APPENDIX 1

ARROW LNG PLANT

Supplementary Air Quality Assessment

arrow energy
go further

Supplementary Air Quality Assessment – Arrow LNG Plant

Prepared for

Arrow CSG (Australia) Pty Ltd (Arrow Energy) and Coffey Environments Australia Pty Ltd

12004

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Final

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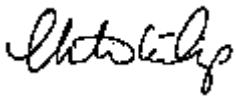
1.0	3/12/2012	Christine Killip	

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1. Introduction

Katestone Environmental Pty Ltd (Katestone) has been commissioned by Coffey Environments Australia Pty Ltd (Coffey), on behalf of Arrow CSG (Australia) Pty Ltd (Arrow Energy) to undertake a supplementary assessment to the air quality impact assessment conducted for the environmental impact statement (EIS) for the proposed Arrow LNG Plant, a component of the larger Arrow LNG Project.

Katestone conducted the air quality impact assessment for the Arrow Energy LNG Plant EIS. Katestone compiled an emissions inventory for all applicable emission sources resulting from project activities (routine and non-routine operations) and assessed the potential impacts on the Gladstone region. The assessment utilised the Gladstone Airshed Modelling System (Version 3) (GAMS), consistent with what was used in the EIS air quality assessment. Site meteorological conditions and factors influencing air quality were also identified and assessed, including discussions of adverse conditions over the life of the project. A cumulative assessment was prepared for existing and approved industries in the region, including other LNG facilities on Curtis Island and Fishermans Landing, to capture the maximum potential impacts of key air pollutants.

Since the exhibition of the EIS, the front end engineering design (FEED) has been completed and Arrow Energy has subsequently modified some key components of the project. The main changes relevant to air quality include changes to power options, plant layout, carbon monoxide emissions and diesel consumption.

A review of the project information including the recent refinement supplied by Arrow Energy indicates that, from an air quality perspective, the changes proposed to the LNG plant are relatively minor. Hence, for the majority of air pollutants likely to be emitted by the LNG plant, the outcomes of the EIS air quality impact assessment remain valid. The following components from the EIS air quality impact assessment remain substantially unchanged, and were therefore not considered in this supplementary air quality impact assessment:

- Non-routine operations
- 50% load option for the gas turbines
- All pollutants other than nitrogen dioxide

No changes are required to the method of the assessment that was used in the EIS air quality impact assessment because:

- There have been no changes to the relevant legislation since the EIS air quality impact assessment was carried out.
- The background air quality data included in the EIS modelling have not changed. No additional industries within the region have been added that could impact the existing air quality since the EIS air quality impact assessment was conducted.
- Continuity and comparability of the assessments is ensured by utilising a methodology consistent with the EIS air quality assessment.

The EIS air quality impact assessment demonstrated that the most critical air pollutant associated with routine operations of the LNG plant was nitrogen dioxide. Hence, this supplementary air quality assessment focuses on the levels of nitrogen dioxide from full load, routine operations.

This report details the outcomes of a supplementary study to address changes to key components of the air quality impact assessment for the Arrow Energy LNG Plant EIS.

2. Project Description

2.1 Arrow Energy modifications

Since the exhibition of the Arrow LNG EIS, through completion of front end engineering design, Arrow Energy has made a number of modifications to the project. The modifications revolve around the LNG plant layout, power generation options and revised input data. The modifications to the project that are relevant to the supplementary air quality assessment are as follows:

- Plant layout– the auxiliary plant has moved from the east to the west side of the plant:
  - Updated location of power generation gas turbines
  - Updated location of gas turbine compressors
  - Updated location of the flare stack
- Source characteristics
  - Flare stack increased from 110 metres to 115 metres
  - Removal of operational flare (F-OP)
- Power options
  - 'all mechanical option' – this is the preferred option, and also referred to as the 'power island mode'
  - 'partial auxiliary power option' – hybrid mechanical and electrical

The power generation options for the project have been revised as part of the modifications to project design. The worst case power generation option for the air quality assessment is the 'all mechanical' option. This has not changed from the EIS in terms of proposed infrastructure requirements. The modified Arrow LNG site layout is shown in Figure 1 and the updated coordinates of the power generation gas turbines, gas turbine compressors and flare are provided in Table 1.

Table 1 Coordinates of stacks for the modified Arrow LNG plant (UTM WGS-84 Zone 56S)

Source	Easting	Northing
Power Generation Gas Turbine 1	319,395	7,369,498
Power Generation Gas Turbine 2	319,391	7,369,466
Power Generation Gas Turbine 3	319,387	7,369,435
Power Generation Gas Turbine 4	319,369	7,369,295
Power Generation Gas Turbine 5	319,365	7,369,264
Power Generation Gas Turbine 6	319,361	7,369,232
Power Generation Gas Turbine 7	319,357	7,369,200
Power Generation Gas Turbine 8	319,353	7,369,168
Train 1 Gas Turbine 1	319,677	7,369,550
Train 1 Gas Turbine 2	319,793	7,369,536
Train 2 Gas Turbine 3	319,650	7,369,342
Train 2 Gas Turbine 4	319,766	7,369,327
Train 3 Gas Turbine 5	319,625	7,369,133
Train 3 Gas Turbine 6	319,741	7,369,118
Train 4 Gas Turbine 7	319,599	7,368,925
Train 4 Gas Turbine 8	319,715	7,368,910
Flare	319,665	7,368,687

3. Legislative Context

There are no changes to the air quality objectives used in the air quality impact assessment for the EIS.

The most critical changes associated with the revised project description from an air quality perspective are changes to ground-level concentrations of nitrogen dioxide.

For the purposes of this assessment, predicted ground-level concentrations of nitrogen dioxide were compared with the air quality objectives as defined in the *Environmental Protection (Air) Policy 2008* (Air EPP). The relevant air quality objectives for nitrogen dioxide, used in the assessment, are summarised in Table 2.

Table 2 Air quality objectives for nitrogen dioxide defined in the Air EPP

Environmental value	Averaging period	Air quality objective (µg/m³)	Number of days of exceedance allowed per year
Health and wellbeing	1-hour	250	1
	1-year	62	N/A
Health and biodiversity of ecosystems		33	N/A

4. Methodology

The supplementary air quality assessment was conducted following the methodology developed for the EIS air quality impact assessment. This is discussed in the detail in Section 3 of the air quality impact assessment of the EIS (Katestone Environmental, 2011).

The following components from the EIS air quality impact assessment remain substantially unchanged, and were therefore not considered in this supplementary air quality assessment:

- Non-routine operations
- 50% load option for the gas turbines
- All pollutants other than nitrogen dioxide.

Emission rates and stack parameters of the gas turbine generators, gas turbines, flare pilot, LNG carriers and tug boats remain consistent with the emissions sources included in the air quality impact assessment conducted for the EIS and have not been changed. These are summarised in Table 3. Updated locations of the gas turbine generators, gas turbines, and flare pilots are based on GIS data provided by Coffey.

Based on the EIS air quality impact assessment, nitrogen dioxide was identified as the critical pollutant. Predicted ground-level concentrations of all other pollutants due to the Arrow Energy LNG plant were low compared to their respective air quality objectives. In general, pollutant concentrations were less than 10% of the air quality objectives for all averaging periods. Therefore, other pollutants were not assessed further.

Table 3 Emission rates and stack parameters of emissions sources in the Arrow Energy LNG Plant

Parameter	Gas turbine generators	Gas turbines	LNG Carriers	Tugs	Flare Pilot
Quantity	8	8	1	4	2 Cold Dry 1 Warm Wet 1 Storage and Loading
Stack Height (m)	25	40	37	6	116.05[a]
Stack Diameter (m)	4	5	1.7	0.65	0.29[b]
Exit Velocity (m/s)	15.4	15.0	20.0	6.7	20
Stack Temperature (K)	800.25	473.15	1273	827.45	1273
NO_X emission rate - each (g/s)	3.39	8.7	77.03	8.3	0.02

Notes:
[a] The stack height is an effective modelled height which is related to the energy release of the flare
[b] Effective diameter.

Following the updated project description, the supplementary air quality assessment was conducted to assess levels of nitrogen dioxide at sensitive receptors and the surrounding environment that are due to the worst-case scenario, which is the operation of the Arrow Energy LNG Plant as the 'all mechanical' option. The operation of the Arrow Energy LNG Plant in 'partial auxiliary power option' would have lower air quality impacts and has not been explicitly modelled. This is due to fewer power generation units operating and therefore lower emissions from the plant. The impacts of the 'all mechanical' option predicted in this supplementary air quality assessment have been compared to the impacts for the 'all mechanical' option from the EIS air quality impact assessment.

Emissions were explicitly modelled using the CALPUFF dispersion model, consistent with the EIS air quality impact assessment. The levels of nitrogen dioxide due to the project were assessed in isolation and with the inclusion of existing levels of pollutant concentrations generated using GAMS. A summary of the industries included in GAMS and included as background sources is presented in Table 4.

Table 4 Modelled annual emissions of oxides of nitrogen dioxide from industries included in GAMS

Facility	Emission rate (t/yr)
	Oxides of nitrogen
NRG Gladstone Power Station	43,621
Queensland Alumina Ltd	7,973
Boyne Smelters Ltd	-
Rio Tinto Aluminium Yarwun Stage 1	3,690
Rio Tinto Aluminium Yarwun Stage 2[1]	2,886
Cement Australia	4,457
Orica	300
Australia Pacific LNG[1]	3,250
Queensland Curtis LNG[1]	2,562
Gladstone LNG[1]	2,369
LNG Limited Fishermans Landing[1]	363

Table note:
[1] Approved but not built at the time of this EIS study

This assessment considered impacts at the same sensitive receptors considered in the air quality assessment for the EIS. The Arrow LNG Plant will be situated approximately 1.6km north of the nearest single residence on Tide Island in Port Curtis, 4.5km northwest of the major residential areas in Gladstone City, and 8km to the west of the community at South End. The closest sensitive receptors are the accommodation camps identified for the Arrow LNG Plant and the other LNG facilities proposed for Curtis Island. The locations of the workforce accommodation camps have been incorporated in to the area assessed.

The predicted maximum ground-level concentration of each pollutant in each receptor area based on the 250 metre modelling grid resolution has been assessed. The sensitive receptor areas are illustrated in Figure 2.

- Mainland Locations:Gladstone
- Tannum Sands
- Yarwun
- Fishermans Landing
- Curtis Island Locations:- South End
- LNG accommodation camps for the Arrow LNG Plant, APLNG, QCLNG and GLNG
- Island receptors including:
- Tide Island, Witt Island, Compigne Island, Quoin Island and Turtle Island

In addition to predicting impacts at sensitive receptors, ground-level concentrations of nitrogen dioxide were also predicted at a network of evenly-spaced gridded receptors within the modelling domain. Contour plots indicative of ground-level concentrations were used to illustrate the spatial distribution of pollutant levels. These were created from the predicted impacts due to the Arrow Energy LNG plant operations in isolation and with the inclusion of background levels at the gridded receptors.

5. Modelling Results

Ground-level concentrations of pollutants at the sensitive receptors were assessed. Predicted 99.9th percentile 1-hour and annual average ground-level concentrations of nitrogen dioxide at sensitive receptor regions attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option are presented in Table 5.

Table 5 shows that the ground-level concentrations of nitrogen dioxide due to the operation of the Arrow Energy LNG Plant in isolation are predicted to **comply** with the relevant air quality objectives for all averaging periods within the sensitive receptor regions. Ground level concentrations of NO_2 comply with the relevant air quality objectives for all averaging periods at the Arrow construction camp, the closest sensitive receptor to the emission sources.

The cumulative results (which take into account other projects impacting the air quality in the region) show that the predicted annual average ground-level concentrations of nitrogen dioxide **comply** with the relevant air quality objective for all receptor zones. The predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide **exceed** the relevant air quality objective at Gladstone. The high 1-hour average concentrations of nitrogen dioxide at this location can be attributed to other existing industry, as the objective is exceeded without the inclusion of the Arrow LNG Plant within GAMS.

Table 5 Predicted 99.9th percentile 1-hour and annual average ground-level concentrations of nitrogen dioxide (µg/m³)

Sensitive receptor region	Arrow LNG ('all mechanical' option) in isolation		GAMS background		Arrow LNG ('all mechanical' option) plus GAMS background	
	1-hour average[3]	Annual average	1-hour average[3]	Annual average	1-hour average[3]	Annual average
Gladstone	45.9	0.4	**257.1**	8.6	**257.7**	8.8
Tannum Sands	9.9	0.1	32.7	0.5	34.8	0.6
Targinie	54.3	1.0	76.8	7.4	76.8	8.1
Yarwun	49.5	0.6	102.6	7.4	106.2	7.6
Fishermans Landing	30.6	0.5	82.8	5.9	82.8	6.3
Southend	30.0	0.2	34.2	0.4	39.3	0.5
Island receptors[4]	60.9	1.0	45.2	0.9	65.0	1.9
Construction camps[5]	148.7	6.8	52.4	1.3	148.7	8.0
Maximum % of air quality objective	59.5	11.0 / 20.6	102.8	13.9 / 26.2	103.1	14.1 / 26.5
Air quality objective	***250***	***62[1] /33[2]***	***250***	***62[1] /33[2]***	***250***	***62[1] /33[2]***

Table notes:
[1] Objective for health and wellbeing
[2] Objective for health and biodiversity of ecosystems
[3] 99.9th percentile, 1-hour average
[4] Value represents the maximum ground-level concentration predicted at all of the sensitive receptors situated on islands in Port Curtis
[5] Value represents the maximum ground-level concentration predicted at all of the construction camps situated on Curtis Island

Contour plots indicative of ground-level concentrations of pollutants within the modelling domain are presented (Figure 3 to Figure 6). These were created from the predicted ground-level concentrations at the network of gridded receptors within the modelling domain and converted to contours using a standard interpolation technique. Contour plots are presented to illustrate the spatial distribution of dust levels. However, the process of interpolation causes smoothing of the base data that can lead to minor differences between the contours and discrete model predictions.

Impacts on specific points of interests, such as identified residences, are assessed as sensitive receptors in the model. Ground-level concentrations of pollutants predicted by the model at these locations have been tabulated.

Contour plots showing the predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide are shown in Figure 3 and Figure 4, respectively. These are indicative of the predicted impacts on the surrounding environment due to the Arrow Energy LNG Plant operating in 'all mechanical' option.

Figure 3 shows that impacts of the plant in isolation **comply** with the air quality objectives within the sensitive receptor regions. Within the modelling domain, there is a single point of exceedance at the location of ship loading activities associated with the Arrow Energy LNG

Plant (marked by the red cross) where the predicted 99.9th percentile 1-hour average NO_2 concentration is higher than the air quality objective of 250 µg/m^3. However, this location, as part of the industrial complex, is not a sensitive receptor; hence, the air quality objectives do not apply.

Figure 4 shows that the cumulative impacts of the plant and existing levels of nitrogen dioxide are predicted to **exceed** the air quality objective at the Gladstone sensitive receptor region. In addition to the area of exceedance at the location of ship loading activities, there is a small area approximately 7 km south of the site on the mainland where concentrations are predicted to be higher than the 250 µg/m^3 objective. The high 1-hour average concentrations of nitrogen dioxide at this location can be attributed to other existing industry, as the objective is exceeded without the inclusion of the Arrow LNG Plant within GAMS.

Contour plots showing the predicted annual average ground-level concentrations of nitrogen dioxide are shown in Figure 5 and Figure 6, respectively. These are indicative of the predicted impacts on the surrounding environment of the Arrow Energy LNG Plant operating in 'all mechanical' option. The impacts of the plant in isolation **comply** with the air quality objectives across the entire model domain. The cumulative impacts of the plant and existing levels of nitrogen dioxide also are predicted to **comply** with the air quality objectives across the entire model domain.

5.1 Comparison with EIS

The predicted 99.9th percentile 1-hour and annual average ground-level concentrations of nitrogen dioxide at sensitive receptor regions attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option are presented in Table 6. For comparison, impacts from the operation of the plant in 'all mechanical option,' as assessed in the EIS air quality assessment are also presented. Ground-level concentrations of nitrogen dioxide predicted at the sensitive receptors from the EIS air quality assessment are summarised in Table 6. The table shows that there are no significant differences between the predicted air quality impacts of the new plant configuration and the configuration assessed in the EIS.

Table 6 Predicted 99.9th percentile 1-hour and annual average ground-level concentrations of nitrogen dioxide (µg/m³)

Sensitive receptor region	Arrow LNG ('all mechanical' option) in isolation as assessed in the EIS		Arrow LNG ('all mechanical' option) in isolation	
	1-hour average[3]	Annual average	1-hour average[3]	Annual average
Gladstone	45.6	0.4	45.9	0.4
Tannum Sands	9.7	0.1	9.9	0.1
Targinie	54.0	1.0	54.3	1.0
Yarwun	49.5	0.6	49.5	0.6
Fishermans Landing	30.3	0.5	30.6	0.5
Southend	30.0	0.2	30.0	0.2
Island receptors[4]	60.5	1.0	60.9	1.0
Construction camps[5]	147.5	6.7	148.7	6.8
Maximum % of air quality objective	59.0	10.8 / 20.3	59.5	11.0 / 20.6
Air quality objective	***250***	***62[1] /33[2]***	***250***	***62[1] /33[2]***

Table notes:

[1] Objective for health and wellbeing

[2] Objective for health and biodiversity of ecosystems

[3] 99.9th percentile, 1-hour average

[4] The reported value represents the maximum ground-level concentration predicted at all of the sensitive receptors situated on islands in Port Curtis

[5] The reported value represents the maximum ground-level concentration predicted at all of the construction camps situated on Curtis Island

6. Management Measures

The Arrow LNG design philosophy is based on the following principle:

> *Minimisation through abatement at source of gaseous emissions that have the potential of causing negative impact on the environment (Arrow LNG Project: Basis of Design Report)*

The avoidance, mitigation and management measures discussed in the air quality impact assessment of the EIS remain applicable after full consideration of the changes in project design. In particular, the following specifications and requirements are applicable to emissions:

- Compliance with all relevant national ambient air quality standards and objectives including the Air NEPM, Air Toxics NEPM and the Air EPP.
- During start-up and shutdown controlled flaring is part of the operational procedure. The operations philosophy shall cover all situations where gas flaring is needed as a consequence of operational upsets.
    - The flare shall be luminous and bright (i.e., show smokeless combustion at operating design gas flow rate). The relative density of emitted smoke shall not exceed No. 1 Ringelmann Number. Maximum allowed exceedence is 5 min/hr with an aggregated 15 min/24 hrs.
- To minimise fugitive emissions from sources such as pumps, seals, valves, connectors and pipe work. The latest proven stage of development of processes, facilities and methods of operation shall be applied, including closed draining, minimising the number of flanges, installation of dry gas seals on compressors, vapour recovery systems and where applicable, double seals for hydrocarbon pumps. The project shall develop and include the new equipment in the existing leak detection and maintenance plan.
- The Arrow Energy LNG Plant will only use low sulfur diesel (max 0.01% sulfur by mass) in diesel powered generators
- Boil off gas originating from stored LNG (including return vapours from the LNG carrier) shall be collected using an appropriate vapour recovery system (e.g. compressor system) and not be released to air
- Low emissions technology (e.g. Dry Low-NO_X (DLN) burners shall be applied throughout for significant combustion equipment (e.g. gas turbines).
- The design shall include provisions to install adequate equipment to monitor and record stack emissions for which regulatory limits exist and/or for which performance statistics are required. All monitoring and recording shall in principle be based on automatic on-line technology, in line with current best practice. All stacks shall be fitted with emissions monitoring ports suitable for continuous monitoring even if continuous monitoring is not recommended/possible, in order to facilitate future monitoring if required.
- Ground-level concentrations of air pollutants at the construction camp shall not exceed the relevant ambient air quality standards and objectives identified for the air quality assessment.
- New installations shall not use chlorofluorocarbons (CFC), halogens or related materials listed as banned under the Montreal Protocol..

7. Conclusions

Katestone Environmental Pty Ltd (Katestone) has been commissioned by Coffey Environments Australia Pty Ltd (Coffey), on behalf of Arrow CSG (Australia) Pty Ltd (Arrow Energy) to undertake a supplementary assessment to the air quality impact assessment conducted for the environmental impact statement (EIS) for the proposed Arrow LNG Plant, a component of the larger Arrow LNG Project. The results of the supplementary air quality assessment show that:

- In isolation:
  - Annual average ground-level concentrations of nitrogen dioxide attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option **comply** with the relevant air quality objective at all sensitive receptors.
  - The predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option **comply** with the relevant air quality objective at all sensitive receptors. Within the modelling domain, there is a single point of exceedance at the location of ship loading activities associated with the Arrow Energy LNG Plant (marked by the red cross) where the predicted concentration is higher than the air quality objective of 250 µg/m^3. However, this location, as part of the industrial complex, is not considered a sensitive receptor.
- With the inclusion of background:
  - Annual average ground-level concentrations of nitrogen dioxide attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option **comply** with the relevant air quality objective at all sensitive receptors.
  - The predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide attributed to the Arrow Energy LNG Plant operating in 'all mechanical' option **exceeds** the relevant air quality objective at Gladstone. The high concentrations of nitrogen dioxide at this location can be attributed to other existing industry, as the objective is exceeded without the inclusion of the Arrow LNG Plant within GAMS. Within the modelling domain, exceedances of the air quality objective also occur at the location of ship loading activities associated with the Arrow Energy LNG Plant. However, this location, as part of the industrial complex, is not considered a sensitive receptor.

The avoidance, mitigation and management measures discussed in the air quality impact assessment of the EIS remain applicable after full consideration of the changes in project design.

8. References

Environmental Protection Agency, 2008. “Environmental Protection (Air) Policy”, Subordinate Legislation 2008 No. 441 and amendments, Office of the Queensland Parliamentary Counsel, Queensland.

Katestone Environmental, 2011, “Air Quality Impact Assessment Arrow LNG Plant”, prepared for Arrow CSG Pty Ltd (Arrow Energy) and Coffey Environments Australia Pty Ltd

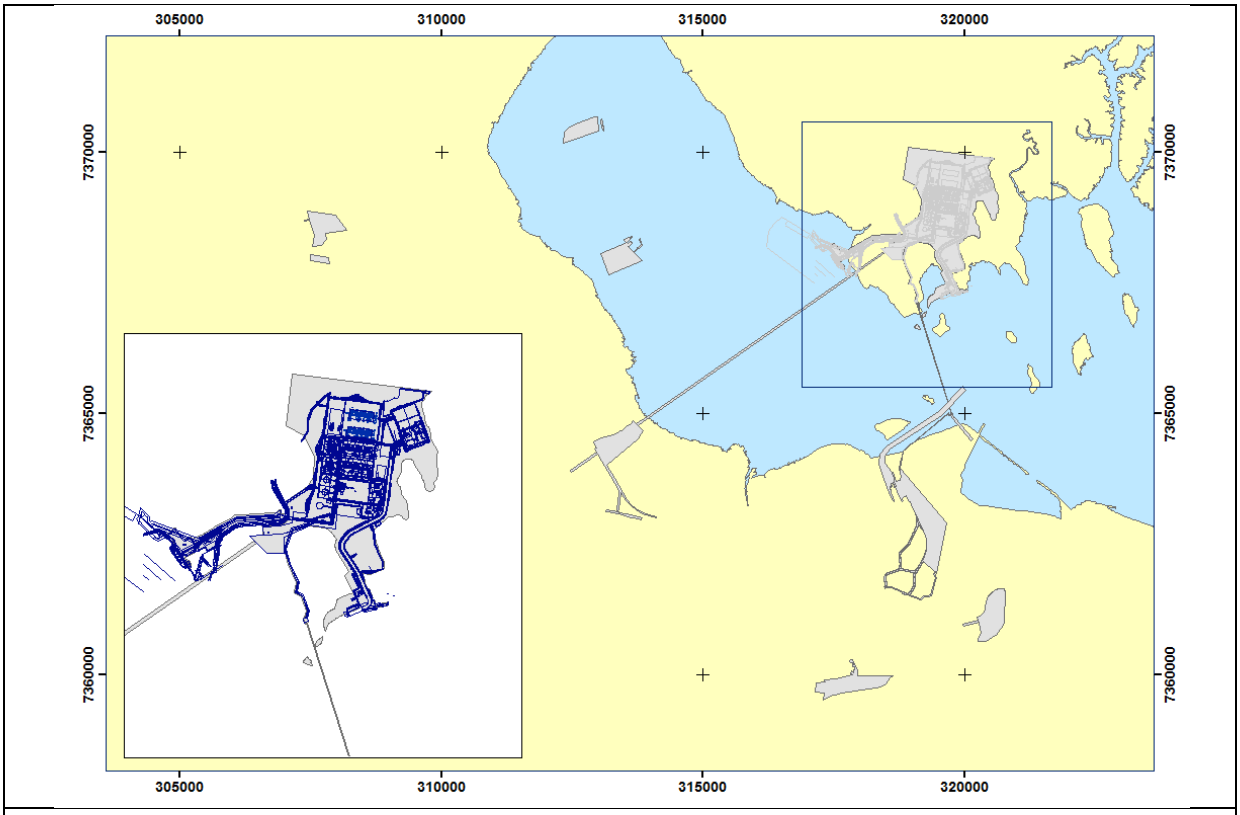

Figure 1 Updated site map

Location: Curtis Island, Queensland	**Data source:** GIS data supplied by Coffey	**Units:** UTM WGS-84 Zone 55 S (metres)
Type: Site map	**Prepared by:** Ella Castillo	**Date:** August 2012

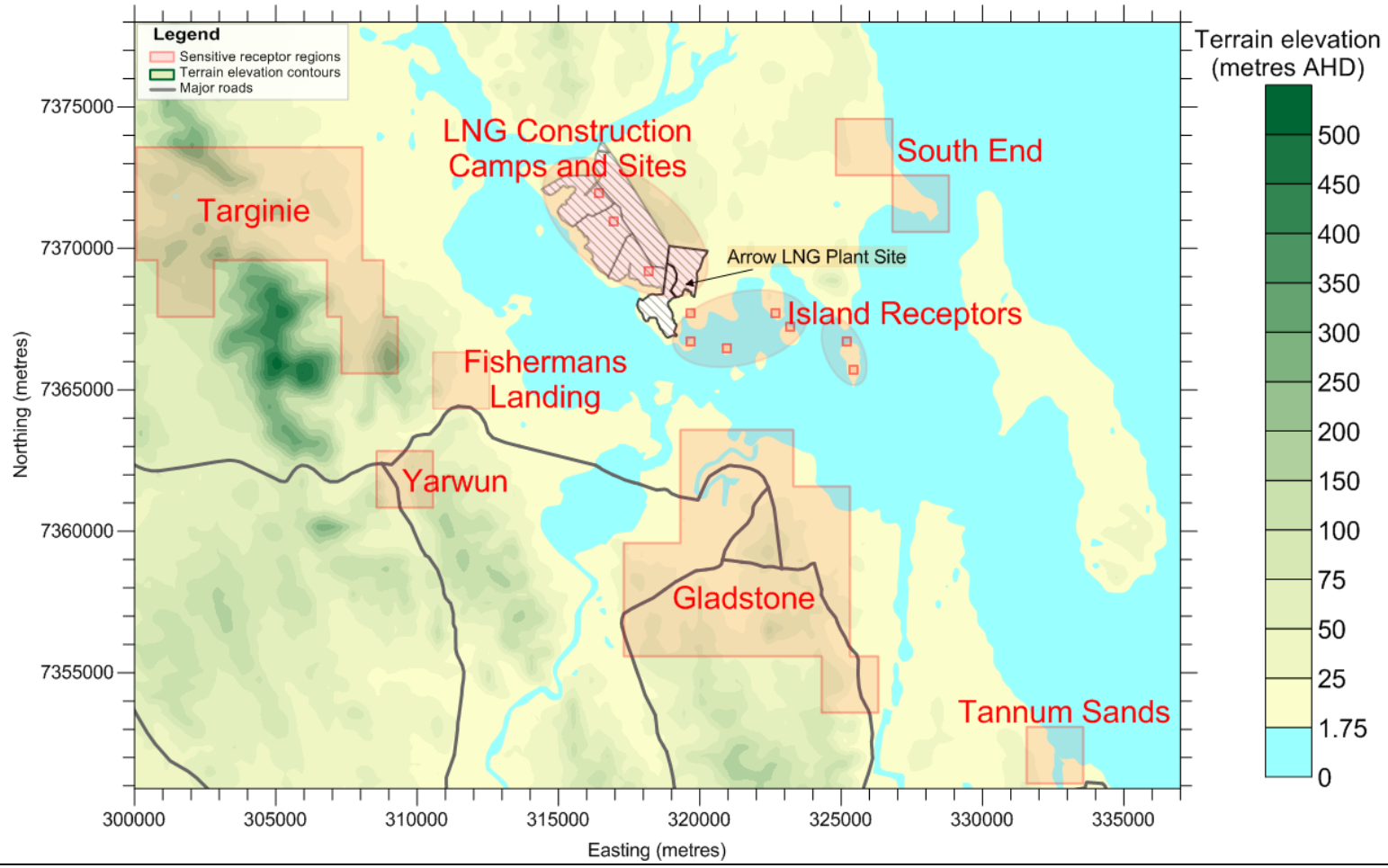

Figure 2 Location of sensitive receptor assessment areas

Location: Gladstone region, QLD	**Type:** Map	**Date:** June 2011	**Prepared by:** S. Menzel

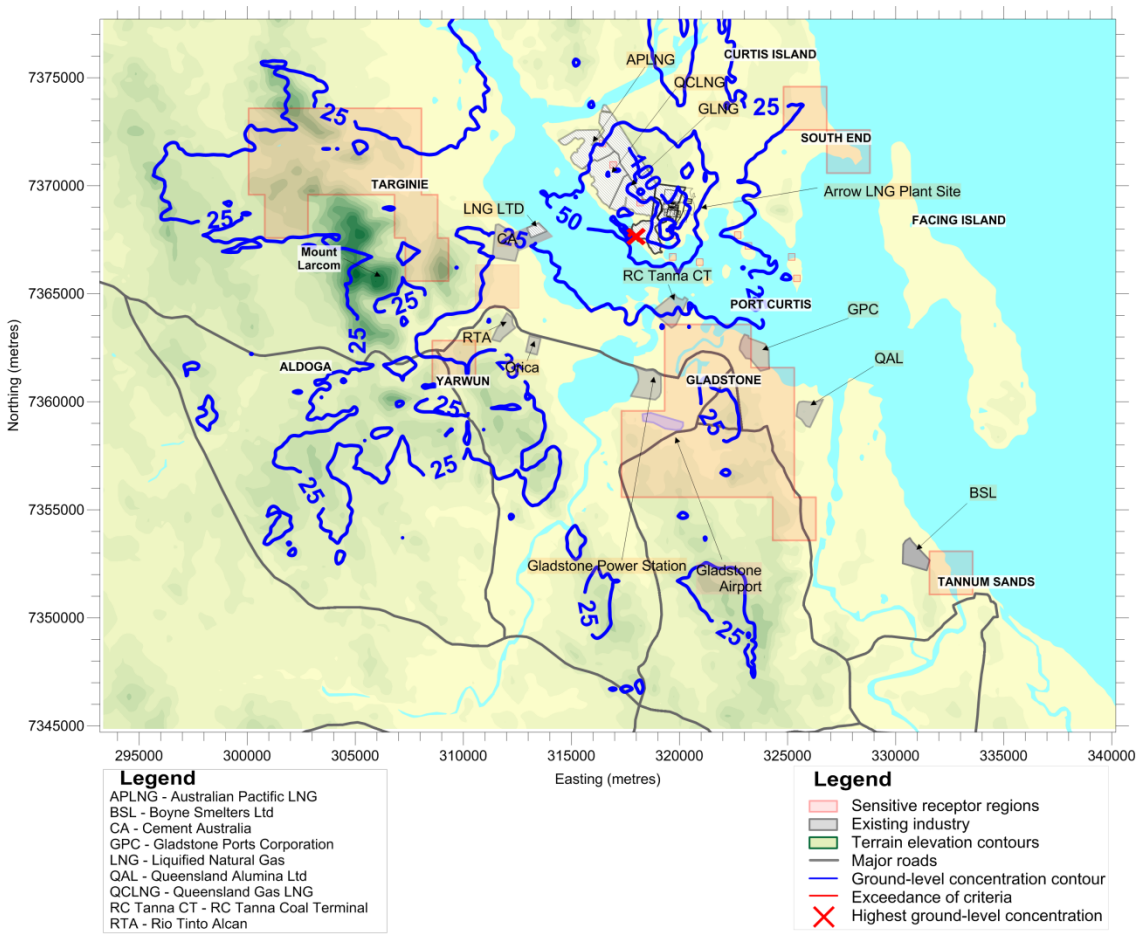

Figure 3 **Predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide for the Arrow Energy LNG Plant ('all mechanical' option) in isolation**

Location: Gladstone, Queensland	**Averaging period:** 1-hour	**Data source:** CALPUFF	**Units:** µg/m³
Type: Contour plot	**Objective:** Health and wellbeing: 250 µg/m³	**Prepared by:** Kyle Wright	**Date:** August 2012

Figure 4 **Predicted 99.9th percentile 1-hour average ground-level concentrations of nitrogen dioxide for the Arrow Energy LNG Plant ('all mechanical' option) with background**

Location:	**Averaging period:**	**Data source:**	**Units:**
Gladstone, Queensland	1-hour	CALPUFF	µg/m³
Type:	**Objective:**	**Prepared by:**	**Date:**
Contour plot	Health and wellbeing: 250 µg/m³	Kyle Wright	August 2012

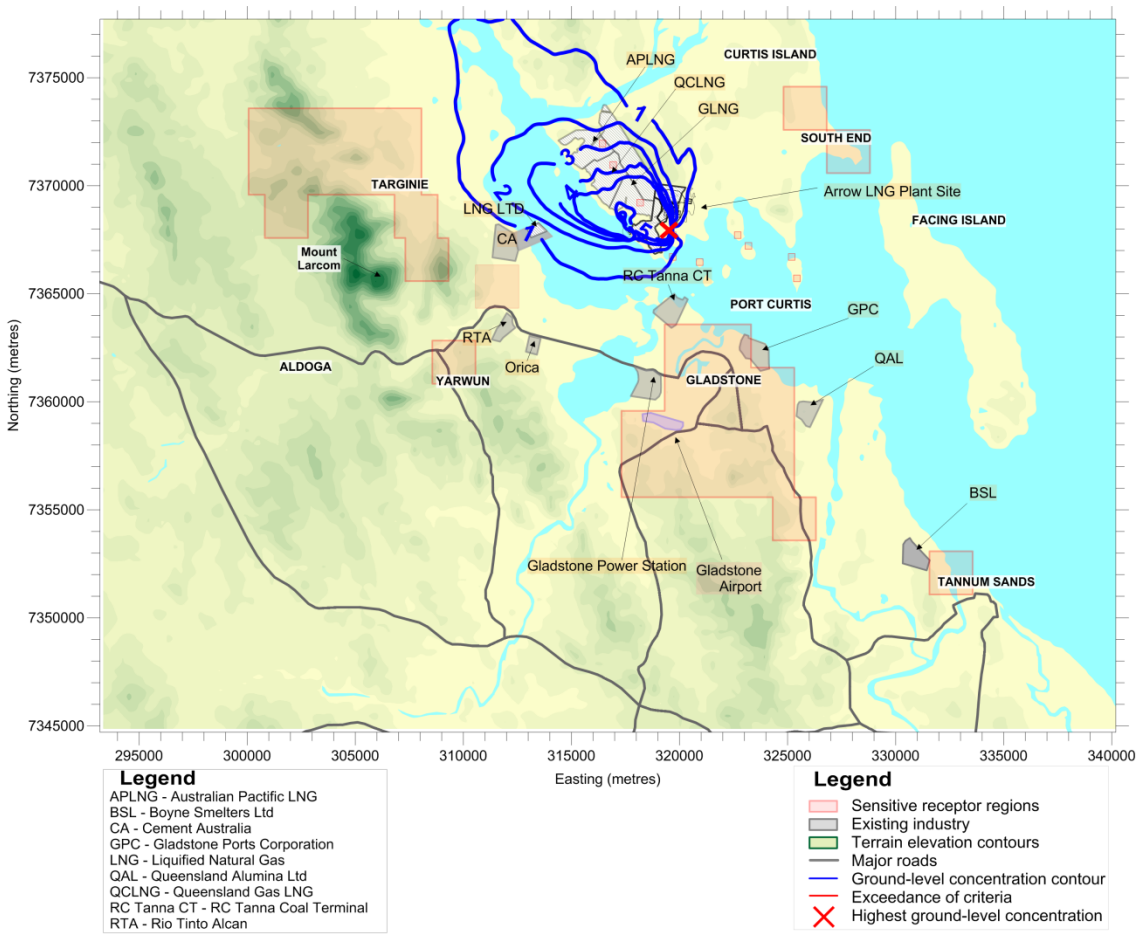

Figure 5 Predicted annual average ground-level concentrations of nitrogen dioxide for the Arrow Energy LNG Plant ('all mechanical' option) in isolation

Location: Gladstone, Queensland	**Averaging period:** Annual	**Data source:** CALPUFF	**Units:** µg/m³
Type: Contour plot	**Objective:** Health and wellbeing: 62 µg/m³ Health and Biodiversity of ecosystems: 33 µg/m³	**Prepared by:** Kyle Wright	**Date:** August 2012

Figure 6 Predicted annual average ground-level concentrations of nitrogen dioxide for the Arrow Energy LNG Plant ('all mechanical' option) in with background

Location:	**Averaging period:**	**Data source:**	**Units:**
Gladstone, Queensland	Annual	CALPUFF	µg/m³
Type:	**Objective:**	**Prepared by:**	**Date:**
Contour plot	Health and wellbeing: 62 µg/m³ Health and Biodiversity of ecosystems: 33 µg/m³	Kyle Wright	August 2012