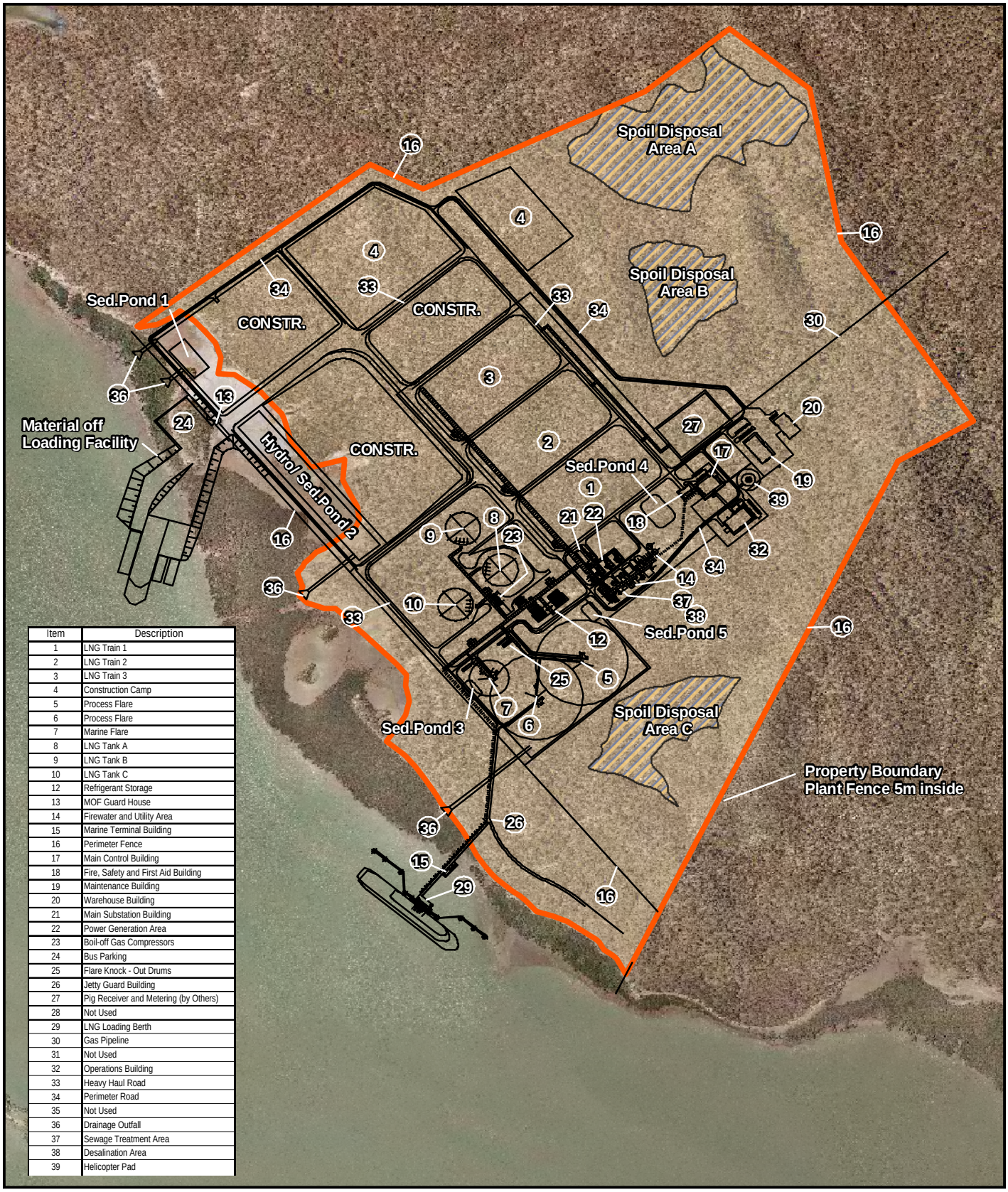
2.1.1 Shoreline configuration and relocation of the LNG loading berth and jetty

A major change in the configuration of the LNG Facility is the relocation of the core plant area 100 - 150 metres inland from the shoreline and relocation of the LNG/LPG loading berth and jetty to the south. Comparative assessment of these changes compared to the Draft EIS scheme, indicates a potential reduction in impacts on landscape and visual amenity through a reduction in disturbance to the shoreline areas including the following:

- Retention of a larger area of the intertidal zone along the shoreline immediately adjoining the LNG Facility and an increase ability to retain undisturbed vegetation, including mangroves;
- Relocation of the LNG Facility behind the intertidal zone provides the opportunity to increase vegetation screening in this area through the reestablishment of terrestrial vegetation species; and
- Relocation of the LNG/LPG loading berth and jetty to an area with minimal mangrove vegetation reduces the extent of disturbance to vegetation and retains a greater visual continuity of the natural shoreline.

2.1.2 Reduction in the footprint of the LNG Facility

Refinement of the engineering design for the LNG Facility has resulted in consolidation of the construction lay-down areas along the north eastern boundary. Whilst these areas are located inland from the shoreline, views from adjoining waterways include the vegetated hills forming a backdrop to the project. These low hills and ridge spurs are important in retaining the natural landscape setting of the area. Comparative assessment of changes indicates a potentially positive outcome will be achieved when compared to



Item	Description
1	LNG Train 1
2	LNG Train 2
3	LNG Train 3
4	Construction Camp
5	Process Flare
6	Process Flare
7	Marine Flare
8	LNG Tank A
9	LNG Tank B
10	LNG Tank C
12	Refrigerant Storage
13	MOF Guard House
14	Firewater and Utility Area
15	Marine Terminal Building
16	Perimeter Fence
17	Main Control Building
18	Fire, Safety and First Aid Building
19	Maintenance Building
20	Warehouse Building
21	Main Substation Building
22	Power Generation Area
23	Boil-off Gas Compressors
24	Bus Parking
25	Flare Knock - Out Drums
26	Jetty Guard Building
27	Pig Receiver and Metering (by Others)
28	Not Used
29	LNG Loading Berth
30	Gas Pipeline
31	Not Used
32	Operations Building
33	Heavy Haul Road
34	Perimeter Road
35	Not Used
36	Drainage Outfall
37	Sewage Treatment Area
38	Desalination Area
39	Helicopter Pad

Legend

- Proposed QCLNG Site Boundary
- QCLNG Footprint Plant Layout
- Spoil Disposal Area

Projection: UTM MGA Zone 56 Datum: GDA 94

0 100 200 400 m

N

QUEENSLAND CURTIS LNG
A BG Group business

Project: Queensland Curtis LNG Project

Client: QGC - A BG Group business

Title: Site Plan

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Drawn	JB	**Figure 2.1**	
Approved	SC	File No:	0086165b_sEIS_VA_GIS003
Date	15.10.09	Revision	0

the Draft EIS, since the extent of disturbance is reduced and hence the impacts on landscape character to these areas will also be reduced.

2.1.3 Extent of vegetation clearing

Reduction to the footprint of the LNG Facility is also reflected in the revised figures for the extent of vegetation clearing. The Draft EIS indicated an area of approximately 300 hectares to be cleared of vegetation, whereas the revised scheme anticipates the area of clearing will be approximately 190 hectares.

The following strategies will be implemented to minimise potential impacts of vegetation clearing as detailed in the Terrestrial Ecology Management Plan:

- Clearing will be undertaken within the LNG Facility boundary across the entire plant footprint, in areas where disposal of topsoil or other site strip material will be undertaken, for construction of sediment and control structures, and for fire breaks, access roads, and fence lines. Clearing outside these areas will be kept to the minimum practicable;

- Vehicle access to sensitive areas, specifically saltmarsh, mudflats, mangroves and riparian zones will be restricted to the minimum practicable; and

- Movement of vehicles outside the LNG plant footprint will be restricted to designated access tracks and roads, except as required for construction purposes.

As identified in the Draft EIS, clearing of vegetation will result in a permanent change to the landscape character of the Project site and a resultant large magnitude of change to visual amenity. Whilst the Draft EIS identified no landscape techniques that could sufficiently mitigate these impacts, retention of vegetation outside the construction zone and in particular vegetation along the shoreline and the vegetated hills and ridgeline spurs surrounding the site, will assist in reducing the severity of visual impacts when viewed from Targinie foreshore and adjoining waterways.

2.1.4 Proposed revisions to site grading and benching

Further refinement of the proposed site grading and benching for the LNG Facility has been undertaken, refer Figure 1.4. Comparative assessment of these changes indicate the main plant areas remains at the same level, whilst areas identified for construction lay-down in the north-eastern and eastern sections of the site have increased in height. Assessment of the impacts of these changes indicates the following:

- Key elements of the LNG facility, the LNG tanks and flare stacks remain at the same height;

- There is a minor increase in the bench height supporting the LNG trains by 2.75 metres to RL 13.75 and subsequent increase in LNG train stack heights. This will not have any noticeable increase in the visual impact of the Project as the tanks and flares remain the highest and visually most dominant elements of the LNG plant;

- Benching for the construction camp areas along the northern boundary increase in height from RL 20 to RL 31, with an additional benching area of RL 17. This increase in bench height will have the visual effect of reducing the extent of cut face to adjoining hill slopes, however it will also increase the height of retaining walls on the downward slope. Retention of the cut face above the benched areas will be undertaken using pitched rock retaining walls. Since the cut face extends to approximately 19 metres high, these retaining walls will be stepped to form a series of benches with the ability to screen each section with vegetation. Pitched rock retaining walls will also be used to retain benching platforms with heights in some sections extending to approximately 17.25 metres. Stepping of the retaining walls will enable some screening with vegetation. The significant alteration in landform, extensive areas of cut, and large retaining structures, will impact on the landscape character and visual amenity of this section of the site when viewed from adjoining waterways. However, the location of the retaining structures towards the back of the LNG Facility will limit the extent of visibility and this, combined with terracing and landscape treatment, will further reduce visual impacts on views from the adjoining waterway.

- The proposed construction camp area to the north-east of the site will result in a cut face of approximately 36.5m in height. Retention of this cut face will require pitched rock terraces. As for other retaining structures, each terraced section would be planted with vegetation to reduce the visual impacts of the retaining walls when viewed from adjoining waterways.

- A series of smaller platforms in the south eastern corner of the site have been included to support various buildings and infrastructure elements. Cut faces and retaining walls in this area are less extensive than the northern section of the site and their location behind the main LNG plant results in some screening of views from adjoining waterways.

2.2 *ADDITIONAL AND EXCLUDED ELEMENTS OF THE LNG FACILITY*

A number of elements have been added and removed from the Project as follows:

- Removal of the LPG storage tank and subsequent reduction in the number of tanks from 4 to 3 tanks. This removal enables a slight reconfigured of the three remaining LNG tanks. Improvements to the

visual impacts of the LNG Facility is achieved through a reduction in the overall bulk created by the combined tanks, however the smaller size of the LPG tank 100,000 m3 as compared to 160,000 m3 for LNG tanks, means this improvement is comparatively small and not visually significant.

- Reconfiguration of the Material Off Loading facility will result in no major changes to the visual impact of this element.

- Addition of a Construction Dock to the south of the LNG Facility. The Construction Dock is a temporary structure utilised by barges delivering material and labour during construction, it is anticipated the Construction Dock will be utilised for a period of approximately 3 years. The low profile of the Construction Dock moderates the visual impacts of this element in comparison to other elements of the LNG Facility.

2.3 *SUMMARY OF OUTCOMES ARISING FROM THE REVISED LNG FACILITY*

In summary, the potential impacts arising from the amended LNG Facility results in no major changes to the significance of impacts identified in the Draft EIS LVIA for the Project.

Several positive outcomes are achieved by the proposed amendments including;

- Reduction of the landscape and visual impacts of the Project on the shoreline areas, and

- Reduction in visual bulk of the LPG/LNG tanks.

Minor additions such as the Construction Dock will not significantly impact visually on the shoreline

The extensive areas of cut and fill required for the construction camp areas have been identified as resulting in localised impacts to visual amenity when viewed from adjoining waterways. This impact was also present in the Draft EIS scheme although increases in bench height result in a slightly greater visual impact. Landscape treatments to terraces and screening in front of retaining wall are recommended in order to reduce this localized visual impact.

3 *UPDATED ASSESSMENT OF VISUAL IMPACT FROM PUBLICLY ACCESSIBLE VIEWPOINTS IN GLADSTONE AND SURROUNDING AREAS*

Reassessment of the visual impacts of the Project from publicly assessable viewpoints has been undertaken to highlight key changes resulting from the amended Project. The most significant alteration to the Draft EIS scheme is the removal of the proposed bridge and road from the assessment. The following table summarises changes to impacts on viewpoints resulting from the amended Project.

Table 3.1 Summary changes to each viewpoint resulting from the amended Project

Viewpoint	Location	Alteration to Impact Significance Rating resulting from the amended project.
VP1	Auckland Point	No change
VP2	Spinnaker Park	No change
VP3	Goodoon St Gladstone	No change
VP4	Radar Hill	No change
VP5	Round Hill	Magnitude of change decreases
VP6	Port Curtis Way	No change
VP7	Port Curtis Way at Calliope River	No change
VP8	Un named track Targinie Foreshore	Magnitude of change decreases

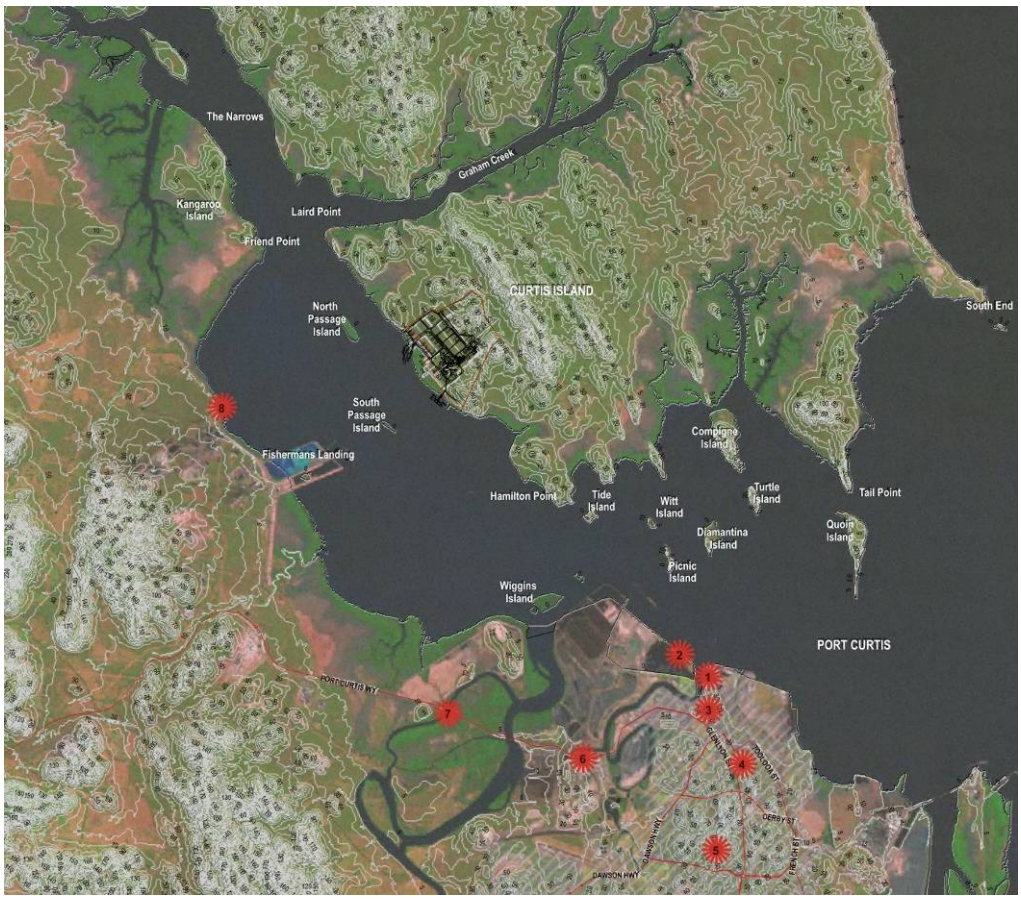


Figure 3.1 Selected Viewpoints from Gladstone and surrounding areas

Viewpoint 5 located at Round Hill and Viewpoint 8 located at Targinie Foreshore have been updated as follows:

3.1 VIEW POINT 5 – ROUND HILL LOOKOUT

Viewpoint 5 is located at the Round Hill Lookout. This elevated location is the most significant vantage point in Gladstone providing extensive views over the City of Gladstone and a perspective of the landscape setting of the city and port. Curtis Island forms a natural backdrop to the urban and industrialised areas of the mainland. From this distance Curtis Island appears visually unmodified by human intervention, displaying a high level of naturalness and therefore forms an important element in the scenic amenity of the area.

The most visible landscape character types in this location are urban/industrial with waterways and Eucalyptus forests in the background.

VP5. N7359289.4 E322343.2

Elevation: 140m AHD

Distance from viewpoint to project structures:

- LNG Facility 11.8 km (approx)

Photograph 3.1 *View looking northeast from Round Hill Lookout*

Whilst this panoramic view encompasses a wide expanse of highly sensitive landscape areas extending across the horizon, the foreground and middleground views are of moderate to low visual quality. The LNG Facility on Curtis Island was identified in the Draft EIS as having a small magnitude of change on landscape character and visual quality as a result of the permanent alteration to the view, and in consideration to the mitigating effect of distance. Proposed amendments to the LNG Facility will not be visible from this distance; therefore there is no alteration to the magnitude of change.

The Draft EIS identified the proposed bridge as having a small magnitude of change to the landscape in the form of a thin line across the entrance to the Narrows. Removal of the proposed bridge and road from the Project assessment will eliminate the resulting impacts with the benefit of negating the previously identified impacts of minor to moderate adverse significance.

Viewpoint 5 Summary of visual impact from Viewpoint 5

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	Majority of the areas is low, with high sensitivity in the background	Medium	Medium
Viewer numbers	High	High	High
Distance to nearest project structures	Approx. 11km	Low	Low
Visibility of the project structure (LNG Facility)	Limited	Low	Low
Magnitude of change (LNG Facility)	Small	Small	Small
Overall significance of the visual impact		**LNG Facility – Minor to Moderate**	**LNG Facility – Minor to Moderate**

3.2 VIEW POINT 8 – UN NAMED TRACK TARGINIE FORESHORE

Viewpoint 8 is located on an un-named track adjoining the Targinie foreshore accessible from Forest Road and to the north of Fisherman's Landing. The track provides access to a dirt boat ramp however accessibility is limited to 4 x 4 vehicles.

The landscape character of the areas is coastal landscape with views across Port Curtis to Curtis Island in the background. The views extend north to the entrance to The Narrows and south to Gladstone. The view is predominately of natural coastal landscape of high scenic quality, especially to the north where there are no visible built elements. To the south the industrial facilities located on Fisherman's Landing, and extending beyond to The Port of Gladstone, are visual intrusions into the natural setting.

VP 8. N7369049.3 E311457.2

Elevation: 6m AHD

Distance from viewpoint to project structures:

- LNG Facility 4 km to loading berth (approx)

This viewpoint is located directly opposite the proposed LNG Facility on Curtis Island and close to the alignment of the previously proposed approach road to the bridge. Proposed amendments to the LNG Facility will be visible from this location due to its close proximity; however these changes are not sufficient enough to impact the significance rating. Increased continuity of the natural shoreline resulting from the reconfiguration of the Facility layout (100 - 150m inland) from the Draft EIS scheme, will have a slightly positive outcome when viewed from this location, refer to amended photomontage *Figure 3.2*.

Removal of the proposed bridge and road from the Project assessment will eliminate the resulting impacts with the benefit of negating the previously identified impacts of moderate to major adverse significance.

Photograph 3.2 *Wide-angle view looking east towards LNG Facility site from Targinie Foreshore*

Photograph 3.3 *Wide-angle view looking north towards The Narrows*

Photograph 3.4 *View of the proposed LNG facility site from Targinie Foreshore*

Figure 3.2 *Photomontage of the amended LNG facility viewed from Targinie Foreshore*

Viewpoint 8. Summary of visual impact from Viewpoint 8

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	High with some intrusive industry	High	High
Viewer numbers	Low	Low	Low
Distance to nearest project structures	Approx. 4km	Moderate to High	Moderate to High
Visibility of the project structure (LNG Facility)	High	High	High
Magnitude of change (LNG Facility)	Medium	Medium	Medium
Overall significance of the visual impact		**LNG Facility – Moderate to Major**	**LNG Facility – Moderate to Major**

3.3 *SUMMARY OF VISUAL IMPACT SIGNIFICANCE OF THE PROJECT FROM PUBLICLY ACCESSIBLE VIEWPOINTS IN GLADSTONE AND SURROUNDING AREAS*

The landscape sensitivity and magnitude of change resulting from the construction and operation of the amended Project, and the significance of the visual impact has been summarized in *Tables 8.1.*

Table 3.2 Updated summary of visual impact significance from each viewpoint

Viewpoint	Location	Impact Significance LNG Facility during construction	Impact Significance LNG Facility during operation
VP1	Auckland Point	Negligible	Negligible
VP2	Spinnaker Park	Negligible	Negligible
VP3	Goodoon St Gladstone	Negligible	Negligible
VP4	Radar Hill	Negligible	Negligible
VP5	Round Hill	Minor to Moderate	Minor to Moderate
VP6	Port Curtis Way	Negligible	Minor
VP7	Port Curtis Way at Calliope River	Negligible	Minor
VP8	Un named track Targinie Foreshore	Moderate to Major	Moderate to Major

The significance of the landscape and visual impacts resulting from the amended LNG Facility when viewed from publicly accessible viewpoints in Gladstone and surrounding areas remain unchanged from the Draft EIS. Removal of the bridge and road from the scope of the assessment negate impacts resulting from these elements.

4 UPDATED ASSESSMENT OF VISUAL IMPACT OF THE PROJECT FROM SURROUNDING WATERWAYS

Reassessment of the visual impacts of the Project from adjoining waterways has been undertaken to highlight key changes resulting from the amended Project. As previously identified, the most significant alteration to the Draft EIS scheme is the removal of the proposed bridge and road from the scope of the assessment. The following table summarises changes in impacts on viewpoints resulting from the amended project.

Table 4.1 Summary of changes to viewpoints resulting from the amended Project

Viewpoint	Location	Alteration to Impact Significance Rating resulting from the amended project.
VP9	Port Curtis adjoining North Passage Island	Magnitude of change decreases
VP10	The Narrows – 500m south of proposed bridge	Magnitude of change decreases
VP11	The Narrows 1 km north of proposed bridge	Magnitude of change decreases
VP12	The Narrows 5 km north of proposed bridge	No change
VP13	Turtle Island	No change
VP14	Witt Island	No change
VP15	Tide Island	No change
VP16	The Port of Gladstone Channel	No change

Viewpoints from the adjoining waterways, directly in line of sight to the proposed bridge and approach road would change as a result of removal of these elements from the impact assessment. These viewpoints include; Port Curtis adjoining North Passage Island, and the three viewpoints from within The Narrows, each viewpoint has been updated as follows:

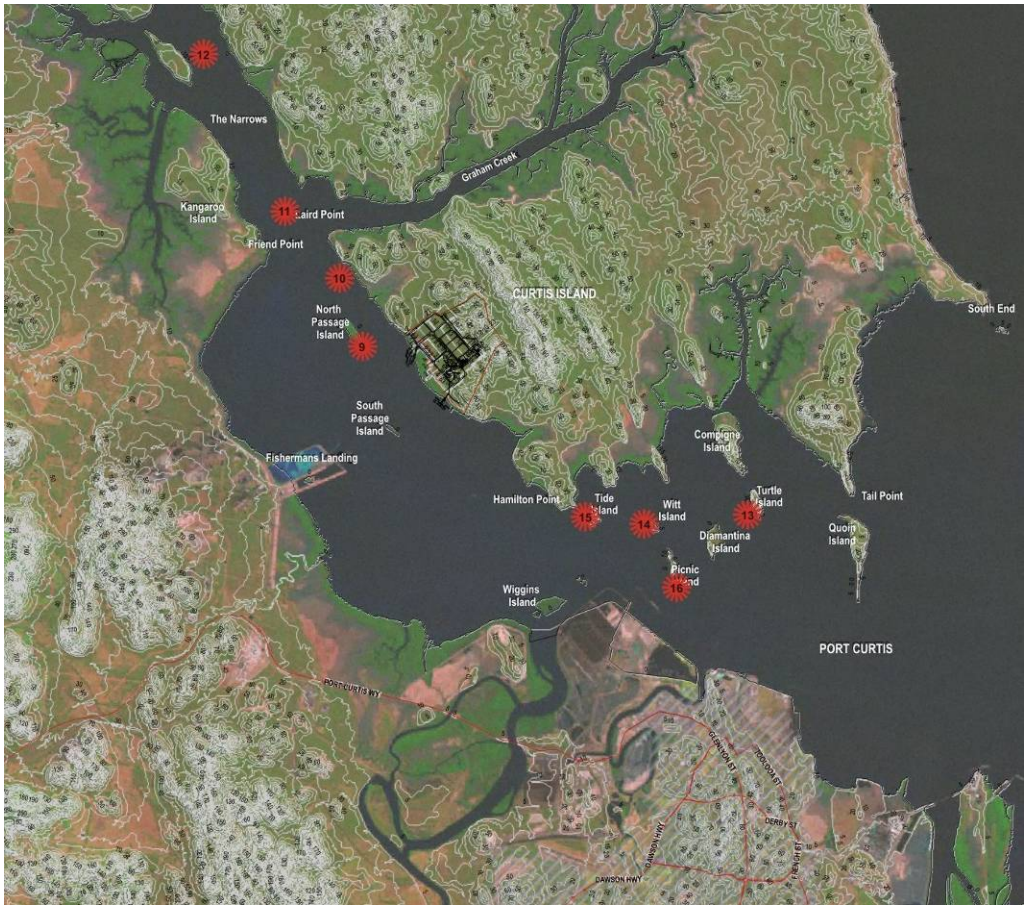


Figure 4.1 Selected Viewpoints from adjoining waterways

4.1 VIEW POINT 9 – PORT CURTIS ADJOINING NORTH PASSAGE ISLAND

Viewpoint 9 is located opposite the site of the proposed LNG Facility, approximately 1.0km east and to the south of North Passage Island.

From this vantage point the linear ridge extending from Ship Hill forms the horizon line. The main landscape character types are eucalyptus forest, estuarine landscapes and waterways. The industrialised landscape of Gladstone waterfront can be seen in the distance to the south.

VP9 E314480.2, N7370464.5

Elevation: 1.5m AHD

Distance from viewpoint to project structures:

- LNG Facility 1 km to loading berth (approx)

The close proximity of the proposed LNG Facility to this viewpoint will result in the Project being visually dominant in the landscape and subsequently create a large magnitude of change and potentially major adverse impact. The proposed amendments to the Project will have a slight benefit in reducing the visual impacts, including reducing the visual bulk of the LNG tanks and retaining greater continuity of the natural shoreline. An updated photomontage of the amended LNG Facility has been prepared from this location, refer *Figure 4.2.*

As for viewpoint 8, removal of the bridge and road from the Project scope will eliminate the landscape and visual impacts of these elements resulting in a negation of the previously identified impacts of major adverse significance.

Photograph 4.1 *View looking east from North Passage Island across the water to the proposed LNG Facility site.*

Figure 4.2 *Photomontage of amended LNG Facility looking east from North Passage Island*

Viewpoint 9 Summary of visual impact from Viewpoint 9

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	High	High	High
Viewer numbers	Low	Low	Low
Distance to nearest project structures	Approx. 1km	High	High
Visibility of the project structure (LNG Facility)	High	High	High
Magnitude of change (LNG Facility)	Large	Large	Large
Overall significance of the visual impact		**LNG Facility – Major**	**LNG Facility - Major**

4.2 VIEW POINT 10 – THE NARROWS - 500M SOUTH OF THE ENTRANCE

Viewpoint 10 is located at the entrance to The Narrows 500m south of the entrance.

The dominant landscape character looking north from this viewpoint is the estuarine landscapes and waterways of the passage landscape, eucalyptus woodland/forest and the mountainous ridgeline of the Mount Larcom ranges on the western horizon. From this point onwards there is not evidence of man-modifications to the landscape and the view is of the '*pristine*' natural landscape of The Narrows.

Looking south from this viewpoint the landscape although predominantly water also contains views of industrial facilities.

VP10. N7371962.9 E313969.0

Elevation: 1.5m AHD

Distance from viewpoint to project structures:

- LNG Facility 2.2 km to marine facility (approx)

The proposed Curtis Island Bridge was identifies in the Draft EIS as visually dominate in the landscape from this location. As for viewpoint 8, removal of the bridge and road from the Project scope will eliminate the landscape and visual impacts of these elements resulting in a negation of the previously identified impacts of major adverse significance.

Views south from this viewpoint will include the LNG Facility, with similar outcomes to those shown in VP 11.

Photograph 4.2 *View Looking north towards proposed bridge at a distance of approximately 500m from proposed crossing.*

Photograph 4.3 *View looking south towards Gladstone with North Passage Island visible in the middleground*

Viewpoint 10 (south) *Summary of visual impact from Viewpoint 10 looking south*

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	Medium/High	Medium/High	Medium/High
Viewer numbers	Low	Low	Low
Distance to nearest project structures	Approx. 500m	High	High
Visibility of the project structure (LNG Facility)	Moderate	Moderate	Moderate
Magnitude of change (LNG Facility)	Medium	Medium	Medium
Overall significance of the visual impact		**LNG Facility – Moderate**	**LNG Facility - Moderate**

View Point 11 – The Narrows 1 km north of the entrance

Viewpoint 11 is located in The Narrows approximately 1 km north of the Great Barrier Reef Marne Park boundary. Views south from this location encompass the interface between The Port of Gladstone and the entrance to The Narrows passage as it opens up into the waters of Port Curtis.

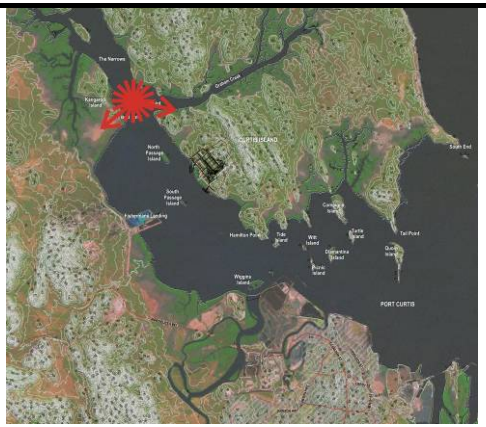
The most visible landscape type from this location is waterways, estuarine landscapes and eucalyptus woodlands, with in the far distance, evidence of the industrialised landscape of The Port of Gladstone and Targinie. The importance of the Mount Larcom ranges with its distinctive western skyline is also evident from this location. The impact of the constructed waterfront of Fisherman's Landing is clearly visible in contrast to the natural vegetated shoreline of The Narrows.

VP11. N7373476 E312757

Elevation: 1.5m AHD

Distance from viewpoint to project structures:

- LNG Facility 4.2 km to marine facility (approx)



Removal of the bridge, and to a lesser extent the road, will result in major changes to impacts as viewed from this location since the bridge was previously identified as potentially visually dominating at this location and distance. Removal of the bridge and road from the scope of work will remove these impacts and negate the previously identified impact of major adverse significance.

The relocation of the main visual components of the LNG Facility 100 - 150 metres inland from the shoreline will result in these elements being screened by intervening topography and vegetation and therefore no longer visible from this viewpoint, refer to updated photomontage Figure 4.3 This will reduce the magnitude of change in the landscape from medium to small and result in a subsequent reduction in the significance of the impact from Moderate to Major for the Draft EIS scheme, to Minor to Moderate for the amended LNG Facility layout.

Photograph 4.4 *View Looking southeast towards Curtis Island, at approx 4 km from the proposed LNG Facility.*

Figure 4.3 *Photomontage of amended LNG Facility at approx 4 km from the site at the entrance to The Narrows, MOF and loading berth are the only visible elements of the LNG Facility from this location.*

Photograph 4.5 View Looking southwest towards Targinie, showing the visual impact of Fisherman's Landing.

Viewpoint 11 Summary of visual impact from Viewpoint 11

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	Medium/High	Medium/High	Medium/High
Viewer numbers	Low	Low	Low
Distance to nearest project structures	Approx. 4.2 km	Moderate	Moderate
Visibility of the project structure (LNG Facility)	Low	Low	Low
Magnitude of change (LNG Facility)	Small	Small	Small
Overall significance of the visual impact		**LNG Facility – Minor to Moderate**	**LNG Facility – Minor to Moderate**

4.3 VIEW POINT 12 –THE NARROWS

Viewpoint 12 is located in The Narrows approximately 5 km north of the Great Barrier Reef Marine Park boundary. Views south from this location are predominately of The Narrows landscape with, in the far distance, the industrialised landscape of The Port of Gladstone.

The most visible landscape type from this location is waterways, estuarine landscapes and Eucalyptus woodlands. Gladstone's industrialised waterfront is just visible from this location in contrasts to the natural landscape of The Narrows.

VP 12. N7376946 E310950

Elevation: 1.5m AHD

Distance from viewpoint to project structures:

- LNG Facility 8 km to marine facility (approx)

Photograph 4.6 *View Looking south from The Narrows.*

Viewpoint 12 Summary of visual impact from Viewpoint 12

Item	Description	Evaluation (Construction)	Evaluation (Operation)
Landscape sensitivity	High	High	High
Viewer numbers	Low	Low	Low
Distance to nearest project structures	Approx. 8km	Low	Low
Visibility of the project structure (LNG Facility)	Low	Low	Low
Magnitude of change (LNG Facility)	Negligible	Negligible	Negligible
Overall significance of the visual impact		**LNG – Negligible**	**LNG – Negligible**

Amendments to the LNG Facility will not result in any changes to the impact significance from this location. Removal of the bridge will negate the previously identified moderate adverse landscape and visual impact.

4.4 *SUMMARY OF VISUAL IMPACT SIGNIFICANCE OF THE PROJECT FROM SURROUNDING WATERWAYS*

The landscape sensitivity and magnitude of change resulting from the construction and operation of the project, and the updated significance of the visual impact has been summarized in *Table 4.2.*

Table 4.2 Updated summary of visual impact significance from each viewpoint

Viewpoint	Location	Impact Significance LNG Facility during construction	Impact Significance LNG Facility during operation
VP9	Port Curtis adjoining North Passage Island	Major	Major
VP10	The Narrows – 500m south of entrance	Moderate	Moderate
VP11	The Narrows 1 km north of proposed bridge	Minor to Moderate	Minor to Moderate
VP12	The Narrows 5 km north of proposed bridge	Negligible	Negligible
VP13	Turtle Island	Negligible	Moderate
VP14	Witt Island	Negligible	Moderate
VP15	Tide Island	Negligible	Negligible
VP16	The Port of Gladstone Channel	Negligible	Negligible

In summary, removal of the bridge and road from the Project results in a negation of the landscape and visual impacts of these elements.

Amendments to the LNG Facility provide potential improvements to views from the adjoining waterways and Targinie foreshore. Views from The Narrows south towards the Project are improved as a result of relocating the LNG Facility further inland from the shoreline. Impacts of the Project from viewpoint 10, located at the entrance to the Narrows, have reduced in significance from Moderate to Major impacts for the Draft EIS scheme, to Moderate impacts as a result of relocation of the LNG Facility inland. Similarly views from viewpoint 11 north of The Narrows entrance has also reduced in significance from Moderate to Major impacts for the Draft EIS scheme, to minor to moderate impacts as a result of relocation of the LNG Facility inland.

5 UPDATED ASSESSMENT OF THE IMPACTS OF NIGHT LIGHTING OF THE LNG FACILITY

The proposed amendments to the LNG Facility layout will not substantially alter the outcomes of the light impact assessment as detailed in the Draft EIS. Two aspects of the amended Project as detailed in this supplementary report have been assessed in relation to altered night lighting impacts as follows:

- The impacts of lighting resulting from the proposed 24 hour bulk-earth works construction; and
- The impacts of night lighting resulting from the proposed marine-based transportation routes during construction and operation of the LNG Facility.

5.1 LIGHT IMPACTS OF NIGHT-TIME CONSTRUCTION ON FAUNA AND HUMAN SETTLEMENTS

Construction of the LNG Facility will include night-shift work undertaken during bulk-earth works, grading and benching stages. Preliminary site preparation including the installation of erosion controls measures and vegetation clearing will not be undertaken at night. It is anticipated that the night shift work will utilise mobile 5kw light plants, with an estimate of 20 light plants used within active construction areas.

An overview of the proposed construction approach in regards to fauna management is briefly outlined below. As previously indicated the first phase of clearing and grubbing will not occur at night:

- Implementation of Fauna Management Plan and Vegetation Management Plan environmental control measures (refer to Draft EIS);
- Establishment of perimeter fencing, erosion control and sedimentation control measures;
- Identification and removal of fauna and fauna habitat (hollow trees and logs) from within the construction area;
- Logging of suitable timber and removal from site in conjunction with fauna spotter; and
- Clearing and grubbing of vegetation in conjunction with fauna spotter.

5.1.1 *Impacts of night lighting during construction on fauna species*

The potential impact of artificial illumination associated with the 24 hour bulk-earth works has been assessed in this supplementary report in relation to the sensitive receptors identified in the Draft EIS. Threatened and nocturnal species identified as potentially impacted by night lighting generated by the LNG Facility are detailed in *Table 5.1*. Those species identified as having a low, or negligible potential impact in the Draft EIS have not been reassessed here.

Table 5.1 Threatened and nocturnal species potentially impacted by night lighting of the LNG Facility.

Light Receptor	Likelihood of occurrence	Significance Rating		Expected Potential Impact
Birds		**NC Act**	**EPBC Act**	
Esacus neglectus (Beach Stone-curlew)	Confirmed	V		High (Regional)
Numenius madagascariensis (Eastern Curlew)	Confirmed	R		High (Local)
Ninox connivens (Barking Owl)	Confirmed	None		High (Local)
Ninox novaeseelandiae (Southern Boobook Owl)	Confirmed	None		High (Local)
Ninox strenua (Powerful Owl)	Confirmed	V		High (Local)
Mammals				
Pteropus alecto (Black Flying-fox)	Confirmed	None		Moderate (Local)
Petaurus breviceps (Sugar Glider)	Confirmed	None		Moderate (Local)
Petaurus norfolcensis (Squirrel Glider)	Confirmed	None		Moderate (Local)
Petaurus australis australis (Yellow-bellied Glider)	Likely	None		Moderate (Local)

V = Vulnerable, R = Rare

NC Act = Queensland *Nature Conservation Act* 1992

EPBC Act = Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999

Impacts on fauna have taken into consideration the proposed removal of all fauna and fauna habitats within the construction areas as part of the Fauna Management Plan, and the establishment of a construction perimeter fence preventing re-entry by terrestrial species. Birds, bats and some nocturnal mammal species capable of re-entering the construction site have been assessed accordingly.

5.1.2 Potential Impacts on Amphibians and Reptiles

The terrestrial field surveys identified 19 reptiles and nine frog species within the study area. Both reptiles and amphibians are potentially impacted to a moderate extent by night lighting within the local area including increased foraging and predation.

For both reptiles and amphibians, it is anticipated that artificial lighting during the 24 hour bulk-earth works will attract insects to the construction areas. However this artificial lighting will only result in short-term impacts and is not expected to effect the greater populations of these species as detailed in the Draft EIS. The proposed amendments to the LNG Facility layout will not result in any additional impacts to those already assessed.

Provisions to minimise impacts on the local populations during construction should be considered in the Fauna Management Plan and measures adopted to reduce impacts. Such measures may include provision for removal/relocation of species re-entering the construction zone and limiting light spill.

5.1.3 Potential Impact on Birds

Bird species identified as having the potential to be impacted by the introduction of artificial light as detailed in the Draft EIS are as follows:

- Beach Stone-curlew –it is predicted that Beach Stone-curlews would continue to forage near the LNG Facility site although they may avoid areas of high activity;
- Eastern Curlew – small numbers of Eastern Curlews forage on the LNG Facility site at high and low tide and may be impacted by the introduction of artificial lighting;
- Powerful Owl – it is probable that the impacts of light pollution on this species will include the reduction in the size of their home-range, and potentially disrupting breeding habitat, foraging areas and potential prey species; and
- Southern Boobook and Barking Owls - the site contains up to four pairs of Boobook and three family groups of Barking Owl within the proposed plant site. It is probable that the illumination from the site will decrease the value of habitat for these species.

The proposed amendments to the LNG Facility layout will not result in any additional impacts to those already assessed. The 24 hour lighting during construction will occur in conjunction with the removal of all vegetation and terrestrial habitat as assessed within the Draft EIS. The impacts of night lighting during the 24 hour bulk-earth works are therefore unlikely to

significantly increase the extent of any roosting and/or nesting displacement within the construction areas.

Foraging and roosting site within adjacent habitat areas, particularly those located to the south and west of the LNG Facility site are expected to be subjected to light spill. Potential impacts on these locations are expected to be low to moderate, and difficult to differentiate from natural fluctuations and trends. An increase in food sources are expected with the introduction of artificial illumination, which could result in increased foraging competition, and ultimately predation. As outlined within the Draft EIS these impacts are expected to be cumulative, given the existing light sources and potential industrial growth on neighbouring sites. Without quantitative data on bird numbers, and relativity to a greater population, the extents of such impacts are unknown.

The impacts of night lighting during bulk-earth works should be considered in preparation of the Fauna Management Plan. Provisions for managing night-lighting impacts, including limiting light spill should be considered to minimise impacts on the local populations.

5.1.4 Potential impacts on Mammals

Nocturnal mammal species recorded on site and identified as having the potential to be impacted by the introduction of artificial light as detailed in the Draft EIS are:

- Micropchiropteran bats (observed);
- Black Flying-fox (observed);
- Sugar Glider (observed and heard);
- Squirrel Glider (observed and heard);
- Yellow-bellied Glider (observed); and

No listed threatened or migratory terrestrial mammal species were recorded during field surveys.

Without quantitative data on mammal numbers, and relative to a greater population, the extent of impacts are unknown. However the following impacts are expected to occur to localised populations of mammals:

- Disruption of foraging behaviour;
- Disruption of biological clocks;
- Decrease in viable roosting and nesting habitat;
- Increased death in collisions on roads, and through predation; and

- Disruption of dispersal movements and corridor use.

As previously highlighted the impacts of night lighting during the 24 hour bulk-earth works will follow the removal of all vegetation and terrestrial habitat as assessed within the Draft EIS. The impacts of night lighting during construction are therefore unlikely to significantly increase the extent of displacement arising from clearing activities.

As for other species (reptiles, amphibians and birds), foraging habitat within adjacent areas is expected to be subjected to light spill. The introduction of artificial illumination is also likely to attract insects into the construction areas, which could result in increased foraging competition, and ultimately predation. As outlined within the Draft EIS these impacts are expected to be cumulative, given the existing light sources and potential industrial growth on neighbouring sites. Without quantitative data on mammal numbers, and relativity to a greater population, the extents of such impacts are unknown.

The impacts of night lighting during construction should be considered in preparation of the Fauna Management Plan. Provisions for managing night-lighting impacts, including limiting light spill and removal/relocation of species re-entering the construction site should be considered to minimise impacts on the local populations.

5.1.5 Potential Impacts on Marine Turtles

The LNG Facility is not expected to affect marine turtle and /or hatchlings due to the distance from the nesting areas. Night lighting during construction will not alter this outcome.

5.1.6 Potential Impact on Fishes

Estuarine fish species have been identified within The Narrows, and along the intertidal areas. The Draft EIS identified fish activity as likely to increase with the introduction of artificial illumination, this is expected to be localised. The existing illumination of nearby coastline indicates impacts caused by artificial illumination currently exist, and any increase caused by the proposed development could contribute to cumulative impacts. Such impacts however, are generally difficult to discern from natural fluctuations in populations. Impacts resulting from night lighting during construction are unlikely to alter this result.

5.1.7 Impacts of night lighting of the LNG Facility on human settlement

The potential impacts of night lighting of the LNG Facility on human settlement was identified in the Draft EIS as mainly affecting perception, that is, the perceived loss of naturalness attributable to the introduction of artificial lighting into a previously unlit natural landscape. Limited visibility of the project site from Gladstone and surrounding residential areas as identified in

the Draft EIS, does however, reduce this perceived impact and, together with high levels of industrial lighting surrounding the Port of Gladstone, reduces the significance of the Project's night lighting impacts when viewed from the mainland areas. The use of night lighting during construction does not increase impacts identified in the Draft EIS.

5.1.8 Summary of impacts resulting from night lighting during construction

In summary, the introduction of artificial lighting as a result of 24 hour bulk-earth works during construction will not result in significant increases to impacts already identified in the Draft EIS, particularly given that the night-shift work will follow the removal of all vegetation/habitat and relocation of species from the site.

The two most likely impacts identified for fauna species are;

- Impacts of light spill on species using undisturbed habitat in the vicinity of the site; and
- Light attraction resulting in species re-entering the site for foraging purposes.

The Fauna Management Plan should include measures to reduce these impacts including provision for removal/relocation species re-entering the construction zone and management provisions for limiting light spill during construction activities.

The impacts of night lighting on human settlement was identified as perceptual, with no permanent impact on residential areas as previously identified in the Draft EIS.

5.2 NIGHT LIGHTING IMPACTS OF ALTERNATIVE MARINE-BASED TRANSPORTATION ROUTES

The Draft EIS assessment of night lighting identified the Port of Gladstone as an active industrial port with marine traffic evident at night and generally characterised by intermittent lighting 'in motion'. Artificial lighting emanating from fixed and constant applications, such as wharfs, was identified as generally having a greater visual impact than that generated by marine traffic.

Additional marine activity associated with the proposed construction and operational routes for the LNG Facility will result in an increased level of lighting associated with marine traffic between Curtis Island and the mainland. In the context of artificial lighting emanating from both the QCLNG Project and potentially other proposed developments on Curtis Island, increases in lighting associated with marine traffic at night will not significantly alter the impacts previously identified in the Draft EIS.

In addition, fixed and constant lighting associated with the previously proposed bridge would have potentially affected the natural landscape values of The Narrows passage. Removal of the bridge from the scope of the assessment in favour of marine transportation within the Port of Gladstone will therefore result in a comparative reduction in the impact of night lighting on the sensitive waterways of the Narrows Passage.

Loading and off-loading facilities at Auckland Point will be serviced via B-Double roads including Port Access Road and Don Young Drive. Increased night-time traffic along the proposed vehicle routes will occur during the construction period. Desk-top assessment of the potential impacts of night lighting resulting from increase traffic identified the following:

- B-Double roads are currently lit via pole-top street lighting, therefore existing background lighting levels are sufficiently high to moderate the impact of vehicle lights using these roads at night;
- The majority of the proposed routes passes through commercial/industrial areas with low sensitivity to night lighting impacts;
- Two sections of the route adjoin residential properties however in both cases these are not directly in line-of-sight of the road alignment and are therefore not subject to impacts resulting from vehicle headlights;
- Residential properties along the route are generally set-back from the road alignment with, in some cases, noise barriers, vehicle barriers and fencing providing light shielding from passing vehicles.

The desk-top assessment indicates impacts of night-lighting resulting from increase vehicle traffic servicing the loading facilities at Auckland Point are unlikely to be significant given there is no direct impact on light sensitive receptors, and these routes are currently lit by fixed and constant artificial lighting.

5.3 SUMMARY OF POTENTIAL IMPACTS ON LIGHT SENSITIVE RECEPTORS

In summary, the potential impacts on light sensitive receptors of the amended Project as detailed in this supplementary report are as follows:

- No significant increase in light impacts associated with night lighting of the construction site during the proposed 24 hour bulk-earth works stage was identified on human settlements due to limited visibility;
- Threatened and nocturnal fauna species identified on the site and/or potentially within the vicinity of the site may be impacted by night lighting. These impacts however will be short-term and the fact that the construction site will already have been cleared of vegetation and fauna

species, will result in no significant increase in existing levels of disturbance as a result of night-lighting;

- Potential adverse affects to nocturnal species of birds, bats, reptiles, amphibians and mammals were identified as potential increased foraging, competition, predation and injury as a consequence of the attraction and concentration of insects around construction lighting;

- Provisions for removal/relocation of species re-entering the construction site should be included in the Fauna Management Plan;

- Measures to reduce light spill during construction stages should be included in the Environmental Management Plan;

- There are no identifiable increases in risks of impact on Turtles or fish;

- Additional marine activity associated with the proposed construction and operational routes for the LNG Facility will not significantly alter the previous findings which identified fixed and constant lighting such as wharfs and jetties, as generally having a greater visual impact than that generated by marine traffic;

- Additional night-time vehicle traffic associated with the proposed construction and operational routes servicing Auckland Point are unlikely to result in significant impacts on light sensitive receptors as there is no direct line-of sight between vehicle lights and residential properties, and the proposed routes are currently lit by fixed and constant artificial lighting; and

- Removal of the bridge from the scope of the assessment will result in a reduction in the impact of night lighting on the sensitive waterways of the Narrows Passage.

6 UPDATED ASSESSMENT OF CUMULATIVE VISUAL IMPACTS

6.1 PROPOSED DEVELOPMENT WITHIN THE PORT OF GLADSTONE WESTERN BASIN

The assessment of cumulative visual impacts takes into consideration the potential impacts of future development within the Project's viewshed in conjunction with the Project's impacts. The viewshed for the QCLNG Project as identified in the Draft EIS predominantly covers the waterway adjoining the site, the Targinie Passage and Targinie foreshore. Future expansion of the Port of Gladstone within this area has been identified in the Port of Gladstone's 50 year Strategic Plan (2008) and focuses on development of the Western Basin including Wiggins Island, Fishermans Landing, Friend Point, Laird Point, North China Bay, Hamilton Point and Boatshed Point.

The Coordinator General (CG) has prepared a draft report on future industry proposed for the Western Basin (Draft Port of Gladstone Western Basin Master Plan, August 2009). The masterplan covers proposed future development within the Gladstone State Development Areas (GSDA) including the Curtis Island Industrial Precinct and Targinie foreshore areas. Future LNG projects proposed for these areas as identified in the CG report are detailed in Table 6.1.

Table 6.1. LNG projects proposed for the GDSA

Proponent	**No. of trains**	**Production (Mtpa)**	**Production date**
Arrow Energy	3	10	2014
QCLNG	3-4	12	2014
Impel LNG	2	1.5	TBC
LNG Limited	2	3	2012
Origin/ConocoPhillips	4	14	2015
Santos/Petronas	3-4	10	2014
Shell Australia LNG	3-4	14	TBC

Other major industrial developments proposed in the area include:

- Wiggins Island Coal Terminal;
- Gladstone Pacific Nickel Project;

- Boulder Steel Gladstone Steel Making Facility, and
- Fisherman's Landing Development.

Potential industries with interests in the Western Basin and/or wider GSDA, as identified in the CG report, include the following:

- Fertiliser production and export;
- Various import/export liquid operations; and
- Shale oil extraction and processing.

In addition to potential industrial developments, Gladstone Port Authority has identified Hamilton Point as Strategic Port Land (SPL) suitable for possible future wharves. The feasibility of such a development is dependent on transport access from the mainland.

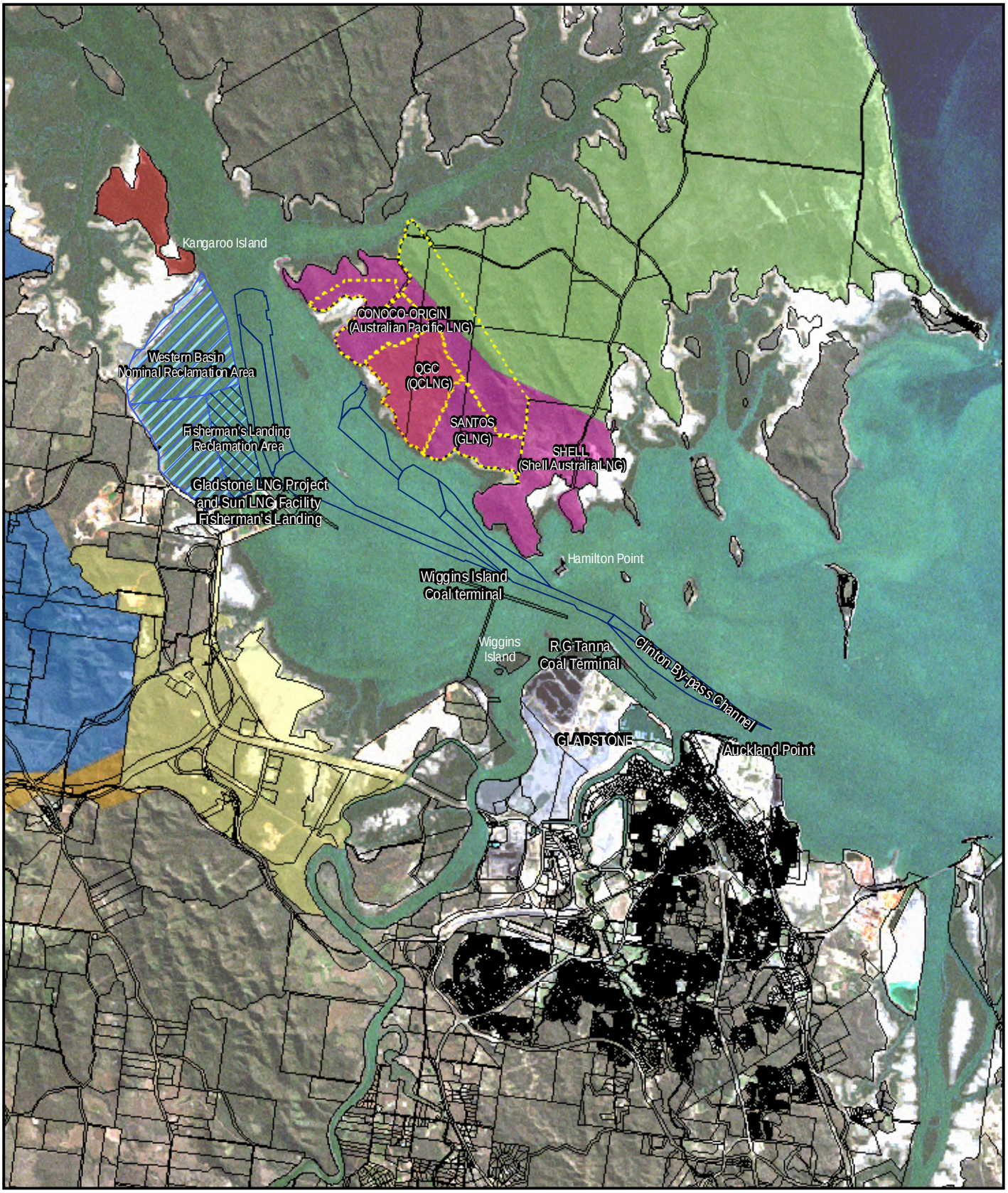
The locations of the above projects in relation to the proposed QCLNG Facility are outlined in *Figure 6.1.*

Assessment of the cumulative impacts of potential industrial developments planned for the GSDA have been considered based on available information including updated information from the Draft EIS, together with new information made available recently from the Department of the Coordinator General. Whilst consideration has been given to all projects currently under investigation within the GDSA, in some cases assessment is limited by the extent of available information. A brief description of potential changes to landscape character arising from cumulative development within the GDSA has been assessed as follows:

6.2 CURTIS ISLAND INDUSTRIAL PRECINCT

Four major LNG projects are proposed for Curtis Island Industrial Precinct each having three to four trains with production of 10 to 14 Mtpa each. Approximate production targets have been nominated as 2014 – 2015, with the potential that construction may occur simultaneously for at least two of the four proposed developments (QCLNG & Gladstone LNG). Similarities in project scales will result in generally similar construction impacts with approximately 150 - 200 hectares of clearing and benching anticipated for each site. Cumulative site disturbances within the footprint of the four LNG facilities are therefore anticipated to cover approximately 600 - 800 hectares. The major elements of the cumulative LNG projects, assuming each facility is similar and there are limited shared infrastructure elements, will include the following:

- 4 marine jetties and specialised LNG loading facilities;
- 12 – 16 LNG trains;



Legend

Gladstone State Development Area

- Clinton Precinct
- Corridor Area Buffer Precinct
- Curtis Island Industry Precinct
- Environmental Management Precinct
- Restricted Development Precinct
- Targinie Precinct
- Yarwun Precinct

Source Note:
Aerial Image: Department of Infrastructure and Planning for QCLNG Project
Cadastral Currency: August 2008, Department of Natural Resources and Water
Indicative Lot Boundaries: SP225924 (preliminary)
Indicative Shell Australia LNG: Shell Australia LNG IAS Figure 4.3

Projection: UTM MGA Zone 56 Datum: GDA 94

0 0.75 1.5 3 km

N

QUEENSLAND CURTIS LNG
A BG Group business

Project: Queensland Curtis LNG Project

Client: QGC - A BG Group business

Title: Future Development within GSDA

ERM
Environmental Resources Management Australia Pty Ltd

Drawn	JB	Figure 6.1	
Approved	SC	File No:	0086165b_sEIS_VA_GIS006
Date	19.11.09	Revision	0

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- 8 to 12 LNG storage tanks;
- 8 Flare stacks and 4 marine flare stacks

The location of each proposed LNG project and a brief outline of the scale of the project are provided below:

6.2.1 Gladstone LNG Project (Santos)

The proposed Gladstone LNG is located on Curtis Island in a valley to the east of China Bay. The facility will comprise of up to three LNG processing trains, two to three LNG storage tanks, two to three flare stacks, and marine off loading facility and product loading facilities. The visual impact assessment undertaken as part of the Gladstone LNG EIS report identified the key visual impacts as occurring from the adjoining waterway. The Gladstone LNG EIS also found views from publically accessible locations were generally blocked by intervening hills and ridges which formed the valley within which the LNG Facility is located. Flaring, particularly at night was identified as a key visual impact, due to the height of the flare, although it was acknowledged as an infrequent occurrence.

6.2.2 Shell Australia LNG Project (Shell)

Shell Australia LNG site is located to the north of Boatshed Point. The proposed project includes a three to four train LNG processing facility. The initial advice statement dated May 2009 provides an outline of the project, however detail regarding layout and potential visual impacts of the LNG Facility are not currently available.

6.2.3 Australia Pacific LNG Project (ConocoPhilips-Origin)

The proposed Australia Pacific LNG project located to the north of the QCLNG Project is a three to four train LNG processing facility. The initial advice statement dated March 2009 provides an outline of the project, however detail regarding layout and potential visual impacts of the LNG Facility are not currently available.

6.2.4 Summary of Potential Cumulative impacts of LNG Facilities on Curtis Island

Construction of four LNG Facilities on Curtis Island will permanently alter the landscape character of the south-western section of the island from its current predominantly natural state, to a highly man-modified industrial landscape. Protection of vegetation on intervening ridgelines between each LNG sites as recommended in the Draft EIS will assist in reducing the visual impacts of cumulative site disturbance. Retention of sections of the natural shoreline will also assist in reducing cumulative visual impacts. In addition to the land based impacts, the impact of marine facilities and shipping vessels will also

change the character of the waterways from its current semi-natural state to one of a working port.

6.3 *TARGINIE PRECINCT*

Major developments within the Targinie Precinct, in particular along the Targinie foreshore include; the Wiggins Island Coal Terminal, Fisherman's Landing Development, two LNG facilities and the proposed Gladstone Pacific Nickel Refinery. A brief outline of each project is provided below:

6.3.1 *Wiggins Island Coal Terminal*

As identified in the Draft EIS, the major components of the Wiggins Island project include the wharfs, coal terminal and connecting jetty. The proposed project is twice the size of the existing and adjoining RG Tanna coal terminal and extents further into the waters of Port Curtis. The RG Tanna coal terminal creates significant visual and night lighting impacts which will be further increased as a result of the proposed Wiggins Island development. As identified in the Draft EIS, the Wiggins Island Terminal will increase the industrialised waterfront around Gladstone and provide further screening of views from Gladstone towards Curtis Island.

6.3.2 *Gladstone Pacific Nickel Project*

The site for the Gladstone Pacific Nickel refinery as identified in the Draft EIS, encroaches into the existing rural and estuarine landscape areas, although this change is a continuation of the industrialised precinct extending from Gladstone to Targinie. In relation to the proposed development of the Western Basin and in particular the Curtis Island Industrial Precinct, the proposed refinery will not impact significantly on the existing viewshed of these proposed developments and therefore cumulative impact will not be significant.

6.3.3 *Fisherman's Landing Development*

The existing reclamation area at Fisherman's Landing allows for the development of five shipping berths. A further six berths are under investigation on a proposed 153 ha reclamation project extending to the north of Fisherman's Landing. The extension of Fisherman's Landing, together with the Western Basin Reclamation project, will substantially alter the natural landscape character of this section of Targinie foreshore extending to Friend Point. The creation of artificially constructed landings will be highly visible from The Narrows entrance and entail removal and disruption of the mangrove vegetation along the shoreline. This artificial edge, associated infrastructure and marine activities, will extend the industrial working port

character of the existing Gladstone Port through the Targinie Passage to the entrance to the Narrows.

6.3.4 Gladstone LNG Facility – Fisherman's Landing

The visual impact of the proposed LNG facilities on Fisherman's Landing will increase the industrial character within this section of the Port of Gladstone. As noted in the Draft EIS, Fisherman's Landing currently has a significant impact on the natural shoreline character being an artificially create bunding with no vegetation in contrast to the natural vegetated estuarine landscape of The Narrows and Curtis Island.

The presence of large scale industrial development either side of the passage to the Narrows will significantly alter the existing character within this section of the passage landscape. The development of Curtis Island Industrial Precinct together with development of industry and shipping berths associated with Fisherman's Landing will alter the character of the landscape from one of a predominantly un-developed waterway to an industrial working port.

6.3.5 Sun LNG Facility – Fisherman's Landing

Limited information is available for the Sun LNG Facility however the location at Fisherman's Landing will further increase the industrial character within this section of the Port of Gladstone. The impacts resulting from the expansion of Fisherman's Landing as detailed above also apply to this project.

6.4 ALDOGA PRECINCT

6.4.1 Gladstone Steel Making Facility (Boulder Steel)

Boulder Steel is proposing to construct and operate an integrated steel making plant at a site within the Aldoga Precinct of the GSDA. The plant will produce steel for export via a berth at Fisherman's Landing. The steel making facility will be developed in conjunction with a power generation facilities for reuse of waste gas and heat from the steel plant. The proposed project is located to the west of Mount Larcom and is not within the viewshed of the QCLNG and therefore does not contribute directly to cumulative visual impacts. Expansion of the export facilities at Fisherman's Landing has been addressed above.

6.5 SUMMARY OF CUMULATIVE VISUAL IMPACTS

The most significant cumulative visual impact of the projects will be the combined visual impacts of the QCLNG Project with the three other LNG Facilities within the Curtis Island Industrial Precinct, together with the

proposed expansion of the reclaimed land and industrial facilities at Fisherman's Landing. The positioning of the industrial/infrastructure elements both sides of the Targinie Passage will substantially alter the landscape character of the area from a predominantly un-developed waterway to a large industrial port precinct, dominated by man-modified elements, and visually linking with the industrial landscapes of the existing Gladstone waterfront port areas.

7 PROPOSED MANAGEMENT AND MITIGATION OF THE AMENDED LNG PROJECT

The Draft EIS identified management and mitigation measures to reduce the impacts of the Project, in particular, impacts on identified landscape and visual amenity values as detailed in the Curtis Coast Regional Coastal Management Plan policy 2.7.1 Schedule 1 - Areas of State Significant (Coastal Landscapes). As previously acknowledged in the Draft EIS, while the GSDA designation allows for heavy impact industry in this location, there remains the requirement to minimise the impact on designated values where possible. This supplementary report updates management and mitigations measures specific to the minimisation of impacts resulting from the amended Project.

7.1 PROPOSED MANAGEMENT AND MITIGATION MEASURES TO REDUCE IMPACTS ON CURTIS ISLAND

As identified in the Draft EIS report, the scale and function of an LNG Facility precludes any significant mitigation measures that can fully comply with the Coastal Landscape policy to *'ensure the development remains unobtrusive and compatible with landscape values'*. However, the amended Project does partially met some of the parameters of the desired outcomes, in particular, relocation of the Facility 100 - 150 metres inland from the shoreline improves outcomes towards protection of the natural shoreline and intertidal vegetation. The following management and mitigation measures have been identified as applicable to the minimisation of impacts identified in this supplementary report:

- Consolidate infrastructure elements such as loading facilities, jetties, services and stormwater drainage outlets and protect natural undisturbed shoreline areas as far as practical consistent with the Terrestrial Ecology Management Plan;

- Facilitate implementation of protection measures of natural shoreline areas consistent with the Terrestrial Ecology Management Plan including appropriate induction training and signage to prevent unauthorised access;

- All vegetation clearing will be confined to identified construction zones as detailed in the Terrestrial Ecology Management Plan;

- Restore areas within the construction zones, not require for permanent structures, to a condition such that endemic intertidal and terrestrial vegetation can be re-established;

- Revegetate intertidal and terrestrial areas with endemic vegetation species as early as practical following construction activities;

- Screen retaining walls using endemic vegetation where practicable, terrace structures to reduce the visible scale and height of structures when viewed from the adjoining waterway;

- Limit the extent of light-spill during construction activities, use mobile lighting efficiently and sufficient for purpose; and

- Incorporate fauna recovery and relocation measures into the Fauna Management Plan in relation to species potentially re-entering the construction zone during night-time activities.

7.2 *PROPOSED MANAGEMENT AND MITIGATION MEASURES TO REDUCE IMPACTS ON THE NARROWS*

As detailed previously, relocation of the LNG Facility inland reduces visibility of the land-based LNG elements from the Narrows. This reduction in visual impacts improves performance of the amended Project in two aspects of the desired outcomes for The Narrows landscape including maintaining; '*existing vegetation along waterways to a maximum extent to form a natural landscape edge and screen,'* and *'ensure infrastructure in areas of high visual quality does not obscure views to water or intrude on waterways'.*

Protection of the natural shoreline and intertidal vegetation as detailed in section 7.1 above will also be importance in reducing impacts on the designated values of The Narrows passage landscape.

8 CONCLUSION

8.1 AMENDMENTS AND ADDITIONS TO THE QCLNG FACILITY

The proposed amendments and additions to the QCLNG Facility assessed in this supplementary LVIA report have resulted in the following key findings:

8.1.1 Reconfiguration of the LNG facility

Reconfiguration of the main LNG Facility and relocation 100 - 150 metres inland from the shoreline will result in positive improvements to the potential landscape and visual impacts of the Project as identified in the Draft EIS, including achieving the following outcomes:

- Retention of a larger area of intertidal shoreline immediately adjoining the LNG Facility and an increased ability to retain undisturbed vegetation in this area, including mangroves;
- Relocation of the LNG Facility outside the intertidal zone also provides the opportunity to increase vegetation screening in this area through the reestablishment of terrestrial vegetation species; and
- Relocation of the LNG/LPG loading berth and jetty to an area with minimal mangrove vegetation reducing the extent of disturbance and retention of a greater visual continuity of the natural shoreline.

Reconfiguration of the LNG Facility provides sufficient improvement to views from The Narrows looking south towards the Project site to result in a decrease to the magnitude of change and a subsequent reduction in the impact significance rating. Viewpoint 10 located at the entrance to the Narrows, has been reassessed as Moderate adverse impact for the amended LNG Facility, a reduction from the previously identified Moderate to Major adverse impacts for the Draft EIS scheme. Viewpoint 11 located to the north of the entrance to the Narrows, has been reassessed as Minor to Moderate adverse impact for the amended LNG Facility, a reduction from the previously identified Moderate to Major adverse impacts for the Draft EIS scheme.

8.1.2 Reconfiguration of the material off loading facility and addition of the construction dock

Assessment of the reconfigured Material Off-Loading Facility and the addition of the Construction Dock found no significant changes to the landscape and visual impact of the Project resulting from these amendments.

8.1.3 Reduction in the footprint of the LNG Facility

Whilst reduction of the footprint of the LNG Facility results in a reduction in impacts of the Project, the significant alteration in landform associated with the Construction camp and access roads through the northern and north eastern areas of the site will impact on the landscape character and visual amenity of this section of the site when viewed from adjoining waterways. The location of these retaining structures towards the back of the LNG Facility will however limit the extent of visibility and this combined with recommended mitigation measures will assist in reducing the visual impact of these elements when viewed from the adjoining waterway. There is no change to the impact significance rating resulting from these alterations.

8.1.4 Removal of the LPG storage tank

Removal of the LPG storage tank and subsequent reduction in the number of tanks from 4 to 3 tanks results in an improvement to the visual impacts of the Project in reducing the visual bulk of the tanks. The smaller size of the LPG tank however, means this improvement is comparatively small in relation to the overall Project elements and not sufficient to alter the impact significance rating identified for the Draft EIS scheme.

8.2 POTENTIAL LANDSCAPE AND VISUAL IMPACTS RESULTING FROM REMOVAL OF THE BRIDGE AND ROAD FROM THE PROJECT SCOPE

Removal of the bridge and road from the scope of the assessment negate landscape and visual impacts resulting from these elements. In particular views from Targinie foreshore and The Narrows previously identified as major adverse significance in the Draft EIS scheme are no longer impacted in the amended Project.

8.3 LIGHTING IMPACTS ASSOCIATED WITH THE AMENDED LNG FACILITY CONSTRUCTION AND OPERATIONAL ACTIVITIES

8.3.1 Potential impacts resulting from night lighting during construction

The introduction of artificial lighting during construction night-shift work will not significantly increase lighting impacts identified in the Draft EIS. Potential light impacts to fauna species follow disturbance initiated by vegetation clearing operations and, as such, fauna will have been removed from the site to enable such activities. Potential light impacts will therefore mainly affect species foraging and roosting in the vicinity of operations. The two most likely impacts identified for fauna species are;

- Impacts of light spill on species using undisturbed habitat in the vicinity of the site; and
- Light attraction resulting in species re-entering the site for foraging purposes.

The Project's Fauna Management Plan should include measures to reduce these impacts including provision for removal/relocation of species re-entering the construction zone and management provisions for limiting light spill during construction activities.

The impacts of night lighting during construction night-shift work on human settlement was identified as perceptual, with no permanent impact on residential areas consistent with the findings identified in the Draft EIS.

8.3.2 Potential impacts resulting from night-lighting associated with the proposed alternative construction and operational routes

Additional marine activity associated with the proposed alternative construction and operational routes for the LNG Facility will not significantly alter the findings of the Draft EIS, which identified fixed and constant lighting as generally having a greater visual impact than that generated by marine traffic.

Increased vehicle traffic associated with the proposed construction and operational routes servicing Auckland Point are unlikely to result in significant impacts at night on light sensitive receptors as there is no direct line-of-sight between vehicle lights and residential properties, and the proposed routes are currently lit by fixed and constant artificial lighting.

Removal of the bridge from the scope of the assessment will result in a reduction in the impact of fixed lighting associated with this structure and a positive outcome for the highly sensitive landscape of The Narrows. Given the benefit of reduced fixed lighting and the slight increase in impact of marine lighting, the overall outcome for the Project will be a reduction in impacts when compared to the Draft EIS scheme.

8.4 POTENTIAL CUMULATIVE LANDSCAPE AND VISUAL IMPACTS RESULTING FROM DEVELOPMENTS WITHIN THE GLADSTONE STATE DEVELOPMENT AREA

The cumulative impacts of the QCLNG Project in combination with other planned future development within the GSDA, is expected to be most significant in relation to the proposed industrial projects on Curtis Island and Fisherman's Landing. Additional information available for assessment in the supplementary report builds on previous findings detailed in the Draft EIS. Assessment of this additional information however, results in no significance changes to the findings of the Draft EIS.

The most significant cumulative landscape and visual impacts of the QCLNG Project will be the combination of four LNG Facilities within the Curtis Island Industrial Precinct. The four major LNG projects each having 3 to 4 trains will potentially result in a combined site disturbances footprint of approximately 600 - 800 hectares and, excluding any future shared infrastructure provisions, include; 4 marine jetties and specialised LNG loading facilities, 12 – 16 LNG trains, 8 to 12 LNG storage tanks, and 8 Flare stacks and 4 marine flare stacks. The impact of four major LNG projects in this south-western section of Curtis Island will result in permanent alteration to the landscape character from the current predominantly undeveloped landscape, to a highly man-modified industrialised landscape. In addition to the land based impacts, the impact of marine facilities and shipping vessels will further alter the current semi-natural character of the Targinie passage to one of an industrialised working port.

The combination of the proposed LNG projects on Curtis Island, developments on Fisherman's Landing, Wiggins Island and potentially Hamilton Point, will further industrial the Targinie Passage creating a large industry precinct, dominated by man-modified elements, and visually linking with the industrial landscapes of the existing Gladstone waterfront port areas. Such development is consistent with the masterplan for future expansion of the Port of Gladstone as identified in the Port of Gladstone's 50 year Strategic Plan.

8.5 UPDATED IMPACT ASSESSMENT FOR THE AMENDED LNG PROJECT

Comparative assessment of the amended QCLNG Project against the results of the Draft EIS scheme are summarised as follows:

- Impacts to the natural 'wilderness' area of The Narrows passage landscape as recognised at International, National and State level will be reduced in significance by the amended Project as a result of removal of the bridge from the scope of work and the relocation of the LNG Facility inland;

- Impacts of the Project on the landscape values of Curtis Island will not be alter as a result of the supplementary amendments, slight improvements are achieved over the Draft EIS scheme, however these are no sufficient to alter the significance rating; and

- Impacts of the Project on the Great Barrier Reef World Heritage Area are reduced by the amended Project in relation to The Narrows landscape but remain for the Curtis Island landscape, however, Curtis Island impacts are consistent with the designated land use and general expansion of industry around the Port of Gladstone.

The amended Project results in improved performance outcomes for protection of the landscape values of Curtis Island and The Narrows. Such improvement largely results from relocation of the Facility outside the highly

sensitive intertidal shoreline areas. In order to achieve these performance outcomes, management and mitigation of this highly sensitive area will be required as part of the Project's Environmental Management Plan including the implementation of Protected Area Zones. Protection of the natural shoreline and intertidal vegetation will be importance in reducing impacts on designated values within Areas of State Significant (Coastal Landscapes).

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Annex A

Photomontages (A3)

VIEW LOOKING EAST FROM NORTH PASSAGE ISLAND ACROSS THE WATER TO THE SITE OF THE PROPOSED LNG FACILITY

PHOTOMONTAGE OF AMENDED LNG FACILITY LOOKING EAST FROM NORTH PASSAGE ISLAND

QUEENSLAND CURTIS LNG
A BG Group – QGC Alliance

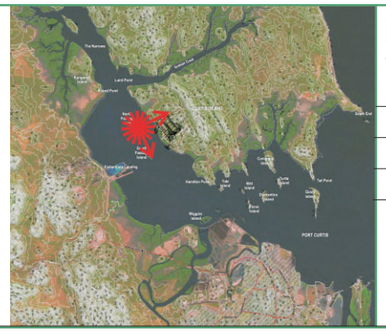
COORDINATES & ELEVATION

GPS 314480.2, 7370464.5

Elevation: 1.5m AHD

Distance from viewpoint to project structures:
LNG Facility 1 km to loading berth (approx)

This photomontage is based on survey data, GIS analysis, and 3D CAD modelling. Whilst all care is taken in preparing the model based on the available scientific data, the accuracy or completeness of base information has not been independently verified by ERM. The photomontage has been prepared using a digitally rendered 3D model to convey an impression of the proposed development for the purpose of representing an exiting view and potential changes to the view. The photomontage does not represent an accurate photo-realistic image of the proposed development.



PHOTOMONTAGES
VIEWPOINT 9

Project No:	0086165	Drawing No:	9
Date:	30/10/09	Drawing size:	A3
Drawn by:	TF	Reviewed by:	SC

QUEENSLAND CURTIS ISLAND LNG PROJECT

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VIEW OF THE PROPOSED LNG FACILITY SITE FROM TARGINIE FORESHORE

PHOTOMONTAGE OF THE AMENDED LNG FACILITY VIEWED FROM TARGINIE FORESHORE

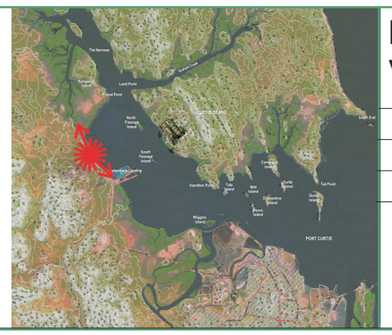
QUEENSLAND CURTIS LNG
A BG Group – QGC Alliance

COORDINATES & ELEVATION

N7369049.3 E311457.2
Elevation: 6m AHD

Distance from viewpoint to project structures:
LNG Facility 4 km to loading berth (approx)

This photomontage is based on survey data, GIS analysis, and 3D CAD modelling. Whilst all care is taken in preparing the model based on the available scientific data, the accuracy or completeness of base information has not been independently verified by ERM. The photomontage has been prepared using a digitally rendered 3D model to convey an impression of the proposed development for the purpose of representing an exiting view and potential changes to the view. The photomontage does not represent an accurate photo-realistic image of the proposed development.



PHOTOMONTAGES
VIEWPOINT 8B

Project No:	0086165	Drawing No:	8b
Date:	30/10/09	Drawing size:	A3
Drawn by:	TF	Reviewed by:	SC

QUEENSLAND CURTIS LNG PROJECT

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VIEW LOOKING SOUTHEAST TOWARDS CURTIS ISLAND, AT APPROX 1KM FROM THE ENTRANCE TO THE NARROWS

PHOTOMONTAGE OF AMENDED LNG FACILITY AT APPROX 1 KM FROM ENTRANCE TO THE NARROWS

QUEENSLAND CURTIS LNG
A BG Group – QGC Alliance

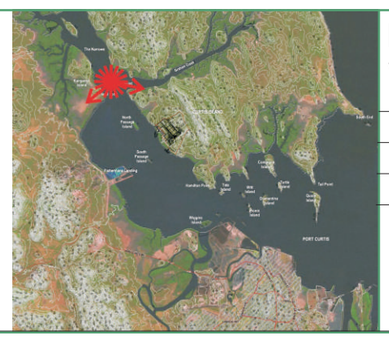
COORDINATES & ELEVATION

N7373476 E312757

Elevation: 1.5m AHD

Distance from viewpoint to project structures:
LNG Facility 4.2 km to marine facility (approx)

This photomontage is based on survey data, GIS analysis, and 3D CAD modelling. Whilst all care is taken in preparing the model based on the available scientific data, the accuracy or completeness of base information has not been independently verified by ERM. The photomontage has been prepared using a digitally rendered 3D model to convey an impression of the proposed development for the purpose of representing an exiting view and potential changes to the view. The photomontage does not represent an accurate photo-realistic image of the proposed development.



PHOTOMONTAGES
VIEWPOINT 11A

Project No:	0086165	Drawing No:	11a
Date:	30/10/09	Drawing size:	A3
Drawn by:	TF	Reviewed by:	SC

QUEENSLAND CURTIS LNG PROJECT

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