



Northeast Business Park Net Benefit Assessment

FINAL REPORT

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Northeast Business Park

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Executive Summary

Background

Northeast Business Park Pty Ltd is in the process of developing a marina based mixed use business and industry employment hub in the Caboolture region of Southeast Queensland, which is referred to as the Northeast Business Park.

The proposed Northeast Business Park will occupy a 795 hectare site, which includes approximately nine kilometres of river frontage to the Caboolture River and is approximately eight kilometres from the river mouth.

The site is strategically situated within proximity to existing major business centres as well as areas of projected growth in the Northern Corridor of South East Queensland. The site also adjoins the eastern edge of the Bruce Highway and supports an identified Queensland Priority Industry, the marine sector (Queensland Government, 2007).

The Northeast Business Park proposal will develop a mixed-use business park and marine precinct featuring commercial, retail, residential, golf course, environmental areas as well as recreational areas (including sports fields, walking/ bike trails and river platforms, etc) centred on an eastern marina and marina facilities.

The commercial and economic benefits (e.g. business and turnover growth, value added production, meeting demand for industrial land) generated through the development of Northeast Business Park commercial precinct are relatively straightforward. It is the integrated nature of the site, including open space, community facilities, recreational infrastructure, and the provision of environmental areas and water management initiatives such as the use of recycled water that deliver the social and environmental benefits of the development.

Purpose of the Report

The purpose of this report is to demonstrate the development of the proposed Northeast Business Park provides a net benefit to the state of Queensland.

On 21st June 2006, the Coordinator General declared the Northeast Business Park project a significant project under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971 (SDPWOA)*. As such, an Environmental Impact Statement (EIS) is required in accordance with Part 4 of the *SDPWOA*.

Additionally, as the proposed Northeast Business Park triggers assessable development under the *Coastal Protection and Management Act 1995 (CPM Act)* policies within the *State Coastal Management Plan (SCMP)* and the *Southeast Queensland (SEQ) Regional Coastal Management Plan (RCMP)* apply which require the development to demonstrate that it provides a net benefit for the State of Queensland.

The definition under the RCMP of a net benefit for the State is as follows:

"there is a net benefit (taking into account all financial, social and environmental impacts) to the State as a whole, as distinct from sectorial, commercial, private or regional gain, and the proposal delivers the greatest net benefit of all viable alternatives".

Policies within the SCMP and RCMP identified, in consultation with Queensland EPA, as triggering the net benefit assessment in relation to the proposed Northeast Business Park development include:

- 2.1.3: Coastal-dependent land uses;
- 2.1.4: Canals and dry land marinas;
- 2.1.5: Maritime infrastructure;
- 2.1.9: Reclamation; and
- 2.8.1: Areas of state significance (natural resources).

The purpose of this report is to assess the suitability of the proposed development according to the requirements of the *SCMP* and *RCMP* for the development of the Northeast Business Park. This requires assessing the net benefit of the development compared to the current site usage across the triple bottom line (economic, social and environmental). Where the positive impacts of development exceed the negative impacts, the development will be deemed to deliver a positive net benefit.

Focus & Scope of the Net Benefit Assessment

All major inputs for the construction of the proposed Northeast Business Park (e.g. labour and materials) sourced from Queensland are expected to be sourced from within the southeast Queensland region, as this is the major service and distribution centre for the state. Similarly all economic benefits associated with the development are anticipated to be experienced within the southeast Queensland region, along with all identified social and environmental benefits and costs. With all impacts (positive and negative, across the triple bottom line) associated with the development experienced within the southeast Queensland region, the analysis has assumed an assessment at the southeast Queensland level is representative of impacts at the state level.

There is some contention as to if the requirement for the net benefit assessment pertains to just those aspects of the development within the Coastal Management District (CMD), for which EPA has an assessment role, or the Coastal Zone, for which EPA can act as advice agency.

The CMD (formerly referred to as the erosion prone area) was remapped as part of the NEBP development proposal by Cardno (2007) using detailed ground surface level survey data, QASCO high resolution aerial photography (June 2007) and ground truthed vegetation mapping (with the landward extent of mangrove occurrence used as the basis for determining the functional MHWS levels across the site and the landward extent of salt marsh vegetation was used as the basis for determining the functional HAT levels across the site).

The coastal zone has been defined under the RCMP as including *"coastal water; or all areas to the landward side of coastal waters in which there are physical features, ecological or natural processes or human activities that affect, or potentially affect, the coast or coastal resources"*

This analysis understands that the triggers under the CPM Act refer to works within the CMD, however, this assessment needs to consider the entire proposed development, which is a highly integrated and interdependent design and which pertains to works in the coastal zone. By assessing the NEBP development as a whole the objectives of *CPM Act* are upheld.

To provide the reader with a full understanding of the scope and nature of the project and its impacts overall within and external to the CMD and pertaining to specific net benefit assessment triggers under the SCMP and RCMP, this report examines two scopes within the analysis:

- **Total Project Scope:** Including all impacts associated with the development; and
- **Medium Scope:** Including the impacts associated with those project elements that trigger specific net benefit policies, in addition, any development and infrastructure that depend directly on those elements as requested by EPA.

These assessments are conducted concurrently throughout the report with a summary at the end of the relevant chapter.

To clarify the components of the assessment included in the 'medium scope' assessment compared to the total project scope, the assumptions outlined in the following table were made and pertain to the analysis contained in this report.

Table E.1. Key Assumptions Relating to the Medium Scope Assessment

Project Component	Aspect & Rationale for Inclusion in Medium Scope Assessment	Key Assumptions
Industry and business precinct with frontage to Bruce Highway including a conference resort and spa facility (approximately 177 hectares).	Aspect: Marine based businesses and associated support sectors located within the industry and business precinct. Rationale: Included as they relate to policies 2.1.3, 2.1.4 and 2.1.5.	35%-40% (37.5% used in the analysis) of businesses are anticipated to be associated with the marine sector. Influences aspects such as construction cost of the site, employment numbers and business activity.
911 berth marina precinct with lock controlled access to the Caboolture river (approximately 68 hectares).	Aspect: Marina and associated facilities, infrastructure and activities. Rationale: All aspects of the marina and associated facilities, infrastructure and activities are included as they relate to policies 2.1.3, 2.1.4 and 2.1.5.	100% of the marina and associated facilities, infrastructure and impacts are included in the analysis.
Residential development ranging from single house lots to high-density apartments (approximately 113 hectares).	Aspect: Residential development component. Rationale: Relevant aspects of the accommodation are included as the SCMP states that "...may also include residential and tourist land uses that are part of an integrated development proposal incorporating a marina". (i.e. those residents owning a marina berth or working in the marine precinct).	40%-50% (45% used in the analysis) of persons residing in the Northeast Business Park are anticipated to own a marina berth, utilise the dry stack facility or work in the marina precinct.
18 hole golf course (approximately 151 hectares).	Aspect: Golf course component. Rationale: Some water quality benefits, incorporated in the following aspect.	Golf course not included in the 'Medium Scope' assessment.
A range of community heritage, recreational, sporting and environmental and open space areas (approximately 288 hectares).	Aspect: Open space and interrelated wetland and water quality management. Rationale: Water quality benefits from scrubbing and cleaning effects of water in conjunction with designed wetland structures	Assumes 70%-80% (75% used in the analysis) of the construction/ establishment cost of recreational, sporting and open space areas relates to areas and wetlands influencing water quality. Assumes all associated water quality benefits.

Source: AECgroup in consultation with Cardno & EPA

Approach & Decision Criteria

The net benefit assessment requires two assessments be undertaken and satisfied:

- **A threshold assessment:** To demonstrate that the project delivers benefits beyond those delivered to the proponent and that alternative sites have been considered, with the selected site providing the greatest net benefit of all viable alternatives.
- **A formal assessment:** In the form of a cost benefit analysis to identify that the direct (proponent based) and indirect (external stakeholder based) benefits of the project exceed the direct and indirect costs of a project. Where an identified impact is unable to be quantified in dollar terms the impact is assessed qualitatively within a likelihood and consequence risk framework (outlined in the Assessment Methodology section of this report).

There are a number of requirements within each of the above. To clarify for the analysis the following table outlines the components, the requirements of their constituent parts, how they will be addressed and the decision criteria in forming a conclusion following the conduct of the net benefit assessment of the above two points.

Table E.2. Assessment Decision Criteria

Component/ Requirement	How addressed	Decision Criteria
Threshold Assessment		
Demonstrate the benefits of the project beyond those direct net benefits to the proponent	<ul style="list-style-type: none"> Addressed as a component of the CBA (Qualitative and Quantitative Assessment sections of this report). 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> Where the quantitative CBA identifies that both the: <ul style="list-style-type: none"> Direct net benefit exceeds zero; and Indirect net benefit exceeds zero. Where the qualitative CBA identifies that both the: <ul style="list-style-type: none"> Direct net benefit exceeds zero; and Indirect net benefit exceeds zero.
Demonstrate that alternative sites have been considered and that the selected site provides the greatest net benefit of all viable alternatives	<ul style="list-style-type: none"> Examine alternative sites for their relative suitability (Alternative Locations section 2.1.5) 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> Where the identified alternative sites are assessed as not providing equivalent or preferred characteristics to the proposed development site.
Formal Assessment		
Quantitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> Cost benefit analysis with direct impacts to the proponent discounted at the appropriate risk weighted discount rate (10.0%) and indirect impacts discounted at the appropriate government bond rate (6.0% Queensland Treasury's project Evaluation Guidelines) The assessment is undertaken in real terms (i.e. does not examine the impact of inflation) 	<p>This requirement is identified as being met where the assessment identifies a:</p> <ul style="list-style-type: none"> Quantitative CBA with a BCR of greater than 1 and a qualitative CBA with sum of benefits exceeding the sum of costs; OR Quantitative CBA with a BCR significantly greater than 1 and a qualitative CBA with a very minor risk of a net cost; OR Quantitative CBA with a BCR of marginally less than 1 and a qualitative CBA with sum of benefits significantly exceeding the sum of costs.
Qualitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> Each identified impact is examined within a likelihood and consequence framework to identify the relative impact/ risk of occurring. 	

Source: Developed based on draft Net Benefit Guidelines (EPA, Undated)

The assessment of the Northeast Business Park combines quantitative and qualitative cost benefit analyses to determine whether the direct and indirect benefits exceed the direct and indirect costs.

Where the decision criteria are met, it is apparent the development of the proposed Northeast Business Park development results in a net benefit.

Project Overview

The proposed Northeast Business Park includes the following key components:

- Industry and business precinct with frontage to Bruce Highway including a conference resort and spa facility (approximately 177 hectares);
- Marina precinct with lock controlled access to the Caboolture river (approximately 68 hectares);
- 18 hole golf course and club (approximately 151 hectares);
- Residential development ranging from single house lots to high density apartments (approximately 113 hectares); and
- A range of community heritage, recreational, sporting and environmental and open space areas (approximately 288 hectares).

The development undertaken by the proponent will deliver land to market for second stage development (i.e. construction) to be undertaken by third parties.

The business park and marine precinct is expected to attract local, national and international businesses, which will form clusters of mixed and complementary industry. The residential and recreational precincts of the proposed development support the economic development promoted by the project as well as the existing growth expectations of the Caboolture Shire Council and the *SEQ Regional Plan*.

The identified objectives of the Northeast Business Park development include:

- Strengthening of the regional economy;
- Provision for world class marina facility with important marine industry linkages to the regional marine industry;
- Effective use of strategically significant property;
- Regeneration of degraded pine plantation land;
- Improvement to local water quality through environmental management practise;
- Management of impacts and safety standards of recreational boating in Moreton Bay and the Pumicestone Passage;
- Rehabilitation of ecological corridors on the site;
- Provision for high quality urban design standards;
- To provide a regional destination and a 'centre' for Burpengary;
- Facilitation of local public transport development; and
- To provide a valuable and unique addition to the economic, social and recreational fabric of the region.

Alternative Sites

Regarding the suitability and subsequently the capacity of alternative sites to provide a greater level of net benefit, the assessment identified that:

- The proposed Northeast Business Park site is unique in its ability to deliver the combination of site attributes required to deliver a project such as the proposed.
- There are potentially available alternative sites for the **business and industry precincts** within the wider southeast Queensland region. However, the development of a number of alternative sites throughout the southeast Queensland region would not deliver the integrated benefits associated with the Northeast Business Park, including the "industrial ecology" benefits from the concentration and co-location of business, the social "work, live play" utility associated with the incorporation of the marina, residential, community open space and recreational areas and the environmental restoration and improvement delivered by the development.
- There are no suitable and currently available alternative sites for the marina and marine facilities within the wider southeast Queensland region.

Key Quantitative Impacts

The quantitative CBA identified that the indirect returns through returns to second stage developers and increased business activity associated with the proposed development outweighs the indirect costs, which included lost agricultural production and secondary development costs for both the 'total project scope' and the 'medium scope' assessments.

Total Project Scope Impacts

The indirect cumulative net present value (i.e. that flowing to external stakeholders other than the proponent) generated by the Northeast Business Park under the total project

scope is positive at over \$2.3 billion for the length of the analysis (6.0% real discount rate) for the total project scope.

The direct benefit to the proponent over the same period whilst positive and significant is less at approximately \$174 million net present value (10.0% real discount rate).

Medium Scope Impacts

The indirect cumulative net present value (i.e. that flowing to external stakeholders other than the proponent) generated by the Northeast Business Park under the medium project scope is positive at over \$928 million for the length of the analysis (6.0% real discount rate) for the total project scope.

The direct benefit to the proponent over the same period whilst positive and significant is less at approximately \$82 million net present value (10.0% real discount rate).

Key Qualitative Impacts

The following key impacts are presented for both the 'total project scope' and the 'medium scope' assessment.

Economic

The economic benefits generated from the Northeast Business Park development are assessed to generally be of high impact, and significantly outweigh the economic costs associated with the development. Key beneficial economic impacts of the Northeast Business Park are expected to include:

- The generation of additional employment, during both construction and operation of the Northeast Business Park;
- Increased tourism visitation and visitor spend, driven by water based tourism opportunities, the development of improved linkages with other water and land based tourism activities in the region; and
- Efficiency and productivity gains through clustering and development of the high value marine sector.

By comparison, two key economic costs were identified as a result of the Northeast Business Park:

- The additional infrastructure costs such as roads, water, wastewater, gas, electricity and ICT, to meet the needs of the residential and business populations of the Northeast Business Park; and
- The cost of additional social and community infrastructure required to meet the additional population such as a range of civic, community, human services, recreation, health and education facilities.

Social

The Northeast Business Park is assessed to provide a comparatively greater level of social benefit than cost. Key beneficial social impacts of the medium scope assessment for Northeast Business Park are expected to include:

- Improved access to affordable public housing through the contribution of \$2,000 per parcel sold to a building trust fund for the development of Council owned public housing;
- Improved access to areas for recreational and leisure activity through the development of wetlands, pathways, fishing platforms, marina berths, other cultural open space areas and recreational areas;
- Improved visual amenity, with improved access to environmental attractions including the Caboolture River and the improvement of current relatively degraded land;

- An enhanced range of housing across the entire housing spectrum; and
- Enhancement of community interaction and cohesion, which is important to a well functioning business and residential community and can significantly influence an individual's wellbeing.

By comparison, key social costs expected to be generated through the development of the Northeast Business Park include:

- Increased demand for accommodation and housing during operation of the development, impacting on an already tight property market; and
- Increased demand for community services and facilities as a result of the anticipated high level of relocation of employees and their families to the region, with an anticipated direct increase in employment of just over 14,000 on completion of the development.

One social impact, 'river safety', has both positive and detrimental impacts. River safety is improved by dredging activities undertaken to deepen navigation channels and river entrance, education programs run by the proponent at Northeast Business Park, the continuation of the reduced speed zones, as well as the incorporation of additional lit navigation beacons. With negative impacts on river safety resulting from the increased number of boats potentially utilising the Caboolture River. On balance, the overall impact on river safety due to the proposed Northeast Business Park development is identified to be neutral as positive impacts are assessed to equal costs (2 to -2) for both the total project and medium scope.

Environmental

The environmental benefits accruing from the Northeast Business Park development are assessed to outweigh the environmental costs associated with the development. Key beneficial environmental impacts of the Northeast Business Park are expected to include:

- Creation of wetlands through active rehabilitation and additional buffering and protection to the "significant coastal wetlands" protected within the environmental buffer zone in the north eastern section of the development; and
- Improved water quality through improved site drainage and run-off.

By comparison, while a number of negative environmental impacts were examined only one key environmental cost was identified, with the potential for the development to increase the risk of general water pollution due to increased water traffic. The marina lock facility would ensure any spills or leaks within the marina were contained within the precinct.

Three environmental impacts were identified to have both positive and negative impacts. In terms of net position with specific environmental considerations, the following can be noted:

- On balance the overall impact on water quality due to the proposed development is assessed as positive with benefits outweighing costs 7 to -5. Impacts improving water quality on the downstream environments of state significance are the use of recycled water, improved water quality (site run-off) and improved water quality (boat operator education and facilities). Negative impacts on water quality are exposure of acid sulfate soils & nutrient load to waterways, dredging the river mouth, storm water run-off and site drainage and general water pollution;
- On balance the overall impact on bank erosion is assessed as being substantively as positive with the benefits outweighing the costs 5 to -1. Improving bank erosion impacts are improvement of fish habitat and decreased erosion and creation of wetlands (environmental protection and maintenance of downstream riparian zones). Negative impacts on bank erosion will be from increased river traffic; and
- All of the costs and benefits in both the 'total project scope' and 'medium scope' assessment relate to impacts on downstream wetland health (wetlands of state

significance). On balance the impact on wetland health is positive with benefits outweighing costs 18 to –8 in the ‘total project scope’ assessment and 15 to –8 in the ‘medium scope’ assessment.

Findings

Total Project Scope Findings

The quantitative CBA assessment of the total project scope found that development of the Northeast Business Park is expected to deliver a total net benefit of \$2.5 billion in present value terms (NPV), with present value of revenues of \$3.8 billion and a present value of costs of \$1.3 billion. Overall, the development provides a benefit cost ratio (BCR) of 2.88 (i.e. returns \$2.88 for every dollar spent in delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms for the total project assessment of \$174 million with a BCR of 1.43. The project delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$2.3 billion with a BCR of 3.51.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a clear benefit to the State of Queensland.

Table E.3. Quantitative CBA Summary, Total Project Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$575	\$401	\$174	1.43
Indirect Impacts	\$3,251	\$926	\$2,324	3.51
Total Impacts	\$3,826	\$1,328	\$2,498	2.88

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the total project scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the total project scope of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the Threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In quantifiable economic terms, the Northeast Business Park development, under the ‘total project scope’ assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are expected to realise a net benefit as a result of the Northeast Business Park development in the ‘total project scope’ assessment.

Qualitative impact assessment shows that the Northeast Business Park is expected to return positive net economic, social and environmental benefits, with net positions of 15, 11 and 10, respectively, and ratios of benefits to cost of 3.1, 1.6 and 2.25 respectively.

Since the positive impacts of development across the economic, social and environmental aspects of the triple bottom line outweigh the negative impacts under the total project scope assessment, the development is deemed to deliver a positive net benefit to the State of Queensland.

Table E.4. Qualitative CBA Summary (Total Project Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Almost Certain	Moderate	High	8	22
Costs	Almost Certain	Major	Very High	2	-7
Net Position					15
Social					
Benefits	Likely	Major	High	9	29
Costs	Likely	Moderate	Medium	9	-18
Net Position					11
Environmental					
Benefits	Likely	Minor	Medium	10	18
Costs	Possible	Minor	Low	8	-8
Net Position					10
Overall TBL Rating					36

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'total project scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

Medium Scope Findings

The quantitative CBA assessment of the medium scope identified the proposed Northeast Business Park development is expected to deliver a total net benefit of \$1.01 billion in present value terms (NPV), with the present value of revenues of \$1.61 billion exceeding the present value of costs of \$598 million. Overall, the development provides a benefit cost ratio (BCR) of 2.69 (i.e. returns \$2.69 for every dollar spent in the delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms for the medium scope assessment of \$82 million with a BCR of 1.46. The project also delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$928 million with a BCR of 3.20.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a net benefit to the State of Queensland.

Table E.5. Quantitative CBA Summary, Medium Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$259	\$177	\$82	1.46
Indirect Impacts	\$1,349	\$421	\$928	3.20
Total Impacts	\$1,608	\$598	\$1,010	2.69

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the medium scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the Threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the medium scope of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In quantifiable economic terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are expected to realise a net benefit as a result of the Northeast Business Park development in the 'medium scope' assessment.

Qualitative impact assessment shows that in the 'medium scope' the Northeast Business Park is expected to return positive net economic, social and environmental positions of 10, 5 and 7, respectively and ratios of benefits to cost of 2.7, 1.3 and 1.9 respectively.

Since the positive impacts of development across the economic, social and environmental aspects of the triple bottom line outweigh the negative impacts under the medium scope assessment, the development is deemed to deliver a positive net benefit to the region.

Table E.6. Qualitative CBA Summary (Medium Project Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Likely	Moderate	Medium	6	16
Costs	Almost Certain	Moderate	High	2	-6
Net Position					10
Social					
Benefits	Likely	Moderate	Medium	8	21
Costs	Likely	Minor	Medium	9	-16
Net Position					5
Environmental					
Benefits	Likely	Minor	Medium	7	15
Costs	Possible	Minor	Low	7	-8
Net Position					7
Overall TBL Rating					22

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is also positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

Conclusion

The proposed Northeast Business Park development provides a net benefit to the State of Queensland as the identified costs of the development are more than offset by the significant benefits generated by it under both the 'total project scope' assessment and the 'medium scope' assessment.

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1. Introduction

1.1 Background

Northeast Business Park Pty Ltd is in the process of developing a marina based mixed use business and industry employment hub in the Caboolture region of Southeast Queensland, which is referred to as the Northeast Business Park.

The proposed Northeast Business Park will occupy a 769 hectare site. The site includes approximately nine kilometres of river frontage to the Caboolture River and at the closest point is approximately eight kilometres from the river mouth. The site is strategically situated within proximity to existing major business centres as well as areas of projected growth in the Northern Corridor of Southeast Queensland. The site also adjoins the eastern edge of the Bruce Highway and supports an identified Queensland Priority Industry, the marine sector (Queensland Government, 2007).

The Northeast Business Park proposal is to develop a mixed-use business park and marine precinct featuring commercial, retail, residential, golf course, environmental areas as well as recreational areas (including sports fields, walking/ bike trails and river platforms, etc) centred on an eastern marina and marine facilities.

1.2 Purpose of the Report

The purpose of this report is to demonstrate the development of the proposed Northeast Business Park provides a net benefit to the State of Queensland.

On 21st June 2006, the Coordinator General declared the Northeast Business Park project a significant project under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971 (SDPWOA)*. As such, an Environmental Impact Statement (EIS) is required in accordance with Part 4 of the *SDPWOA*.

Additionally, as the proposed Northeast Business Park triggers assessable development under the *Coastal Protection and Management Act 1995 (CPM Act)* policies within the *State Coastal Management Plan (SCMP)* and the *Southeast Queensland (SEQ) Regional Coastal Management Plan (RCMP)* apply which require the development to demonstrate that it provides a net benefit for the State of Queensland.

The definition under the RCMP of a net benefit for the State is as follows:

"there is a net benefit (taking into account all financial, social and environmental impacts) to the State as a whole, as distinct from sectorial, commercial, private or regional gain, and the proposal delivers the greatest net benefit of all viable alternatives".

Policies within the SCMP and RCMP identified, in consultation with Queensland EPA, as triggering the net benefit assessment in relation to the proposed Northeast Business Park development include:

- 2.1.3: Coastal-dependent land uses;
- 2.1.4: Canals and dry land marinas;
- 2.1.5: Maritime infrastructure;
- 2.1.9: Reclamation; and
- 2.8.1: Areas of state significance (natural resources).

The purpose of this report is to assess the suitability of the proposed development according to the requirements of the SCMP and RCMP for the development of the Northeast Business Park. This requires assessing the net benefit of the development compared to the current site usage across the triple bottom line (economic, social and environmental). Where the positive impacts of development outweigh the negative impacts, the development will be deemed to deliver a positive net benefit.

1.3 The Net Benefit Assessment

1.3.1 Focus and Scope of the Assessment

All major inputs for the construction of the proposed Northeast Business Park (e.g. labour and materials) sourced from Queensland are expected to be sourced from within the southeast Queensland region, as this is the major service and distribution centre for the state. Similarly all economic benefits associated with the development are anticipated to be experienced within the southeast Queensland region, along with all identified social and environmental benefits and costs. With all impacts (positive and negative, across the triple bottom line) associated with the development experienced within the southeast Queensland region, the analysis has assumed an assessment at the southeast Queensland level is representative of impacts at the state level.

There is some contention as to if the requirement for the net benefit assessment pertains to just those aspects of the development within the Coastal Management District (CMD), for which EPA has an assessment role, or the Coastal Zone, for which EPA can act as an advice agency.

The CMD (formerly referred to as the erosion prone area) was remapped as part of the NEBP development proposal by Cardno (2007) using detailed ground surface level survey data, QASCO high resolution aerial photography (June 2007) and ground truthed vegetation mapping (with the landward extent of mangrove occurrence used as the basis for determining the functional MHWS levels across the site and the landward extent of salt marsh vegetation was used as the basis for determining the functional HAT levels across the site).

The coastal zone has been defined under the RCMP as including *"coastal water; or all areas to the landward side of coastal waters in which there are physical features, ecological or natural processes or human activities that affect, or potentially affect, the coast or coastal resources"*

This analysis understands that the triggers under the CPM Act refer to works within the CMD, however, this assessment needs to consider the entire proposed development, which is a highly integrated and interdependent design and which pertains to works in the coastal zone. By assessing the NEBP development as a whole the objectives of CPM Act are upheld.

To provide the reader with a full understanding of the scope and nature of the project and its impacts overall, within and external to the CMD, and pertaining to specific net benefit assessment triggers under the SCMP and RCMP, this report examines two scopes within the analysis:

- **Total Project Scope:** Including all impacts associated with the development; and
- **Medium Scope:** Including the impacts associated with those project elements that trigger specific net benefit policies, in addition, any development and infrastructure that depend directly on those elements as requested by EPA.

These assessments are conducted concurrently throughout the report with a summary at the end of the relevant chapter.

1.3.2 Policy Context

The following table outlines the policies triggering the requirement for a net benefit assessment in relation to Northeast Business Park, their definition as appearing in the *CPM Act*, *SCMP* or *RCMP*, their policy application, and the aspect of the proposed Northeast Business Park relating to that policy.

Table 1.1. Coastal Management Plan Policies & Net Benefit Assessment Triggers

State & Regional Coastal Management Plan Policy	Definition	Policy Direction	Aspect of Northeast Business Park Relating to Policy
2.1.3: Coastal-dependent land uses	Land use for which a location adjoining the waterfront or access to the water is essential to function, including industrial and commercial facilities such as ports, harbours, jetties, pontoons, marinas, ramps and slipways, coastal or marine (boating) tourism facilities and appropriate marine service industries. It may also include residential and tourist land uses that are part of an integrated development proposal incorporating a marina and such land uses are located landward of the marina and are protected from coastal processes and hazards by the marina. Coastal-dependent land uses do not include residential land uses or tourist accommodation which conflict with the principles and policies of this Plan, waste management facilities (landfills, sewage treatment plants) and transport infrastructure (other than for access to the coast).	<p>This Policy provides that adequate provision needs to be made for coastal dependent land uses. Where there is competition for available land, preference should be given to necessary coastal dependent land uses ahead of other urban land uses. In the planning for new coastal dependent land uses outside existing township, areas should avoid impacts on coastal resources and values.</p> <p>It is recognised that development is not supported under this Policy in environmentally sensitive areas unless a net benefit for the State is demonstrated by the assessable development. This includes areas:</p> <ul style="list-style-type: none"> • of state significance (natural resources); • with an increased risk of flooding and coastal hazards; • within largely undeveloped tidal waterways (including the Caboolture River); and • declared as Fish Habitat. 	Marina and associated infrastructure and activities including marine businesses within the NBP and residential areas owned or lived in by persons utilising the marina facilities or working in the NBP marine industry cluster.
2.1.4: Canals and dry land marinas	A canal is artificial waterway that is connected, or intended to be connected, to tidal water and from which boating access to the tidal water is not hindered by a lock, weir or similar structure. A dryland marina is a marina created by the excavation of land above high water mark.	New canals and dry land marinas, including the proposed expansion of existing developments, must demonstrate that construction and operation will not adversely affect coastal resources and their values unless a dry land marina is a net benefit for the State.	Marina facility and associated infrastructure.
2.1.5: Maritime infrastructure	Includes ports, harbours, marinas, jetties, pontoons, ramps, and marine transport facilities of a public, commercial or private nature.	Policy 2.1.5 identifies that undeveloped tidal waterways in the region have high environmental, biodiversity, cultural, recreational and tourism values and that the construction and use of maritime infrastructure in these undeveloped tidal waterways can result in significant adverse impacts on coastal resources and values. While the preference is for new maritime infrastructure to be located in developed tidal waterways in locations that recognise public access requirements and protection of natural and cultural values of the waterway, new maritime infrastructure in undeveloped tidal waterways is acceptable provided there is a net benefit for the State.	Marina facility and associated infrastructure.
2.1.9: Reclamation	Loss of one environment (tidal waters) and the creation of another (land above tidal waters).	Policy 2.1.9 identifies that reclamation can result in the degradation and loss of coastal resources including foreshores, wetlands and wader bird habitats as well as adversely affecting coastal processes and scenic landscape values, and requires the demonstration of a net benefit to	Rebatment walls of the marina facility and associated infrastructure.

State & Regional Coastal Management Plan Policy	Definition	Policy Direction	Aspect of Northeast Business Park Relating to Policy
2.8.1: Areas of state significance (natural resources)	<p>The following areas, where they are located on the coast, or within the coastal zone and linked to the coast through their contribution to protecting coastal resources and their values, are defined as 'areas of state significance (natural resources)' for the purposes of coastal management:</p> <ul style="list-style-type: none"> • significant coastal wetlands; • significant coastal dunes; • endangered regional ecosystems; and • protected areas (State land), land declared as critical habitat, and areas of major interest as defined under the <i>Nature Conservation Act 1992</i>. 	<p>the state or region</p> <p>Land identified to be developed in the future for urban, maritime and rural land uses in regional plans, planning schemes and port land use plans is to be located outside of areas of state significance (natural resources). Existing urban, maritime and rural land uses within 'areas of state significance (natural resources)' will not expand in these areas unless:</p> <ul style="list-style-type: none"> • it can be demonstrated that there will be no adverse impacts on coastal resources and their values; or • the development has a demonstrated net benefit for the State as a whole. 	Cardno (2006e) identify the following areas of State significance: Ramsar listed wetlands of Moreton Bay; Moreton Bay Marine Park; Deception Bay Fish Habitat Area; and known and potential habitat for a diversity of migratory species listed under international agreements.

Source: AECgroup Cardno

To clarify the components of the assessment included in the 'medium scope' assessment compared to the total project scope, the assumptions outlined in the following table were made and pertain to the analysis contained in this report.

Table 1.2. Key Assumptions Relating to the Medium Scope Assessment

Project Component	Aspect & Rationale for Inclusion in Medium Scope Assessment	Key Assumptions
Industry and business precinct with frontage to Bruce Highway including a conference resort and spa facility (approximately 177 hectares).	<p>Aspect: Marine based businesses and associated support sectors located within the industry and business precinct.</p> <p>Rationale: Included as they relate to policies 2.1.3, 2.1.4 and 2.1.5.</p>	35%-40% (37.5% used in the analysis) of businesses are anticipated to be associated with the marine sector. Influences aspects such as construction cost of the site, employment numbers and business activity.
911 berth marina precinct with lock controlled access to the Caboolture river (approximately 68 hectares).	<p>Aspect: Marina and associated facilities, infrastructure and activities.</p> <p>Rationale: All aspects of the marina and associated facilities, infrastructure and activities are included as they relate to policies 2.1.3, 2.1.4 and 2.1.5.</p>	100% of the marina and associated facilities, infrastructure and impacts are included in the analysis.
Residential development ranging from single house lots to high-density apartments (approximately 113 hectares).	<p>Aspect: Residential development component.</p> <p>Rationale: Relevant aspects of the accommodation are included as the SCMP states that "...may also include residential and tourist land uses that are part of an integrated development proposal incorporating a marina". (i.e. those residents owning a marina berth or working in the marine precinct).</p>	40%-50% (45% used in the analysis) of persons residing in the Northeast Business Park are anticipated to own a marina berth, utilise the dry stack facility or work in the marina precinct.
18 hole golf course (approximately 151 hectares).	<p>Aspect: Golf course component.</p> <p>Rationale: Some water quality benefits, incorporated in the following aspect.</p>	Golf course not included in the 'Medium Scope' assessment.
A range of community heritage, recreational, sporting and environmental and open space areas (approximately 288 hectares).	<p>Aspect: Open space and interrelated wetland and water quality management.</p> <p>Rationale: Water quality benefits from scrubbing and cleaning effects of water in conjunction with designed wetland structures</p>	Assumes 70%-80% (75% used in the analysis) of the construction/ establishment cost of recreational, sporting and open space areas relates to areas and wetlands influencing water quality. Assumes all associated water quality benefits.

Source: AECgroup in consultation with Cardno & EPA

1.3.3 Approach & Decision Criteria

The net benefit assessment requires two assessments be undertaken and satisfied:

- **A threshold assessment:** To demonstrate that the project delivers benefits beyond those delivered to the proponent and that alternative sites have been considered, with the selected site providing the greatest net benefit of all viable alternatives.
- **A formal assessment:** In the form of a cost benefit analysis to identify that the direct (proponent based) and indirect (external stakeholder based) benefits of the project exceed the direct and indirect costs of a project. Where an identified impact is unable to be quantified in dollar terms the impact is assessed qualitatively within a likelihood and consequence risk framework (outlined in the Assessment Methodology section of this report).

There are a number of requirements within each of the above. To clarify for the analysis the following table outlines the components, the requirements of their constituent parts, how they will be addressed and the decision criteria in forming a conclusion following the conduct of the net benefit assessment of the above two points.

Table 1.3. Assessment Decision Criteria

Component/ Requirement	How addressed	Decision Criteria
Threshold Assessment		
Demonstrate the benefits of the project beyond those direct net benefits to the proponent	<ul style="list-style-type: none"> • Addressed as a component of the CBA (Qualitative and Quantitative Assessment sections of this report). 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> • Where the quantitative CBA identifies that both the: <ul style="list-style-type: none"> o Direct net benefit exceeds zero; and o Indirect net benefit exceeds zero. • Where the qualitative CBA identifies that both the: <ul style="list-style-type: none"> o Direct net benefit exceeds zero; and o Indirect net benefit exceeds zero.
Demonstrate that alternative sites have been considered and that the selected site provides the greatest net benefit of all viable alternatives	<ul style="list-style-type: none"> • Examine alternative sites for their relative suitability (Alternative Locations section 2.1.5) 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> • Where the identified alternative sites are assessed as not providing equivalent or preferred characteristics to the proposed development site.
Formal Assessment		
Quantitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> • Cost benefit analysis with direct impacts to the proponent discounted at the appropriate risk weighted discount rate (10.0%) and indirect impacts discounted at the appropriate government bond rate (6.0% Queensland Treasury's project Evaluation Guidelines) • The assessment is undertaken in real terms (i.e. does not examine the impact of inflation) 	<p>This requirement is identified as being met where the assessment identifies a:</p> <ul style="list-style-type: none"> • Quantitative CBA with a BCR of greater than 1 and a qualitative CBA with sum of benefits exceeding the sum of costs; OR • Quantitative CBA with a BCR significantly greater than 1 and a qualitative CBA with a very minor risk of a net cost; OR • Quantitative CBA with a BCR of marginally less than 1 and a qualitative CBA with sum of benefits significantly exceeding the sum of costs.
Qualitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> • Each identified impact is examined within a likelihood and consequence framework to identify the relative impact/ risk of occurring. 	

Source: Developed based on draft Net Benefit Guidelines (EPA, Undated)

Where the decision criteria are met, it is apparent the development of the proposed Northeast Business Park development results in a net benefit.

1.4 Report Structure

The structure of this report is as follows:

Chapter 1: Introduction. Provides the purpose and background of this report.

Chapter 2: Project Overview & Context. Provides an overview of the projects objectives, location background and description and alignment with government (State and Local) policies and planning frameworks. This chapter also provides an overview of the Queensland marina market.

Chapter 3: Assessment Methodology. Outlines the cost benefit analysis (CBA) methodology used to measure the costs and benefits of the Northeast Business Park development.

Chapter 4: Identification of Impacts. This chapter identifies all the costs and benefits of the project outlining either quantitative or qualitative assessment for each scope.

Chapter 5: Quantitative Assessment. Discusses and measures the quantifiable benefits and costs of the Northeast Business Park development in dollar terms.

Chapter 6: Qualitative Assessment. Discusses and measures those impacts resulting from the Northeast Business Park that are not readily measured in dollar terms using a qualitative risk (likelihood and consequence) assessment framework.

Chapter 7: Summary of Findings. Summarises the findings of the Northeast Business Park Net Benefit Assessment.

2. Project Overview & Context

2.1 Project Description

2.1.1 The Vision

An integrated, holistic, landmark development changing the face and advancing the identity, ecological health and prosperity of the Caboolture Region (PMM, 2006).

2.1.2 Location

The proposed site is located on a 795 hectare site on the banks of the Caboolture River in the heart of the Northern Corridor of southeast Queensland and lies:

- 4.5km east of Caboolture town centre;
- 8km west from the Caboolture River mouth;
- Has direct access to Buchanan Road, the interchange of the Bruce Highway; and includes:
- Lot 2: RP902075, Lot 10: RP902079, Lot 24: SP158298, Lot 7: RP845326 and Lot 15: RP902073

The site is largely cleared having previously been used for agricultural (grazing and sugar cane) and pine forestry production.

2.1.3 Key Features

Components

The key features of the 795 hectare Northeast Business Park project include:

- Industry and business precinct with frontage to Bruce Highway including a conference resort and spa facility (approximately 177 hectares);
- 911 berth marina precinct with lock controlled access to the Caboolture river (approximately 68 hectares);
- 18 hole golf course (approximately 151 hectares);
- Residential development ranging from single house lots to high density apartments (approximately 113 hectares); and
- A range of community heritage, recreational, sporting and environmental and open space areas (approximately 288 hectares).

The development undertaken by the proponent will deliver land to market for second stage development (i.e. construction) to be undertaken by third parties.

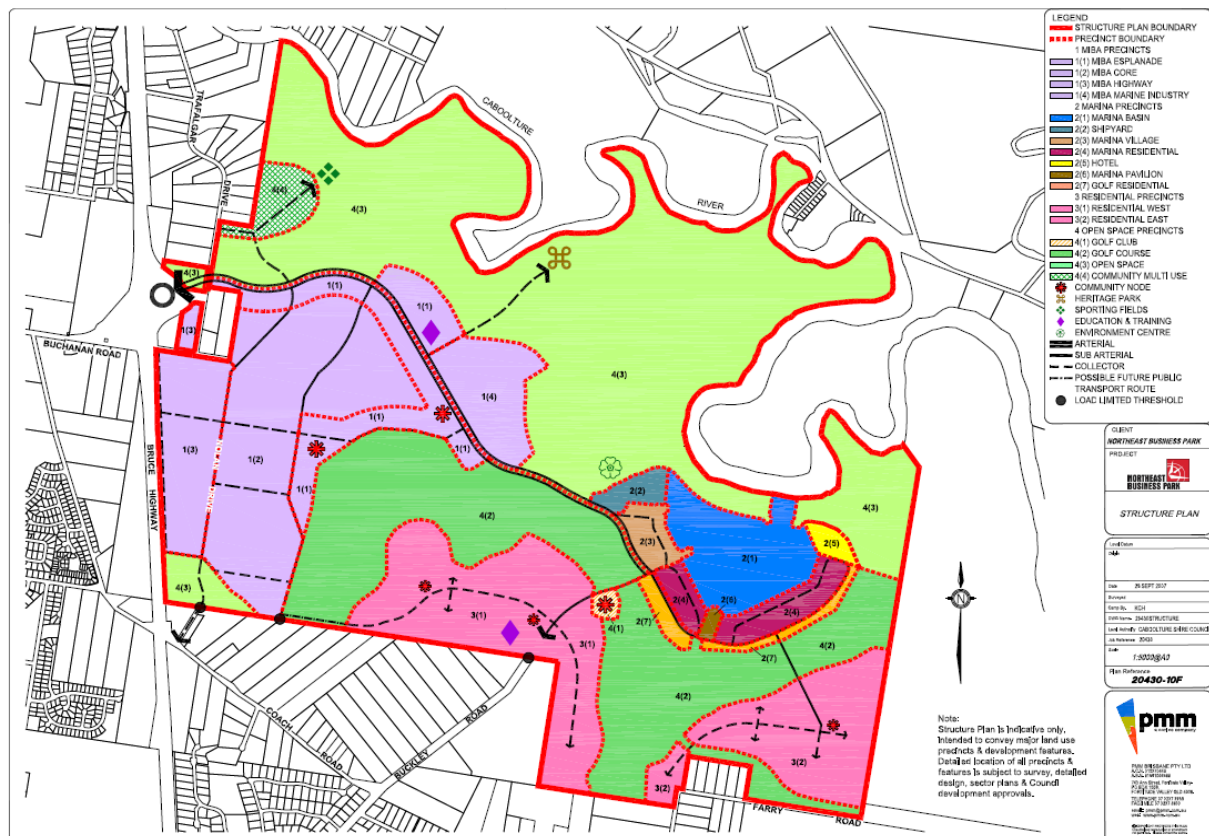
The business park and marine precinct is expected to attract local, national and international businesses, which will form clusters of mixed and complementary industry.

The residential and recreational precincts of the proposed development will support the economic development promoted by the project as well as the existing growth expectations of the Caboolture Shire Council, southeast Queensland and the broader Queensland economy.

Master Plan

A master plan, which highlights the key aspects, facilities and layout of the Northeast Business Park is included below.

Figure 2.1. Northeast Business Park Master Plan



Source: PMM (2006)

Expected Outcomes of the Development

The Northeast Business Park development is an opportunity to build a mixed-use business park and marina precinct that will create net benefits across the triple bottom line.

The objectives and outcomes of the Northeast Business Park development include:

- Strengthening of the economy and diversify the labour market;
- Provision for world class marina facility with important marine industry linkages to the regional marine industry;
- Effective use of strategically significant property;
- Regeneration of degraded pine plantation land;
- Improvement to local water quality through environmental management practise;
- Management of impacts and safety standards of recreational boating in Moreton Bay and the Pumicestone Passage;
- Rehabilitation of ecological corridors on the site;
- Provision for high quality urban design standards;
- To provide a regional destination and a 'centre' for Burpengary;
- Facilitation of local public transport development; and
- To provide a valuable and unique addition to the economic, social and recreational fabric of the local and broader southeast Queensland region.

Environmental Management

The environmental management features of the proposal include:

- Flood mitigation;
- Stormwater and water quality management;
- Rehabilitation of riparian zones and fish habitats to improve ecological value;
- Buffering and protection of foreshores from erosion;
- Management of weeds and pest species;
- Demonstration of best practise harbouring repair to marry ecological sustainability and marine industry practises; and
- Reduced environmental impacts of industry through sustainable design and promotion of 'clean and green' industry in the business park.

2.1.4 Site selection

The site was identified as a significant site for the Business Park and marine precinct development for the following reasons:

- **Location:** The large and strategically located site within proximity of the Northern corridor to major business centres, infrastructure, the Caboolture River, Deception Bay and Pumicestone passage, provides the ideal location for the Business Park and marine precinct, presenting possibly the last viable opportunity for a substantial marina between Brisbane and Mooloolaba.
- **Environmental:** The current state of the site as a large heavily altered environment on the fringe of urban development provides the opportunity for development in this strategic location with minimal damage to the existing environment. Opportunity exists for the rehabilitation and preservation of the surrounding environment and eco-systems to improve their ecological value.
- **Demonstrated demand:** A regional and state demand for industry growth that aligns with the projects proposal for a business park and marine precinct with provision for community facilities (e.g. residential, recreational, etc.) that will promote and assist in supporting the economic growth of the southeast Queensland region. There is a substantial and growing demand for marina facilities in southeast Queensland.

This combination of factors is considered to be unique in southeast Queensland. The proposal is an opportunity to create a local and regional 'destination development' which adds substantially to the business and social fabric of the local and broader southeast Queensland region, whilst providing very significant levels of environmental rehabilitation.

A number of alternative sites were examined for the core components of the development, with none of these identified to be as suitable as the currently proposed site (PMM, 2006). A summary is provided in the following section.

2.1.5 Alternative Locations for Project Development

The proposed Northeast Business Park development is a significant strategic development for southeast Queensland and beyond that provides an important community and business focus for Caboolture as well as supplying marine facilities and associated uses that are currently in demand (PMM, 2006).

There are two key and interrelated components of the Northeast Business Park development, the business and industry precinct and the marina facility on which it centres.

The proposed site for the Northeast Business Park is unique in terms of its size of developable land, proximity to key infrastructure and of course abutment to the Caboolture River (PMM, 2006). As a result, this section considers alternative sites for the two key components of the proposed development separately as undertaken by Core Economics (2006).

Summary of Assessment of Alternative Locations:

The proposed Northeast Business Park site is unique in its ability to deliver the combination of site attributes required to deliver such a project.

There are potentially alternative sites available for the **business and industry precincts** within the Caboolture and wider southeast Queensland region. However, the development of a number of alternative sites would not deliver the integrated benefits associated with the Northeast Business Park, including the “industrial ecology” benefits from the concentration and co-location of business, the social “work, live play” utility associated with the incorporation of the marina, residential, community open space and recreational areas and the environmental restoration and improvement delivered by the development.

There are no suitable and currently available alternative sites for the **marina and marine facilities** within the wider southeast Queensland region.

Business and Industry

Demand for industrial and business estate expansion is growing throughout southeast Queensland and specifically to the North of Brisbane where there is currently an undersupply of land available for industrial use. Core economics (2006) identify that the combined area (4,300 ha of suitable land) of the major industry precincts in south east Queensland fall well short of the 6,050 hectares estimated in the SEQ Regional Plan required to accommodate the projected southeast Queensland workforce by 2021, which implies a requirement for an additional 1,750 ha of appropriate employment hosting land.

A number of industrial zoned lands were identified as alternative sites (Core Economics, 2006). Of these the available land amounts to approximately 594ha. However, these available lands are either of small size (blocks of approximately 20-30 hectares), restricted from development (e.g. environmental restriction, airport-air traffic restricted) and/or not appropriately located to provide for marine-related industries.

The proposed 795 hectare site provides a unique opportunity to create a cluster and multi-functional industry hub to the north of Brisbane and is identified as one of the last strategically located industrial land parcels of significant size suitable for this style of development to the north of Brisbane.

Marina and Marine Facilities

Recreational boat registrations are growing at approximately 5.0% per annum, which is greater than the rate of population growth (Living the Queensland Lifestyle, 2006), whilst this includes smaller boats that would not require mooring, the increase in larger recreational vessels is also expected to increase.

Southeast Queensland has a distinct lack of suitable sites for marina and marine facility development (Pacific Southwest Strategy Group, 2006a). There is waiting list of approximately 1,480 for marina berths in Queensland (Pacific Southwest Strategy Group, 2006a). Given that approximately one half of boat registrations are located in southeast Queensland, the demand for marinas in southeast Queensland is expected to be significant (additional discussion contained in the Queensland Marina Market section).

Existing marina facilities in the region include Scarborough and Bribie Island, however these sites do not accommodate tall mast vessels or have the capacity for expansion to do so. Alternative marina sites in southeast Queensland either have little or no room to accommodate marina facilities or development of a marine industry precinct.

The proposed site on the Caboolture River has both deep water frontage and access to Deception Bay and has been identified as the last available opportunity for a marina development between Manly and Mooloolaba and the last opportunity for a large scale marina development north of the Brisbane River and south of the Mary River in Maryborough. Southeast Queensland currently has a total of 21 marina/marine precincts, however, the current demand for marina facilities exceeds the available supply.

2.2 Alignment With Regional Planning

The North East Business Park development is a project that has competitive advantages that align with the *Queensland Government Priorities*, the *South East Queensland Regional Plan* (SEORP) and the *Caboolture Shire Economic Development Strategy*. These documents each provide key areas for action and focus to ensure the delivery of sustainable economic development that provides environmental, social and community benefits producing prosperous communities.

The following section identifies the key priorities for each strategy and the relevant outcome delivered by the Northeast Business Park project for each.

2.2.1 Queensland Government Priorities

The Queensland Government Priorities have been identified by the Queensland Government to provide a directional approach to the development of policy and are outlined in the following table along with the synergies delivered by the Northeast Business Park development.

Table 2.1. Queensland Government Key Priorities & NBP Attributes

Queensland Government Key Priorities	Delivered by Northeast Business Park
Improve health care and strengthening services to the community	<ul style="list-style-type: none"> • Affordable housing: The project proposes to create 1,300 lots for residential housing where a proportion of lot sale will be donated to an affordable housing trust, which will be managed by the newly amalgamated Local Government, and used to construct housing throughout the region. The affordable housing trust will have a focus to co-locate with the areas of employment lands. • Community service and facilities: The creation of nodes of community services and facilities are expected to relieve the demands for general community services in the region.
Realising the <i>Smart State</i> (education, skills and innovation)	<ul style="list-style-type: none"> • Skills hub: Provision for a skills hub initially focused around education and training for marine-based industry will provide a skilled labour force base for the industries of the region and supports an identified Queensland Priority Industry, the marine sector (Queensland Government, 2007).
Protecting children and enhancing community safety	<ul style="list-style-type: none"> • Improved river safety: Removal of the 'river plug' at the mouth of the river will improve navigational safety of the river. Management and regulation of illegal and unmanaged moorings and marine practices will improve the general community safety in and around the Caboolture River. Safe public access to the river will be provided by the development. • Flood mitigation: Reduced peak flood levels will potentially reduce damage from flood to residential property of Beachmere. • Improved social and economic welfare: Improvement of social and economic conditions in the region will potentially decrease the level of crime by providing education and employment opportunity and an overall increase in the region's economic wealth.
Managing urban growth and building Queensland's Regions	<ul style="list-style-type: none"> • Social and community infrastructure: Provision for recreation, transport, community centres and infrastructure will meet current demands and provision for future urban growth. • Regional job creation: The site will cater to the targeted increase in local and regional workforce through the development of new businesses and industry not currently located in the region. • Transport linkages: Provision for transport linkages with other major business and industry centres of the region. • Marine industry hub: A marine industry hub will be created where there is a locational advantage, a market demand and capacity for industry growth and development.
Protecting the environment for a sustainable future	<ul style="list-style-type: none"> • Marina design: The design outcome is a fully river locked marina (closed channel) that will provide a central management and regulation facility of operational marina activity to improve water quality. • Sustainability: Regulation of marine and industry practices with a 'clean and green' philosophy and best practice sustainable design codes and guidelines. • Rehabilitation and environmental management: Rehabilitation of terrestrial and riparian vegetation, land and urban design management such as stormwater management and WSUD.

Queensland Government Key Priorities	Delivered by Northeast Business Park
Growing a diverse economy and creating jobs	<ul style="list-style-type: none"> • Job creation and employment opportunity: Direct and indirect flow of effects on employment with education and training opportunity to expand the skilled workforce base. • Diversification, productivity and growth: Increased productivity of previously underproductive and under managed lands with key industry hub establishment and capacity for growth. • Increasing capacity of the marina market: Increased supply of marina berths to the currently undersupplied market, supported by a shipyard and marine industries precinct.

Source: Queensland Government Key Priorities (2006), PMM & AECgroup

2.2.2 State Led Local Government Amalgamations

The release of the findings of the Local Government Reform Commission on Friday 27 July identify that Caboolture Shire Council, the principle study area for this project, is to be amalgamated with Pine Rivers Shire and Redcliffe City Councils. The outcome of council reform amalgamations is not expected to directly impact the project beyond providing an even greater opportunity to collectively plan for the future development of the broader region.

For the purposes of this assessment, the primary study area is retained as the Caboolture Shire Council boundary, with the focus and alignment of the project being to two key planning documents, namely the *South East Queensland Regional Plan* and the *Caboolture Shire Economic Development Strategy*, the relevant aspects and synergies of which are outlined below.

2.2.3 SEQ Regional Plan

The South East Queensland (SEQ) region is Australia's fastest-growing region, attracting an estimated 55,000 additional residents each year on average over the past two decades. The region is also experiencing rapid employment growth and is emerging as a significant economic hub with national and international recognition (SEORP, 2005).

The *South East Queensland Regional Plan* was established to provide a sustainable growth management strategy for SEQ to the year 2026 and enhance the quality of life in the region. To achieve the vision and the desired outcomes for the region, the *South East Queensland Regional Plan* proposes to manage growth and change through appropriate policies and the timely provision of infrastructure and employment.

The strategy examined and identified areas, levels and requirements for:

- Appropriate developable land to meet future population growth;
- Timely and cost-effective infrastructure and services;
- Sound urban development principles that support a compact, well serviced and efficient urban form;
- Protecting and enhancing the region's natural environment, biodiversity and natural resources;
- Maintaining and enhancing the quality of life for the existing and future communities; and
- Supporting a viable and diverse economy with well-located employment opportunities and economic activity centres.

The development of the Northeast Business Park aligns with the 12 identified regional outcomes within the *South East Queensland Regional Plan*, which are summarised in the table below.

Table 2.2. SEQ Desired Regional Outcomes & NBP Attributes

SEQ Regional Plan Desired Regional Outcome	Delivered by Northeast Business Park
Sustainability: The region grows and changes in the most sustainable way; generating prosperity, maintaining and enhancing quality of life, and providing high levels of environmental protection.	<ul style="list-style-type: none"> Northeast Business Park has been conceived and designed in an integrated and holistic manner in order to maximise sustainable net benefits to the community, the environment and the economy. An Industrial Ecology framework has been proposed for the MIBA and its relationship to the development and to the region. The land uses proposed have been designed to complement each other such that they all benefit from collocation. The integration of uses in a master planned environment allows people to genuinely 'live, work and play' in the one locality. The development will facilitate Public Transport. The development codes and design guidelines are based on best practice sustainability principles and practices. A key objective of the development is to be an exemplar of sustainable development. The development will clearly generate prosperity, enhance quality of life and provide high levels of environmental protection.
Natural Environment: A healthy natural environment supports the region's rich biodiversity, clean air and water; and is sustainably managed to support economic development, outdoor lifestyles and community needs.	<ul style="list-style-type: none"> Rehabilitation of riparian vegetation and degraded lands. Marina design regulation and management to decrease pollution impacts and improve water quality. Areas of open space and managed access points to the river will protect riverbanks and meet demand for community river access and recreation areas. A balance of economic and social development with environmental protection and open space areas. The design focuses on the integration of all aspects of the development, social, cultural & lifestyle activities, economic & business activity and environmental maintenance. Eucalypt trees favoured by Koalas and cockatoos will be an important feature of the native vegetation rehabilitation program. WSUD, wetland and treatment train to improve existing stormwater quality.
Regional Landscape: The key environmental, economic, social and cultural resources of the regional landscape are identified and secured to meet community needs and achieve ecological sustainability.	<ul style="list-style-type: none"> The maintenance and preservation of the cultural assets and history of the site are ensured through the facilitation of the cultural precinct and associated interpretation facilities. The Northeast Business Park is a high standard development designed to meet the demands of regional industry growth that aims to make optimum use of the site to meet community needs whilst enhancing ecological sustainability. Rehabilitation of open space areas including access to Caboolture River greatly improves the community's access and ability to appreciate the landscape values of the site and surrounds.
Natural Resources: Regional natural resource and rural protection areas are protected, enhanced and used sustainably.	<ul style="list-style-type: none"> Protection of the declared fish habitat area (FHA) and rehabilitation of riparian vegetation. Increase in potential fish habitat in marina. Protection and operational regulation of marine based activity to reduce impacts of pollution, etc on the Caboolture river ways. Stormwater treatment train incorporating WSUD principles to improve stormwater quality. Development of additional wetlands and natural areas. Responsible development of degraded agricultural land.
Desired Regional Outcomes: Rural communities are strong and viable with sustainable economies contributing to the health, character and liveability of the region.	<ul style="list-style-type: none"> Economic flow on effects arising from the development are of sufficient magnitude to noticeably permeate the region, including rural communities.
Strong Communities: Cohesive, inclusive and healthy communities with a strong sense of identity and place, and access to a full range of services and facilities that meet diverse community needs.	<ul style="list-style-type: none"> Improvement of community identity and ownership with the marine precinct and business park development that boasts a range of facilities (recreational, community, etc), employment opportunities and lifestyle choices currently limited or not available in the region. The development provides a complete community with a wide range of community facilities encouraging a 'live, work & play' lifestyle. Community and recreational facilities promote healthy lifestyles and provide benefit to the region.

SEQ Regional Plan Desired Regional Outcome	Delivered by Northeast Business Park
Engaging Aboriginal and Torres Strait Islander Peoples: Aboriginal and Torres Strait Islander peoples are actively involved in community planning and decision-making processes and Aboriginal Traditional Owners are engaged in business about their country.	<ul style="list-style-type: none"> • Cultural heritage studies undertaken and development subject to a Cultural Heritage Management Plan • Heritage precinct draws out the indigenous and European cultural heritage of the site and disseminates the history of the site to visitors. • Adoption of equal opportunities policy and opportunity for education, training and employment.
Urban Development: A compact and sustainable urban pattern of well-planned communities, supported by a network of accessible and convenient centres close to residential areas, employment locations and transport.	<ul style="list-style-type: none"> • The Northeast Business Park provides a level of density in alignment with the SEORP making efficient use of a strategically located site. • The Marina Village and community nodes conveniently provide for the needs of residents and workforce, by collocating residential with employment and transport to engender relative 'self containment'. • The open space and integrated transport and recreation infrastructure also influence the positive contribution to urban development in the region. • A synergy and complementary relationship between the site and Morayfield/Caboolture Principal Activity Centre, with both areas catering to different markets, but employees located on the site will utilise the facilities offered in the centre.
Economic Development: A strong, resilient and diversified economy – growing prosperity in the region by utilising its competitive advantages to deliver exports, investment, and sustainable and accessible jobs.	<ul style="list-style-type: none"> • NBP will be a flagship employment district for the region leveraging its proximity to the natural (river) and built (Bruce highway & existing business precincts) to create an outstanding business environment attracting high value and diversified economic development. • The marine industry hub provides a competitive advantage for the region to supply the current shortages of the marina and marine industries market, whilst holding a strategic location that is highly accessible. • Indirect economic flow on effects to the region are commensurate with direct economic benefit, strongly enhancing the regional economy and adding to the economic strength of the State. • The integrated nature of the proposal proactively leverages the region's competitive advantages to deliver exports, investment, and sustainable and accessible jobs.
Infrastructure: Regional infrastructure and services are planned, coordinated and delivered in a timely manner to support existing and future settlement patterns and desired community outcomes.	<ul style="list-style-type: none"> • Infrastructure will be provided and upgraded to meet the needs of the development in an integrated and coordinated manner, in accordance with an Infrastructure agreement, equitably sharing costs and benefits. • Internal infrastructure includes marine, residential, community facilities and recreational facilities supporting the development and the community. • Employment, housing, facilities and public transport all support the strengthening role of Caboolture/Morayfield as the region's Principal Activity Centre.
Water Management: Water in the region is managed on a sustainable and integrated basis to provide adequate supplies for human and environmental uses.	<ul style="list-style-type: none"> • The development will have full access to reticulated recycled water for non potable uses, reducing potable demands and improving Caboolture river quality by polishing the water prior to discharge. • Best practice water efficiency measures and water harvesting further reduce potable water demands. • The marina design and marine regulated activity will potentially improve the effects on water quality in the Caboolture River from under regulated marine activity. • Development and planning incorporates storm water management strategies to effectively reduce the nutrient and pollutant export from the existing site.
Integrated Transport: A connected and accessible region based on an integrated transport system that supports more compact urban growth and efficient travel; connects people, places goods and services; and promotes public transport use, walking and cycling.	<ul style="list-style-type: none"> • The development will facilitate strengthened public transport links to Morayfield and Caboolture, including the northern rail corridor, to encourage greater public transport use and accessibility in all centres. • The development has been designed as a master planned community providing efficient connections between people, employment and recreation whilst promoting public transport and walking and cycling. • The site is well located to take strategic advantage of its location adjacent to the Bruce Highway and close to the northern rail corridor.

Source: SEQ Regional Plan (2005), PMM & AECgroup

2.2.4 Caboolture Shire Economic Development Strategy

Caboolture Shire is one of Queensland's fastest growing regions, and covers more than 1,200 square kilometres and has a significant proportion of southeast Queensland's coastal wetlands. Currently the Caboolture Shire is failing to meet economic targets to achieve sustainable regional growth. The *Caboolture Shire Economic Development Strategy* identifies the challenges facing the region in achieving economic sustainability and the competitive advantages that could be developed to achieve specified targets.

The Caboolture Shire's current economic development targets include:

- Growth management incorporating roads, bikeways, open space, industrial estates, heritage, cultural and tourism sites;
- 'Smart' industry development compatible with the Shires environmental values;
- Expansion of targeted industry by sourcing export outlets and actively seeking companion industries to offer centralised service sectors;
- Establishment of Caboolture as a major transport interchange/freight transit centre;
- Maximisation of current industrial estate usage and identification sites for future growth opportunities; and
- To identify, develop and promote the Shire's diverse features and amenities and encourage visitor accommodation provision.

From these targets eight key projects have been identified by the Caboolture Shire Council to ensure leadership in achieving sustainable economic development. These projects include:

- *Regional freight/logistics and business service centre*: Which will be facilitated by the additional business activity within the Northeast Business Park.
- *Build tourism diversity*: Development of a marina facility will attract high value water based tourism expenditure to the region, particularly where there are adequate maintenance and support facilities.
- *Redevelopment of Caboolture CBD and Morayfield connection*: The develop provides links to and subsequently supports the development of the Caboolture Morayfield Principle Activity Centre (CMPAC) through the development of an industry base and clusters that support rather than compete with those businesses in the CMPAC.
- *Aquaculture industry development*: The development does not address the aim of encouraging aquaculture development.
- *Regional service sector employment*: The Northeast Business Park provides significant employment opportunities for the sectors targeted.
- *Marine industry cluster facilitation*: The Northeast Business Park, centres on a marina facility and provides the requisite support facilities to encourage clustering of business in the marine support sector in the proximity of Morton Bay and the Pumicestone Passage.
- *Industrial land/industrial cluster facilitation*: The development of 169ha of MIBA development directly contributes to the dual objective of development and release of industrial land and the facilitation of clustering of associated marina facilities and support sectors in the region where demand for industrial land exceeds the available lands in the region.
- *Rural industry facilitation*: The development does not address the aim of encouraging rural industry facilitation.

The North East Business Park also has the potential to contribute to the diversity of the Caboolture tourism industry by promoting the region as an aquatic tourism destination in southeast Queensland providing an aquatic and marine tourism activity base.

2.3 The Queensland Marina Market

2.3.1 Queensland Marine Industry

The Boating Industry Association of Queensland (2007a) estimate that the Queensland marine industry, including manufacture, servicing, retail, distribution, brokerage and marinas, has an annual turnover of \$2.6 billion and employs approximately 11,000 people. Further, it is estimated that the Queensland marine industry contributed \$1.4 billion to State's economy in 2002-03, or approximately 1.2% of total Queensland Gross State Product (GSP) for the year (Pacific Southwest Strategy Group, 2006b).

The marine industry and boatbuilding sector is one of the largest manufacturing and value added sectors in Queensland. Southeast Queensland accounts for approximately 75% of total Australian recreational and light commercial boating manufacture (Boating Industry Association of Queensland, 2007b), and has a significant presence in the Caboolture region (including Caboolture, Redcliffe and Pine Rivers Shires).

2.3.2 Boat Registrations

Queensland boat registrations reached 200,000 in January 2006 (Collins PRD, 2007), and have continued to grow since, with 223,425 boats registered in July 2007, representing average annual growth of 5.3% over the past decade (Boating Industry Association of Queensland, 2007a), approximately double the Queensland population growth rate.

Of the 223,425 boats registered in Queensland, 11,602 (or 5.2%) of these are greater than 8 metres in length (Pacific Southwest Strategy Group, 2007). Boats larger than 8 metres typically require a mooring or berth for storage for a variety of reasons, including (URS, 2005):

- Larger boats are difficult to handle on a trailer as towing and launching larger boats can be difficult;
- Larger boats tend to be more valuable, with owners who tend to prefer and can afford alternate storage options; and
- With trends toward medium and higher density living, there are fewer suburban storage options.

Since 2002, registrations for boats greater than 8 metres in length have been growing at a faster rate than smaller boats (7.1% per annum on average compared to 6.0%), reflecting the current trend towards larger and more luxurious watercraft (Pacific Southwest Strategy Group, 2007; Collins PRD, 2007).

2.3.3 Existing Marina Capacity and Demand in SEQ

Within SEQ there are 21 marina/marine precincts with a total capacity exceeding 4,910 wet berths, all of which are occupied, or set aside for visitors. There was a total waiting list of 1,480 for marina berths in Queensland in January 2005 (Pacific Southwest Strategy Group, 2006a), consisting of 795 waiting to purchase and 685 wanting to lease. The majority of demand for berths is in SEQ, and the current shortfall in berths is believed to be in line with that reported for January 2005 (Pacific Southwest Strategy Group, 2007).

This equates to a current total demand for marina berths in SEQ of 6,390 berths (4,910 existing berths plus unmet demand of 1,480 berths).

2.3.4 Anticipated Additional Berthing Demand in SEQ

Based on existing population and boat registration trends, and assuming that boat registrations continue to grow by between 4% and 8% per annum (with a midrange of 6%, which is considered conservative based on historic growth of 7.1% since 2002), it is estimated that an additional 3,641 berths will be required in SEQ by 2010 (range of 2,864 to 4,479), and 10,404 by 2020 (range of 6,598 to 15,360) (Pacific Southwest Strategy Group, 2007).

3. Assessment Methodology

This section outlines the quantitative and qualitative cost benefit assessment (CBA) framework and how it is applied to the economic, social and environmental assessment of the Northeast Business Park Project.

3.1 Cost Benefit Analysis

Cost benefit analysis (CBA) is an analytical tool to aid decision-makers in the efficient allocation of resources. It identifies and attempts to quantify the relative costs and benefits of a project and converts available data into manageable and comparable information units. The strength of the method is that it provides a framework for analysing complex and sometimes confusing data in a logical and consistent way.

CBA assesses the impact of a development by comparing the “with” and “without” scenarios, and helps decision makers answer questions such as:

- Does the proposed project provide a net benefit to the community, region or State as a whole?
- Should the proposed project, be undertaken?

CBA is a methodology for assessing the net benefits accruing to society as a whole as a result of a project and is considered over a 30 year time frame. 30 years has been selected as the generally acceptable point at which future flows of benefits and costs approximate zero due to discounting.

The CBA method considers the effect of real resource costs and benefits, and excludes, for example, taxes and subsidies, which are regarded as transfer payments from one part of the economy to another.

CBA attempts to measure the value of all costs and benefits that are expected to result from the activity in economic terms. It includes estimating costs and benefits that are ‘unpriced’ and not the subject of normal market transactions but which nevertheless entail the use of real resources. These attributes are referred to as ‘non-market’ goods or impacts. In each of these cases, quantification of the effects in money terms is an important part of the evaluation. However, projects frequently offer non-market benefits and costs that can be difficult to quantify. Where it is not possible to quantify an identified impact in dollar terms, the impact is considered in a qualitative assessment framework.

A quantitative CBA can only provide accurate information to assist in decision-making where all impacts are appropriately valued on a comparable basis. To ensure an unbiased assessment, this analysis includes a qualitative and quantitative CBA assessment of the Northeast Business Park Project.

3.2 Quantitative Impact Assessment Framework

3.2.1 Converting Future Impacts to Today’s Values

Because costs and benefits are specified over time it is necessary to reduce the stream of benefits and costs to present values. The present value concept is based on the time value of money – the idea that a dollar received today is worth more than a dollar to be received in the future. The present value of a cash flow is the value today that is equivalent to a cash flow in the future. The time value of money is determined by the given discount rate to enable the comparison of options by a common measure.

The selection of appropriate discount rates is of particular importance because they apply to much of the decision criteria and consequently the interpretation of results. The higher the discount rate, the less weight or importance is placed on future cash flows.

The choice of discount rates should reflect the weighted average cost of capital. For this analysis a base discount rate of 8.0% was examined with a range from 6.0% to 12.0% examined.

The formula for determining the present value is:

$$PV = \frac{FV_n}{(1 + r)^n}$$

Where:

PV = present value today
 FV = future value n periods from now
 r = discount rate per period
 n = number of periods

Extending this to a series of cash flows the present value is calculated as:

$$PV = \frac{FV_1}{(1 + r)^1} + \frac{FV_2}{(1 + r)^2} + \dots + \frac{FV_n}{(1 + r)^n}$$

Once the stream of costs and benefits have been reduced to their present values the Net Present Value (NPV) can be calculated as the difference between the present value of benefits and present value of costs. If the present value of benefits is greater than the present value of costs then the option or project would have a net economic benefit.

Because the NPV can result from the combination of any magnitude of benefits and costs it is not all that useful when comparing projects. A useful measure to use to compare between two different projects is the benefit cost ratio (BCR). The BCR is calculated by dividing the present value of benefits by the present value of costs. If the resulting BCR is greater than one (1) then the project has a net economic benefit. The higher the BCR the greater the quantified economic benefits compared to the quantified economic losses.

3.2.2 Assumptions

- The economic planning period is 30 years due to the impact of discounting on values beyond this time scale.
- It is assumed that the current case provides the state of the development for the next 30 years and it is assumed that no other actions will occur apart from the proposed project.
- All values are expressed in 2007 dollars.

3.3 Qualitative Impact Assessment Framework

Risk based impact assessment frameworks are well recognised as an appropriate approach for assessing economic, social and environmental impacts. This analysis has used a generic assessment framework modified and expanded from Crawford (2003) and Fletcher *et al.* (2004) for the qualitative CBA impact assessment.

3.3.1 Impacts, Likelihood and Consequence

The first step in applying the qualitative assessment framework is identifying the possible impacts (cost or benefit), followed by an assessment of the likelihood of the impact occurring and the anticipated consequences of the impact should it occur (**Table 4.1** and **Table 4.2**). Once complete, the combination of the likelihood and consequence of each impact identifies the associated risk and impact level (**Table 4.3**). Descriptions of each of the assigned risk levels are discussed following the risk assessment table.

Table 3.1 Qualitative Measure of Likelihood

Level	Descriptor	Description
1	Almost certain	It is expected to occur in most circumstances
2	Likely	It will probably occur in most circumstances
3	Possible	Might occur at some time
4	Unlikely	Could occur but not expected
5	Rare	May only occur in very exceptional circumstances
6	Remote	Never heard of, but not impossible

Source: Modified from Crawford (2003) and Fletcher *et al.* (2004)**Table 3.2 Qualitative Measure of Consequence**

Level	Descriptor	Description: Benefits	Description: Costs
1	Negligible	Very insignificant impacts. Unlikely to be measurable against benchmarks.	Very insignificant impacts. Unlikely to be measurable against benchmarks.
2	Minor	Possibly detectable impacts but minimal changes to the established structure and function. The impact and its magnitude are small relative to the wider context of the population/area being impacted. Benefits maintained over the short term without extended management and/ or works	Possibly detectable impacts but minimal changes to the established structure and function. The impact and its magnitude are small relative to the wider context of the population/area being impacted. Return to pre impact levels achievable and expected to occur over the short term once management initiatives are implemented.
3	Moderate	Detectable impacts, characterised by significant changes in structure, composition and function. The benefit is maintained over the medium term with minimal management and/or works.	Detectable impacts, characterised by significant changes in structure, composition and function. Recovery from impacts is achievable over the medium term once management initiatives are implemented.
4	Major/ Severe	Wider and longer term impacts occurring and likely to result in a highly changed structure, composition and function. The benefit is maintained over the longer term with minimal management and/or works.	Wider and longer term impacts occurring and likely to result in a highly changed structure, composition and function. Recovery from impacts possible with sustained effort over the long term.
5	Outstanding/ Catastrophic	Wider and longer term impacts occurring and likely to result in a highly changed structure, composition and function. The benefit is maintained over the longer term without management and/or works.	Wider and longer term impacts occurring and likely to result in a highly changed structure, composition and function. Return to pre impact levels unlikely to occur even with mitigation and intervention.

Source: Modified from Crawford (2003) and Fletcher *et al.* (2004)**Table 3.3: Qualitative Impact Assessment Matrix**

Likelihood	Consequence				
	Negligible	Minor	Moderate	Major/Severe	Outstanding/ Catastrophic
Remote	Very Low	Very Low	Very Low	Low	Medium
Rare	Very Low	Very Low	Low	Medium	Medium
Unlikely	Very Low	Low	Low	Medium	High
Possible	Very Low	Low	Medium	High	High
Likely	Low	Medium	Medium	High	Very High
Almost certain	Low	Medium	High	Very High	Very High

Source: Modified from Crawford (2003) and Fletcher *et al.* (2004)

3.4 Key Elements & Assumptions of the Northeast Business Park

The following key elements of the Northeast Business Park influence the structure and discussion of the following analysis:

- Construction phase from 2008 to 2020 delivers land lots and marina development;
- Secondary development phase is assumed to be undertaken by external developers;
- Residential and business/ industry activity commences on a staged basis following the release of land and secondary development construction activity;
- The Northeast Business Park will be operated under community title with a Body Corporate administrative structure with by-laws and internal planning controls; and
- The vision of the Northeast Business Park is an to be an integrated, holistic, landmark development changing the face and advancing the identity, ecological health and prosperity of the Caboolture Region and forms the basis of all developments and business activity in the precinct, which will benefit the State of Queensland.

4. Identification of Impacts

4.1 Introduction

The following sections identify the potential costs and benefits, causal activity and description of effect for the environmental, economic and social costs and benefits associated with the proposed Northeast Business Park development. The direct (i.e. experienced by the proponent) and indirect (experienced by external stakeholders) are also identified.

All impacts outlined in the following tables and examined in section 5 are included in the 'Total Project Scope' net benefit assessment. The relevant impacts and rationale for inclusion in the 'Medium Scope' are identified in the following tables.

4.2 Costs

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Economic								
Construction cost of the site	The capital cost of the development during its eleven phases borne by the proponent and other stakeholders including the cost of site preparation and development, secondary stage construction, open space and wetland areas.	37.5% of construction cost of business park. 45% of residential cost. 75% of recreational, sporting and open space areas.	2.1.3, 2.1.4, 2.1.5, 2.1.9 & 2.8.1	Direct & Indirect	Yes		Yes	
Cost of new infrastructure	Additional and upgraded infrastructure (electricity, transport, water, sewerage and telecommunications) required to accommodate the additional business and residential activity associated with the development.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Direct & Indirect	Yes		Yes	Yes
Additional Social and Community Infrastructure & Services	Costs associated with additional social and community infrastructure & services required to facilitate the needs of the increased residential and workforce population of Northeast Business Park.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Loss of agricultural land	The loss of existing agricultural production from the site, which is currently used for grazing, with much of this area being returned to open space and wetland areas.	100% of lost value as land is no longer used for agriculture.	2.1.3, 2.1.4, 2.1.5, 2.1.9 & 2.8.1	Indirect		Yes	Yes	
Social								
Increased road traffic	The activity of the business park and marine precinct will increase local traffic including larger numbers of heavy vehicles, boats and trailers on roads in the region.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes	Yes		Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Decreased boat user utility from increased river traffic	The marina will increase the number and range of vessels that use the Caboolture River, decreasing boat users utility through impacts such as decreased manoeuvrability and increased wash and noise.	All impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Decreased river safety from increased river traffic	The marina will increase the number and range of vessels that use the Caboolture River, increasing the risk of incidence of an accident.	All impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Loss of cultural heritage	The potential loss of cultural heritage values associated with the site resulting from the development to traditional owners.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Increased demand for accommodation and housing	The influx of construction and operational workers to the region may place pressure on housing supply in Caboolture Shire and surrounding regions.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, & 2.1.9	Indirect	Yes	Yes		Yes
Increased demand for community services and facilities	Growth in employment and population during both construction and operation will increase the demand for community service and facilities in Caboolture Shire and the broader service centre.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, & 2.1.9	Indirect	Yes	Yes		Yes
Noise impacts	Noise impacts include those generated through the use of machinery and equipment during the construction phase. Noise impacts during the operational phase of the development are not assessed as individual businesses will be required to operate within the requirements of the governing agency so as not to have external affects.	37.5% of business park associated impacts. 45% of residential associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes			Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Environmental								
Exposure of acid sulfate soil and nutrient load to waterways.	Excavation of the marina basin has the potential to expose acid sulfate soils as well as the export of soil bound nutrients during the marina excavation.	All impacts.	2.1.4 & 2.8.1	Indirect	Yes			Yes
Disturbance of aquatic habitat	Excavation and alteration of shoreline may disrupt and displace fish habitats (including the declared Fish Habitat Zone) that exist along the shoreline of the site.	All impacts.	2.1.4 & 2.8.1	Indirect	Yes	Yes		Yes
Disturbance of terrestrial habitat	Excavation and clearing of the development site may disturb the existing terrestrial habitat of the site.	Not included		Indirect	Yes	Yes		Yes
Dredging of the river mouth	Dredging of the river mouth has the potential to increase turbidity in the water and impact fish habitat.	All impacts.	2.1.5, 2.1.9 & 2.8.1	Indirect	Yes	Yes		Yes
Storm water run-off and site drainage	The site development has the potential to increase nutrient flow into local waterways via increased volume of water flow across and from the site.	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes
Bank erosion from increased river traffic	Increased boat traffic accessing the marina may potentially contribute to increased erosion of the Caboolture River bank.	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes
Impacts on downstream inter-tidal habitats	Changes to the hydrology of the river, sediments exported from the site and increased boat traffic have the potential to impact inter-tidal habitats downstream of the development.	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes
General water pollution	Increased marine industry and activity within and surrounding the marina may potentially increase the risk of pollution and contaminants to the Caboolture River (e.g. fuel, motor boat oil, etc.).	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes

4.3 Benefits

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Economic								
Building sales revenue	Return to the proponent and secondary developers from land and building sales following their release.	37.5% of business park associated impacts. 45% of residential cost.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Direct		Yes	Yes	
Increased business activity	The Northeast Business Park development will increase business and economic activity undertaken at the development site.	37.5% of business park associated impacts. 45% of residential cost.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes	Yes	Yes	
Increased business confidence (investment attraction)	The development is anticipated to contribute to increased business confidence, which has well established links to local investment and re-investment of business and residents in the local economy.	37.5% of business park associated impacts.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes	Yes		Yes
Tourism diversification and support (increased tourism visitation and spend)	Strengthening of the regional tourism sector through the development of tourist attractions such as parklands and golf courses, as well as cross promotion around adventure aquatic types of activities that will be provided by the region. The development of high quality marina facilities will also assist in the transition of marine based tourism to land based tourism and expenditure.	100% of marina.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Value adding and clustering efficiencies of the marine sector	The site will increase the critical mass of the sector, generate efficiencies and provide education and training opportunities for the marine sector and its primary support sectors including marine engineering, manufacture and repair services.	100% of marina.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Additional employment and training opportunities	The development is expected to contribute over 600 direct FTE positions each year during construction and create one third of the anticipated employment positions required in Caboolture Shire in the next 20 years during operation.	37.5% of business park associated impacts. 45% of residential cost.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes	Yes		Yes
Improved local and regional traffic linkages	Located within the Northern Corridor of the SEQ Regional Plan with the potential to facilitate the development of additional road infrastructure by avoiding environmental areas.	Not included		Indirect	Yes	Yes		Yes
Reduction in average peak flood height	Reduction by 400mm to 500mm across the inundation area through the removal (by dredging and then self maintenance) of the "plug" in the river.	100% of marina.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect	Yes	Yes		Yes
Social								
Improved river safety from dredging activities	The dredging of the river mouth will increase safety of marine traffic entering the river mouth.	100% of marina.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Public transport network	Infrastructure and transport demand will promote the development of a public transport network that will benefit the community by improving access to and from the development site as well as the facilitation of broader east-west community transport requirements.	37.5% of business park associated impacts. 45% of residential cost.	2.1.3 & 2.1.9	Indirect		Yes		Yes
Improved social and community infrastructure and services	Provision of additional childcare centres within the development as well as community halls, aged care, general health, etc. to enable a self-sufficient development.	37.5% of business park associated impacts. 45% of residential cost.	2.1.3 & 2.1.9	Indirect		Yes		Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Improved access to areas for recreational and leisure activity	The proximity of the river, marina and associated facilities, golf course, café and restaurant precincts, open space and recreational infrastructure (fishing platforms, walking trails, etc) contribute to the development of a recreational and leisure precinct. Precincts such as these contribute significantly to the wellbeing of residents and works of the development as well as the broader Caboolture region. Termed the "work-live-play" approach.	37.5% of construction cost of business park. 45% of residential cost. 75% of recreational, sporting and open space areas.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Visual amenity	Ongoing management and conformity of design from a body corporate community will ensure architectural and landscape conformity for the lifetime of the development.	37.5% of construction cost of business park. 45% of residential cost. 75% of recreational, sporting and open space areas.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Range and choice of residential alternatives	Residential development areas proposed for the precinct will increase the range of available housing and accommodation choice within the Caboolture region.	45% of residential cost.	2.1.3 & 2.1.9	Indirect		Yes		Yes
Protection of unique environmental and heritage assets	The protection of unique environmental and heritage assets includes the development of the "Heritage Park" precinct including picnic areas, sculpture forest and heritage trails as part of a broader open space precinct.	Not included	N/A	Indirect		Yes		Yes
Affordable housing strategy	The affordable housing strategy is an initiative of the proponent to contribute approximately \$2,500 from the sale of 1,300 lots to a building trust fund, with these funds to be used to construct affordable housing developments on Council owned land in the region.	45% of residential cost.	2.1.3 & 2.1.9	Indirect		Yes		Yes
Enhancement of community interaction and cohesion	The collective community use and benefit of the marina and support facilities of the development will enhance the community cohesion, interaction, vitality, wellbeing and prosperity of the region as well as the local community perception and image.	37.5% of construction cost of business park. 45% of residential cost.	2.1.3 & 2.1.9	Indirect		Yes		Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Environmental								
Improvement of fish habitat and decreased erosion	Provision has been incorporated into the proposed development to rehabilitate the ecological riparian zone along the site shoreline and provide a foreshore buffer zone. The management of dedicated access points will also prevent degradation from unauthorised access to the riverbank and riparian vegetation.	All impacts.	2.1.4 & 2.8.1	Indirect		Yes		Yes
Creation of wetlands (environmental protection and maintenance)	Active rehabilitation efforts will be undertaken to increase the coverage of wetland resources on the development site. Wetlands provide important refuges for plants and animals, particularly species listed as being endangered and of concern in SEQ.	Revegetation work through trust fund on downstream habitats of state significance	2.1.9 & 2.8.1	Indirect		Yes		Yes
Use of recycled water from treatment plant	Use of approximately 2-3ML of recycled water from the Caboolture STP that would previously have been pumped into the Caboolture River.	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes
Improved water quality (site run-off)	Water management and mitigation measures to slow water flow from the site will decrease the soil erosion compared to the current land use, which will significantly decrease reduce nutrient and contaminant loads and improve the quality of site run-off water, particularly in high rainfall events. Improved flushing (from the removal of the "plug") will also significantly improve water quality in the river.	All impacts.	2.1.9 & 2.8.1	Indirect		Yes		Yes
Improved water quality (boat operator education and facilities)	Regulation of boat harbouring and marine industry practices by demonstrating and educating boat operators/owners as to best practice activities and providing facilities for enable this to occur will reduce pollution.	All impacts.	2.1.5, 2.1.9 & 2.8.1	Indirect		Yes		Yes
Management of weed/pest species	Designation of conservation areas and active management to sustain the natural habitat will allow for control of pest/weed species on site.	Not included	N/A	Indirect		Yes		Yes
Reduced pollution from travel to work	Creation of significant employment opportunities close to residential areas will reduce the distance travelled to work by residents	37.5% of construction cost of business park.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Creation of terrestrial habitats	Landscaping of significant riparian and terrestrial areas with local native species will create habitat for native species	Not included	N/A	Indirect		Yes		Yes

Impact	Activity and Description	Scope of Dependent Uses Included in 'Medium' Assessment	Associated Policy Trigger	Impact Type (Direct / Indirect)	Phase		Assessment	
					Construction	Operation	Quantitative	Qualitative
Improved resource efficiency and recovery	Creation of industrial business clusters in a model of Industrial Ecology will maximize the synergies between businesses, minimize resource use and create opportunities for resource-sharing and recycling.	37.5% of construction cost of business park.	2.1.3, 2.1.4, 2.1.5 & 2.1.9	Indirect		Yes		Yes
Improved bushfire management	Site excavation and clearing and improved management will decrease fuel loads in a previously identified high risk area, reducing bushfire risk.	Not included	N/A	Indirect		Yes		Yes

5. Total Project Scope Quantitative Assessment

This section uses a cost benefit analysis (CBA) framework, as outlined in section 3.2, to assess the quantifiable impacts of the proposed Northeast Business Park development. Each impact is converted into a monetary value and is assessed individually before being combined in the CBA model to calculate the net impact of the proposed development. All values are presented in 2007-dollar terms.

This chapter examines the 'total project scope' assessment as outlined in section 1.3, with the 'medium scope' assessed in the following chapter.

The assessment has been conducted in accordance with the *Draft Net Benefit Assessment Guidelines* provided (EPA Undated) and examines two forms of impacts:

- **Direct impacts:** Those borne by the proponent, have been discounted at 10.00%, which is the indicative risk adjusted rate; and
- **Indirect impacts:** Those externalities or impacts borne by those other than the proponent, are discounted at 6.0% (Queensland Treasury, 2006).

As with any ex ante assessment assumptions must be made regarding the future flow of costs and benefits. For confidentiality reasons, the following assessment is undertaken utilising existing industry benchmarks, which have been clarified with the proponent regarding their relative accuracy. The overwhelmingly positive nature of the findings of this assessment, both directly and indirectly, indicate that even if there were to be some revision of the input figures as more information becomes available, the overall result and conclusions would be the same.

Not all impacts can be readily quantified in dollar terms. To ensure all project impacts are adequately considered, those impacts, not readily attributed a monetary value are examined in the qualitative cost CBA in the following section.

5.1 Direct Development Impacts

Direct impacts refer to the costs and benefits that apply directly to the project proponent. In the case of the Northeast Business Park:

- Direct costs include the site development costs that are incurred by the proponent in converting the site from its current use to project completion over the 21 year period of the development; and
- Direct benefits include the site development revenues that will be received by the proponent as the development proceeds and sections are sold or leased out. In this analysis, it is assumed that site development revenues commence in 2009, with the last revenue cashflow received by the proponent in 2025.

5.1.1 Direct Development Costs

Site Development Costs

The Northeast Business Park will be undertaken in 11 separate stages. Site development costs include all expenditure incurred in converting the site from current state (agricultural land) into saleable residential and business lots, marina facilities, recreational areas, open space and environmental restoration areas, etc.

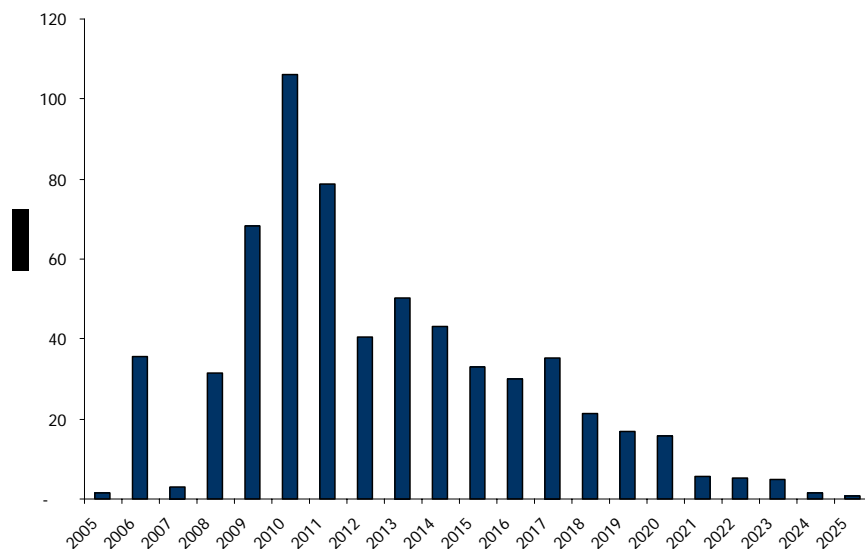
The development costs are broken down across eight elements and the following table presents a summary of the work elements that are associated with each stage.

Table 5.1. Development Cost Stages

Stage	Elements
Master Civil Works	Site environmental (dust and sedimentation control), site clearing and bulk earthworks
External Infrastructure	Roads, electricity, water, sewerage, gas, communications
Internal Infrastructure	Bridges, roads, services mains (electricity, potable water, recycled water, sewer and gas)
Business Park	Construction (detailed earthworks, roads and stormwater), services (sewer, water, gas, communications and security, electricity and grey water)
Residential Lots	Construction (detailed earthworks, roads, entry statements, foot/ bike/ golf cart pathways, stormwater), services (sewer, water, gas, communications and security, electricity and grey water) and community facilities (pools and amenities, tennis courts, parks)
Marina Precinct	Construction (marina and development detailed earthworks, revetment walls, lock, boardwalk, landscaping, parks/openspace, car parking, roads and footpaths), services (sewer, water, gas, communications and security, electricity and grey water)
Landscaping, Openspace and Recreation	Construction (golf course), recreation and landscape (residual flood level landscaping, trails, heritage park and regional park and sporting fields and facilities)
Construction	Golf (temporary clubhouse and maintenance facilities, permanent clubhouse and recreation facilities), Marina Club (marina club and sporting and community clubs) and Marina berths

Source: Northeast Business Park Pty Ltd (2007)

Direct costs are estimated to be approximately \$628 million over the course of the development, with a maximum annual spend of over \$100 million in 2010 and the last direct cost expenditure is undertaken in 2025. The following figure summarises the distribution of direct costs associated with the proposed Northeast Business Park.

Figure 5.1. Direct Costs of the Northeast Business Park, Total Project Scope (\$M2007)

Source: Northeast Business Park Pty Ltd (2007)

The construction of the Northeast Business Park is expected to cost approximately \$628 million to 2025, which has a present value of \$401 million (discount rate 10%).

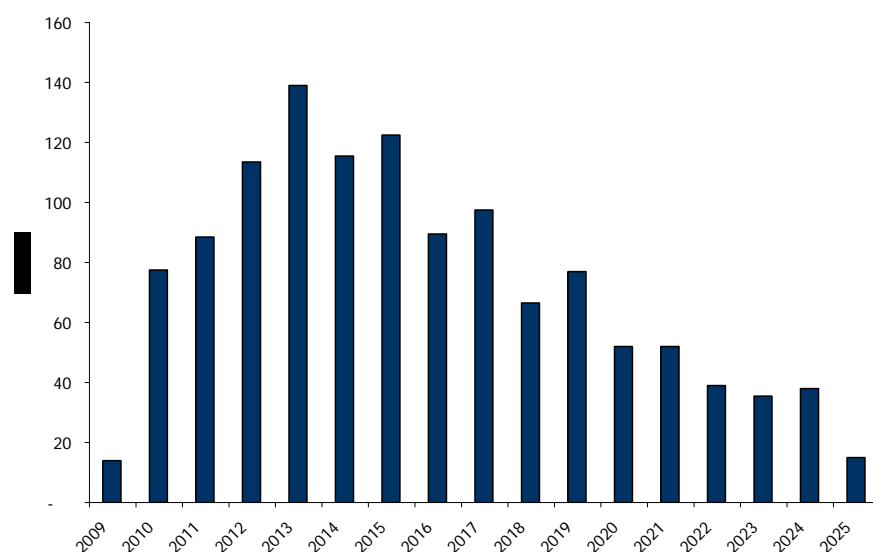
5.1.2 Direct Development Revenues

Site Development Revenues

As the site development works on the sequential stages of the project are completed, the sites will be released for sale to secondary developers for residential and business/industrial development. The revenue stream from this activity is expected to commence in 2009 and continue until 2025.

The first direct revenues are scheduled to be received in 2009 and continue until 2025. Over the lifetime of the project, direct revenues are expected to total approximately \$1.2 billion. The largest estimated annual revenue of approximately \$138 million is due to be received in 2013. The following figure summarises the flow of direct revenue associated with the proposed Northeast Business Park.

Figure 5.2. Direct Revenues of the Northeast Business Park, Total Project Scope (\$M2007)



Source: Northeast Business Park Pty Ltd (2007)

The total benefit from site development revenues is forecast to be approximately \$1.2 billion, which has a present value of approximately \$575 million (discount rate 10%).

5.1.3 NPV of Direct Impacts

The net present value (NPV) of the direct impacts of the Northeast Business Park is calculated by subtracting the present value of the direct costs from the present value of the direct revenues as outlined in the following table.

Table 5.2. Direct NPV & BCR of the Northeast Business Park Development, Total Project Scope (\$M2007)

Real Discount Rate	PV of Direct Revenues (\$M)	PV of Direct Costs (\$M)	Direct Net Present Value (\$M)	BCR
6%	\$762	\$471	\$290	1.62
8%	\$659	\$434	\$226	1.52
10%	\$575	\$401	\$174	1.43
12%	\$505	\$373	\$131	1.35

Source: AECgroup

The net present value of the direct impacts of the Northeast Business Park, assuming a discount rate of 10.0% is estimated to be \$174 million, and has a benefit to cost ratio (BCR) of 1.43, which implies a return in present value terms of \$1.43 for each dollar invested.

Sensitivity: Breakeven Point:

In order for the NPV of the direct impacts of the project to be equal to 0 and the BCR ratio to equal 1, the total direct costs would need to increase by 96% or the direct revenues would need to decrease by 49%.

Direct Economic Impact Finding

Direct Impact Finding:

The direct quantifiable impact of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the threshold assessment and the direct component of the formal assessment requirements of the Net Benefit Test.

5.2 Indirect Development Impacts

The following sections examine the readily quantifiable indirect impacts associated with the development of the Northeast Business Park. Indirect impacts are those that accrue beyond those experienced by the project proponent.

The analysis examines the following identified and quantifiable impacts:

- Indirect costs include:
 - **Building costs to secondary developers** – following initial development by the proponent the lots will be made available for sale. It is anticipated that secondary developers including major building companies and owner builders will purchase lots and begin constructing various properties;
 - **Lost agricultural production** – once the site has been converted there will no longer be any grazing activity undertaken on the Northeast Business Park site;
- Indirect benefits include:
 - **Building sales revenue to secondary developers** – following the completion of the construction phases the secondary developers will put the structures on the market;
 - **Additional business activity at Northeast Business Park** – as the development begins to take shape and residents and businesses move into the area it is anticipated that there will be considerable additional business activity resulting from the development.

5.2.1 Indirect Development Costs

Building Costs

When the site preparation works have been completed, the plots will be sold or leased to secondary parties who will then undertake secondary development work in accordance with the site master plan (i.e. construction of buildings on the divided lots).

In the Northeast Business Park there are four main property types: residential, industrial/commercial, recreation and retail. It is estimated that the total building costs will be \$1.4 billion, which is estimated to have a present value of \$918 million (discount rate 6%). This is based on an estimated land preparation cost of \$628 million, which has a present value of \$401 million (discount rate 10%). The total project cost, including secondary development costs, of \$2.0 billion, (Urbis, 2007).

The first land release is anticipated to occur in 2009. For the purposes of the CBA it is assumed that building expenditure by secondary developers commences two years after the first proponent expenditure reflecting the initial works to prepare land for release must be undertaken before secondary construction could begin. The final building expenditure costs are forecast to be incurred in 2027.

Loss of Agricultural Activity

The identified site is predominantly cleared and largely degraded, having previously been used for pine plantation, and more recently for grazing and limited cropping. A detailed assessment of the agricultural production potential of the site is contained in the good quality agricultural land assessment conducted by Place Environmental (2007). The following is a summary:

‘Good quality agricultural lands (Class A and Classes A-B) are also split into two land parcels, 85.5 ha along the western boundary and 52.5 ha adjacent to the central southern boundary of the site. Whilst suitable for agricultural purposes, they possess inherent limitations to the implementation of agriculture in these areas. The better quality Class 2 soils only occur in small unconnected areas on the crests of low ridges and rises where the viability of cropping is marginal. Further, the areas of better agricultural land (Class A and Class A-B) are contained within areas set aside for urban development and are located in parts of the site contained within the ‘Urban Footprint’ of the South East Queensland Regional Plan, and ‘District Industry Zonings’ of the Caboolture Planning Scheme.

The surrounding slopes Class 3 soils may require provision of a supplementary water supply for sustained productivity. The low nutrient status of the upper soil profile and the moderate to strongly acidic soil profile reaction trend may also necessitate some level of soil remediation and the selective use of fertilizers. In addition, the implementation of erosion control measures may be necessary on the steeper parts of some slopes.

The remaining parts of the site are not considered good quality agricultural land and are marginally suitable for crops (Class B) and improved pasture (Class C) (493 ha) while 143.6 ha is rated Class D non-agricultural land.’

It is not envisaged that there will be any other negative external impacts that will affect neighbouring freehold or leasehold properties for the purposes they are currently used (i.e. cattle grazing).

An analysis was undertaken to determine the impact of the reduction in grazing activities at the site. The following analysis is considered to deliver a somewhat optimistic return given the degraded nature of the existing pasture on the site, and assumes:

- Grazing cattle currently have access to the entire 720 ha of the site;
- No cattle are grazed following the commencement of construction for the Northeast Business Park (2008);
- An average stocking rate of 2 beasts per hectare across the entire property;
- An average production cycle of 2.5 years producing a 3.5-4 year old Jap Ox style beast (assumes purchase of yearling stores);

- An average market price of \$850/head (\$2007);
- Value added estimate for grazing of 20% of cattle output (Queensland Government, 2004), based on the Brisbane-Moreton Statistical Division.

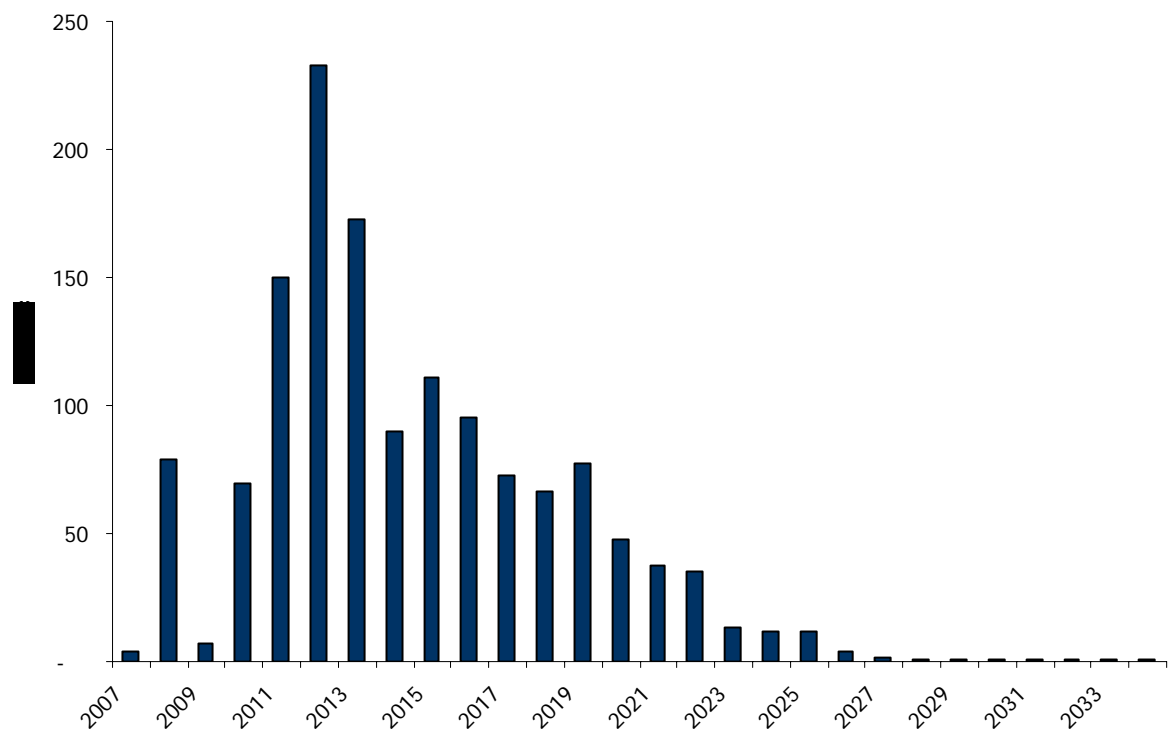
These calculations result in an annual average gross return per hectare of \$680, which equates to an annual gross revenue for the property of approximately \$489,600. For input to the CBA model the value added component of this annual production figure was estimated to be approximately \$97,920 per annum (Queensland Government, 2004).

The above assessment is considered to be the maximum per hectare gross return the property could produce in its current condition and equates to a present value loss to the region from reduced agricultural output of approximately \$8.3 million over the time period of the assessment (discount rate 6%).

Total Indirect Development Costs

The following figure shows the indirect costs over the lifetime of the project.

Figure 5.3. Indirect Costs of the Impacts of the Northeast Business Park, Total Project Scope (\$M2007)



Source: AECgroup from Northeast Business Park Pty Ltd (2007) & Urbis (2007)

It is apparent that the majority of indirect costs are incurred in the early stages of the project and are due to secondary stage development expenditure.

Over the period of the analysis, total indirect costs are estimated to be \$1.39 billion, which has a present value of \$926 million (discount rate 6%).

5.2.2 Indirect Development Benefits

Building Sales Revenue

It is anticipated that there will be a lag of one year between the first indirect revenue flows from land sales and the first revenue flows from the sale of finished properties, that is, one year per dwelling for the second stage construction. This reflects the estimated

time taken from the conclusion of the site preparation works, the sale of the land, building construction and finally the sale of the completed property.

Building sales revenue has been calculated on a cost plus basis. Industry analysis suggests that secondary developers of this type would require a return of approximately 20% on the costs of construction before they would consider undertaking this type of project. In some cases returns of up to 40% may be possible, however, to ensure a conservative analysis a costs plus 20% rate of return has been used.

On this basis, and utilising the construction cost data from Urbis (2007) the total building sales revenue is estimated to be approximately \$1.65 billion, which has a present value of \$963 million (discount rate 6%), which will flow over 17 years. It is estimated that the final buildings sales revenue will be received in 2026.

Additional Business Activity

Once operational the Northeast Business Park would be expected to stimulate considerable ongoing additional business activity in the region. This analysis only considers the additional business activity originating from the industrial/commercial, golf club and marina developments. It does not include the additional business activity from the residential aspect of the development as it is not possible to identify the proportion of residents that are new to the region compared those that relocate from within the southeast Queensland region at this stage. This approach ensures a conservative result.

- Business Park \$319.0 million;
- Marina Precinct \$15.4 million; and
- The Golf Club \$1.1 million per year.

Given the development will not be fully complete until 2027, the benefits are introduced in proportion with the completion of the development. The analysis assumes the additional business activity associated with the Business Park commences in the same year as the first building sales revenues are received, while the additional business activity associated with the golf club and marina will begin one year after first building sales revenues are received. This reflects the planned site preparation sequence, which will release plots for business properties before residential, golf and marina sites.

The value of the additional business activity to 2034 is anticipated to be \$6.13 billion, which equates to a present value of \$2.29 billion (discount rate 6%).

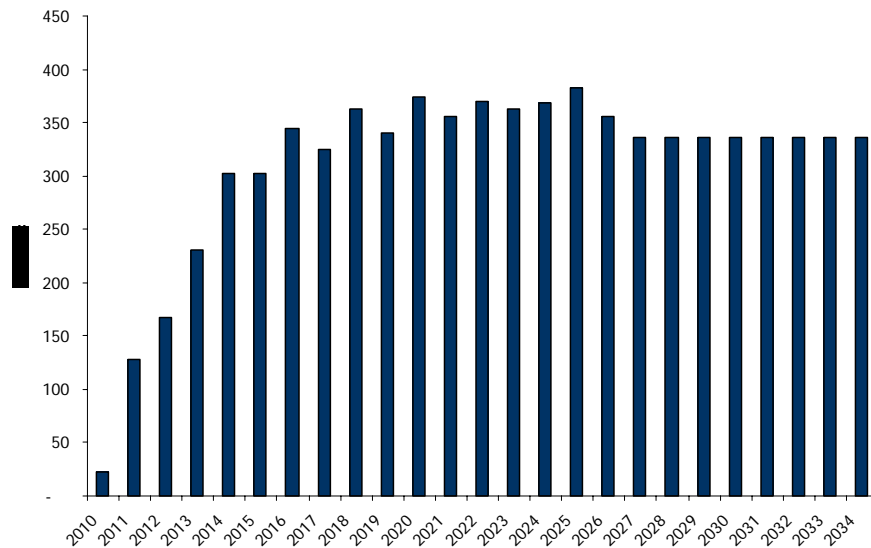
The following figure shows the indirect revenue flows as a result of the development. Whilst the revenues associated with the sale of the secondary developments are loaded in the first section of the graph and finish in 2026 those revenues associated with increased business activity are ongoing.

Total Indirect Development Benefits

The following figure summarises the flow of indirect benefits associated with the proposed Northeast Business Park.

The following figure demonstrates the consistent indirect benefits from the development. The first cash flows from sales revenues are expected to be received in 2010 and continue until 2026.

Figure 5.4. Indirect Benefits of the Impacts of the Northeast Business Park, Total Project Scope (\$M2007)



Source: AECgroup

Business activity from the development reaches steady state following the second stage construction and maturity of businesses/ activity in the precinct in 2027.

Over the period of the analysis, total indirect benefits are estimated to be \$7.78 billion, which has a present value of \$3.25 billion (discount rate 6%) over the period of the analysis.

5.2.3 NPV of Indirect Impacts

The net present value of the indirect impacts of the Northeast Business Park is calculated by subtracting the present value of the indirect revenues from the present value of the indirect costs.

Table 5.3. Indirect NPV & BCR of the Northeast Business Park Development, Total Project Scope (\$M2007)

Real Discount Rate	PV of Indirect Revenues (\$M)	PV of Indirect Costs (\$M)	Indirect Net Present Value (\$M)	BCR
5%	\$3,711	\$987	\$2,724	3.76
6%	\$3,251	\$926	\$2,324	3.51
7%	\$2,861	\$871	\$1,996	3.28
10%	\$2,003	\$732	\$1,271	2.74

Source: AECgroup

The net present value of the indirect impacts of the Northeast Business Park is estimated to be \$2.3 billion over the next 30 years, and has a benefit to cost ratio of 3.51.

Sensitivity: Breakeven Point:

In order for the NPV of the indirect impacts of the project to be equal to 0 and the BCR ratio to equal 1, total indirect costs would need to increase by 513% or the indirect revenues would need to decrease by 92%.

Indirect Economic Impact Finding

Indirect Impact Finding:

The indirect quantifiable impact of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the indirect component of the threshold assessment and the indirect component of the formal assessment requirements of the Net Benefit Test.

5.3 Impact Summary

5.3.1 Project NPV

The net present value of the all impacts (direct and indirect) of the Northeast Business Park is calculated by subtracting the present value of the costs from the present value of the revenues.

The following table shows the present values of the estimated project revenues and costs as well as the impact that an increase or decrease in the discount rates used would have on overall project NPV.

Table 5.4. Project NPV Sensitivity, Total Project Scope (\$M2007)

Real Discount Rate	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct @ 8% & Indirect @ 5%	\$4,370	\$1,420	\$2,950	3.08
Direct @ 10% & Indirect @ 6%	\$3,826	\$1,327	\$2,498	2.88
Direct @ 12% & Indirect @ 7%	\$3,366	\$1,245	\$2,121	2.70

Source: AECgroup

The net present value of the project, including both the direct and indirect components is estimated to be \$2.5 billion and a BCR of 2.88, which implies for every dollar spent in the delivery of the project (including proponent development expenditure, secondary developer costs and other costs such as lost agricultural activity, etc) the Northeast Business Park returns \$2.88.

5.3.2 Quantitative CBA Finding

The quantitative CBA assessment found that development of the Northeast Business Park is expected to deliver a total net benefit of \$2.5 billion in present value terms (NPV), with present value of revenues of \$3.8 billion and a present value of costs of \$1.3 billion. Overall, the development provides a benefit cost ratio (BCR) of 2.88 (i.e. returns \$2.88 for every dollar spent in delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms of \$174 million with a BCR of 1.43. The project delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$2.3 billion with a BCR of 3.51.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a clear benefit to the State of Queensland.

Table 5.5. Quantitative CBA Summary, Total Project Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$575	\$401	\$174	1.43
Indirect Impacts	\$3,251	\$926	\$2,324	3.51
Total Impacts	\$3,826	\$1,328	\$2,498	2.88

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the Threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In economic terms, the Northeast Business Park development, under the 'total project scope' assessment provides a net benefit to the State of Queensland.

6. Medium Scope Quantitative Assessment

This section uses a cost benefit analysis (CBA) framework, as outlined in section 3.2, to assess the quantifiable impacts of the proposed Northeast Business Park development. Each impact is converted into a monetary value and is assessed individually before being combined in the CBA model to calculate the net impact of the proposed development. All values are presented in 2007-dollar terms.

This chapter examines the 'medium scope' scenario as outlined in section 1.3 with the 'total project scope' assessed in the previous chapter.

The assessment has been conducted in accordance with the *Draft Net Benefit Assessment Guidelines* provided (EPA Undated) and examines two forms of impacts:

- **Direct impacts:** Those borne by the proponent, have been discounted at 10.00%, which is the indicative risk adjusted rate; and
- **Indirect impacts:** Those externalities or impacts borne by those other than the proponent, are discounted at 6.0% (Queensland Treasury, 2006).

As with any ex ante assessment assumptions must be made regarding the future flow of costs and benefits. For confidentiality reasons, the following assessment is undertaken utilising existing industry benchmarks, which have been clarified with the proponent regarding their relative accuracy. The overwhelmingly positive nature of the findings of this assessment, both directly and indirectly, indicate that even if there were to be some revision of the input figures as more information becomes available, the overall result and conclusions would be the same.

Not all impacts can be readily quantified in dollar terms, to ensure all project impacts are adequately considered, those impacts that are not readily attributed a monetary value are examined in the qualitative cost CBA in the following section.

6.1 Direct Development Impacts

Direct impacts refer to the costs and benefits that apply directly to the project proponent under the medium scope as they pertain to SCMP and RCMP policies 2.1.3, 2.1.4, 2.1.5, 2.1.9 & 2.8.1. In the case of the Northeast Business Park:

- Direct costs include the site development costs that are incurred by the proponent in converting the site from its current use to project completion over the 21 year period of the development; and
- Direct benefits include the site development revenues that will be received by the proponent as the development proceeds and sections are sold or leased out. In this analysis, it is assumed that site development revenues commence in 2009, with the last revenue cashflow received by the proponent in 2025.

6.1.1 Direct Development Costs

Site Development Costs

The construction phase of the Northeast Business Park will be undertaken in 11 separate stages. Site development costs include all expenditure incurred in converting the site from its current state (agricultural land) into saleable residential and business lots, marina facilities, recreational areas, open space and environmental restoration areas, etc.

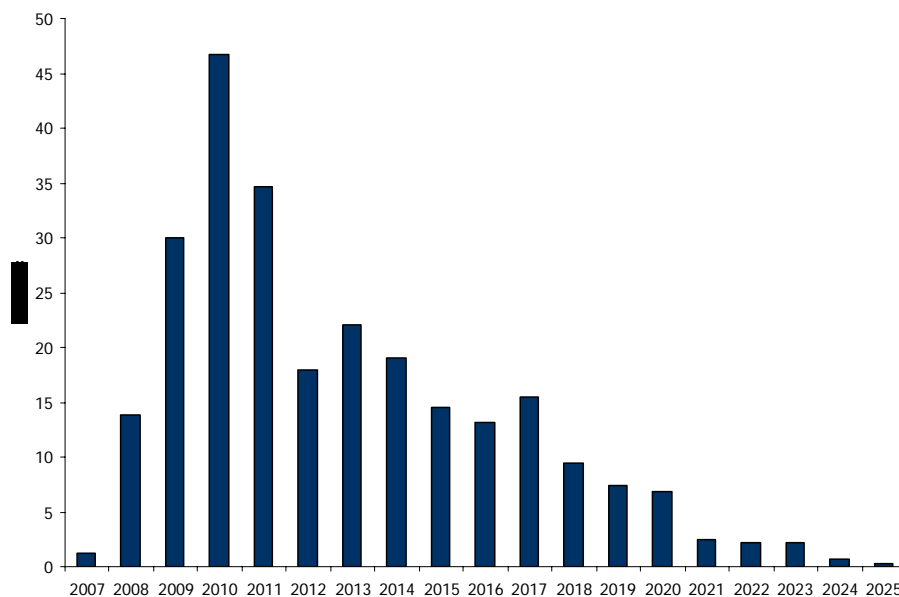
The development costs are broken down across eight elements and the following table presents a summary of the work associated with each.

Table 6.1. Northeast Business Park Development Cost Stages

Stage	Elements
Master Civil Works	Site environmental (dust and sedimentation control), site clearing and bulk earthworks
External Infrastructure	Roads, electricity, water, sewerage, gas, communications
Internal Infrastructure	Bridges, roads, services mains (electricity, potable water, recycled water, sewer and gas)
Business Park	Construction (detailed earthworks, roads and stormwater), services (sewer, water, gas, communications and security, electricity and grey water)
Residential Lots	Construction (detailed earthworks, roads, entry statements, foot/ bike/ golf cart pathways, stormwater), services (sewer, water, gas, communications and security, electricity and grey water) and community facilities (pools and amenities, tennis courts, parks)
Marina Precinct	Construction (marina and development detailed earthworks, revetment walls, lock, boardwalk, landscaping, parks/openspace, car parking, roads and footpaths), services (sewer, water, gas, communications and security, electricity and grey water)
Landscaping, Openspace and Recreation	Construction (golf course), recreation and landscape (residual flood level landscaping, trails, heritage park and regional park and sporting fields and facilities)
Construction	Golf (temporary clubhouse and maintenance facilities, permanent clubhouse and recreation facilities), Marina Club (marina club and sporting and community clubs) and Marina berths

Source: Northeast Business Park Pty Ltd (2007)

The direct project costs of the Northeast Business Park (under the medium scope see section 1.3) are estimated to be approximately \$277 million over the course of the development, with a maximum annual spend of over \$47 million in 2010 and the last direct expenditure undertaken in 2025. The following figure summarises the distribution of direct costs associated with the medium scope elements of the proposed Northeast Business Park.

Figure 6.1. Direct Costs of the Northeast Business Park, Medium Scope (\$M2007)

Source: Northeast Business Park Pty Ltd (2007)

The construction of the medium scope elements of the Northeast Business Park is expected to have been completed by 2025 and to cost approximately \$277 million, which has a present value of \$177 million (discount rate 10%).

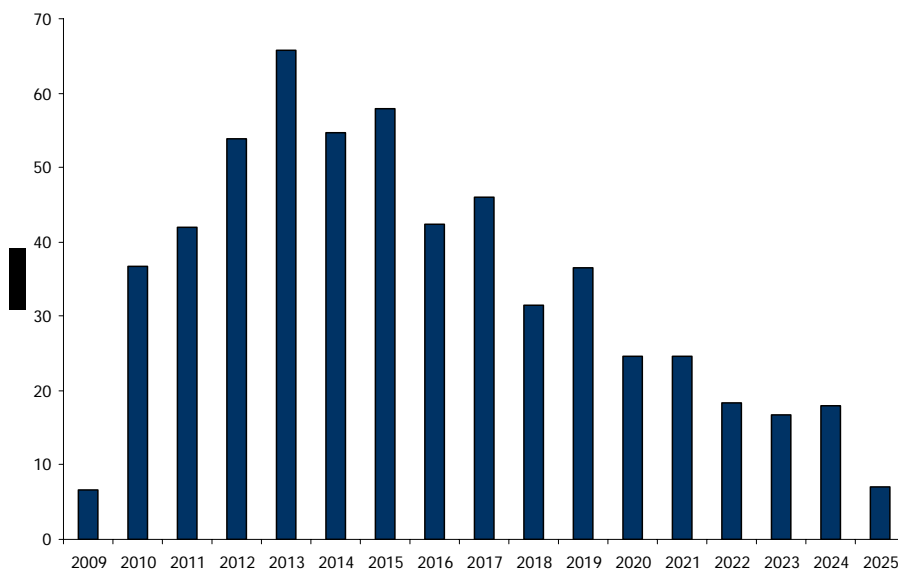
6.1.2 Direct Development Revenues

Site Development Revenues

As work on the sequential stages of the project is completed, the sites will be released for lease or sale to secondary developers for residential and business/ industrial development. The revenue stream from this activity related to the 'medium scope' assessment (see section 1.3) is expected to commence in 2009 and continue until 2025.

Over the lifetime of the project, direct revenues are expected to total approximately \$554 million. The largest estimated annual revenue of approximately \$62 million is due to be received in 2013. The following figure summarises the flow of direct revenue associated with the medium scope elements of the proposed Northeast Business Park.

Figure 6.2. Direct Revenues of the Northeast Business Park, Medium Scope (\$M2007)



Source: Northeast Business Park Pty Ltd (2007)

The medium scope direct benefit from the site development revenues is forecast to be approximately \$554 million, which has a present value of approximately \$259 million (discount rate 10%).

6.1.3 NPV of Direct Impacts

The net present value (NPV) of the direct impacts of the Northeast Business Park is calculated by subtracting the present value of the direct costs from the present value of the direct benefits as outlined in the following table.

Table 6.2. Direct NPV & BCR of the Northeast Business Park Development, Medium Scope (\$M2007)

Real Discount Rate	PV of Direct Revenues (\$M)	PV of Direct Costs (\$M)	Direct Net Present Value (\$M)	BCR
6%	\$343	\$207	\$135	1.65
8%	\$297	\$191	\$106	1.55
10%	\$259	\$177	\$82	1.46
12%	\$227	\$164	\$63	1.38

Source: AECgroup

The net present value of the direct impacts of the Northeast Business Park, assuming a discount rate of 10.0% is estimated to be \$82 million, and has a benefit to cost ratio (BCR) of 1.46, which implies a return in present value terms of \$1.46 for each dollar invested.

Sensitivity: Breakeven Point:

In order for the NPV of the direct impacts of the project to be equal to 0 and the BCR ratio to equal 1, the total direct costs would need to increase by 100% or the direct revenues would need to decrease by 50%.

Direct Economic Impact Finding

Direct Impact Finding:

The direct quantifiable impact of the medium scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the threshold assessment and the direct component of the formal assessment requirements of the Net Benefit Test.

6.2 Indirect Development Impacts

The following sections examine the readily quantifiable (medium scope) indirect impacts associated with the development of the Northeast Business Park. Indirect impacts are those that accrue beyond those experienced by the project proponent.

The analysis examines the following identified and quantifiable impacts associated with the 'medium scope' assessment as they pertain to SCMP and RCMP policies 2.1.3, 2.1.4, 2.1.5, 2.1.9 & 2.8.1:

- Indirect costs include¹:
 - **Building costs to secondary developers** – following initial development by the proponent the lots will be made available for sale. It is anticipated that secondary developers including major building companies and owner builders will purchase lots and begin constructing various properties;
 - **Lost agricultural production** – once the site has been developed there will no longer be any grazing activity undertaken on the Northeast Business Park site;
- Indirect benefits include:
 - **Building sales revenue to secondary developers** – following the completion of the construction phases the secondary developers will put the structures on the market;
 - **Additional business activity at Northeast Business Park** – as the development begins to take shape and residents and businesses move into the area it is anticipated that there will be considerable additional business activity resulting from the development.

6.2.1 Indirect Development Costs

Building Costs

When the site preparation works have been completed, the plots will be sold or leased to secondary parties who will then undertake secondary development work in accordance with the site master plan (i.e. construction of buildings on the divided lots).

There will be four main property types at the Northeast Business Park: residential, industrial/commercial, recreation and retail. It is estimated that the total building costs will be \$619 million, which is estimated to have a present value of \$413 million (discount rate 6%) (adapted by AECgroup from Urbis (2007)).

The first land release is anticipated to occur in 2009. For the purposes of the CBA it is assumed that building expenditure by secondary developers commences two years after

¹ Pertains to approximately 37.5% of the business and industry precinct and 45% of the residential precinct.

the first proponent expenditure recognising the initial works that must be completed to prepare land for release before secondary construction can begin. The final building expenditure costs are forecast to be incurred in 2027.

Loss of Agricultural Activity

The identified site is predominantly cleared and largely degraded, having previously been used for pine plantation, and more recently for grazing and limited cropping. A detailed assessment of the agricultural production potential of the site is contained in the good quality agricultural land assessment conducted by Place Environmental (2007). The following is a summary:

‘Good quality agricultural lands (Class A and Classes A-B) are also split into two land parcels, 85.5 ha along the western boundary and 52.5 ha adjacent to the central southern boundary of the site. Whilst suitable for agricultural purposes, they possess inherent limitations to the implementation of agriculture in these areas. The better quality Class 2 soils only occur in small unconnected areas on the crests of low ridges and rises where the viability of cropping is marginal. Further, the areas of better agricultural land (Class A and Class A-B) are contained within areas set aside for urban development and are located in parts of the site contained within the ‘Urban Footprint’ of the South East Queensland Regional Plan, and ‘District Industry Zonings’ of the Caboolture Planning Scheme.

The surrounding slopes Class 3 soils may require provision of a supplementary water supply for sustained productivity. The low nutrient status of the upper soil profile and the moderate to strongly acidic soil profile reaction trend may also necessitate some level of soil remediation and the selective use of fertilizers. In addition, the implementation of erosion control measures may be necessary on the steeper parts of some slopes.

The remaining parts of the site are not considered good quality agricultural land and are marginally suitable for crops (Class B) and improved pasture (Class C) (493 ha) while 143.6 ha is rated Class D non-agricultural land.’

It is not envisaged that there will be any other negative external impacts that will affect neighbouring freehold or leasehold properties for the purposes they are currently used (i.e. cattle grazing).

An analysis was undertaken to determine the impact of the reduction in grazing activities at the site. The following analysis is considered to deliver a somewhat optimistic return given the degraded nature of the existing pasture on the site, and assumes:

- Grazing cattle currently have access to the entire 720 ha of the site;
- No cattle are grazed following the commencement of construction for the Northeast Business Park (2008);
- An average stocking rate of 2 beasts per hectare across the entire property;
- An average production cycle of 2.5 years producing a 3.5-4 year old Jap Ox style beast (assumes purchase of yearling stores);
- An average market price of \$850/head (\$2007);
- Value added estimate for grazing of 20% of cattle output (Queensland Government, 2004), based on the Brisbane-Moreton Statistical Division.

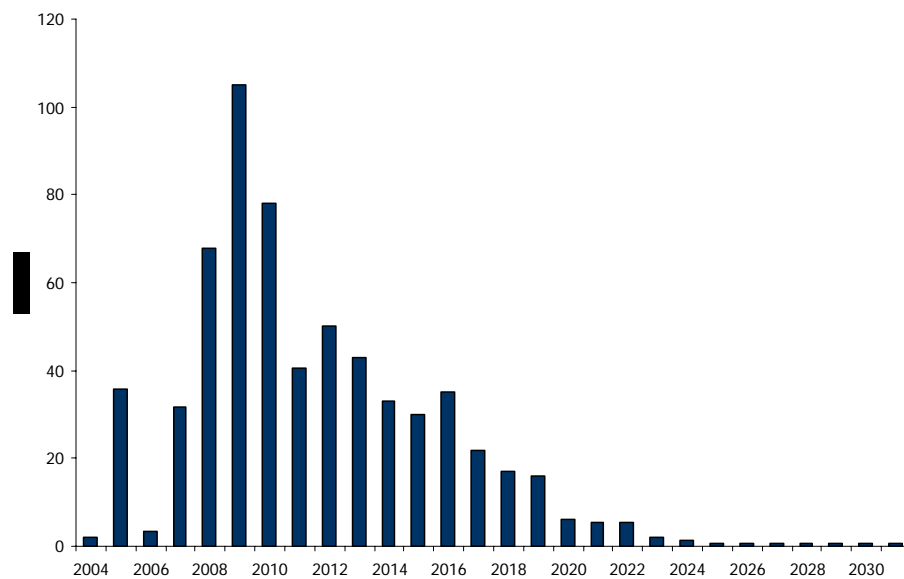
These calculations result in an annual average gross return per hectare of \$680, which equates to an annual gross revenue for the property of approximately \$489,600. For input to the CBA model the value added component of this annual production figure was estimated to be approximately \$97,920 per annum (Queensland Government, 2004).

The above assessment is considered to be the maximum per hectare gross return the property could produce in its current condition and equates to a present value loss to the region from reduced agricultural output of approximately \$8.3 million over the time period of the assessment.

Total Indirect Development Costs

The following figure shows the indirect costs, under the medium scope, over the lifetime of the project.

Figure 6.3. Indirect Costs of the Impacts of the Northeast Business Park, Medium Scope (\$M2007)



Source: AECgroup from Northeast Business Park Pty Ltd (2007) & Urbis (2007)

The majority of indirect costs are incurred in the early stages of the project and are due to secondary stage development expenditure. Over the period of the analysis, total indirect costs are estimated to be \$636 million, which has a present value of \$421 million (discount rate 6%).

6.2.2 Indirect Development Benefits

Building Sales Revenue

It is anticipated that there will be a lag of one year between the first indirect revenue flows from land sales and the first revenue flows from the sale of finished properties in the second stage construction. This reflects the estimated time taken from the conclusion of the site preparation works, the sale of the land, building construction and sale.

Building sales revenue has been calculated on a cost plus basis. Industry analysis suggests that secondary developers of this type would require a return of approximately 20% on the costs of construction before they would consider undertaking this type of project. In some cases, returns of up to 40% may be possible, however, to ensure a conservative analysis a costs plus 20% rate of return has been used.

On this basis, and utilising the construction cost data from Urbis (2007) the total building sales revenue (using the medium scope) is estimated to be approximately \$743 million, which has a present value of \$433 million (discount rate 6%), which will flow over 17 years. It is estimated that the final buildings sales revenue will be received in 2026.

Additional Business Activity

Once operational the Northeast Business Park would be expected to stimulate considerable ongoing additional business activity in the region. This medium scope analysis only considers the additional business activity originating from the industrial/commercial and marina developments. It does not include the additional business activity from the golf course or residential aspects of the development. This approach ensures a conservative result.

- Business Park \$120.0 million; and
- Marina Precinct \$15.4 million.

Given that the development will not be fully complete until 2027, the benefits are introduced in proportion with the completion of the development. The analysis assumes

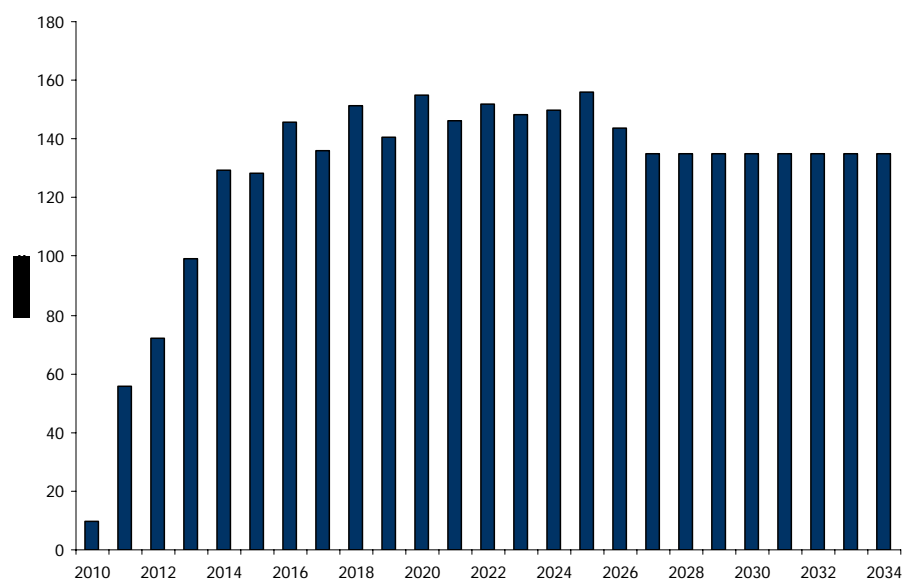
the additional business activity associated with the Business Park commences in the same year as the first building sales revenues are received, while the additional business activity associated with the marina will begin one year after first building sales revenues are received. This reflects the planned site preparation sequence, which will release plots for business properties before residential and marina sites.

The value of the additional business activity to 2034 is anticipated to be \$2.46 billion, which equates to a present value of \$916 million (discount rate 6%).

Total Indirect Development Benefits

The following figure shows the indirect revenue flows as a result of the development. Whilst the revenues associated with the sale of the secondary developments are loaded in the first section of the graph and finish in 2026, those revenues associated with increased business activity are ongoing.

Figure 6.4. Indirect Benefits of the Impacts of the Northeast Business Park, Medium Scope (\$M2007)



Source: AECgroup

Business activity from the development reaches steady state following the second stage construction and maturity of businesses/ activity in the precinct in 2027.

Over the period of the analysis, total indirect benefits are estimated to be \$3.20 billion, which has a present value of \$1.35 billion (discount rate 6%)

6.2.3 NPV of Indirect Impacts

The net present value (NPV) of the indirect impacts of the Northeast Business Park is calculated by subtracting the present value of the indirect revenues from the present value of the indirect benefits.

Table 6.3. Indirect NPV & BCR of the Northeast Business Park Development, Medium Scope (\$M2007)

Real Discount Rate	PV of Indirect Revenues (\$M)	PV of Indirect Costs (\$M)	Indirect Net Present Value (\$M)	BCR
5%	\$1,538	\$449	\$1,089	3.42
6%	\$1,349	\$421	\$928	3.20
7%	\$1,189	\$396	\$793	3.00
10%	\$836	\$333	\$503	2.51

Source: AECgroup

The net present value of the indirect impacts of the Northeast Business Park is estimated to be \$928 million over the next 30 years, and has a benefit to cost ratio of 3.20.

Sensitivity: Breakeven Point:

In order for the NPV of the indirect impacts of the project to be equal to 0 and the BCR ratio to equal 1, total indirect costs would need to increase by 403% or the indirect revenues would need to decrease by 80%.

Indirect Economic Impact Finding

Indirect Impact Finding:

The indirect quantifiable impact of the medium scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the indirect component of the threshold assessment and the indirect component of the formal assessment requirements of the Net Benefit Test.

6.3 Impact Summary

6.3.1 Medium Scope Project NPV

The net present value of the all impacts (direct and indirect) of the Northeast Business Park is calculated by subtracting the present value of the revenues from the present value of the costs.

The following table shows the present values of the estimated project revenues and costs as well as the impact that an increase or decrease in the discount rates used would have on overall project NPV.

Table 6.4. Project NPV Sensitivity, Medium Scope (\$M2007)

Real Discount Rate	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct @ 8% & Indirect @ 5%	\$1,834	\$640	\$1,195	2.87
Direct @ 10% & Indirect @ 6%	\$1,608	\$598	\$1,010	2.69
Direct @ 12% & Indirect @ 7%	\$1,416	\$561	\$855	2.53

Source: AECgroup

The net present value of the medium scope project, including both the direct and indirect components is estimated to be \$1.01 billion and have a BCR of 2.69. This implies that for every dollar spent in the delivery of the project (including proponent development expenditure, secondary developer costs and other costs such as lost agricultural activity, etc) the Northeast Business Park returns \$2.69.

6.3.2 Quantitative CBA Finding

The quantitative CBA assessment of the medium scope impacts found that development of the Northeast Business Park is expected to deliver a total net benefit of \$1.01 billion in present value terms (NPV), with the present value of revenues of \$1.61 billion exceeding the present value of costs of \$598 million. Overall, the development provides a benefit cost ratio (BCR) of 2.69 (i.e. returns \$2.69 for every dollar spent in the delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms of \$82 million with a BCR of 1.46. The project also delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$928 million with a BCR of 3.20.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a clear benefit to the State of Queensland.

Table 6.5. Quantitative CBA Summary, Medium Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$259	\$177	\$82	1.46
Indirect Impacts	\$1,349	\$421	\$928	3.20
Total Impacts	\$1,608	\$598	\$1,010	2.69

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the medium scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the Threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the medium scope of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In economic terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland.

7. Qualitative Assessment

This section presents the qualitative economic, social and environmental impact assessment for those impacts identified as flowing to or being borne by stakeholders other than the proponent (i.e. the indirect impacts). The methodology for the qualitative assessment is outlined in **Section 3.3, Qualitative Impact Assessment Framework**.

The report and assessment has not identified any qualitative impacts accruing to the proponent with all impacts accruing to the proponent (positive and negative) incorporated in the quantitative assessment.

This assessment presents information for both the total project assessment and the medium scope, with information for the total project assessment presented first, followed by discussion outlining differences for the medium scope assessment.

The likelihood of an impact occurring is the same for both the total project and medium scope (unless the impact is not related to one of the policy triggers and is thereby not assessed in the medium scope assessment).

The consequence of the impact may differ between the total project scope and the medium scope depending on the impacts applicability to the five policies triggering the requirement for a net benefit assessment in relation to the Northeast Business Park.

7.1 Costs

7.1.1 Economic Costs

Additional infrastructure costs

Additional infrastructure, such as roads, water, wastewater, gas, electricity and ICT, is required to meet the needs of the residential and business populations of the Northeast Business Park.

Whilst provision for these facilities has been included in the quantitative assessment, and assumes full funding by the proponent

The quantitative assessment assumes the additional infrastructure required in the site development costs is fully funded by the proponent. However, it is expected that infrastructure providers will also contribute to the costs of completing these works. The final proportion of additional infrastructure costs funded by each party is still the subject of negotiation and to ensure a conservative approach the following qualitative assessment is undertaken on the basis of 100% of the cost of additional infrastructure being borne by 3rd parties, however it should be noted this will significantly overestimate the impacts to 3rd parties as they will not bear 100% of the cost.

Water and Sewerage

Water and sewerage costs will be shared between the developer and Caboolture Shire Council. As well as the cost of increasing the existing networks to include the development, a series of plant upgrades will also be necessary. Using Caboolture Shire Council's headworks calculation formula, the developer will be required to pay \$20 million in headworks charges plus acceleration costs of over \$7 million for additional work including upgrades to treatment plants, increasing the size of the planned water main serving the development and burying the mains pipes under the Bruce Highway.

Roads

Caboolture Shire Council also uses a headworks formula to calculate the level of developer contribution for road upgrades. This calculation is based on all journeys that will be undertaken on the road minus the planned traffic for the road before the development. This data is still being refined, however initial estimates put the costs of road upgrades at approximately \$24 million. Additional transport infrastructure beyond these charges may also be required to facilitate broader public transport linkages in response to demand generated by the proposed Northeast business park development over the life of the development.

Electricity

Due to the Northeast Business Park's forecast electricity demand, a new Energex zone and substation will be required, supplied by a 33kV distribution feed from the nearest existing zone at Morayfield South. It is estimated that an area of 2,000 sqm will be needed for the substation and it will be a minimum of two years before the zone and substation are operational. In the interim period, it will be necessary to establish a temporary supply. It is considered that this can be achieved with minimal external works at a maximum cost of \$30,000 by accessing the 11kV supply that is already available close to the development. It is understood that the proponent will provide the required land for this without charge.

Within the development, single supply points will be needed to provide bulk loads for some industrial processes, this will be achieved through commercial size 'green boy' pillars. Some areas may also need multiple supply points for separate large loads. Further work will be required to determine the supply requirements of the large industrial consumers when more detail is known about the plant and equipment that will be used.

Pad-mounted transformers (PMTs) will be needed every 100 residential lots and in the industrial/ commercial zone every 15 lots. Each PMT requires an area of 3.5m x 4.1m on level ground, slightly more on sloping ground. It is estimated that developers should allow \$10,000 for the installation of each PMT including 500m of cable. In the industrial zones Energex also require that as well as a road excision every 15th lot for current demand there must be an additional excision created at every sixth lot to cater for future demand increases. Energex also require that easements are provided to any part of the network not on Council land.

Energex will carry out all of the works associated with providing the 33kV supply and would be expected to fund the full costs of this work other than the sub-station land costs. If the staging of the development is co-ordinated with the extension of the network then the developer will also be able to access an Energex contribution towards the costs of materials based on the number of lots being created.

As of 1/7/07, Energex offer a contribution to the developer of \$2,000 for every residential and industrial lot and individual buildings in group title areas. This is to assist with the costs of transformers, cable and overhead materials. However, this scheme is currently being phased out and the level of the Energex contribution will reduce by \$1,000 per year until 2009 when the scheme will end. It is expected that a new developer subsidy scheme will be established and that Energex will offer developers the better of the existing or new scheme. Energex estimate that the average contribution from the new scheme will be around \$1,500 per lot. A new scheme for industrial/ commercial connections is expected to provide a contribution of around \$750 per lot but also includes support for cable for PMT ties and a payment for unused PMT capacity.

Natural Gas

The Northeast Business Park is within Origin Energy's pipeline supply area and the nearest mains network is 7.5 kms to the south at Narangba Industrial Estate. Although Origin have previously considered expanding the network to service other industrial users to the north of Narangba, feasibility studies have suggested that such an investment would only offer marginal returns and so this option has not been pursued.

Envestra, who is the owner of the natural gas distribution network north of the Brisbane River, is currently undertaking an evaluation to determine the economic viability of extending its current network to service the Northeast Business Park development. It is estimated that the cost of installing a gas main to the development would be \$150,000 per km.

Envestra is committed to making this environmentally friendly fuel available to residential and business consumers in South East Queensland by extending its network in accordance with the National Third Party Access Code for Natural Gas Pipelines.

Telecommunications

It is understood that Telstra will supply a copper network throughout the development free of charge providing that all excavation works are carried out on their behalf. In the residential areas the copper cables can be placed in the same trench as the electricity supply cables, however, in the industrial/commercial zone separate excavation works are required which must be undertaken at the developer's cost.

It is considered likely that Telstra will ask to provide high capacity mains cabling throughout the Northeast Business Park. This would be subject to the same trenching requirements as the standard copper network.

As only some of the indicative costs for this infrastructure are currently available, there is the potential for a shortfall between the proponent's contribution and the full costs of providing these services. It is anticipated that any such shortfall would be borne by the utilities and ultimately their customers.

It is **almost certain** (expected to occur in most circumstances) that the creation of the Northeast Business Park will result in some additional infrastructure costs to the service providers during the construction phase.

The consequence of this infrastructure provision for the total project scope is assessed to be **moderate** (detectable and recoverable over the medium term) to **major** (significant impacts over the long term) in the wider context of the operation of utility organisations, however this depends on the cost recovery regime required (any capital costs to service providers are anticipated to be recovered through usage charges to consumers under full cost pricing through their operational agreements). The assessment has assumed a **major** consequence (wider and longer term impacts), so as not to underestimate the potential impact.

With approximately 45% to 50% of infrastructure required to support the aspects of the Northeast Business Park examined in the medium scope assessment (relating to 2.1.3, 2.1.4, 2.1.5 and 2.1.9), the assessment identifies a **moderate** cost consequence (detectable and recoverable over the medium term) of additional infrastructure for the medium scope scenario.

Total Project Scope:

Construction	Likelihood: Almost certain x Consequence: Major = Impact: Very High
Operation	N/A

Medium Scope:

Construction	Likelihood: Almost certain x Consequence: Moderate = Impact: High
Operation	N/A

Additional Social and Community Infrastructure & Services

Social and community facilities identified as likely being required include a range of civic, community, human services, recreation, health and education facilities (Hornery Institute, 2007b) as well as the opportunity cost of council land utilised in the Affordable Housing Strategy. It is not possible to quantify the cost of these facilities, as the exact nature of the demand will not be known until the market develops. However, indicative facilities required range from Police beat community interaction and service facilities to supermarkets, community halls and schools (Hornery Institute, 2007b). These facilities, in the most part will be provided when there is demonstrated market demand, the trigger for which will be an appropriate return on investment for the given level of risk, which would ensure a positive net position for the provision of the services and facilities. To

provide the context of the contribution of land from Council, the median price for a vacant block of land in the Caboolture LGA for the 12 months to the end of September 2007 was recorded as \$168,000 (Real Estate Institute of Queensland, 2007).

It is **almost certain** (expected to occur in most circumstances) that the creation of the Northeast Business Park will result in the provision of additional community infrastructure and services during the operational phase of the development.

The consequence of the additional social and community infrastructure and services for the total project scope is assessed to be **moderate** (detectable and recoverable over the medium term) in the wider context of the development and operation of social and community organisations and facilities.

With approximately 45% of residences and approximately 37.5% of business activity associated with the marina identified as relevant for inclusion in the medium scope assessment (relating to policies 2.1.3, 2.1.4, 2.1.5 and 2.1.9), the consequence (cost) of the provision of additional social and community infrastructure and services is identified as being **moderate** (detectable and recoverable over the medium term), which is the same as the total project scope.

Total Project Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Medium Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

7.1.2 Social Costs

Increased road traffic

The social impacts of increased road traffic pertain to increased noise, risk of injury and increased travel times to the population resulting from increased traffic and congestion. Impacts associated with additional road traffic are considered to be **almost certain** to occur during both the construction (from increased traffic due to construction vehicles and workers, as well as traffic disruptions during road construction at and near access points to the external road network) and operational (from increased tourism as well as business and industry activity) phases of the development (Cardno Eppell Olsen, 2006).

The development intends to gain access to the external road network via a primary access point at the Buchanan Road/Bruce Highway interchange. Secondary access to the development is proposed via Buckley Road and Coach Road, which provide connection to Uhlmann Road and its interchange at the Bruce Highway (PMM, 2006). Impacts may also be incurred due to slowing of traffic during the actual construction of the upgrade of the interchange.

Due to the spacious and somewhat isolated nature of much of the construction activity on the Northeast Business Park site, as well as the location of facilities such as concrete batching plants on site allowing the majority of heavy vehicle traffic to be contained within the development precinct, impacts from increased road traffic during the construction phase are expected to be of a **minor** consequence (possibly detectable, but minimal change over the short term), despite the site being adjacent to residential lots.

Traffic impacts during construction are relevant to the medium scope as they pertain and are associated with the construction of the marina (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9)

as well as the relevant dependent aspects of the business park and residential components of the development. The medium scope assessment assumes all aspects of the marina, approximately 37.5% of business in the Northeast Business Park precinct and 45% of residential aspects are dependent uses. The consequence of traffic impacts would likely be reduced from those experienced in the total project assessment, however, as the impacts are still anticipated to be potentially measurable, the consequence for the medium scope is also assessed to be **minor** (possibly detectable, and small relative to the wider context with minimal changes to the established structure and function).

Regarding the operational traffic impacts, the Cardno Eppell Olsen (2006) traffic impact report examined the acceptability of the proposed development in light of its impacts on the surrounding existing and proposed transport system. Cardno Eppell Olsen (2006, p 17) identify that the road infrastructure, in its existing form, would be required to "...operate over capacity at the completion of the development". The Cardno Eppell Olsen (2006, p17) report identifies that "...solutions to potential traffic impacts can be adequately reached". The key upgrades required for this solution to be adequately reached includes:

- The Buchanan Road interchange be upgraded with signalised control of the interchange intersections and duplication of the highway overpass;
- Signalisation of the northbound ramps intersection, upgrading of the southbound ramps intersection and duplication of the overbridge will be required during the life of the assessment; and
- Appropriate design of the road network will limit the impact on Council controlled roads such as Coach Road and Buckley Road, with the "...ultimate volumes on Coach and Buckley Road can be expected to be within acceptable levels".

With the key road upgrades required planned to be undertaken within the works program of the development, the consequence from increased road traffic during operation is expected to be **minor** (possibly detectable, and small relative to the wider context of the region with minimal changes to the established structure and function), and is incorporated in the assessment of the construction phase of the development to avoid double counting.

Impacts from increased road traffic during operation are relevant to the medium scope as they pertain to and are associated with the marina (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9) and the operation of the relevant dependent aspects of the business park and residential components of the development. As is the case for the construction phase, it is not anticipated that the consequence of increased road traffic during the operating phase will differ significantly between the total project scope and the medium scope, with the consequence of increased road traffic in relation to the construction of the marina and associated facilities and business structures assessed as being **minor** (possibly detectable, and small relative to the wider context with minimal changes to the established structure and function).

For additional information regarding the traffic impacts see Cardno Eppell Olsen (2006).

Total Project Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation Incorporated above

Medium Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation Incorporated above

Decreased boat user utility from increased river traffic

The proposed marina will accommodate for 911 berths at the facility and a further 500 dry boat stacker berths, as well as a shipyard and marine industry infrastructure (Cardno Lawson Treloar, 2008). It is acknowledged that the provision of these facilities will increase boat traffic between the development site and the mouth of the Caboolture River (Cardno Lawson Treloar, 2008). This increase in total waterway traffic on the river is **likely** to restrict boat users utility when boating on the Caboolture River, through reduced areas for manoeuvring, and increased wash and noise.

The section of the river that the development site is located is already subject to a moderate level of vessel traffic due to the number of available private moorings, located upstream, and Monty's marina, located downstream of the proposed marina entrance (The Ecology Lab, 2007). The Caboolture River has designated navigation channels and speed limits that assist in reducing the wash and noise impacts associated with the current level of water traffic (The Ecology Lab, 2007). This will help mitigate against the negative social impacts associated with the increase in marine related activity arising from the Northeast Business Park.

Additionally, the Northeast Business Park will undertake education and extension programs regarding boating best practice (*Pers Comm*, 3 August, 2007 – J. Smith, CEO: Northeast Business Park). The extension programs will impact on all water users, not just those utilising the Northeast Business Park facilities, and will assist in mitigating both social and environmental impacts from the local marine industry. Coupled with the existing speed restrictions on the Caboolture River, it is expected that there will be very little detrimental change as a result of increased river traffic. As a result, the consequence of the social impacts associated with increased river traffic are anticipated to be **minor** (possibly detectable but minimal changes to structure and function of operation).

Impacts on boat user utility are relevant to the medium scope assessment as they pertain to and are associated with the marina operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9) and its dependent uses. The consequence of this impact for the medium scope assessment is identical (**minor**) to the total project scope as impacts from river traffic pertain solely to the marina and associated infrastructure.

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium**

Decreased river safety from increased river traffic

The development of 911 berths at the Northeast Business Park marina facility, as well as 500 additional dry boat stacker berths and other marine infrastructure, is acknowledged to result in an increase in total waterway traffic on the Caboolture River (Cardno Lawson Treloar, 2008), which without proper management would be expected to increase the risk of incidence of an accident and decrease the safety of navigating on the river. However, the Caboolture River has designated navigation channels and speed limits, reducing the risk of incidence of an accident, and the section of the river that the development site is located is already subject to a moderate level of vessel traffic (The Ecology Lab, 2007). As such, the likelihood of the increased water activity resulting in an increase in incidence of accidents is most appropriately rated as **possible** (might occur at some time).

It should be noted that this decrease in navigational safety from increased river traffic is somewhat mitigated by the anticipated increase in navigational safety resulting from dredging activities that will deepen the navigational channels and entrance to the river and other safety attributes such as the positioning of lit navigation beacons which is supported by the Regional Harbour Master as enhancing safety². This beneficial impact is assessed separately in the “Improved river safety from dredging activities” impact in the social benefits section.

In a worst case scenario an individual boating accident may result in the loss of life. However, more commonly boating accidents relate to damaged or lost equipment and minor injuries. In the five years to 2004, there were 31 fatalities and 113 persons receiving serious injuries from boating activities in Queensland (ABC, 2004).

Where the expected increase in water traffic on the Caboolture River results in one fatality, this could be said to be a significant cost from the Northeast Business Park marina development. However, when considered against the outcome of all potential/likely boating accidents of those entering the river (i.e., not all boating accidents result in the loss of life) the impact is assessed to be **moderate** (detectable impact, maintained over the medium term). The assessment acknowledges the catastrophic nature to the families and those directly involved in boating fatalities.

Impacts on river safety from increased river traffic are relevant to the medium scope assessment as they pertain to and are associated with the marina operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9) and its dependent uses. The consequence of this impact for the medium scope assessment is identical (**moderate**) to the total project scope as impacts from river traffic pertain solely to the marina and associated infrastructure.

Total Project Scope:

Construction	N/A
Operation	Likelihood: Possible x Consequence: Moderate = Impact: Medium

Medium Scope:

Construction	N/A
Operation	Likelihood: Possible x Consequence: Moderate = Impact: Medium

Loss of cultural heritage

Loss of cultural heritage includes the loss of significance of a site regarding its traditional owners values and/ or early European history. There are a number of traditional owner cultural sites in Caboolture such as bora rings, artefact manufacturing sites and pathways, etc. Further, with Caboolture once being the northern most settlement of the then New South Wales Colony, the region can be said to have a rich, but quiet history and an emerging cultural identity (Hornery Institute, 2007a).

The Northeast Business Park includes provision of the “Heritage Park” complex to preserve and promote the early settler history of the site. The “Heritage Park” precinct, which is to include a colonial style homestead, some of the earliest forestry enterprises and one of the first regions to import ‘Kanaka’ labour will be open to the public and include interpretative displays to extend and disseminate information regarding the history of the site. As the impact on Early European settler cultural heritage is anticipated to be positive, they are assessed in the Social Benefits section.

² Comments from the regional Harbour Master “I am satisfied that the revised navigation channel will further promote navigation safety in the river and improve natural waterflow. I am also satisfied that the suggested lit navigation beacons are appropriately positioned to further enhance safety.” (R. Johnston, Regional Harbour Master, email 28 November, 2008).

A Draft Cultural Heritage Management Plan (Davies Heritage Consultants, 2007) regarding the site is currently undergoing a review and voluntary acceptance by the Gubbi Gubbi, who are recognised as the traditional owners of the site. The Cultural Heritage Management Plan identifies a process by which traditional owner cultural heritage will be preserved and outlines the principles, responsibilities, requisite management and dispute resolution procedures to be followed.

Whilst a number of areas of interest have been identified for further investigation, to date no traditional owner significant sites have been identified. In accordance with the Draft Cultural Heritage Management Plan further investigations of any potential cultural heritage sites will be conducted in accordance with the commitment to maintaining an appropriate response to any cultural heritage issues associated with the site.

While the cultural heritage assessment is yet to be conducted for the Northeast Business Park development, due to the freehold nature and extensive grazing and forestry (monoculture pine plantations) over the past 100 years the likelihood of detrimental cultural heritage impacts is considered **remote** (never heard of, but not impossible).

Where a detrimental cultural heritage impact does occur, given the proponent's commitment to developing an integrated and holistic development that advances the identity, ecological health and prosperity of the region (PMM, 2006), the anticipated consequence is rated as **moderate** (detectable, with recovery following the implementation of management initiatives).

It is not possible to assess if any cultural heritage impacts may occur until the cultural heritage plan is completed and site works commence. While only 37.5% of business in the Northeast Business Park precinct and 45% of residential aspects are anticipated to be associated/ dependent on the marina, the anticipated consequence for the medium scope is rated the same as the total project (**moderate** - detectable, with recovery following the implementation of management initiatives).

Total Project Scope:

Construction N/A

Operation Likelihood: **Remote** x Consequence: **Moderate** = Impact: **Very Low**

Assessment finding:

Construction N/A

Operation Likelihood: **Remote** x Consequence: **Moderate** = Impact: **Very Low**

Increased demand for accommodation and housing

Increased demand for accommodation and housing from the development will occur where the existing resident labour force is insufficient to accommodate the increase in jobs related to the construction and operation phases of the development.

Queensland Treasury (2006) notes that flow-on impacts are not suitable for inclusion in a cost benefit assessment and as such flow-on impacts are excluded from the quantitative and qualitative net benefit assessments undertaken in this report.

Urbis (2007) identifies that the development will require an average annual construction work force of approximately 714 persons (construction is over a 14 year period).

The direct impact of a sustained and sizeable construction crew is mitigated by the proponent's commitment to training and utilising the local labour pool, which has flow on benefits of facilitating skilling and training for the unemployed and/or disenfranchised component of the labour pool and providing employment opportunities for them. It is not yet known the proportion of workers that would be trained locally. Conservatively assuming that 5.0% of the currently unemployed labour pool of the Caboolture LGA

(3,817 persons) (DEWR, March Qtr untrended, 2007) are suitable and able to be adequately trained for the construction work force, this equates to approximately 191 persons or approximately 30% of the construction workforce.

Where 65% (approximately 340 FTE) of the remaining 523 employment positions are sourced from within driving distance (40-60 km radius or 50 minute drive time) this implies that approximately 183 employees (or approximately 25% of the construction workforce) will likely seek to relocate to the region.

Should 10% of the unemployed labour force be able to be appropriately trained for the construction workforce, the number of employees sourced from more than 40-60 kms away would be approximately 116 persons.

As the analysis above indicates, based on assumptions representing the characteristics of the labour force and prevailing labour market trends, a portion of the construction workforce will likely need to be sourced from outside the local labour force, which will **almost certainly** result in an increase in demand for accommodation and housing during the construction phase of the development.

At commencement, additional construction workers may form group households, which would significantly lessen this impact. However, over the 14 year construction period additional construction workers are expected to trend toward the existing household structure of the region and integrating with the broader community, which would require a gradual increase in housing stocks to meet their demand rather than creating an acute impact in year one. For example, where approximately three additional workers share accommodation, this would generate an additional demand of between 30 and 50 dwellings from within Caboolture and nearby areas.

Hornery Institute (2007a) identify the Caboolture LGA, which is the catchment most likely to experience housing impacts, to have a tight rental market with a lack of "affordable" housing for rent and/ or sale, with a decreasing number of caravan park spaces being available. Additional detail relating to any potential excess demand for accommodation and housing is outlined in Hornery Institute (2007a).

Based on the range of impacts outlined above, where there is adequate planning and provision of additional housing within the region, as per the Northern Corridor strategy and the Caboolture Economic Development Strategy, the consequence of the impact of increased demand for accommodation and housing associated with the construction workforce for the total project scope is assessed to be **moderate** (detectable impacts, characterised by significant changes in structure and function with recovery over the medium term).

Impacts associated with increased demand for accommodation and housing during construction are relevant to the medium scope assessment where they pertain to and are associated with the marina (policies 2.1.3 and 2.1.9) and the relevant dependent aspects of the business park and residential components of the development. This includes approximately 37.5% of the industry and business precinct, 100% of the marina, and approximately 45% of residential dwellings (see Table 1.2). Applying these factors to the aspects of Northeast Business Park included in the medium scope assessment identifies that approximately 44.0% of the total project is appropriate for inclusion, or approximately an additional 50 workers. The consequence of this demand is assessed to be **minor** (possibly detectable, but minimal change in the established structure and function).

The Industry and Employment Lands Report, as reported in Caboolture Shire Council's March Quarter 2007 Facts and Figures publication (AEC Group Ltd, 2007), identified that at current levels of labour force participation and with expected resident labour force growth, Caboolture Shire will require approximately 33,000 additional jobs over the next 20 years. This development will be a major contributor to additional job demand over this period, with Urbis (2007) identifying a total direct employment impact of just under 15,000 on completion of the full development, and just under 14,000 anticipated as being employed within the industry/ business park precinct. Given the current tight labour market, it is expected that the majority of new employment positions would be

filled by those relocating to the region, which will **almost certainly** result in an increase in demand for housing during the operation phase of the development.

The development itself provides a total residential development of approximately 2,400 attached and detached dwellings, which will assist in accommodating anticipated population growth in the Shire in line with the increase in density proposed in the Northern Corridor Strategy. Assuming average employment per dwelling of 1.5 persons, which is considered conservative given the targeted demographic of young professional couples, the development itself is conservatively expected have the potential to accommodate approximately 25% of additional direct employment.

It is anticipated, given the specialised nature of employment at the site and associated anticipated higher income of workers in these sectors, that the operational workforce will have the capacity to pay for accommodation where current trends continue, that is, tight housing market with a lack of “affordable” housing for rent (Hornery Institute, 2007a). However, regardless of this there is a requirement for significant planning and development of residential lots to meet the demand generated by the Northeast Business Park development to ensure the additional demand does not result in spiralling housing prices.

The consequence of the impact of increased demand for accommodation and housing associated with the operational workforce of the total project scope is assessed to be **major** (wider impacts over the longer-term).

Impacts associated with increased demand for accommodation and housing during operation are relevant to the medium scope assessment where they pertain to and are associated with the marina and the operation of its dependent uses (policies 2.1.3 and 2.1.9), namely the business and industry precinct (37.5% of the industry precinct or over 5,000 employees). The consequence of these additional workers on demand for accommodation and housing is assessed to be **moderate** (detectable impacts characterised by significant changes in structure and function).

Total Project Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Operation Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very High**

Assessment finding:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Increased demand for community services and facilities

Increased demand for community services and facilities from the development may **possibly** (might occur at some time) be experienced during the construction phase of the development, with the construction workers locating to the region (discussed above) potentially requiring the use of community services and facilities.

The consequence of this impact from construction workers, given the net increase may be expected to be between approximately 100 and 180 persons, is assessed to be **negligible** (insignificant and unlikely to be measurable against benchmarks) as this forms only approximately 0.1% of the current estimated population of Caboolture Shire, the anticipated major service centre. Based on community services and facility benchmarks from the Southeast Queensland Regional Plan (SGS Economics & Planning *et. al.*, 2007) requirements for community services and facilities are unlikely to be influenced where impacts do not significantly exceed 1,000 persons.

Impacts associated with increased demand for community services and facilities during construction are relevant to the medium scope assessment where they pertain to and are

associated with the marina and the operation of its dependent uses (policies 2.1.3 and 2.1.9). This includes approximately 37.5% of the industry and business precinct, 100% of the marina, and approximately 45% of residential dwellings (see Table 1.2), which is identified to be approximately 44% of total construction workers. Whilst the consequence of this is significantly less than the total project scope, the consequence is assessed as **negligible** (unmeasurable against benchmarks), which is the same as the total project scope.

During operation, the Northeast Business Park is expected to result in a high level of relocation of employees and their families to the region, with an anticipated direct increase in employment of approximately 14,000 on completion of the development (over a 13 year period), the majority of which will likely need to be sourced from outside the region. Given the expected increase in the local population, increased demand for community services and facilities from the development is **almost certainly** expected to be experienced during the operational phase of the development.

Hornery Institute (2007b) provide recommendations for the community services and facilities required based on a “self containment” test with respect to the needs of the anticipated workforce and resident communities, which is outlined in the table below. Where these recommendations are incorporated into the development, they will significantly mitigate any additional demand by facilitating the “self containment” of the operational employment generated by the development.

Table 7.1. Recommended Social, Community & Recreational Infrastructure & Services

Classification	Threshold Services
Civic	<ul style="list-style-type: none"> • Basic amenities: banking, post office, telephone & post boxes. • Neighbourhood retail: supermarket, bakery, bottle shop, video/DVD store, newsagents, coffee shop/ café. • Public transport: shuttle and local bus route integrated with other activity centres and employment nodes.
Community	<ul style="list-style-type: none"> • Infrastructure: community meeting spaces, community hall. • Organisations: registered childcare facilities with fulltime places from baby to kindergarten (0 to 4 years).
Cultural	<ul style="list-style-type: none"> • Not necessitated, but facilitated through the development of the Cultural Precinct.
Human services	<ul style="list-style-type: none"> • Police Beat.
Recreation	<ul style="list-style-type: none"> • Major amenities: golf course, marina, jetties for fishing and launching water sports. • Built infrastructure: none necessitated. • Parklands: Regional parkland, neighbourhood and linear park network, dog off leash space, district playing fields with spectator facilities, tennis courts, walking and cycle ways, exercise circuit.
Health	<ul style="list-style-type: none"> • General practitioners
Education	<ul style="list-style-type: none"> • State School, Prep to Year 7 (provision of available land). • Vocational education & training programs, up-skilling and connecting local people with on-site opportunities.

Source: Hornery Institute (2007b).

The consequence of the impacts of operational workforce on community services and facilities is assessed to be **moderate** (detectable impacts resulting in significant change in structure and function, but mitigated over the medium term once initiatives are initiated). It is anticipated that additional community services would be provided based on prevailing market demand, however, until the “market threshold” is reached, excess demand may be experienced locally. While community services are not anticipated to be delivered until the cost of providing them is exceeded by their expected revenue generation, the cost of additional facilities is incorporated in the qualitative assessment economic cost of additional infrastructure.

When considered in context of the additional demand identified as being required/ targeted within the region by the Caboolture Shire Council Economic Development Strategy, the development of the Northeast Business Park and the self containment

regarding community service provision is anticipated to generate a positive influence. This is explored in the benefit section of this report.

Impacts associated with increased demand for community services and facilities during operation are relevant to the medium scope assessment where they pertain to and are associated with the marina and the operation of its dependent uses (policies 2.1.3 and 2.1.9), which relate to approximately 37.5% of the Northeast Business Park (approximately 5,250 employees), approximately 348 employment positions in the marina, and approximately 45% of residential dwellings. The consequence of these additional workers and residents on demand for community services and facilities is assessed to be **moderate** (detectable impacts characterised by significant changes in structure and function).

Total Project Scope:

Construction Likelihood: **Possible** x Consequence: **Negligible** = Impact: **Very Low**

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Medium Scope:

Construction Likelihood: **Possible** x Consequence: **Negligible** = Impact: **Very Low**

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Noise impacts

Predicted noise levels from plant and equipment at all sensitive places will, in a worst case scenario, negatively affect sensitive places from construction of activities associated with the Northeast Business Park development (Cardno, 2007b) and is subsequently considered **almost certain** to occur during the construction phase.

Construction impacts were determined by examining the noise levels of plant and equipment proposed for each activity across all stages of the development and were considered under a 'worst case' scenario. The spacious and relatively isolated nature of much of the construction activity on the Northeast Business Park site, with the exception of the residential lots on the south western fringe of the site, will mitigate much of the noise impacts generated during the construction phase to existing residents through the mitigation strategies identified and outlined in the acoustic section of the EIS (Cardno, 2007b). Residents moving to the development during the ongoing construction once areas are released do so with full knowledge and are assumed to accept these impacts.

The consequence of the noise impacts is thereby assessed to be **minor** (possibly detectable, with minimal change in existing structure and function with return to previous limits with relevant mitigation measures implemented).

Noise impacts during construction are relevant to the medium scope as they pertain and are associated with the construction the marina (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). Whilst there is anticipated to be some change in the noise impacts (slight reduction), technical reports are not available that adequately identify the nature or consequence of noise impacts. The assessment for the medium scope is assessed to be the same as the major scope (i.e. **minor** - possibly detectable, with minimal change in existing structure and function with return to previous limits with relevant mitigation measures implemented), which is anticipated to, if anything, overestimate the consequence of noise impacts pertaining to the medium scope.

Noise impacts during the operational phase of the development were also assessed by Cardno (2007b) and identified that the noise from the operation of the proposed development will either be negligible or adequately managed so as to not impact on amenity of surrounding sensitive areas. This assessment considered the operational impacts of the Northeast Business Park marina facilities and associated uses as well as

the off-site impacts due for example, increased road transportation and haulage and Caboolture River dredging.

The Cardno (2007b) assessment concludes that, due to the noise reduction afforded by structures and landforms in sub-division works, noise from marina operations will not impact on sensitive places and that industrial impacts at Residential Areas A and B will comply with relevant noise criteria and recommends additional works to ensure compliance.

The quality of the existing environment and simple mitigation measures as outlined in Cardno (2007b) will be sufficient to prevent any deterioration of amenity to off-site areas from road traffic. Off-site impacts relating to noise from the dredging of the Caboolture River were deemed negligible (Cardno, 2007b).

Cardno (2007b) identify that operationally, noise from the proposed development will either be negligible or adequately managed so as to not impact on the amenity of surrounding sensitive areas. Subsequently this assessment has not included the operational noise impacts for either the total project scope or the medium project scope.

Total Project Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation N/A

Medium Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation N/A

Cardno (2007b) conclude that the proposed development will not adversely impact on adjacent existing noise sensitive places primarily due to the staged development plan and associated acoustic absorption from built-up sub-divisions, realistic attenuation distances, and mitigation strategies proposed as part of the works.

7.1.3 Environmental Costs

Exposure of acid sulfate soils & nutrient load to waterways

Excavation of the marina basin has the potential to expose Potential Acid Sulfate Soils (PASS) as well as the export of soil bound elements during the marina excavation. PASS are defined by the Queensland Department of Natural Resources and Water (2007a) as:

"Soils which contain iron sulfides or sulfidic material which have not been exposed to air or oxidised. The field pH of these soils in their undisturbed state can be pH4 or more and may be neutral or slightly alkaline. However, they pose a considerable environmental risk when disturbed, as they will become very acidic when exposed to air and oxidised."

As indicated in this definition PASS become Acid Sulfate Soils (ASS) only in presence of oxygen, a process which is often accelerated by the bacterium *Thiobacillus ferrooxidans*. As such PASS are not a problem provided they remain anaerobic (Queensland Department of Natural Resources and Water, 2007b).

ASS are defined by the Queensland Department of Natural Resources and Water (2007a) as:

"Soils containing highly acidic soil horizons or layers resulting from the aeration of soil materials that are rich in iron sulfides, primarily sulfide. This oxidation produces hydrogen ions in excess of sediment's capacity to neutralise the acidity resulting in soils of pH of 4 or less when measured in dry season conditions. These soils can usually be identified by the presence of yellow mottles and coatings of jarosite."

The subject land for the Business Park includes land mapped below 5m AHD. State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils is applicable and is required to be addressed. Preliminary reports (Lensworth Group Pty Ltd, 2004) have indicated that all soil samples taken to a depth of 2.5m in the potential fill source areas to have low to moderate PASS.

PASS can be successfully and simply managed (Watling & Dear, 2006) provided its distribution is understood. The proposal will address the SPP (in conjunction with SPP 2/02 Guideline: Acid Sulfate Soils) given the extent of excavation and filling required. Details of the excavations including volumes, existing (and finished) ground levels, depth of excavations and fill will be provided. Extensive testing of soils has been undertaken as part of the EIS and an Acid Sulfate Soil Management Plan (ASSMP) has been prepared by Cardno (2007a) outlining the methods to be undertaken for monitoring the disturbance of PASS and to deal with and neutralise these soils when encountered, based on current Queensland government and EPA guidelines.

Given that the potential for Acid Sulfate Soils is understood for the site, that an ASSMP is in place, and that PASS are successfully managed in many other sites in Queensland and Australia, it is considered **unlikely** that impacts from the disturbance will be encountered.

The impacts associated with ASS can be severe for the environment. Cox et al. (2005) list the following possible impacts of ASS:

- Sulfuric acid mobilises Fe, Al, Mn and Cd, and lowers soil pH making some soils toxic to plant growth causing scalding (similar to salinity);
- Sulfuric acid corrodes concrete, iron and steel foundations and piping;
- Acid waters can cause rust coloured stains and slimes;
- Plastic corrugated drainage becomes blocked by iron oxides;
- Drainage waters can release sufficient sulfuric acid and Al to cause fish disease and mortality;
- Acid waters can mobilise aluminium and heavy metals such as cadmium which can be adsorbed by fish and aquatic life;
- Effects on aquaculture industries;
- Poor quality stock water;
- Bitumen road failure;
- Irreversible soil shrinkage;
- Low bearing capacity of soils;
- Human health problems: algae, heavy metals in drinking water, dermatitis, eye inflammations; and
- Arsenic toxicity.

It is also noted by the Ecology Lab (2007) that increased nutrient loads and possibly elevated metal levels from acid sulfate runoff can stimulate the growth of *Lyngbya* (a noxious marine blue-green algae).

Clearly the consequences of mismanaged PASS can be severe. However given that the PASS likely to be uncovered at the site is of low to moderate value in terms of oxidisable sulphur and the already degraded nearby waterways with existing evidence of ASS runoff (Lensworth Group Pty Ltd, 2004) the consequence is most appropriately rated as **moderate**.

Impacts for the exposure of acid sulfate soils and nutrient load to waterways applies to policy 2.1.4. (a) degradation of water quality and policy 2.8.1. Cardno (2007e) notes that an Acid Sulfate Soils Management Plan that has been designed to ensure that no significant adverse impacts on the receiving environment occur as a result of the

disturbance of actual or potential acid sulfate soils will not have a significant impact on Matters of National Environmental Significance that occur within and adjacent to the site. Under the medium scope assessment the consequence (**moderate**) is identical to the total project scope, with the affected ecosystem the same in both assessments.

Total Project Scope:

Construction	Likelihood: Unlikely x Consequence: Moderate = Impact: Low
Operation	N/A

Medium Scope:

Construction	Likelihood: Unlikely x Consequence: Moderate = Impact: Low
Operation	N/A

Disturbance of aquatic habitats

The Aquatic Ecology Report (The Ecology Lab, 2007) indicates that the project site bounds several areas of aquatic habitat, including Raft Creek (which is within the Deception Bay Fish Habitat Area), as well as areas of mangroves and salt marshes fringing the site boundary and Caboolture River. Most of the recreational, residential and business precincts of the Northeast Business Park will be in areas of previous development. As such impacts to these aquatic habitats are largely not expected to be above those already incurred. The exception to this is Raft Creek, with this watercourse forming part of the proposed golf course, with a small weir to be located in its tidal portion, and the proposed entrance to the marina. This exception will result in relatively minor impacts, for example 0.83ha of the 18.6ha of mangroves on the site and 0.28ha of the 7ha of salt marshes would be removed by the development. In recognition of its ecological value identified in the Aquatic Ecology Report on the Proposed Redevelopment of Land at Caboolture (The Ecology Lab, 2007), the tidal portion of the Raft Creek habitat would be protected within a buffer as part of the proposed development.

The report by Cardno (2007e) found no evidence of likely impacts on aquatic species of national environmental significance that the Northeast Business Park project has the potential to affect, other than for possible interactions with increased boat traffic from species that may occasionally enter the Caboolture River as identified in Cardno (2007c).

The proposed entrance to the marina has been identified in the Aquatic Ecology Report (The Ecology Lab, 2007) as an area subject to some erosion and with few aquatic plants. Due to this, and due to the fact that it contains little water, this area is considered to provide little value as an aquatic habitat (The Ecology Lab, 2007). The remaining shoreline of the site is to be preserved as a riparian buffer. Due to the current pressures in the shoreline through unauthorised access (also evidenced by the depauperate assemblage of macroinvertebrates) (The Ecology Lab, 2007) this protection has the potential to improve the foreshore's status as a biological corridor and Fish Habitat Area.

Given the level of protection to be afforded sensitive aquatic habitats it is **unlikely** (could occur but is not expected) that the excavation and alteration of the shoreline will disrupt the aquatic habitat (including the declared Fish Habitat Area) of Raft Creek and at the entrance of the marina.

The Aquatic Ecology Report (The Ecology Lab, 2007) indicates that there is a relatively low-diversity macroinvertebrate assemblage occurring both in the river channel (sub-tidal) and on the river banks (where not colonised by mangroves). Fish communities in tidal creeks in and around the project site are dominated by mosquito fish, a noxious introduced species. A number of native species are present, including species of economic interest, however none of the species accounted are considered rare or endangered.

Three species of fish, three species of marine mammals and five species of marine reptiles in the endangered, vulnerable, or rare schedules of the NC Act or EPBC Act were identified in the Aquatic Ecology Report as having potential presences in the region. However the Caboolture River is already considered a degraded habitat (2006 report card rating of D, Ecosystem Health Monitoring Program, 2006) and is unlikely to presently provide habitat to these species in the upper reaches where the development will be situated. The Aquatic Ecology Report (The Ecology Lab, 2007) did not detect any of these aquatic species of concern. However given that the nearby location is a Fish Habitat Area, where the excavation and alteration of the shoreline does impact aquatic habitats, this impact is best rated to be of **moderate** (detectable impacts, with recovery achievable over the medium term with ameliorative actions) consequence.

As the costs are experienced during the construction phase and maintained during the operational phase, the assessment incorporates the impact in the construction phase only to avoid double counting.

Under the medium scope assessment the disturbance of aquatic habitats as associated with the proposed development has the potential to impact on policy 2.1.4 (c) degradation and loss of coastal wetlands; and, (d) degradation and loss of declared Fish Habitat Area and policy 2.8.1. The assessed consequence under the total scope above (**moderate**) is not altered under the medium scope.

Total Project Scope:

Construction Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Operation Incorporated above

Medium Scope:

Construction Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Operation Incorporated above

Disturbance of terrestrial habitats

The project site is predominantly highly disturbed grassland with some scattered trees, having been subject to previous land clearing for sugar cane production, grazing and plantation forest activities. These areas without doubt provide some ecological value, however, are limited in their value by their disturbed status, previous and existing uses and high intrusion by exotic weed species (Cardno, 2007d).

The project site has been identified as containing two types of Certified Regional Ecosystem (RE) (Cardno, 2007d). The RE's are detailed in Cardno (2007d), which may be described as 'scribbly gum' forest and a 'swampy paperbark' forest. The swampy paperbark forest to the south-west of the site is considered to provide the most important and largest area of intact fauna habitat within the site (Cardno, 2007d). The plan for the site preserves this habitat (PMM, 2006; Place Environmental, 2007b) along with the scribbly gum forest.

There are also areas of marine vegetation (including mangroves, swamp oak, ruby saltbush and saltwater couch as well as a number of weed species), which fringe the Caboolture River and associated waterways and constructed drainage channels that are tidally influenced (Cardno, 2007c; The Ecology Lab, 2007). Many of these areas are degraded from previous uses and unauthorised current use (Cardno, 2007c; The Ecology Lab, 2007). There has been no significant terrestrial flora species observed on the site (Cardno, 2007d) although 11 species were identified as having some possibility of occurrence on the site.

The site is not recognised by any existing plans as having ecological corridor value for terrestrial species and due to its disturbed status it is not considered that this is an oversight (Cardno, 2007d). The fringe of vegetation along parts of the Caboolture River is

considered to be too narrow to form an effective corridor (Cardno, 2007d). No part of the Northeast Business Park site is considered by the Queensland Environmental Protection Agency to be an important shore bird habitat (Cardno, 2007e). Furthermore the majority of the existing potential shore bird habitat will be retained and/or rehabilitated (Cardno, 2007e).

Overall, it is apparent that the majority of the project site has limited to no functional habitat for native species (with some minor exceptions, such as the paperbark forest to be preserved). Therefore it is **unlikely** that the development will have a negative impact on the existing terrestrial habitat.

Five species of significant flora are considered to have some likelihood of occurrence within the project area (Cardno, 2007d). However, given the vast majority of the project site is highly disturbed land it is considered unlikely that these species are now found in the project area (Cardno, 2007d). In addition, there are six fauna species of conservation significance that have either been recorded within the site, or are likely to occur within the site. The habitats within the project area of potential value to these six fauna species (tall mangroves and paperbark forest) will be preserved in the development (PMM, 2006; Place Environmental, 2007b).

Due to the highly degraded nature of the site, the area of natural habitat within the broader Caboolture Shire and surrounding areas, the preservation of the highest ecological value areas and since there were few species of conservation significance identified as occurring within the site, the consequence of the terrestrial habitat being negatively impacted is considered to be **negligible** (very insignificant impacts, which are unlikely to be measurable against benchmarks).

As the costs are experienced during the construction phase and maintained during the operational phase, the assessment incorporates the impact in the construction phase only to avoid double counting.

The disturbance of terrestrial habitat impacts are not relevant to policies within the SCMP and hence are not assessed under the medium scope.

Total Project Scope:

Construction Likelihood: **Unlikely** x Consequence: **Negligible** = Impact: **Very Low**

Operation Incorporated above

Medium Scope:

Construction N/A

Operation N/A

Dredging the river mouth

The construction of the proposed marina will require capital dredging works in the order of 545,000m³. Dredging is required for the entrance to the marina as well as in the navigable section of the lower Caboolture River. This dredging achieves two primary purposes (PMM, 2006):

- Provision of a safe navigable entrance to the river at all tides facilitating marine traffic for the marina, and addressing an existing safety concern whereby the safe passage of larger vessels currently restricted to top of tide navigation are not compromised in adverse weather conditions;
- Dredging of the river entrance increases the outflow of water in flood events, providing substantial flood mitigation upstream.

Proposed dredging of the existing navigation channel at the river entrance is likely to require a channel approximately 3.4km long and 70 metres wide at the base to adequately meet these objectives. Such dredging will occur within the defined navigation channel, and hence is outside the declared Fish Habitat Area (PMM, 2006). The benthic macroinvertebrate survey (The Ecology Lab, 2007) and the poor healthy waterways rating (South East Queensland Healthy Waterways, 2007) indicates that the areas to be dredged have a reduced ecological value.

None-the-less dredging of the river mouth has the potential to increase turbidity in the water and impact fish habitat. Any impacts will not be contained within the dredging area and hence need to be seriously considered.

In their Supplementary Report on Coastal Processes, Cardno Lawson Treloar (2008) indicate that dredging activities within the lower reaches of the Caboolture River will slightly increase the tidal prism, and have relatively minor impacts on low tide water levels within the River and tidal flushing.

Geotechnical investigation of the dredge areas (Coffey Geotechnics Ptd Ltd, 2007) indicate:

- All soils within the proposed dredge area should be considered PASS and managed as such. While the presence of neutralising materials (calcium carbonate) was apparent in the samples this may involve mixing lime with the dredging spoils if they are to be used as fill in sensitive areas;
- Settlement rate testing of the proposed dredging sites shows that 99% of all sediment falls out of suspension within one hour and therefore there should be no problems in meeting the suspended solids criteria for release waters during dredging. However the settled material would impact the bottom sediments of the affected zones;
- All soils within the proposed dredge area are non-dispersive; and,
- There was no evidence of heavy metals or tributyl tin in the sediments.

The PASS and settlement rates can be appropriately managed to minimise environmental impacts (Coffey Geotechnics Ptd Ltd, 2007; Cardno, 2007a). A Dredging Site Based Management Plan, which specifies mechanisms that will be incorporated to ensure environmental impacts associated with the dredging and spoil disposal are minimised as far as practicable is considered in Cardno (2007e) to ensure that there will not be a significant impact on Matters of NES that occur within and adjacent to the site. As such, the likelihood of negative impacts from the dredging activities is considered to be **unlikely**.

The settling of fine muds from the dredging activities has the potential to impact the benthic macroinvertebrate fauna in the vicinity of the dredging (WBM Oceanics Australia, 2004). However the aquatic ecology report by The Ecology Lab (2007) indicates that this macroinvertebrate community is not of high biodiversity or numbers and the poor healthy waterways rating (South East Queensland Healthy Waterways, 2007) also indicates that this eco-system is far from pristine. As such, the consequence of any excessive settlement of sediments is not considered to be great. Furthermore, the consequence of mismanaging the PASS dredge spoils is considered to be tempered by the inherent neutralising capacity of the spoils (Coffey Geotechnics Ptd Ltd, 2007) and the other negating points raised in section on Acid Sulfate Soils. Hence the overall consequence rating for the dredging activities is considered to be **moderate**.

The proposed development would limit direct physical disturbance to the Caboolture River to the marina entrance, with most of the foreshore of the property protected. As the costs are experienced during the construction phase and maintained during the operational phase, the assessment incorporates the impact in the construction phase only to avoid double counting.

The dredging of the river mouth has the potential to impact on policies 2.1.5, 2.1.9 and 2.8.1 under the medium scope assessment. The Caboolture River downstream of the proposed development is considered an area of significant coastal wetlands (EPA, 2007)

under areas of state significance. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The potentially impacted ecosystems considered in the total project scope assessment above are the same as those for the medium scope. The assessed consequence of the dredging of the river mouth (**moderate**) equally applies under policies 2.1.9 and 2.8.1.

Total Project Scope:

Construction Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Operation Incorporated above

Medium Scope:

Construction Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Operation Incorporated above

Storm water run-off and site drainage

Water quality tests indicate that the overall water quality of the Caboolture River (including the area adjacent to the project site) is poor. According to the SEQ Ecosystem Health report card produced by the Ecosystem Health Monitoring Program (2006), the river recorded a quality rating of D+ in 2006. This poor result is primarily being driven by a combination of poor concentrations of dissolved oxygen, turbidity and nutrient levels, which are partially attributed to relatively poor flushing of the river, but have also increased in recent years due to rapid urbanisation of Caboolture Shire (PMM, 2006) and associated inputs of sewerage effluent from two treatment plants into the river (The Ecology Lab, 2007). The nutrient loads in Caboolture River have the potential to significantly impact Moreton Bay, for example by stimulating blooms of the noxious blue-green algae Lyngbya. If poorly managed, the Northeast Business Park development could potentially increase sediment and nutrient flow into local waterways via increased volume of water flow across and from the site, and subsequently further decrease the water quality of Caboolture River (Parsons Brinckerhoff, 2006).

In order to mitigate these issues, the proposed development incorporates a range of water management and mitigation measures to slow water flow from the site, and “polish” the runoff water in wetlands and riparian buffer zones (Parsons Brinckerhoff, 2006). This will decrease the level of soil erosion compared to current land use, which will significantly reduce nutrient and contaminant loads and improve the quality of site run-off water, particularly in high rainfall events. Additionally, dredging of the river to remove the “plug” at the entrance will increase flushing, which is also expected to significantly improve water quality in the river (PMM, 2006). Due to these measures Cardno (2007c) believes that the development will not have a significant impact on Matters of National Environmental Significance that occur within and adjacent to the site,

As a result, it is **unlikely** (could occur, but not expected) that the proposed development will result in a decrease in water quality due to storm water run off and site drainage, and in fact has the potential to improve the water quality of the Caboolture River (which is examined in the benefits section). However, if the development were to result in an increase in sediment and nutrient run-off, given the current very poor rating of the river's water quality (South East Queensland Healthy Waterways, 2007) the consequence of this is expected to be **minor** (possibly detectable impacts but small in the wider context of the Caboolture River water quality).

Storm water run-off and site drainage has the potential to impact on policies 2.1.9 and 2.8.1 through impacts on downstream water quality and is assessable under the medium scope. The Caboolture River downstream of the proposed development is considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The potentially impacted ecosystems considered in the total project scope assessment above are the same as those for the medium scope. The assessed consequence of storm water run-off and site drainage (**minor**) equally applies under the policies 2.1.9 and 2.8.1.

Total Project Scope:

Construction N/A

Operation Likelihood: **Unlikely** x Consequence: **Minor** = Impact: **Low**

Medium Scope:

Construction N/A

Operation Likelihood: **Unlikely** x Consequence: **Minor** = Impact: **Low**

Bank erosion from increased river traffic

The rise in marine related activity has the potential to disrupt the aquatic habitats of the Caboolture River and cause erosion where little foreshore vegetation exists. Parts of the Caboolture River are in areas prone to shoreline erosion, particularly where natural vegetation has been cleared to the edge of the river channel (Cardno, 2007c). The Ecology Lab (2007) attributed shoreline erosion to:

- Land clearing and cattle grazing;
- Possible changes to flow and sediment transport associated with construction of the weir; and
- Vessel traffic on the river.

Currently, the Caboolture River has designated navigation channels and speed limits that decrease the impacts of water traffic on the ecological habitats and erosion of riverbanks (The Ecology Lab, 2007).

Cardno (2007c) assessed the condition of the Caboolture River's riverbank erosion at and downstream from the development site. Of 34km of riverbank, 9km was considered highly eroded and 12km showing some signs of erosion. In general erosion was worse moving up the river and in the areas with increased scale of development.

The section of the river that the project site is located is already subject to a moderate level of relatively large vessel traffic due to the number of available private moorings, located upstream, and Monty's marina, located downstream of the proposed marina entrance. The riverbank of the proposed site has poor quality riparian coverage of its riverbanks with the proposed entrance to the marina is in a section of the river already subject to some erosion and has few aquatic plants (The Ecology Lab, 2007).

The Ecology Lab (2007) identify that there are significant opportunities to improve the shoreline of the project site by implementing appropriate management practices. Rehabilitation of the riparian and vegetation buffer zones along the bank of the project site has been incorporated into the proposal to mitigate any potential erosion impacts associated with an increase in the volume of river traffic resulting from the development. Furthermore the proponent will establish an environmental trust fund to be administered by an environmental group for ongoing riparian revegetation works downstream of the marina (which protect against boat wash impacts) and will provide information to boat users of the marina regarding boat wash, its impacts and how to minimise it. The environmental trust is to be funded through the application of a levy on all completed berths within the marina, and it is anticipated that this trust will provide an incentive mechanism and community focus on riparian maintenance where previously no programs existed ensuring on-ground tangible results.

An assessment of impacts of boat traffic on riverbank erosion by Cardno Lawson Treloar (2008) indicates that the impact of boat wash on riverbank erosion should be no greater than existing conditions so long as vessels travelling between the Northeast Business Park site and the Caboolture River mouth maintain speeds consistent with existing speed limits.

As a result of the environmental trust providing an ongoing funding base for riverbank restoration, and provided that vessels stay within the appropriate navigation channels and adhere to the appropriate speed limit, it is **unlikely** (could occur, but is not expected) that the increased water traffic will cause additional bank erosion from the already relatively eroded banks. However, where erosion was to occur, the consequences are expected to be **moderate** (detectable impacts with recovery over the medium term once management initiatives are initiated).

It is anticipated that the implementation of the riverbank restoration program may actually result in an improvement in the condition of riverbanks downstream of the proposed site.

Bank erosion from increased river traffic has the potential to impact on policies 2.1.9 and 2.8.1 with the Caboolture River downstream of the proposed development considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Therefore it is assessable under the medium scope. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The potentially impacted ecosystems considered in the total project scope assessment above are the same as those for the medium scope. The assessed consequence of bank erosion from increased river traffic (**moderate**) equally applies under policies 2.1.9 and 2.8.1.

Total Project Scope:

Construction N/A

Operation Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Medium Scope:

Construction N/A

Operation Likelihood: **Unlikely** x Consequence: **Moderate** = Impact: **Low**

Impacts on downstream inter-tidal habitats

Significant inter-tidal habitats are found downstream of the proposed marina, namely in Moreton Bay and on the banks of the Caboolture River. These inter-tidal areas are recognised as Ramsar wetlands and Areas of State Significance (Natural Resources) – Significant Coastal Wetlands (Cardno 2007e). Important species that may be found in these habitats include a number of migratory birds and grey-headed flying foxes.

The inter-tidal wetland areas have the potential to be impacted by the development through:

- Changes to the river hydrology changing areas that flood; and
- Pollution or sediments from the construction and/or operation of the marina.

The flood mitigation works proposed for the site have been modelled for wider impacts across the Caboolture River by Parsons Brinckerhoff (2007). The modelling indicates reductions of between 4cm to greater than 10cm in peak water levels downstream of the development. Cardno Lawson Treloar (2008) identify that dredging activities will slightly increase the tidal prism, and have relatively minor impacts on low tide water levels within the River and tidal flushing. This may have some effects on the way in which inter-tidal wetland areas in the river form by changing the hydrology and sedimentation patterns. However, given the inherent variability in flooding events due to the natural variation in weather events and the natural dynamism of inter-tidal wetlands it is considered that the impacts will be minor or undistinguishable from background variability (Parsons Brinckerhoff, 2007).

The Ecology Lab (2007) noted of potential concern:

‘The construction of two of the eight flood mitigation embankments which extend into the coastal management district. If these significantly affect the flow of flood and tidal waters within wetlands, then they may cause a loss of wetland habitat and diminish, on a small scale, the value of the Fish Habitat Area. Access to the embankment sites during construction may also impact upon wetland habitat. A precautionary approach suggests that the siting of the embankments be done to minimise the loss of wetland habitat and to minimise any changes to normal water movement that could adversely affect to wetland.’

Pollution or sediment from the construction and/or operation of the marina are discussed in detail in other impacts in this report. While risks are apparent the management plans and operating procedures proposed should adequately address these. It is also important to highlight that the Caboolture River already experiences significant pollution and sediment inflows and the development can contribute to reducing some of the existing impacts.

It is considered that the proposed development will have a **likely** impact on the inter-tidal wetland areas downstream of the development site as it is clear that there will be some changes to river hydrology and possibly some impact from increased boat traffic. Given that the changes in hydrology will be minimal in the context of natural variability it is considered that the consequences of the impacts will be **negligible** (unlikely to be measurable against benchmarks).

Impacts to downstream inter-tidal habitats is relevant under policies 2.1.9 and 2.8.1 and is assessable under the medium scope. The Caboolture River downstream of the proposed development is considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The potentially impacted ecosystems considered in the total project scope assessment above are the same as those for the medium scope. The assessed consequence of impacts to downstream inter-tidal habitats (**negligible**) equally applies under policies 2.1.9 and 2.8.1.

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Negligible** = Impact: **Low**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Negligible** = Impact: **Low**

General water pollution

The operation of the marina will result in increased marine activity within and surrounding the marina, which is **almost certain** to increase the risk of pollution and contaminants to the Caboolture River (e.g. fuel, motor boat oil, etc.). This could potentially influence the water quality, marine habitats and aquatic life of the river and estuaries.

The Aquatic Ecology Report (The Ecology Lab, 2007) indicates that the Caboolture River has poor water quality, with evidence of eutrophication, stratification and high levels of turbidity. These assessments are further supported by the Ecosystem Health Monitoring Program (2006) recording a quality rating of D+ in 2006. High levels of nutrients were detected in river waters in December 2005 and January 2006. The river also has elevated concentrations of copper, and potentially iron and aluminium and most likely evidence of some acid sulfate runoff as noted in 4site Natural Solutions (2004).

Potential contributing factors to this poor water quality include:

- Monty's marina and slipway, downstream of the project site. This contains moorings within the main river channel and along the northern boundary of the river, as well as a large hardstand area and slipway running directly into the river. Despite the potential for detrimental impacts, where the marina is appropriately managed in line with current best management practice benchmarks it is highly unlikely that the marina would have any significant impact on water quality in the river (PLACE Environmental, 2007b);
- Unauthorised use and subsequent degradation of large areas of the Caboolture River foreshore contributing to sedimentation and eutrophication;
- The weir at Caboolture that reduces the flushing capacity of the river during minor rain events;
- Foreshore works, bank stabilisation and private slipways at various points along the river;
- A small residential area near the entrance to Goong Creek. This area has several large vessels moored on the side of the river channel; and
- Two Wastewater Treatment Plants, one discharging into the Caboolture River just downstream of the weir and one near the entrance to the river, discharging into Burpengary Creek.

The impact of any chance spills within the marina precinct will be largely mitigated by the loch system that will prevent the vast majority of spills ever reaching the Caboolture river. The loch system is effectively an extra layer of defence as the marina precinct is able to operate as a relative closed system, and with a constant monitoring regime, changes in water quality may be identified immediately and addressed.

Given the existing level of marine activity already occurring in the vicinity of the proposed site, the poor existing quality of the water, the proposed design of the marina precinct and operational strategies to negate and regulate marine activity, the consequence of increased marine activity, in relation to increasing general water pollution and contaminants, is expected to be **minor** (possibly detectable, but small relative to the wider context and able to be mitigated over the short term once addressed).

General water pollution due to the operation of the marina has the potential to impact on policies 2.1.9 and 2.8.1 through impacts on downstream water quality. Therefore the impact is assessable under the medium scope. The Caboolture River downstream of the proposed development is considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The potentially impacted ecosystems considered in the total project scope assessment above are the same as those for the medium scope. The assessed consequence of general water pollution (**minor**) equally applies under policies 2.1.9 and 2.8.1.

Total Project Scope:

Construction	N/A
Operation	Likelihood: Almost Certain x Consequence: Minor = Impact: Medium

Medium Scope:

Construction	N/A
Operation	Likelihood: Almost Certain x Consequence: Minor = Impact: Medium

7.2 Benefits

7.2.1 Economic Benefits

Increased business confidence (investment attraction)

The development of the Northeast Business Park is expected to provide a significant boost to regional business confidence and increase the attractiveness of the area to new business investment. The development is likely to become a central component of economic activity within Caboolture and surrounding areas and compliment the activities undertaken within the Caboolture Morayfield Principle Activity Centre as part of the Northern Corridor outlined in the SEQ Regional Plan (SEQRP, 2005).

The development provides existing business investors, and those considering investing in the region for the first time, tangible evidence that the development strategy outlined in the SEQ Regional Plan and the Caboolture Shire Economic Development Plan (MacroPlan Australia, 2004) is being delivered by generating additional "places to do business".

The Northeast Business Park also meets a goal of the Caboolture Economic Development Plan of growing industry development and trade through incubation and clustering (MacroPlan Australia, 2004). As the number of businesses expending or locating to the region increases additional opportunities to leverage business to business transactions and networking would become apparent, further increasing economic activity within the region.

It is **likely** (will probably occur in most circumstances), due to the scale of the proposed development, that the Northeast Business Park will have a positive impact on business confidence and associated activity during both the construction and operational phases.

It is anticipated that there will be an immediate minor (possibly detectable impacts, but small relative to the wider context) consequence when the project is approved and that this will become **moderate** (detectable impacts, experienced over the medium) as construction work begins and businesses begin to locate at the park. Once this process begins, the benefits of the development are expected to become apparent and will be reflected in further investment decisions. This moderate assessment is considered conservative considering the scale of the development. PMM (2007) state that every aspect of the North East Business Park development concept is conceived around what is necessary to create a Business Park which is notable and competitive in a Regional, National and International marketplace, which will likely support and encourage increased business confidence and investment.

As the benefits are experienced conjointly over the construction and operational phases rather than discretely, the assessment incorporates the impact in the construction phase only to avoid double counting.

Benefits associated with increased business confidence during construction and operation are relevant to the medium scope assessment where they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). This includes approximately 37.5% of the industry and business precinct and 100% of the marina (see Table 1.2), which equates to approximately 25% of the total development expenditure. The consequence of this demand is assessed to be **minor** (possibly detectable, but minimal change in the established structure and function) for the medium scope.

Total Project Scope:

Construction Likelihood: **Likely** x Consequence: **Moderate**= Impact: **Medium**

Operation Incorporated above

Medium Scope:

Construction Likelihood: **Likely** x Consequence: **Minor**= Impact: **Medium**

Operation Incorporated above

Tourism diversification and support (increased tourism visitation and spend)

The southeast Queensland region boasts a number of recognised visitor drawcards, specifically within the Caboolture region key drawcards include Pumicestone Passage, Bribie Island and Moreton Bay. The presence of a large-scale marina and marine services cluster in proximity to the popular Moreton Bay and Pumicestone Passage is likely to attract additional private boat owners and marine tourism operators. It is anticipated the marina will become a hub for water based tourism services from the Caboolture River, which are currently expanding including the establishment of the first whale watching charters from the Sunshine Coast in 2007 (Courier Mail, 2007). The construction of a championship standard golf course as part of the development is also expected to support further tourism growth in the region.

The Northeast Business Park development will provide a first class facility that enables easy linkages between land and water based activities, which is in line with the state government priorities outlined in the Living the Queensland Lifestyle (2006) document for encouraging and facilitating participation in boating leisure activities. There are significant opportunities to create high value tourism services around the development with significant flow on benefits for other tourist attractions in the region.

There is also a significant shortage of appropriate berthing facilities in SEQ (Pacific Southwest Strategy Group, 2006a), with 4,910 wet berths available at 21 marina /

marine precincts in the region, and a current waiting list for marina berths in SEQ of approximately 1,500 berths. Registration of boats requiring mooring or berths for storage (typically those greater than 8 metres in length) in SEQ has been growing at approximately 7.3% per annum since 1999 and this rapid growth is expected to continue in coming years, ultimately resulting in a lack of capacity in SEQ of approximately 1,800 berths by 2010 and 9,500 berths by 2020 (refer section 2.3.4). This increases the risks of boat owners mooring their vessels inappropriately with associated environmental and health and safety risks.

Both the marina and golf course are expected to be popular with local residents and visitors from outside of the region and it is likely that both developments would attract high value consumers. The proposed hotel will set a new standard in short term accommodation in the study area hotel market and is expected to be highly desirable to holiday makers and corporate travellers given its scale, high quality and ancillary facilities (golf course and marina) (Urbis, 2007c). Urbis (2007b) identify that demand for rounds of golf at the proposed for the Northeast Business Park complex will be sufficient to support viability from 2014.

The development of the nearby Sunshine Coast airport and other infrastructure improvements means that the marina and golf developments could be used to attract consumers directly to the region as a destination, rather than as a day visit while staying in Brisbane. Using these feature developments to attract visitors to the region is also expected to contribute positively to visitation figures at other regional tourist attractions.

Given the significance of the project in the region and the high quality of development, it is **likely** (will probably occur in most circumstances) that there will be a **major** (wider longer term impacts) consequence in the operating phase with increased tourism visitation and visitor spend in the region driven by the development.

Benefits from tourism diversification and support are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). The consequence of this impact for the medium scope assessment is identical (**major**) to the total project scope as benefits from tourism diversification and support pertain solely to the marina and associated infrastructure.

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Major** = Impact: **High**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Major** = Impact: **High**

Value adding and clustering efficiencies of the marine sector

The marine sector is a high value industry with the potential to sustain a substantial support services network including businesses with direct marine connections such as marine engineering, boat manufacture and repair services, a service sector including clothing and equipment sales and administrative, financial and management functions (Queensland Department of State Development, 2007).

The Northeast Business Park development supports and facilitates the goal of the Caboolture Shire Council Economic Development Plan of growing industry development and trade through incubation and clustering (MacroPlan Australia, 2004).

It is envisaged that the Northeast Business Park will develop as the regional marine services hub, capable of attracting visitors and consumers from within the region and beyond. As well as the direct economic impact of this additional business activity

(examined in the quantitative assessment), the development of such a hub is also likely to result in the creation of significant additional training and employment opportunities, many in technical and skilled roles. The co-location of the industry precinct with the marina precinct provides the space to allow a full marine industry cluster to emerge to support the marina, along with education and training facilities, highway access and the like (PMM, 2007). Having established this strong foundation, the balance of the uses work to support and strengthen the functionality, viability and commercial attractiveness of the marina and industry precinct (PMM, 2007).

The marine sector would also derive many benefits from the establishment of a cluster arrangement including (Berk & Associates, 2007):

- Facilitating the creation of business to business networks and co-operation;
- Enhanced business and industry productivity through increased access to specialised suppliers, skills, and information;
- Improved targeting and impact of marketing activities;
- Increased industry efficiency through improved industry coordination and collaboration; and
- Other supply chain synergies between companies (for example between a boat builder and a boat sales dealer).

The proponent's focus on sustainable development for the Northeast Business Park encourages the concept of "industrial ecology", that is, the shifting of industrial process from open loop systems (where resource and capital investments move through the system to become waste) to a closed loop system (where wastes become inputs for new processes). This is much easier to achieve in a clustered environment and helps to drive further efficiencies. Industrial ecology principles apply at a scale broader than individual industries and extend to the beneficial relationship between any network of uses, communities of interest and in the relationship between the development and the surrounding ecology. Additional detail relating to the principle of industrial ecology and its relevance and application within Northeast Business Park is incorporated in PMM (2007).

There are significant potential benefits to the marine sector from clustering, mainly due to the high degree of specialisation that characterises the sector. It is **likely** (will probably occur in most circumstances) that these benefits will have a **major** (wider longer term impacts) consequence for the region.

Benefits from value adding and clustering efficiencies of the marine sector are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). The consequence of this impact for the medium scope assessment is identical (**major**) to the total project scope as benefits from tourism diversification and support pertain solely to the marina and associated infrastructure.

Total Project Scope:

Construction	N/A
Operation	Likelihood: Likely x Consequence: Major = Impact: High

Medium Scope:

Construction	N/A
Operation	Likelihood: Likely x Consequence: Major = Impact: High

Additional employment and training opportunities

The Caboolture labour market is anticipated to experience the majority of the labour force impacts and forms the focus of the analysis. Caboolture Shire Council have established a target that within the next 20 years two out of three working residents will be employed inside the Caboolture Shire boundary (Urbis, 2007). To achieve this target, it is forecast that an additional 30,000 jobs will need to be created over the next 20 years (AEC Group Ltd, 2007). It is estimated that the Northeast Business Park will contribute just over 700 direct FTE employment positions each year during the construction phase of the project and over 14,000 direct FTE employment positions when it is operational (Urbis, 2007), including:

- 348 within the marina precinct;
- 15 at the golf course; and
- 13,606 in the industry business park.

The spend of residents houses within the Northeast Business Park is estimated to generate approximately 900 direct employment positions (Urbis, 2007).

The Northeast Business Park project will attract a stable and growing workforce over the development period by providing:

- Alternative employment opportunities currently unavailable in the region;
- Opportunities to improve the regional skills base through diversification of employment opportunities and new education/training facilities;
- Improved transport services and access to the region;
- A specialised location on the Caboolture River with marina facilities, marina precinct and associated businesses; and
- Business/industry infrastructure to meet the current lack of facilities north of Brisbane in southeast Queensland.

A substantial increase in employment opportunities is expected following the development of the Northeast Business Park with positive impacts on the local and regional economy. The impacts of the development are expected to not only increase the number of employment opportunities but also improve the type of roles on offer and broaden the skills base in line with the region's long term goals of diversifying the base and type of employment.

The proponent is actively engaged with education and training providers (e.g. Northeast Business Park Pty Ltd have signed a Memorandum of Understanding with Cadet who is a Job Network Provider) to identify the skill sets and training required for pre-construction and construction, with a focus on targeting local youth, local underemployed, local indigenous persons and local small businesses, to provide as many of the employment positions from within the regional catchment. There are also anticipated to be 'cohort' effects by targeting vocational training and education opportunities to specific groups of stakeholders.

As such, during the construction phase it is **almost certain** (expected to occur in most circumstances) that there will be an increase in employment in the local labour force. It is unclear what proportion of workers would be suitable and able to be trained locally, however where a conservative estimate of one fifth of the construction workforce (120 FTE employment positions) was sourced locally this would reduce the Shire's number of unemployed persons by over 3% (DEWR, 2007). It is therefore expected that the construction phase of the development will have a **moderate** (detectable impacts over the medium term) consequence for the local employment market.

Benefits associated with the additional employment and training positions during construction are relevant to the medium scope assessment where they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). This includes approximately 37.5% of the industry and business precinct, 100% of the marina, and approximately 45% of residential dwellings (see Table 1.2). Applying these factors to the aspects of the Northeast Business Park development included in the

medium scope assessment identifies that approximately 44.0% of the total project is appropriate for inclusion, or approximately 53 employment positions from local unemployed labour. The consequence of this demand is assessed to be **minor** (possibly detectable, but minimal change in the established structure and function).

As evidenced by the estimated job creation figures for the operational phase, it is **almost certain** (expected to occur in most circumstances) that there will be an impact on employment in the region from the development once completed. The majority of these employment impacts will be in the business/industrial sector and the projected staff numbers are sufficiently large that the impact is likely to have an **outstanding** (wider longer term impacts maintained without ongoing initiatives) consequence for the region.

Benefits associated with the additional employment and training positions during operation are relevant to the medium scope assessment where they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). This includes approximately 37.5% of the industry and business precinct, 100% of the marina, and approximately 45% of residential dwellings (see Table 1.2). This equates to approximately 348 employment positions for the marina, approximately 400 employment positions associated with expenditure by residents associated or utilising the marina and over 5,000 employment positions in the industry business park. The consequence of these additional employment positions are assessed to be **outstanding** (wider long term impacts likely to result in a changed structure and function).

Total Project Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Operation Likelihood: **Almost Certain** x Consequence: **Outstanding** = Impact: **Very High**

Medium Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation Likelihood: **Almost Certain** x Consequence: **Outstanding** = Impact: **Very High**

Improved local and regional traffic linkages

The provision of viable and efficient transport linkages and services is highly reliant on achieving a critical mass of consumers wanting and needing to utilise the linkage or services. Without this critical mass it is unlikely that additional service networks will be provided. It is anticipated that as the Northeast Business Park is developed it will stimulate the need for new transport linkages to connect with the main regional centres due to a combination of factors, including:

- Connection of business and industry within the development to suppliers and markets outside the development, and vice versa;
- Connection of new residents within the development to other areas of the region; and
- Connection of residents to the recreational, leisure, lifestyle and community services and facilities that will be available within the Northeast Business Park.

Establishing improved transport services would be an effective means of increasing the visitation to the Northeast Business Park as well as from the Northeast Business Park to the rest of the region. The new linkages would not only connect existing consumers with the new development, they would also allow residents and visitors to the Northeast Business Park access to the rest of the region increasing business opportunities throughout the region as well as at the Northeast Business Park.

It is **almost certain** (expected to occur in most circumstances) that there will be some improvements to traffic linkages in both the construction and operational phases of the

development, with access to the development site required during both phases of development.

It is expected that during the construction phase the consequences will be **minor** (possibly detectable impacts but minimal changes), with essential transport linkages provided for construction workers and vehicles. However, as the development reaches a critical mass, then more substantial improvements to transport linkages and services would be made with a **moderate** (detectable impacts over the medium term) consequence.

Improved regional traffic linkages are not identified as being relevant to the medium scope assessment and are not assessed in the medium scope assessment.

Total Project Scope:

Construction Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium**

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Medium Scope:

Construction N/A

Operation N/A

Reduction in average peak flood height

Any flood event brings considerable property damage to businesses, residences, infrastructure such as roads and bridges as well as the loss of memorabilia (Queensland Department of Emergency Services, 2002a). As well as the direct impacts, indirect impacts such as loss of business, transport delay and access problems and demands on emergency services also have a significant impact (Queensland Department of Emergency Services, 2002b).

Parsons Brinckerhoff (2006, 2007) show initiatives including re-profiling of land near the marina, and widening the dredged navigation channel will result in a reduction in peak flood levels for the 1 in 100 year ARI event. The increased conveyance through the development site by use of earth diversion banks, grass management and additional earthworks reduces the flood risk to the wider community. As a result, it is considered that the likelihood of a benefit accruing from achieving a reduction in average peak flood height is **likely** (will probably occur in most circumstances) in both the construction and operational phases.

A reduced flood risk would be a large benefit for both residents with properties on the flood plain and those living nearby. A major flood has the potential to have a devastating impact on their properties requiring significant remedial work to repair and replace the flood damage.

Reducing the flood impact would also be a benefit to businesses in the region. In a flood event, they could incur significant losses of stocks and equipment as well as damage to their properties. In the longer term significant flood event/s could make the region much less attractive to new businesses who would not only be concerned about potential losses from the flood but also about possible reductions in overall business activity in the area.

The consequence of a reduction in the peak height of a flood event is assessed in both periods to be **minor** (possibly detectable, but minimal changes in structure and function) based on a reduction in flood height over the inundation area of up to one metre. Only one aspect is included in the overall assessment to ensure no double counting as the benefits are maintained once dredging is complete.

Benefits from a reduction in average peak flood height are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation

(policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). The consequence of this impact for the medium scope assessment is identical (**minor**) to the total project scope as the benefits from a reduction in peak flood height pertain solely to activities undertaken to facilitate the operation of the marina and associated infrastructure.

Total Project Scope:

Construction Likelihood: **Likely** x Consequence: **Minor** = Impact **Medium**

Operation Incorporated above

Medium Scope:

Construction Likelihood: **Likely** x Consequence: **Minor** = Impact **Medium**

Operation Incorporated above

It is not possible to quantify the probability distribution of damage to estimate the annual average damage reduction from reduced peak flood height based on statistics from the one flood event that have been modelled for Northeast Business Park (Parsons Brinckerhoff, 2007).

To demonstrate the potential distribution the following table summarises results from a flood study undertaken for flooding on the Nerang River on the Gold Coast, which highlights the significant nature of flooding impacts for a one in 100 year event. These estimates were taken from a study completed by Sinclair Knight Merz (2002) for Gold Coast City Council.

Table 7.2. Indicative Flood Impacts: Nerang River Case Study (100 Year event)

Type of Impact	Impact
Residential	\$84.0 million
Commercial	\$9.6 million
Infrastructure	\$15.3 million
Vehicles and boats	\$21.8 million
Business disruption	\$2.6 million
Transport network disruption	\$3.2 million
Tourism	\$3.6 million
Disaster response and relief	\$0.9 million
Death, injury and health	\$15.2 million
Environmental	\$0.5 million
Total	\$146.7 million

Source: SKM (2002)

This table illustrates the potential magnitude of the costs involved in a one in one hundred flooding event.

7.2.2 Social Benefits

Improved river safety from dredging activities

The dredging of the river mouth will result in deeper navigation channels and river entrance, increasing the safety of all those entering the Caboolture River, regardless of their intent to utilise the facilities at the Northeast Business Park marina precinct. The education programs run by the proponent at Northeast Business Park, the continuation of the reduced speed zones, as well as the incorporation of additional lit navigation beacons will contribute to the increased safety of existing boating activities. Improved safety resulting from Northeast Business Park is supported by comments from the regional Harbour Master "I am satisfied that the revised navigation channel will further promote navigation safety in the river and improve natural waterflow. I am also satisfied that the suggested lit navigation beacons are appropriately positioned to further enhance safety." (R. Johnston, Regional Harbour Master, email 28 November, 2008).

The education program is anticipated to have a positive impact on boating safety. However, due to the diffuse and somewhat subjective nature of its impacts, and to ensure a conservative assessment, only the safety benefits from dredging the river mouth are assessed in this report with the safety benefits flowing from the boating education program excluded.

Recreational boat registrations are growing at approximately 5.0% per annum, which is greater than the rate of population growth (Living the Queensland Lifestyle, 2006). This implies a significant increase in the number of boats and users in the coming years. The likelihood of a reduction in the rate and/or incidence of accidents of those entering the Caboolture River from the safer navigation channels and entrance as a result of dredging activities is assessed as **likely** (will probably occur in most circumstances). However, it should be noted that this increase in navigational safety from dredging activities is somewhat mitigated by the anticipated increase in water traffic, which is assessed separately in the "Decreased river safety from increased river traffic" impact in the social costs section.

In a worst case scenario an individual boating accident may result in the loss of life. However, more commonly boating accidents relate to damaged or lost equipment and minor injuries. In the five years to 2004, there were 31 fatalities and 113 persons receiving serious injuries from boating activities in Queensland (ABC, 2004).

Where the dredging of the Caboolture River, which is expected to be self maintaining once established, saves only one life, this could be said to be a significant benefit from the Northeast Business Park Marina development. However, when considered against the outcome of all potential/ likely boating accidents of those entering the river (i.e. not all boating accidents result in the loss of life) the impact is assessed to be **moderate** (detectable impact, maintained over the medium term). The assessment acknowledges the catastrophic nature to the families and those directly involved in boating fatalities.

Benefits from improved river safety from dredging activities are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). The consequence of this impact for the medium scope assessment is identical (**moderate**) to the total project scope as benefits from improved river safety from dredging activities pertain solely to the marina and associated infrastructure.

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Moderate** = Impact: **Medium**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Moderate** = Impact: **Medium**

Public transport network

There are currently poor public transport networks within Caboolture, as identified through the "Burpengary Community Attitude Survey" (Three Plus, 2007 and Hornery Institute, 2007b) as well as road movement being identified as challenging in all suburbs (Hornery Institute, 2007a), with east west movements being poor. A broader regional transport issue was also identified by the eleven working groups of the SEQ 2021 project (MacroPlan Australia, 2004).

Adequate access and transport provision linking the Northeast Business Park, Caboolture, Morayfield and other regional areas is a critical need for the success of the development to ensure the full realisation and development of its industry, business, residential and recreational precincts (Three Plus, 2007; Hornery Institute, 2007a) and currently those

areas east of the highway have poor or no service (Hornery Institute, 2007a). Existing bus service providers have applied for funding to assist in the delivery of services to meet current demand, which further supports demand for the planned services to be provided by the Northeast Business Park.

Planning has commenced for a transport network linking the Northeast Business Park to key regional centres. It is currently anticipated that this would start with a shuttle bus and ultimately build up to the establishment of a broader service contract with a bus service provider, potentially servicing Burpengary and beyond (*Pers Comm*, 3 August, 2007 – J. Smith, CEO: Northeast Business Park; Cardno Eppell Olsen, 2006).

The increased employment activity and resident population of the Northeast Business Park will provide impetus for improved public transport systems. These new and augmented transport systems will not only provide benefits within the Northeast Business Park development itself but also to the greater region through improved linkages, once an appropriate level of critical mass is generated within the Northeast Business Park development.

Northeast Business Park will ensure adequate public transport to and from the development to ensure its viability, initially through the operation of a shuttle bus for construction workers and contribute a subsidy towards a bus service for the general public as the population grows. It is considered **likely** (will probably occur in most circumstances, i.e. on reaching critical mass) that this transport system will provide community benefits beyond those directly related to the operation of the Northeast Business Park.

The SEQ Regional Plan (Queensland Government, 2006) identifies improved regional transport networks as being required throughout the region and the Caboolture Economic Development Strategy (MacroPlan Australia, 2004) identifies transport nodes and infrastructure as facilitating the development of targeted growth for the region. PMM (2007) identify the facilitation of public transport as being essential to the effective functioning of NBP and of significant benefit to the community. The consequence of the outcome is assessed to be **major** (wider significant impacts maintained over the longer term).

The project also addresses an identified need for marina facilities in South East Queensland (Pacific Southwest Strategy Group, 2006a).

Benefits resulting from an expansion of the transport network in relation to persons working and/or living in the marina and associated residential are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3 and 2.1.9). Considering that approximately 37.5% of employees and business activity may be anticipated to relate to the marina and approximately 45% of residential accommodation, it is reasonable to assume the consequence of this population driven improvements to the transport infrastructure would be **moderate** (detectable changes characterised by significant changes in structure and function).

Consideration of the cost of this additional infrastructure is incorporated in the additional infrastructure costs section of the qualitative economic analysis section.

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Major** = Impact: **High**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Moderate** = Impact: **Medium**

Improved social and community infrastructure and services

The development of a business and industry precinct, centred on a marina facility with associated residential lots of the size and nature of the proposed Northeast Business Park require many services to be provided within the facility. The Hornery Institute (2007a) through mapping of social infrastructure showed identify there are currently very limited social services located on the eastern side of the highway (see figures in Section 5 Hornery Institute, 2007a) and recommend the following social, community and human services are provided to ensure an appropriate level of self-sufficiency. These facilities would also provide benefits to residents outside the development.

Table 7.3. Recommended Social and Community Infrastructure & Services

Classification	Threshold Services
Civic	<ul style="list-style-type: none"> • Basic amenities: banking, post office, telephone & post boxes. • Neighbourhood retail: supermarket, bakery, bottle shop, video/DVD store, newsagents, coffee shop/ café.
Community	<ul style="list-style-type: none"> • Infrastructure: community meeting spaces, community hall. • Organisations: registered childcare facilities with fulltime places from baby to kindergarten (0 to 4 years).
Human services	<ul style="list-style-type: none"> • Police Beat.

Source: Hornery Institute (2007b).

The NBP development provides a critical mass of development to support the provision of many of these services (PMM, 2007). The residential population will be of a scale that requires and supports the provision of a range of social services, not only catering for the needs of the North East Business Park community, but providing services for the broader region who are currently isolated from most social services (PMM, 2007).

When considered in the context of a contribution to the broader community it is considered **unlikely** (could occur, but is not expected) that the Northeast Business Park development will provide additional social and community infrastructure and services beyond those residential and business occupants of the development itself. The cost of these facilities is assessed in the qualitative economic assessment.

Urbis (2007) identify that the proposed marina on the site and supporting amenities and facilities will enhance community interaction and cohesion as the site provides the opportunity to create a marine based hub for businesses and local and regional recreation opportunity for residents and tourists.

The consequence of the development providing beneficial community infrastructure and service beyond the demand of the immediate residents, where it does occur, is assessed to be **minor** (possibly detectable, but minimal changes in structure and function).

Benefits from improved social and community infrastructure provided within the Northeast Business Park associated with the marina and dependent aspects of associated residential and business park components are appropriate for incorporation in the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3 and 2.1.9). The consequence of this impact is assessed to be **minor** (detectable impacts over the medium term) within the medium scope assessment, which is the same as the total project scope.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Unlikely** x Consequence: **Minor** = Impact: **Low****Medium Scope:****Construction** N/A**Operation** Likelihood: **Unlikely** x Consequence: **Minor** = Impact: **Low***Improved access to areas for recreational and leisure activity*

The Caboolture Shire Plan identifies development that enhances community wellbeing and the timely provision of social infrastructure as a key platform required for achieving strong communities with high performing local economies. Three Plus (2007), through community surveys and consultation, identified that lifestyle facilities and infrastructure rated most highly, with café and restaurant precincts, the picnic and open space areas and the yacht club itself the highest scoring suggested facilities within the Northeast Business Park development by the community (all rating greater than an 8 out of 10).

The survey analysis reports that community and social infrastructure ("better facilities", "enhance local infrastructure", "much needed boating infrastructure", "a much needed golf course", "planned public areas", "outdoor recreational activities", etc.) received the greatest number of positive comments in the open-ended questions on the benefits of the development.

The Northeast Business Park incorporates 365ha of open space including wetlands, pathways, golf courses, fishing platforms, marina berths, and other sporting, cultural and open space areas (PMM, 2006).

Further, the Northeast Business Park opens approximately nine kilometres of previously denied river frontage and effectively provides this as a community asset. The development also provides for approximately 400 hectares of open space, which comprises a mix of rehabilitated ecological and environmental areas, sports fields, Heritage Parks, a golf course and a system of bike and walkways, etc, as well as café and dining and retail precincts.

PMM (2007) identify Northeast Business Park as an outstanding opportunity to provide an integrated and complete living and working environment by the co location of significant social and recreational opportunities catering for the macro trends associated with the changing face of business and industrial development and associated worker/ resident demand.

The current government election promise outlined in the Living the Queensland Lifestyle (2006) document highlights a policy to encourage...

"...Queenslanders to live a more relaxed, more healthy and less stressful outdoors lifestyle, to reconnect with family and nature."

The Living the Queensland Lifestyle (2006) document goes on to highlight the key components encouraged by the current government to include:

- Greater participation in recreational fishing and boating;
- Coordination of regional outdoor recreation within SEQ;
- Increased numbers of walking trails for locals and visitors; and
- Promote canoeing and kayaking trails on rivers and creeks.

The proposed Northeast Business Park facilitates each of the above factors highlighting the collaborative and integrated nature of the Northeast Business Park development with respect to broader lifestyle priorities of the State Government.

With respect to encouraging boating, the Living the Queensland Lifestyle (2006) document outlines upgraded recreational boating facilities, infrastructure works and navigation channels as being required, particularly in response to the anticipated increase in boat registrations in SEQ (approximately 5.0% annually). This highlights the requirement to manage moorings for boats in SEQ to not only encourage and facilitate recreational boating pursuits but also to ensure minimal environmental harm.

The proposed Northeast Business Park is the first marina development north of Brisbane in SEQ. Beyond providing a mooring for boat owners, the marina complex of the Northeast Business Park aims to facilitate water based lifestyle activities by delivering and maintaining a high standard and broad range of facilities to facilitate and encourage the pursuit of water based leisure activities, including maintenance, repair and a range of other services once the marine cluster is established.

The appropriateness and level of service provided can be measured by various codes of practice and rating/ award schemes, which the Northeast Business Park anticipate will be achieved, for example the **Gold Anchor Award Scheme**, which aims to measure and improve the standards of facilities available to all boat owners. The level of the Awards range from Three to Five Gold Anchors (YHA, 2007). Any Award is a sign of a quality marina, whilst the number of anchors indicates the level of the facilities available.

As can be seen, the likelihood of improved access to areas of recreational and leisure activity through the development of the Northeast Business Park is **almost certain** (expected to occur in most circumstances).

Due to the high priority placed on areas for recreational and leisure activity, by both the Queensland Government and the community, and the myriad of benefits that flow from it, the consequence of the benefits associated with improved access to areas for recreational activity are assessed to be **major** (wider longer term impacts maintained with minimal maintenance).

Benefits associated with improved access to areas for recreational and leisure activity is relevant to the medium scope assessment where they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). This includes the marina and associated infrastructure and facilities, associated open space, but excludes other recreational pursuits, such as the golf course. The consequence of this demand is assessed to be **moderate** (detectable and associated with significant change).

Total Project Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very high**

Medium Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Improved visual amenity

Studio Tekton (2007) identifies that for the Northeast Business Park:

- Buildings will not dominate the visual amenity and are considered compatible with the adjoining rural/ rural residential zoning;
- Development will not intrude on any vistas or view corridors across the site or to the Glass House Mountains;

- Single residential precincts are compatible with the surrounding character and amenity;
- Taller structures can be effectively screened;
- Buffer areas and separation will effectively prevent the spill of required lighting from the site; and
- The development will meet the appropriate design standards (AS4282-1997) with the implementation of guides identified.

Studio Tekton (2007) also note that the masterplan planning intent is to create a balance between development footprint, open space and building height, with visual separation provided by distance. Controls will be assured through the proposed community title arrangements ensuring the quality of the built form and landscape to achieve high standards. As there are no identified detrimental visual amenity impacts that can not be mitigated, this assessment has focussed on the positive visual amenity impacts provided by the development.

Improved visual amenity from the Northeast Business Park development is delivered in two ways:

- Through the improvement of the relatively degraded land (Place Environmental, 2007) visible from the water through construction of aesthetically appealing urban form that integrates with the natural habitat and beauty of the surrounding area; and
- Opening up access points to environmental areas as well as the river that were previously inaccessible to the broader public, which contribute to visual amenity of visitors.

Access to areas of improved visual amenity will be facilitated through the network of roads, bikeways, walking trails and general open space of the site as well as platforms overlooking the river for fishing and viewing (Place Environmental, 2007b).

While the development site will almost certainly change in its aspect and visual nature, the likelihood of improved visual amenity through the development of the Northeast Business Park is considered to be **almost certain** (will probably occur in most circumstances) although the assessment notes that some individuals may consider the current agricultural land appealing. However, the currently degraded site is unlikely to facilitate any significant visual amenity and is subsequently not assessed.

The consequence of improved visual amenity, based on community feedback (Three Plus, 2007) and the anticipated residents and visitors participating in recreational and leisure activities within the precinct, is considered to be **major** (detectable and significant changes maintained over the longer term).

Benefits associated with improved visual amenity are relevant to the medium scope assessment where they pertain to and are associated with the marina its associated infrastructure (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). It is anticipated that much of the positive visual amenity associated with the development will be associated with the marina and associated facilities, however, the amenity benefits derived from utilising infrastructure not associated with the marina are not relevant for inclusion. It is difficult to assess exactly the contribution to visual amenity from each aspect of the development. The consequence of the visual amenity benefits within the medium scope are conservatively assessed to be **moderate** (detectable impacts characterised by significant in structure and composition).

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very High****Medium Scope:****Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High***Range and choice of residential alternatives*

The SEQ Regional Plan identifies the Northern corridor to be an area suitable for higher density residential development with a target of 26,400 new dwellings in Caboolture Shire by 2026. Of these, 6,000 will be infill base. Across the region, this housing is required to meet local need and affordability. It is accepted that these targets are conservative, and it is clear that the residential components of the Northeast Business Park development will assist in meeting these targets over the short and medium term. The Northeast Business Park provides a significant volume and range of accommodation facilities in Caboolture and the wider SEQ region, including (Urbis, 2006):

- 85 attached marina villa dwellings;
- 927 attached apartment dwellings;
- 120 attached resort rooms;
- 203 detached golf course frontage dwellings;
- 987 detached dry lots; and
- 88 detached golf villas.

The Northeast Business Park development provides a diverse range of housing at the moderate to top end of the market within the region, and facilitates, through the proposed housing betterment system (land affordability strategy examined below) an increase in the volume of available housing at the lower end of the scale/ market to ensure that additional housing alternatives are provided throughout the housing spectrum (PMM, 2007).

The range of residential products to be offered increases the range of residential options available in the region, some of which are currently under represented. The development will provide housing choices ranging from affordable small lot housing through to premium golf and marina villas, as well as apartment living in a high amenity village environment (PMM, 2007).

Where the Northeast Business Park proceeds, it is **almost certain** that these benefits will be attained. The range of residential alternatives that will be made available will result in an increase of approximately 5% in total dwellings in Caboolture Shire (ABS, 2007), and as such is assessed to have a **moderate** (detectable impacts over the medium term) consequence in the context of the region's housing market.

Benefits from a range and choice of residential alternatives are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3 and 2.1.9). The consequence of this impact, when considering only those residential alternatives that are associated with the marina facility (approximately 45%), while lower than for the total project scope is still assessed to be **moderate** with detectable impacts over the medium term, which is the same as the total project scope.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High****Medium Scope:****Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High***Protection of unique environmental and heritage assets*

The protection of unique environmental and heritage assets includes the development of the "Heritage Park" precinct including picnic areas, sculpture forest and heritage trails as part of a broader open space precinct.

The "Heritage Park" precinct, which is to include a colonial style homestead, some of the earliest forestry enterprises and one of the first regions to import 'Kanaka' labour will be open to the public and include interpretative displays to extend and disseminate information regarding the history of the site. This facility will be integrated with a network of parks, gardens, pathways, sporting fields and recreational and open space that will be accessible to visitors.

Whilst a number of areas of interest have been identified for further investigation, to date no traditional owner significant sites have been identified. In accordance with the Draft Cultural Heritage Management Plan (Davies Heritage Consultants, 2007) further investigations of any potential cultural heritage sites will be conducted in accordance with the commitment to maintaining an appropriate response to any cultural heritage issues associated with the site. The Draft Cultural Heritage Management Plan (Davies Heritage Consultants, 2007) regarding the site is currently undergoing a review and voluntary acceptance by the Gubbi Gubbi, who are recognised as the traditional owners of the site. The Cultural Heritage Management Plan identifies a process by which traditional owner cultural heritage will be preserved and outlines the principles, responsibilities, requisite management and dispute resolution procedures to be followed.

The likelihood of benefits from the retention and maintenance of the heritage assets of the area is **almost certain**.

Currently the site is degraded and the key heritage assets are at risk of being lost. The development of the Northeast Business Park proposes to rehabilitate the old Raff Homestead and other key features of the initial European settlement within a broader Heritage Park precinct. The Heritage Park will not only preserve the cultural history of the local area but also provide a means for extension and education to the local and visiting population that would otherwise not have been possible.

The consequence of protecting unique environmental and heritage assets through the provision of the Heritage Park precinct within the Northeast Business Park is identified to be **major** (significant and detectable impacts over the long term).

The protection of unique environmental and heritage assets is not identified as being relevant to the medium scope assessment and is not assessed in the medium scope.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very high****Medium Scope:****Construction** N/A**Operation** N/A*Affordable housing strategy*

The Caboolture Shire Plan identifies the provision of a diverse housing mix, that includes affordable and appropriately located housing, as a key element required for achieving strong communities with high performing local economies. The affordable housing strategy (betterment system) proposed by the proponent is an innovative platform for providing a collaborative approach to provide appropriate alternative and affordable housing to meet an identified community need.

The affordable housing strategy is an initiative of the proponent and includes a contribution to a building trust of \$2,000 per residential parcel (excluding residential apartments) from the sale of the 1,300 lots within the development. This would equate to approximately \$2.6 million in the trust fund, with the funds to be administered by the newly amalgamated Council and used for the development of affordable public housing developments on Council owned land. This cost has been incorporated in the quantitative assessment.

The likelihood of this proceeding where it is adopted and accepted by Council is **almost certain**.

Utilising an average return for the fund of between 6.0% and 9.0%, this equates to an annual return of approximately \$200,000 which could be used for the construction of affordable housing without reducing the principal of the trust to ensure that the trust is maintained into the future. Assuming an average construction cost (excluding land but including materials and labour) of between \$100,000 and \$150,000 (Rawlinsons, 2007) this would enable the construction of between 3-4 new houses every 2 years into the future. This is assessed to be a **major** impact (detectable over the medium term).

Further benefits of this strategy are that it is a managed solution, it may be co-located with employment nodes and it has synergies and direct links with the Caboolture Morayfield Principle Activity Centre which is associated with increased planning activity as a result of the Northern Corridor development and SEQ Regional Plan, a "kick start" to medium density development in the region, and is co-located with other regional social services.

Benefits resulting from the affordable housing strategy are relevant to the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3 and 2.1.9) through the sale of residential lots. Given that approximately 45% of residential accommodation relates to the marina and its associated infrastructure, just under half of the contribution to the affordable land strategy is associated with the marina and facilities, that is up to one new house each year into the future. Given the sustainable nature of this impact its consequence is assessed as **major** (detectable changes characterised by significant changes in structure and function).

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very High****Medium Scope:****Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very High***Enhancement of community interaction and cohesion*

Community interaction and cohesion is important to a well functioning business and residential community and can significantly influence an individual's wellbeing. A detailed assessment of the socio-demographic characteristics is contained in Hornery Institute (2007a). The wellbeing of an individual is closely linked to and influenced by the level of satisfaction and amenity they receive from their home, work and recreational surroundings. The structure and combination of facilities in the Northeast Business Park development will positively impact on all key contributing factors to individual wellbeing, for instance:

- The "work, live, play" approach adopted for the development;
- Operated under community title with a Body Corporate administration, which provides a professional structure and dedicated funds for self direction;
- Building design and controls that ensure the development fits with and interacts with the existing landscape and local region;
- Location of clubs (golf club), cafés and restaurants for community and social interaction; and
- Access to recreational and lifestyle facilities (walkways, sports fields, open space, marina facilities, etc).

The international recognition and perception of the southeast Queensland region is already relatively high as a result of the long-standing, high quality range of events held in the region. The Northeast Business Park will also serve to enhance the local community's own identify and perception of Caboolture with a focus on the integration and promotion of festivals and events with the development locally and regionally.

The integration of the Northeast Business Park with the broader community and the improved east-west transport linkages that facilitate the needs of those individuals directly associated with the Northeast Business Park, coupled with the increased population throughout the northern corridor (SEQ Regional Plan) and broader general community transport needs and requirements, will combine to contribute to the enhancement of community interaction at the local and regional level.

Also, controls for the development have been targeted to cater for the development's own essential services rather than competing with and attempting to change the existing centres hierarchy. This addresses some identified community concerns to not "...take on Morayfield shopping centre or Caboolture Business Park/airport complex" (Three Plus, 2007).

The likelihood of increased community interaction and cohesion resulting from the Northeast Business Park development, particularly related to the marina and associated facilities, is **almost certain**, with an identified consequence of for the total project scope assessed as being **major** (significant and detectable impacts over the long term).

Benefits from improved community interaction and cohesiveness resulting from the marina and relevant dependent aspects of the residential and business park are

appropriate for incorporation in the medium scope assessment as they pertain to and are associated with the marina and its operation (policies 2.1.3 and 2.1.9). The consequence of this impact is assessed to be **moderate** (detectable impacts over the medium term) within the medium scope assessment, which is slightly less than the total project scope due primarily to the exclusion of the golf course and associated interaction and the components of the residential and business park excluded from the medium scope assessment.

Total Project Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Major** = Impact: **Very high**

Medium Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

7.2.3 Environmental Benefits

Improvement of fish habitat and decreased erosion

The majority of the riverbanks of the Caboolture River are currently adequately protected from erosion by riparian and vegetation buffer zones, however, the riverbank of the proposed site has poor quality riparian coverage of its riverbanks (The Ecology Lab, 2007). This is due to previous poor use of the site and continued unauthorised recreational use of the site with little regard for the environment (Cardno, 2007c).

The Northeast Business Park development proposes to rehabilitate the ecological riparian zone along the site shoreline and provide a foreshore and vegetation buffer zone (Cardno, 2007c; The Ecology Lab, 2007). The management of dedicated access points will also reduce degradation from unauthorised access to the riverbank and riparian vegetation (Cardno, 2007c) and is included in the cost of the development to the proponent.

The rehabilitation is identified to result in a decrease in the level of erosion experienced along the Caboolture River shoreline of the site and a reduction in soil and nutrient run-off into Caboolture River (The Ecology Lab, 2007). This would result in an improvement in the water quality, resulting in a **likely** (probably occur in most circumstances) increase in food and habitat for fish species as well as long term protection for fish habitat. Where the rehabilitation of the buffer zones results in an increase in water quality due to reduced soil erosion and nutrient run-off, this is assessed to result in a **minor** (possibly detectable over the long term but minimal changes to the established structure and function in the wider context of the population/area being examined) beneficial outcome. The minor assessment is due to the only limited effect that rehabilitating the project area can have on the overall river dynamics and ecology.

The impact of improvement of fish habitat and decreased erosion is relevant under policy 2.1.4 in mitigating (c) degradation and loss of coastal wetlands and (d) degradation and loss of declared Fish Habitat Areas and policy 2.8.1. The scope of this benefit under the medium scope assessment is identical to the scope discussed above for the total project scope assessment. The assessed consequence of the improvement of fish habitat and decreased erosion therefore remains as **minor** under the medium scope assessment.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium****Medium Scope:****Construction** N/A**Operation** Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium***Creation of wetlands (environmental protection and maintenance)*

Wetlands provide important refuges for plants and animals, particularly species listed as being endangered and of concern in SEQ. While most are not likely to be currently present at the site, there are five flora and six fauna species of conservation significance that may make use of rehabilitated habitats in the project area (Cardno, 2007d). Vegetated wetlands also serve to filter run-off water, reducing its nutrient and silt loadings before flowing into larger waterways such as the Caboolture River (Queensland Environmental Protection Agency, 2007).

The developers also propose to create an environmental trust from levies on marina berths. The trust will be administered by an environmental group for the purpose of revegetation works (particularly riparian areas) downstream of the marina. Over time, this has the potential to result in some significant improvements to the environmental health of the Caboolture River.

Wetlands shelter and provide habitat and roosting sites for many animals and birds and are vital for the survival of many threatened species (Queensland Environmental Protection Agency, 2007). Active rehabilitation efforts within these areas to increase the coverage of wetland resources is considered **almost certain** (it is expected to occur in most circumstances) to provide additional buffering and protection to the "significant coastal wetlands" protected within the environmental buffer zone in the north eastern section of the development (Cardno, 2007d, The Ecology Lab, 2007).

The additional wetlands created on site will be relatively minor in scale in the context of the regional availability of salt and freshwater wetlands along the Caboolture River; however, the ongoing works from the environmental trust has the potential to be more significant. Therefore the consequence of the creation of the wetlands in the project area is assessed as **moderate** (detectable impacts, characterised by changes in structure, composition and function and maintained over the medium term with minimal management and/or works).

Revegetation works in riparian areas downstream of the development will be of benefit to outcomes under policies 2.1.9 and 2.8.1 with the Caboolture River downstream of the proposed development considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Therefore it is assessable under the medium scope. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The improved ecosystems assessable under the medium scope are the downstream riparian areas of state significance. While the on-site wetlands are not included in the assessable area in the medium scope the consequence of the impact remains the same (**moderate** – detectable impacts, characterised by significant changes in structure,

composition and function). The benefit is maintained over the medium term with minimal management and/or works) with significant benefits expected to accumulate over time.

Total Project Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Medium Scope:

Construction N/A

Operation Likelihood: **Almost Certain** x Consequence: **Moderate** = Impact: **High**

Use of recycled water

Within State and Local Government policy, there is a clear directive to employ effective use and reuse of existing water resources where possible. The Northeast Business Park development will integrate a range of established water saving and reuse initiatives aimed at providing a quality and efficient infrastructure system with sustainable outcomes for the region. Recycled water will be used to flush toilets, irrigate gardens and open space, and for any appropriate industrial purposes.

Council's South Caboolture Water Reclamation Plant (WRP) is approximately one kilometre from the Northeast Business Park development, and connection to this water source will be established for construction related and ongoing recycled water usage. The size of the main connection will accommodate future development demands, which is also sufficient for construction usage.

Currently the South Caboolture WRP produces high-quality tertiary treated water, however, the majority is discharged directly into the Caboolture River (GHD, 2007). Information from Cabwater indicates that future recycled water demands projected for the Northeast Business Park development are likely to outstrip the supply capacity of the South Caboolture WRP and advise that an alternative recycled water source is required through a future connection to the Burpengary East Sewage Treatment Plant (STP). Recycled water infrastructure enabling connection to this source will be provided once available to augment recycled water substitution capacity (ultimately estimated to be 2.3 ML/day) across the development.

By utilising recycled water from South Caboolture WRP and potentially Burpengary East STP the Northeast Business Park will improve environmental outcomes by:

- Reducing total volumes of discharge from the South Caboolture WRP directly into the Caboolture River through recycling; and,
- Ensuring that water discharged by the South Caboolture WRP passes through the extra 'polishing' step of irrigation onto gardens and open space in the Northeast Business Park. The 'Class A' recycled water produced by the South Caboolture WRP has an average nitrogen content of 1.8mg/l and average total phosphorus content of 0.3mg/l. These levels will be reduced by irrigation through uptake by plants, microbial processes in the soil and by chemical binding in the soil (phosphorus). The indirect resulting inflows into the Caboolture River will hence have lower nutrient loadings than would be the case with direct discharge.

The likelihood of environmental benefits from the use of recycled water at the Northeast Business Park is assessed as **almost certain** (expected to occur in most circumstances) as the development will result in a major reduction in discharge from the South Caboolture WRP and reduced nutrient levels of indirect discharge. The consequence of this benefit is assessed as **minor** (possibly detectable, but minimal changes) as the quality of water discharged from the South Caboolture WRP is already relatively high.

The reduction of nitrogen and phosphorous discharges to the Caboolture River (due to increased use of recycled water by the development) will be of benefit to outcomes under policies 2.1.9 and 2.8.1 with the Caboolture River downstream of the proposed development considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Therefore it is assessable under the medium scope. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The ecosystems assessable under the medium scope are the downstream riparian areas of state significance. These are the same ecosystems assessed above for the total project scope. As such the consequence (**minor**) remains identical within the medium scope as a result of use of recycled water from the treatment plant.

Total Project Scope:

Construction	Incorporated below
Operation	Likelihood: Almost Certain Consequence: Minor = Impact: Medium

Medium Scope:

Construction	Incorporated below
Operation	Likelihood: Almost Certain Consequence: Minor = Impact: Medium

Improved water quality (Site run-off)

Rapid urbanisation of Caboolture Shire in recent years has resulted in increased sediment and nutrient loads entering the Caboolture River, contributing to a decline in the river's water quality. Recent tests indicate that the overall water quality of the Caboolture River is poor, with the SEQ Ecosystem Health report card (Ecosystem Health Monitoring Program, 2006) providing a rating of D+ in 2006.

The proposed Northeast Business Park site is currently also identified as being relatively degraded (Place Environmental, 2007) which contributes to nutrient export from the site. Raff Creek has an extended catchment with typically poor runoff control. The water runoff management system proposed to be employed by the Northeast Business Park includes combinations of grass swales, bio-retention ponds and wetlands, etc. to "polish" the water before it reaches the Caboolture River.

Parsons Brinckerhoff (2006) examined the proposed stormwater and drainage model and compared it to the existing land use. The model identifies that there is no net change in the quantity of runoff discharge from the site between the existing land use and the proposed Northeast Business Park, and in-fact identify that the proposed site is possibly the only development in Queensland with the potential to meet the stringent thresholds outlined in the Queensland storm water quality objectives. However, by slowing water flow through the proposed water runoff management system, the Northeast Business Park has the capacity to reduce sediment and nutrient loads through settling and bioremediation (Queensland Environmental Protection Agency, 2007).

The proposed water drainage of the site is **likely** to improve the water quality of the Caboolture River in the direct vicinity of the site given the current poor run-off and stormwater flow. It is expected that the reduced nutrient and sediment loads from storm water provision and management on the site will protect and enhance riparian and wetland vegetation resulting in a **major** (detectable, longer term impacts, which are

maintained with minimal management works and treatment) benefit to the Caboolture River water quality.

Improved water quality to the Caboolture River (due to improved quality site run-off) will be of benefit to outcomes under policies 2.1.9 and 2.8.1 with the Caboolture River downstream of the proposed development considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Therefore it is assessable under the medium scope. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The ecosystems assessable under the medium scope are the downstream wetland and aquatic areas of state significance. These are the same ecosystems assessed above for the total project scope. As such the consequence (**major**) remains identical within the medium scope as a result of improved water quality (run-off).

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Major** = Impact: **High**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Major** = Impact: **High**

Improved water quality (Boat operator education and facilities)

By demonstrating and educating boat operators/owners the best practice reform in marina activities, the levels of pollution from the proposed marina and existing marine operators of Caboolture River will be reduced. The marina will provide facilities for sewerage pump-out and repair work in a controlled environment likely reducing the impacts of boat users already resident on the river.

The overarching theme of the business park and marine precinct is to provide a landmark development and industrial hub that has an environmental and sustainable policy of practise. The proposed marina and marine-precinct proposes to adopt best practises in boat harbouring and repair. Measures of this are various codes of practice and rating/award schemes, which the Northeast Business Park anticipate will be achieved, for example the:

- **The Clean Marinas Program:** Is a national, voluntary accreditation system for marinas, yacht clubs, boating clubs, slipways, boat yards and associated industry operators. The program provides a system to develop environmental practices. There are three steps to be taken and attained by marina operators in order to attain Clean Marina status. They must make a public commitment to improve, attain appropriate levels of environmental management systems and have an independent assessment, carried out every second year (MIAA, 2007). Any marina accredited under this program is ensured to have appropriately designed environmental management systems.

Also the Northeast Business Park will implement an education program for berth owners and dry stack tenants regarding environmental values and the need for marine safety. It will be a combined program run by North Harbour Marina with input information from Marine Safety Queensland, Marine Parks, DPIF and EPA. It is estimated that a workshop

program of four workshops per year (1 per quarter) in the form of information nights, as well as posters and pamphlets and other media will be utilised to extend the program. Cost estimates for this program are approximately \$2,500 to \$3000 per quarter. The scheme is scheduled to run until development and will be completed with reviews every two years or as required. The education program for berth owners scheme will commence once the marina is developed and open for business.

Despite the likely increase in boat activity within the Caboolture River, it is considered **likely** (it will probably occur in most circumstances) that the marina facilities associated with the development and the education programs and regulation of boat operators will result in improved water quality from improved practices. The consequence of this improvement is considered **minor** (detectable but minimal change to structure and function), even though they will be maintained into the longer term.

Improved water quality to the Caboolture River (due to boat operator education and facilities) will be of benefit to outcomes under policies 2.1.5, 2.1.9 and 2.8.1 with the Caboolture River downstream of the proposed development considered an area of significant coastal wetlands (EPA, 2007) under areas of state significance. Therefore it is assessable under the medium scope. Further relevant areas of state significance (Cardno, 2007e) by default of national or international significance are:

- The Ramsar listed wetlands of Moreton Bay;
- Known and potential habitat for a diversity of listed threatened species; and,
- Known and potential habitat for a diversity of migratory species listed under international agreements.

The ecosystems assessable under the medium scope are the downstream wetland and aquatic areas of state significance. These are the same ecosystems assessed above for the total project scope. As such the consequence (**minor**) remains identical within the medium scope as a result of improved water quality (boat operator education and facilities).

Total Project Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium**

Medium Scope:

Construction N/A

Operation Likelihood: **Likely** x Consequence: **Minor** = Impact: **Medium**

Management of weed/pest species

The highly disturbed nature of the proposed site and use of the surrounding land has allowed the establishment of a number of significant weed and pest species to the area, including prickly pear, groundsel bush, lantana and wild pigs (Cardno, 2007d). Weed infestations are widely considered to have negative impacts on biodiversity although quantitative studies confirming this are surprisingly rare (Adair & Groves, 1998).

The proposed development is **almost certain** to result in the removal and / or improved management / control of weed and pest species on site, through processes including:

- Excavation and construction works, removing weed and pest species in construction areas;
- Designation of conservation areas, requiring improved management practices;

- Restoration and replanting with native species, especially in the Heritage Park area; and,
- Active management to support and sustain native vegetation and animal species.

While it is almost certain that the development of the site will improve the management of weed and pest species the impact of this in the broader region would be relatively insignificant. As such the impact within the region is assessed to be **negligible** (very insignificant and unlikely to be measurable against benchmarks) without discounting that the impacts on the actual project site will be significant.

Management of weed/pest species impacts are not relevant to policies within the SCMP and hence are not assessed under the medium scope.

Total Project Scope:

Construction	N/A
Operation	Likelihood: Almost Certain x Consequence: Negligible = Impact: Low

Medium Scope:

Construction	N/A
Operation	N/A

Reduced pollution from travel to work

Many Caboolture Shire residents travel significant distances to work, with the Shire recording less than 50% job self containment (AEC Group Ltd, 2007), creating road congestion with associated air pollution and carbon emissions. The proposed development will create an estimated 14,000 jobs when fully operational (Urbis, 2007). It is likely that the majority of these jobs will be filled by people living in Caboolture Shire, with Caboolture Shire Council having established a target that within the next 20 years two out of three working residents will be employed inside the Caboolture Shire boundary (Urbis, 2007). Some of these workers will likely reside within the Northeast Business Park residential precincts, increasing containment and reducing the number of cars travelling each day to places of work outside of the Shire. However, it is expected that a number of positions will be filled by people travelling from outside of the Caboolture area, somewhat mitigating the benefit.

Reduced travel to work and corresponding reductions in transport related pollution and carbon emissions is considered an **almost certain** (expected to occur in most circumstances) beneficial impact from the proposed development. Given the wider context of the volume of road travel in Caboolture Shire and southeast Queensland every day the consequence is assessed as **minor** (possibly detectable, but minimal change).

Benefits from reduced pollution from travel to work during operation are relevant to the medium scope as they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). The medium scope assessment assumes approximately 37.5% of business in the Northeast Business Park precinct are associated with the marina and dependent infrastructure, business and industry activities. As such, the benefits of travel to work reduction would be reduced from those experienced in the total project assessment. As impacts are still anticipated to be detectable the consequence for the medium scope is also assessed to be **minor** (possibly detectable, and small relative to the wider context of the region with minimal changes to the established structure and function), which is the same as the total project scope.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium****Medium Scope:****Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium***Creation of terrestrial habitats*

The development site and surrounding land is significantly degraded in many parts with reduced ecological value (Cardno, 2007d). The Northeast Business Park development will revegetate significant areas with local native plant species. The proponent has signed a "Heads of Agreement" document to offset 40.24ha of vegetation against the 10.73ha area of relevant vegetation to be cleared (Greening Australia Queensland, 2008). The landscape masterplan (Place Planning and Design, 2007) involves the use of tree species of food value to local flora, such as koala eucalypt species and casuarina and allocasurina of value to black cockatoos, as part of an extensive suite of endemic flora to create revegetated areas of significant value to native fauna. Buffers will be revegetated along the river, boundaries and sport and recreation areas to create corridors of natural vegetation for wildlife transit (Place Planning and Design, 2007).

Given the well-documented degraded nature of much of the existing terrestrial site and the extensive plans for the revegetation works with endemic species it is considered the likelihood of the creation of terrestrial habitats is **almost certain** (expected to occur). The site is relatively isolated from other areas of vegetation of value for terrestrial species and is considered to have limited potential as an ecological corridor (Cardno, 2007d). It is also relatively small compared to remnant natural areas in the region. However, it is likely to be able to support populations of some important species (e.g. Tusked Frog) and provide value to flying species (e.g. Grey-headed flying fox) and as such the consequence of the revegetation is considered to be **minor** (possibly detectable, but minimal change to structure and function), despite being maintained over the long term.

Creation of terrestrial habitats is not relevant to policies within the SCMP and hence is not assessed under the medium scope.

Total Project Scope:**Construction** N/A**Operation** Likelihood: **Almost Certain** x Consequence: **Minor** = Impact: **Medium****Medium Scope:****Construction** N/A**Operation** N/A*Improved resource efficiency and recovery*

The proposed business park offers to operate a model of industrial ecology for the region. In the model of industrial ecology, businesses work in synergy through co-location in clusters. More specifically in terms of environmental outcomes the industrial ecology aims to provide better ability for (PMM, 2007):

- Businesses to match their input and output register to see whether there is a local source or market for their inputs and outputs (saving transport needs);
- Creation of a resource recovery centre for internal sorting of 'waste' materials or by-products for beneficial reuse;
- Creation of relationships with regional waste recovery programs;
- Encouraging resource recovery enterprises;
- Facilitating businesses making beneficial reuse or processing of 'waste' materials;
- Create sustainable design guidelines which encourage individual businesses to construct and operate their buildings and businesses to be resource efficient; and
- Protection and rehabilitation of environmental precincts, particularly riparian corridors, providing strengthened ecological corridors through the use of WSUD principles in landscaping.

The overall environmental outcomes from the industrial ecology model is a more self-contained business cluster trading within itself. This has the potential to reduce transport inputs and increase resource sharing, reuse and recycling (PMM, 2007).

The industrial ecology model is a good theoretical concept, however, it requires sufficient businesses within the Northeast Business Park to commit to and apply the concept in practice to have a significant effect. As such the likelihood of a positive impact is considered to be **possible** (might occur at some time). The concept, where it is extended to all developments, would appear to have the potential for significant positive impacts. Given that the scale of the proposed business park, while significant, is only a fraction of the industrial activity in the region and the broader southeast Queensland area and to ensure a conservative assessment the consequence is assessed as **minor** (possibly detectable but minimal changes to established structure and function).

Benefits associated with improved resource efficiency and recovery during operation are relevant to the medium scope assessment where they pertain to and are associated with the marina and its operation (policies 2.1.3, 2.1.4, 2.1.5 & 2.1.9). This includes approximately 37.5% of the industry and business precinct and 100% of the marina (see Table 1.2), which equates to approximately 25% of the total business activity. The consequence of this portion of improved resource efficiency and recovery is assessed to be **minor** (possibly detectable, but minimal change in the established structure and function).

Total Project Scope:

Construction N/A

Operation Likelihood: **Possible** x Consequence: **Minor** = Impact: **Low**

Medium Scope:

Construction N/A

Operation Likelihood: **Possible** x Consequence: **Minor** = Impact: **Low**

7.3 Summary

This section summarises the above qualitative economic, social and environmental (TBL) impact assessment and outlines the key benefits and costs generated by the Northeast Business Park. The methodology for the qualitative assessment is outlined in **Section 3.3, Qualitative Impact Assessment Framework**.

7.3.1 Economic

The economic benefits generated from the Northeast Business Park development are assessed to generally be of high impact, and significantly outweigh the economic costs

associated with the development. Key beneficial economic impacts of the Northeast Business Park are expected to include:

- The generation of additional employment, during both construction and operation of the Northeast Business Park;
- Increased tourism visitation and visitor spend, driven by water based tourism opportunities, the development of improved linkages with other water and land based tourism activities in the region; and
- Efficiency and productivity gains through clustering and development of the high value marine sector.

By comparison, two key economic costs were identified as a result of the Northeast Business Park:

- The additional infrastructure costs such as roads, water, wastewater, gas, electricity and ICT, to meet the needs of the residential and business populations of the Northeast Business Park; and
- The cost of additional social and community infrastructure required to meet the additional population such as a range of civic, community, human services, recreation, health and education facilities.

The two tables below summarise the assessed economic impacts for the 'total project scope' and 'medium scope' assessments, with scores provided for total benefits and costs and the assessed overall net economic position.

Total Project Scope Assessment Summary

The 'total project scope' is assessed to provide a net economic benefit to the State of Queensland (assessed net position of 15), with the total economic benefits (assessed score of 22 across eight benefits) outweighing the total economic costs (assessed score of -7 across two costs) on a ratio of approximately 3.1 to 1.

The total project scope is assessed to include one additional key economic benefit of improved local and regional traffic linkages during the operational phase of the development over the medium project scope.

Table 7.4. Qualitative Economic Impact Summary (Total Project Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Increased business confidence (investment attraction)	Likely	Moderate	Medium	2
Tourism diversification and support (increased visitation and spend)	Likely	Major	High	3
Value adding and clustering efficiencies of the marine sector	Likely	Major	High	3
Additional employment and training opportunities (construction)	Almost Certain	Moderate	High	3
Additional employment and training opportunities (operation)	Almost Certain	Outstanding	Very High	4
Improved local and regional traffic linkages (construction)	Almost Certain	Minor	Medium	2
Improved local and regional traffic linkages (operation)	Almost Certain	Moderate	High	3
Reduction in average peak flood height	Likely	Minor	Medium	2
<i>Total Economic Benefits</i>	<i>Almost Certain</i>	<i>Moderate</i>	<i>High</i>	<i>22</i>
Costs				
Additional infrastructure costs	Almost Certain	Major	Very High	-4
Additional social and community infrastructure and services	Almost Certain	Moderate	High	-3
<i>Total Economic Costs</i>	<i>Almost Certain</i>	<i>Major</i>	<i>Very High</i>	<i>-7</i>
Net Position				15

Note: The "Likelihood", "Consequence" and "Impact" scores provided for Total Economic Benefits and Total Economic Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Economic Benefits and Total Economic Costs is the total score of the individual impacts.

Medium Project Scope Assessment Summary

The medium scope assessment is also estimated to provide a net economic benefit to the State of Queensland (assessed net position of 10), with the total economic benefits

(assessed score of 16 across six benefits) outweighing the total economic costs (assessed score of -6 across two costs) on a ratio of approximately 2.7 to 1.

Table 7.5. Qualitative Economic Impact Summary (Medium Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Increased business confidence (investment attraction)	Likely	Minor	Medium	2
Tourism diversification and support (increased visitation and spend)	Likely	Major	High	3
Value adding and clustering efficiencies of the marine sector	Likely	Major	High	3
Additional employment and training opportunities (construction)	Almost Certain	Minor	Medium	2
Additional employment and training opportunities (operation)	Almost Certain	Outstanding	Very High	4
Reduction in average peak flood height	Likely	Minor	Medium	2
<i>Total Economic Benefits</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>	<i>16</i>
Costs				
Additional infrastructure costs	Almost Certain	Moderate	High	-3
Additional social and community infrastructure and services	Almost Certain	Moderate	High	-3
<i>Total Economic Costs</i>	<i>Almost Certain</i>	<i>Moderate</i>	<i>High</i>	<i>-6</i>
Net Position				10

Note: The "Likelihood", "Consequence" and "Impact" scores provided for Total Economic Benefits and Total Economic Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Economic Benefits and Total Economic Costs is the total score of the individual impacts.

7.3.2 Social

The Northeast Business Park is assessed to provide a comparatively greater level of social benefit than cost. Key beneficial social impacts of the Northeast Business Park are expected to include:

- Improved access to affordable public housing through the contribution of \$2,000 per lot sold to a building trust fund for the development of Council owned public housing;
- Improved access to areas for recreational and leisure activity through the development of wetlands, pathways, fishing platforms, marina berths, other cultural open space areas and recreational areas;
- Improved visual amenity, with improved access to environmental attractions including the Caboolture River and the improvement of current relatively degraded land;
- An enhanced range of housing across the entire housing spectrum; and
- Enhancement of community interaction and cohesion, which is important to a well functioning business and residential community and can significantly influence an individual's wellbeing.

By comparison, key social costs expected to be generated through the development of the Northeast Business Park include:

- Increased demand for accommodation and housing during operation of the development, impacting negatively on an already tight property market; and
- Increased demand for community services and facilities as a result of the anticipated high level of relocation of employees and their families to the region, with an anticipated direct increase in employment of just over 14,000 on completion of the development.

The two tables below summarise the assessed social impacts for the 'total project scope' and 'medium scope' assessments, with scores provided for total benefits and costs and the assessed overall net social position.

One social impact, 'river safety', has both positive and detrimental impacts. River safety is improved by dredging activities undertaken to deepen navigation channels and river entrance, education programs run by the proponent at Northeast Business Park, the continuation of the reduced speed zones, as well as the incorporation of additional lit

navigation beacons. With negative impacts on river safety resulting from the increased number of boats potentially utilising the Caboolture River. On balance the overall impact on river safety due to the proposed Northeast Business Park development is identified to be neutral as positive impacts are assessed to equal costs (2 to -2) for both the total project and medium scope.

Total Project Scope Assessment Summary

The 'total project scope' is assessed to provide a net social benefit to the State of Queensland (assessed net position of 11), with the total social benefits (assessed score of 29 across nine benefits) outweighing the total social costs (assessed score of -18 across nine costs) on a ratio of approximately 1.6 to 1.

The total project scope is assessed to provide one additional key social benefit of a "Heritage Park" precinct, which will assist in the retention and maintenance of unique environmental and heritage assets. One additional social cost is also provided in the total project scope assessment, with the increase in demand for accommodation and housing anticipated to provide a high impact during construction as well as operation.

Table 7.6. Qualitative Social Impact Summary (Total Project Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Improved river safety from dredging activities	Likely	Moderate	Medium	2
Public transport network	Likely	Major	High	3
Improved social and community infrastructure and services	Unlikely	Minor	Low	1
Improved access to areas for recreational and leisure activity	Almost Certain	Major	Very High	4
Improved visual amenity	Almost Certain	Major	Very High	4
Range and choice of residential alternatives	Almost Certain	Moderate	High	3
Protection of unique environmental and heritage assets	Almost Certain	Major	Very High	4
Affordable housing strategy	Almost Certain	Major	Very High	4
Enhancement of community interaction and cohesion	Almost Certain	Major	Very High	4
<i>Total Social Benefits</i>	<i>Likely</i>	<i>Major</i>	<i>High</i>	<i>29</i>
Costs				
Increased road traffic	Almost Certain	Minor	Medium	-2
Decreased boat user utility from increased river traffic	Likely	Minor	Medium	-2
Decreased river safety from increased river traffic	Possible	Moderate	Medium	-2
Loss of cultural heritage	Remote	Moderate	Very Low	0
Increased demand for accommodation and housing (construction)	Almost Certain	Moderate	High	-3
Increased demand for accommodation and housing (operation)	Almost Certain	Major	Very High	-4
Increased demand for community services and facilities (construction)	Possible	Negligible	Very Low	0
Increased demand for community services and facilities (operation)	Almost Certain	Moderate	High	-3
Noise impacts	Almost Certain	Minor	Medium	-2
<i>Total Social Costs</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>	<i>-18</i>
Net Position				11

Note: The "Likelihood", "Consequence" & "Impact" scores provided for Total Social Benefits & Total Social Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Social Benefits and Total Social Costs is the total score of the individual impacts.

Medium Project Scope Assessment Summary

The 'medium scope' is assessed to provide a net social benefit to the State of Queensland, albeit lower than for the 'total project scope' (assessed net position of 5), with the total social benefits (assessed score of 21 across eight benefits) outweighing the total social costs (assessed score of -16 across nine costs) on a ratio of approximately 1.3 to 1.

Table 7.7. Qualitative Social Impact Summary (Medium Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Improved river safety from dredging activities	Likely	Moderate	Medium	2
Public transport network	Likely	Moderate	Medium	2
Improved social and community infrastructure and services	Unlikely	Minor	Low	1
Improved access to areas for recreational and leisure activity	Almost Certain	Moderate	High	3
Improved visual amenity	Almost Certain	Moderate	High	3
Range and choice of residential alternatives	Almost Certain	Moderate	High	3
Affordable housing strategy	Almost Certain	Major	Very High	4
Enhancement of community interaction and cohesion	Almost Certain	Moderate	High	3
<i>Total Social Benefits</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>	<i>21</i>
Costs				
Increased road traffic	Almost Certain	Minor	Medium	-2
Decreased boat user utility from increased river traffic	Likely	Minor	Medium	-2
Decreased river safety from increased river traffic	Possible	Moderate	Medium	-2
Loss of cultural heritage	Remote	Moderate	Very Low	0
Increased demand for accommodation and housing (construction)	Almost Certain	Minor	Medium	-2
Increased demand for accommodation and housing (operation)	Almost Certain	Moderate	High	-3
Increased demand for community services and facilities (construction)	Possible	Negligible	Very Low	0
Increased demand for community services and facilities (operation)	Almost Certain	Moderate	High	-3
Noise impacts	Almost Certain	Minor	Medium	-2
<i>Total Social Costs</i>	<i>Likely</i>	<i>Minor</i>	<i>Medium</i>	<i>-16</i>
Net Position				5

Note: The "Likelihood", "Consequence" & "Impact" scores provided for Total Social Benefits & Total Social Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Social Benefits and Total Social Costs is the total score of the individual impacts.

7.3.3 Environmental

The environmental benefits accruing from the Northeast Business Park development are assessed to outweigh the environmental costs associated with the development. Key beneficial environmental impacts of the Northeast Business Park are expected to include:

- Creation of wetlands through active rehabilitation and additional buffering and protection to the "significant coastal wetlands" protected within the environmental buffer zone in the north eastern section of the development; and
- Improved water quality through improved site drainage and run-off.

By comparison, while a number of negative environmental impacts were examined only one key environmental cost was identified, with the potential for the development to increase the risk of general water pollution due to increased water traffic. The marina lock facility would ensure any spills or leaks within the marina were contained within the precinct.

The two tables below summarise the assessed environmental impacts for the 'total project scope' and 'medium scope' assessments, with scores provided for total benefits and costs and the assessed overall net environmental position.

Three environmental impacts were identified to have both positive and negative impacts. In terms of net position with specific environmental considerations, the following can be noted:

- On balance the overall impact on water quality due to the proposed development is assessed as positive with benefits outweighing costs 7 to -5. Impacts improving water quality on the downstream environments of state significance are the use of recycled water, improved water quality (site run-off) and improved water quality (boat operator education and facilities). Negative impacts on water quality are exposure of acid sulfate soils & nutrient load to waterways, dredging the river mouth, storm water run-off and site drainage and general water pollution;
- Impacts that are expected to have a positive impact on bank erosion are improvement of fish habitat and decreased erosion and creation of wetlands

(environmental protection and maintenance of downstream riparian zones). Negative impacts on bank erosion will be from increased river traffic. While it is noted that bank erosion has not been assessed independently, on balance, the rating for environmental benefits that are expected to have an impact on bank erosion outweigh the environmental costs that are expected to have an impact on bank erosion 5 to -1; and

- All of the costs and benefits in both the 'total project scope' and 'medium scope' assessment relate to impacts on downstream wetland health (wetlands of state significance). On balance the impact on wetland health is positive with benefits outweighing costs 18 to -8 in the 'total project scope' assessment and 15 to -8 in the 'medium scope' assessment.

Total Project Scope Assessment Summary

The 'total project scope' is assessed to provide a net environmental benefit to the State of Queensland (assessed net position of 10), with the total environmental benefits (assessed score of 18 across nine benefits) outweighing the total environmental costs (assessed score of -8 across eight costs) on a ratio of approximately 2.25 to 1.

Table 7.8. Qualitative Environmental Impact Summary (Total Project Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Improvement of fish habitat and decreased erosion	Likely	Minor	Medium	2
Creation of wetlands (environmental protection and maintenance)	Almost Certain	Moderate	High	3
Use of recycled water	Almost Certain	Minor	Medium	2
Improved water quality (site run-off)	Likely	Major	High	3
Improved water quality (Boat operator education and facilities)	Likely	Minor	Medium	2
Management of weed/pest species	Almost Certain	Negligible	Low	1
Reduced pollution from travel to work	Almost Certain	Minor	Medium	2
Creation of terrestrial habitats	Almost Certain	Minor	Medium	2
Improved resource efficiency and recovery	Possible	Minor	Low	1
<i>Total Environmental Benefits</i>	<i>Likely</i>	<i>Minor</i>	<i>Medium</i>	<i>18</i>
Costs				
Exposure of acid sulfate soils & nutrient load to waterways	Unlikely	Moderate	Low	-1
Disturbance of aquatic habitats	Unlikely	Moderate	Low	-1
Disturbance of terrestrial habitats	Unlikely	Negligible	Very Low	0
Dredging the river mouth	Unlikely	Moderate	Low	-1
Storm water run-off and site drainage	Unlikely	Minor	Low	-1
Bank erosion from increased river traffic	Unlikely	Moderate	Low	-1
Impacts on downstream inter-tidal habitats	Likely	Negligible	Low	-1
General water pollution	Almost Certain	Minor	Medium	-2
<i>Total Environmental Costs</i>	<i>Possible</i>	<i>Minor</i>	<i>Low</i>	<i>-8</i>
Net Position				10

Note: The "Likelihood", "Consequence" and "Impact" scores provided for Total Environmental Benefits and Total Environmental Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Environmental Benefits and Total Environmental Costs is the total score of the individual impacts.

Medium Project Scope Assessment Summary

The 'medium project scope' is assessed to provide a net environmental benefit to the State of Queensland (assessed net position of 7), with the total environmental benefits (assessed score of 15 across seven benefits) outweighing the total environmental costs (assessed score of -8 across seven costs) on a ratio of approximately 1.9 to 1

Table 7.9. Qualitative Environmental Impact Summary (Medium Scope)

Impact	Likelihood	Consequence	Impact	Score
Benefits				
Improvement of fish habitat and decreased erosion	Likely	Minor	Medium	2
Creation of wetlands (environmental protection and maintenance)	Almost Certain	Moderate	High	3
Use of recycled water	Almost Certain	Minor	Medium	2
Improved water quality (site run-off)	Likely	Major	High	3
Improved water quality (Boat operator education and facilities)	Likely	Minor	Medium	2
Reduced pollution from travel to work	Almost Certain	Minor	Medium	2
Improved resource efficiency and recovery	Possible	Minor	Low	1
<i>Total Environmental Benefits</i>	<i>Likely</i>	<i>Moderate</i>	<i>Medium</i>	<i>15</i>
Costs				
Exposure of acid sulfate soils & nutrient load to waterways	Unlikely	Moderate	Low	-1
Disturbance of aquatic habitats	Unlikely	Moderate	Low	-1
Dredging the river mouth	Unlikely	Moderate	Low	-1
Storm water run-off and site drainage	Unlikely	Minor	Low	-1
Bank erosion from increased river traffic	Unlikely	Moderate	Low	-1
Impacts on downstream inter-tidal habitats	Likely	Negligible	Low	-1
General water pollution	Almost Certain	Minor	Medium	-2
<i>Total Environmental Costs</i>	<i>Possible</i>	<i>Minor</i>	<i>Low</i>	<i>-8</i>
Net Position				7

Note: The "Likelihood", "Consequence" and "Impact" scores provided for Total Environmental Benefits and Total Environmental Costs are weighted averages calculated from the individual impacts. The "Score" provided for Total Environmental Benefits and Total Environmental Costs is the total score of the individual impacts.

7.4 Qualitative CBA Finding

7.4.1 Total Project Scope

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are expected to realise a net benefit as a result of the Northeast Business Park development in the 'total project scope' assessment.

Qualitative impact assessment shows that the Northeast Business Park is expected to return positive net economic, social and environmental benefits, with net positions of 15, 11 and 10, respectively and ratios of benefits to cost of 3.1, 1.6 and 2.25 respectively.

Since the positive impacts of development across the economic, social and environmental triple bottom line outweigh the negative impacts, the development is deemed to deliver a positive net benefit to the State of Queensland.

Table 7.10. Qualitative CBA Summary (Total Project Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Almost Certain	Moderate	High	8	22
Costs	Almost Certain	Major	Very High	2	-7
<i>Net Position</i>					15
Social					
Benefits	Likely	Major	High	9	29
Costs	Likely	Moderate	Medium	9	-18
<i>Net Position</i>					11
Environmental					
Benefits	Likely	Minor	Medium	10	18
Costs	Possible	Minor	Low	8	-8
<i>Net Position</i>					10
<i>Overall TBL Rating</i>					36

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'total project scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

7.4.2 Medium Scope

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are expected to realise a net benefit as a result of the Northeast Business Park development in the 'medium scope' assessment.

Qualitative impact assessment shows that in the 'medium scope' the Northeast Business Park is expected to return positive net economic, social and environmental positions of 10, 5 and 7, respectively and ratios of benefits to cost of 2.7, 1.3 and 1.9 respectively.

Since the positive impacts of development across the economic, social and environmental aspects of the triple bottom line outweigh the negative impacts, the development is deemed to deliver a positive net benefit to the State of Queensland.

Table 7.11. Qualitative CBA Summary (Medium Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Likely	Moderate	Medium	6	16
Costs	Almost Certain	Moderate	High	2	-6
Net Position					10
Social					
Benefits	Likely	Moderate	Medium	8	21
Costs	Likely	Minor	Medium	9	-16
Net Position					5
Environmental					
Benefits	Likely	Minor	Medium	7	15
Costs	Possible	Minor	Low	7	-8
Net Position					7
Overall TBL Rating					22

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

8. Summary of Findings

8.1 Net Benefit Assessment Criteria

The net benefit assessment requires two assessments be undertaken and satisfied:

- **A threshold assessment:** To demonstrate that the project delivers benefits beyond those delivered to the proponent and that alternative sites have been considered, with the selected site providing the greatest net benefit of all viable alternatives.
- **A formal assessment:** In the form of a cost benefit analysis to identify that the direct (proponent based) and indirect (externalities) benefits of the project exceed the direct and indirect costs of a project. Where an identified impact is unable to be quantified in dollar terms the impact is assessed qualitatively within a likelihood and consequence risk framework (outlined in the Assessment Methodology section of this report).

There are a number of requirements within each of the above. To clarify for the analysis the following table outlines the components, the requirements of their constituent parts, how they will be addressed and the decision criteria in forming a conclusion following the conduct of the net benefit assessment of the above two points.

Table 8.1. Assessment Decision Criteria

Component/ Requirement	How addressed	Decision Criteria
Threshold Assessment		
Demonstrate the benefits of the project to the region beyond those direct net benefits to the proponent	<ul style="list-style-type: none"> • Addressed as a component of the CBA (Qualitative and Quantitative Assessment sections of this report). 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> • Where the quantitative CBA identifies that both the: <ul style="list-style-type: none"> o Direct net benefit exceeds zero; and o Indirect net benefit exceeds zero. • Where the qualitative CBA identifies that both the: <ul style="list-style-type: none"> o Direct net benefit exceeds zero; and o Indirect net benefit exceeds zero.
Demonstrate that alternative sites have been considered and that the selected site provides the greatest net benefit of all viable alternatives	<ul style="list-style-type: none"> • Examine alternative sites for their relative suitability (Alternative Locations section 2.1.5) 	<p>This requirement is identified as being met:</p> <ul style="list-style-type: none"> • Where the identified alternative sites are assessed as not providing equivalent or preferred characteristics to the proposed development site.
Formal Assessment		
Quantitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> • Cost benefit analysis with direct impacts to the proponent discounted at the appropriate risk waited discount rate (10.0%) and indirect impacts discounted at the appropriate government bond rate (6.0%) (Queensland Treasury's project Evaluation Guidelines) • The assessment is undertaken in real terms (i.e. does not examine the impact of inflation) 	<p>This requirement is identified as being met where the assessment identifies a:</p> <ul style="list-style-type: none"> • Quantitative CBA with a BCR of greater than 1 and a qualitative CBA with sum of benefits exceeding the sum of costs; OR • Quantitative CBA with a BCR significantly greater than 1 and a qualitative CBA with a very minor risk of a net cost; OR • Quantitative CBA with a BCR of marginally less than 1 and a qualitative CBA with sum of benefits significantly exceeding the sum of costs.
Qualitative assessment demonstrating the direct (proponent) and indirect (externalities) benefits of the project exceed the direct and indirect costs.	<ul style="list-style-type: none"> • Each identified impact is examined within a likelihood and consequence framework to identify the relative impact/ risk of occurring. 	

Source: Developed based on draft Net Benefit Guidelines (EPA, Undated)

Where all decision criteria are met, it is apparent the development of the proposed Northeast Business Park development results in a net benefit to the region.

8.2 Quantitative Summary

8.2.1 Total Project Scope

The total project, incorporating all aspects of the integrated Northeast Business Park development is expected to deliver a total net benefit of \$2.5 billion in present value terms (NPV), with a present value of revenues of \$3.8 billion and a present value of costs of \$1.3 billion. Overall, the development provides a benefit cost ratio (BCR) of 2.88 (i.e. returns \$2.88 for every dollar spent in delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms of \$174 million with a BCR of 1.43. The project delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$2.3 billion with a BCR of 3.51.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a clear benefit to the State of Queensland.

Table 8.2. Quantitative CBA Summary, Total Project Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$575	\$401	\$174	1.43
Indirect Impacts	\$3,251	\$926	\$2,324	3.51
Total Impacts	\$3,826	\$1,328	\$2,498	2.88

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the total project scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the Threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the total project scope of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In economic terms, the Northeast Business Park development, under the 'total project scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

8.2.2 Medium Project Scope

The quantitative CBA assessment of the medium scope impacts found that development of the Northeast Business Park is expected to deliver a total net benefit of \$1.01 billion in present value terms (NPV), with the present value of revenues of \$1.61 billion exceeding the present value of costs of \$598 million. Overall, the development provides a benefit cost ratio (BCR) of 2.69 (i.e. returns \$2.69 for every dollar spent in the delivery of the project).

The project provides a positive direct net benefit (i.e. to the proponent) in present value terms of \$82 million with a BCR of 1.46. The project also delivers a positive indirect net benefit (i.e. to stakeholders other than the proponent) in present value terms of \$928 million with a BCR of 3.20.

From the outcomes of the net present value assessments and BCR it is clear that the direct, indirect and overall impacts of the project would result in a clear benefit to the State of Queensland.

Table 8.3. Quantitative CBA Summary, Medium Scope (\$M2007)

Impact	PV of Revenues (\$M)	PV of Costs (\$M)	Net Present Value (\$M)	BCR
Direct Impacts	\$259	\$177	\$82	1.46
Indirect Impacts	\$1,349	\$421	\$928	3.20
Total Impacts	\$1,608	\$598	\$1,010	2.69

Source: AECgroup

Quantitative Assessment Finding:

The direct quantifiable impact of the medium scope of the Northeast Business Park is identified to be positive with a BCR of greater than one, thereby satisfying the direct component of the Threshold assessment and the direct component of the Formal assessment requirements of the Net Benefit Test.

The indirect quantifiable impact of the medium scope of the Northeast Business Park is also identified to be positive with a BCR of greater than one, and therefore satisfies the indirect component of the threshold assessment and the indirect component of the Formal assessment requirements of the Net Benefit Test.

In economic terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

8.3 Qualitative Summary

8.3.1 Total Project Scope

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are expected to realise a net benefit as a result of the Northeast Business Park development in the 'total project scope' assessment.

Qualitative impact assessment shows that the Northeast Business Park is expected to return positive net economic, social and environmental benefits, with net positions of 15, 11 and 10, respectively, and ratios of benefits to cost of 3.1, 1.6 and 2.25 respectively.

Since the positive impacts of development across the economic, social and environmental aspects of the triple bottom line outweigh the negative impacts, the development is deemed to deliver a positive net benefit to the State of Queensland.

Table 8.4. Qualitative CBA Summary (Total Project Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Almost Certain	Moderate	High	8	22
Costs	Almost Certain	Major	Very High	2	-7
Net Position					15
Social					
Benefits	Likely	Major	High	9	29
Costs	Likely	Moderate	Medium	9	-18
Net Position					11
Environmental					
Benefits	Likely	Minor	Medium	10	18
Costs	Possible	Minor	Low	8	-8
Net Position					10
Overall TBL Rating					36

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'total project scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

8.3.2 Medium Scope

The qualitative CBA assessment found that all aspects across the triple bottom line (economic, social and environmental) are also expected to realise a net benefit as a result of the Northeast Business Park development in the 'medium scope' assessment.

Qualitative impact assessment shows that in the 'medium scope' the Northeast Business Park is expected to return positive net economic, social and environmental positions of 10, 5 and 7, respectively and ratios of benefits to cost of 2.7, 1.3 and 1.9 respectively.

Since the positive impacts of development across the economic, social and environmental aspects of the triple bottom line outweigh the negative impacts, the development is deemed to deliver a positive net benefit to the region.

Table 8.5. Qualitative CBA Summary (Medium Project Scope)

TBL Aspect	Average Likelihood	Average Consequence	Average Impact	Number of Impacts	Total Score
Economic					
Benefits	Likely	Moderate	Medium	6	16
Costs	Almost Certain	Moderate	High	2	-6
Net Position					10
Social					
Benefits	Likely	Moderate	Medium	8	21
Costs	Likely	Minor	Medium	9	-16
Net Position					5
Environmental					
Benefits	Likely	Minor	Medium	7	15
Costs	Possible	Minor	Low	7	-8
Net Position					7
Overall TBL Rating					22

Qualitative Assessment Finding:

Individually the positive impacts of development across the triple bottom line outweigh the negative impacts and so the project can be deemed to deliver a qualitative benefit to the region beyond the direct financial benefits to the proponent. In aggregate the overall TBL rating is positive. As such the threshold and formal assessment criteria are deemed to be satisfied.

In qualitative terms, the Northeast Business Park development, under the 'medium scope' assessment provides a net benefit to the State of Queensland with the benefits of the proposed development exceeding the cost.

8.4 Conclusion

The proposed Northeast Business Park development provides a net benefit to the State of Queensland as the identified costs of the development are more than offset by the significant benefits generated by it under both the 'total project scope' assessment and the 'medium scope' assessment.

Since all Net Benefit Assessment decision criteria are met for both the quantitative and qualitative assessments, it is apparent the development of the proposed Northeast Business Park results in a net benefit to the State of Queensland.

Further to the benefits delivered by the proposed development, it is worth noting that the Northeast Business Park also addresses key State issues of concern, for example:

- **The provision of marine industries and facilities:** These will facilitate and assist in the management of the increasing demand for boats (for example, mooring, out of water maintenance); and
- **The rehabilitation of the Caboolture River:** Water quality improvements in the Caboolture River resulting from the Northeast Business Park development will have a beneficial impact on the subsequent water quality in Moreton bay.

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