Appendix E

Cairns Regional Council

Feasibility Assessment for Swimming Lagoon in Port Douglas

FINAL REPORT

August 2011

STRATEGIC LEISURE GROUP

Planning for Spaces, Places, People

In association with:

FEASIBILITY ASSESSMENT FOR SWIMMING LAGOON IN PORT DOUGLAS

FINAL REPORT

CAIRNS REGIONAL COUNCIL

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SPACES PLACES PEOPLE

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1. EXECUTIVE SUMMARY

1.1 Purpose of this Document

Cairns Regional Council engaged the Strategic Leisure Group to undertake an assessment of the feasibility of developing a swimming lagoon in Port Douglas. The Feasibility Study was a priority action arising from the Port Douglas Waterfront Master Plan.

The Feasibility Study has been undertaken according to the project specification prepared by Council.

1.2 CRC Guiding Principles

Council's **vision** for the project has grown from the Port Douglas Waterfront Master Plan and is based on nine **guiding principles**:

- Sustainability
- Providing a "green heart" encompassing the market area though to Rex Smeal Park
- Activating and accessing the waterfront while maintaining the working port
- Reflecting the tropical, relaxed, unhurried character of Port Douglas in the way people move around the town on foot, in the architecture and in the nature of low scale commercial activities.
- Supporting local economic growth
- Safety and security.
- Ensuring that any development of the waterfront is sympathetic to the local context and is highly accomplished in terms of design and innovation.
- Exploring a range of options and their implications including a 'no development' option
- Acknowledge, preserve and reflect the Indigenous and non-indigenous heritage.

1.3 Project Background

Cairns Regional Council and the Port Douglas community have identified the potential for development of a recreational lagoon through the master planning of the Port Douglas waterfront.

As part of this study Council sought an assessment of the most appropriate location, characteristics and costs associated with developing, managing and maintaining a proposed lagoon.

Port Douglas and surrounds boast stunning natural recreational assets and the community has clearly expressed its desire to remain 'in sync' with the environment and to build on these resources through the redevelopment of the township's foreshore to integrate and enhance existing region and town values that will clearly demonstrate Council's commitment to the provision of world-class recreational spaces for residents and visitors.

The Master Plan recognised that there were numerous issues involved in the proposal for a lagoon and recommended that the next step would be to:

> *Conduct a feasibility study to understand whether a swimming lagoon can be established in the proposed and/or the alternative location, including a cost analysis to establish and maintain the facility. Identification of other alternatives to a swimming lagoon may be identified and subsequent consultation undertaken to identify whether deviation from the lagoon is appropriate.*

Council's specification for the Feasibility Study required the assessment of a swimming lagoon at four locations (see Figure 1):

- Location 1: Adjacent to Rex Smeal Park – within the tidal zone
- Location 2: Adjacent to the Surf Life Saving Club;
- Location 3: Adjacent to Rex Smeal Park – outside of the tidal zone;
- Location 4: South of St Mary's by the Sea and the Sugar Wharf.

1.4 Location Assessment

Benchmarking of comparable swimming facilities in Queensland, together with community and stakeholder input regarding possible size and associated facilities formed the basis to develop a likely facility footprint used in assessment of the four Locations.

The assessment of the candidate locations considered a number of factors and used a multi-criteria analysis to determine the most feasible or favourable site. Community views were considered, as were architectural challenges and possibilities for each location. The detailed Location Assessment Report can be found at Appendix 5.

The assessment considered the following factors and used a process of "forced ranking" to assess the sites relative to each other and identify sites that performed most and least favourably in regard to these factors. The process used did not seek to score the sites in an absolute sense against an independent benchmark rather, it assessed relative merit of each site against the others so the result was a ranking for each site of 1-4 against each criteria. The assessment factors were:

- Access
- Environmental Impacts
- Design
- Site Impacts
- Social impacts
- Economic Benefits
- Construction issues and costs
- Geotechnical issues
- General positives and negatives of each site.

The recommended location for Port Douglas lagoon is Location 4 – South of the Sugar Wharf, as part of the Waterfront Park proposed for that area.

The reasons for this recommendation are summarised below.

1.4.1 Decision for Dickson Inlet

The community and visitor preferences were clear that Dickson Inlet is the preferred location. In addition to this, part of the motivation for the Port Douglas Waterfront Master Plan is to stimulate the economy by the location of the lagoon as an anchor for the Waterfront Parklands and business precinct.

Within the Dickson Inlet locations there was strong support from a community member and ex Advisory Committee member for Location 1. This support extended to overall disagreement with the Waterfront Parklands Concept being developed at the same time as the Feasibility Study. Considerable community debate was generated from these activities including the reinforcement of a view from some that a lagoon is not needed.

1.4.2 Environmental Concerns

Location 1 (filling in the tidal plain - reclamation) received strong support in the on-line survey and was ranked 3rd in the telephone survey. The visitor survey was inconclusive save for showing very little support for Location 2 at Jalunbu Park. However key concerns regarding all locations expressed in the surveys were; environmental impact, amenity of the proposed location and loss of existing car parking. The issues associated with environmental impact and approvals for Location 1 cannot be understated. By its very nature, reclaiming of land within a tidal area can result in degradation and a loss of coastal resources including foreshores, wetlands and habitats. Reclamation can also adversely affect coastal processes and scenic landscape values. **Pre-lodgement advice from Council's development assessment planners is that they would not support development of a Port Douglas lagoon in Location 1. Responses from DERM and DEEDI confirm that they would not support development of a Lagoon in Location 1 (Reclamation of tidal land) particularly when there are viable alternatives with significantly less impact or environmental risk**

Location 3 (parkland between Rex Smeal and Anzac Park) will also have some significant environmental impacts as it will require modification of the coastline and clearing of coastal vegetation.

The location on Dickson Inlet with the least environmental impact is Location 4 (south of Sugar Wharf).

1.4.3 Need for a Parkland Setting

The community feedback on use and design and the information gained from the benchmarking made clear that the lagoon as an isolated body of water is not desirable. The location of the lagoon within a park land setting with extensive capacity for surrounding 'dry' activities is critical to providing a successful facility. Location 4 provides the

greatest opportunity for Port Douglas Lagoon to be provided within (as opposed to adjacent) a surrounding parkland setting as it is proposed within the new Waterfront Park.

1.4.4 ACCESS

Overall the most accessible location when considering the revised car parking arrangements arising from the waterfront masterplan, access for people with mobility challenges and centrality to the waterfront precinct, is Location 4.

1.4.5 COST OF CONSTRUCTION

The real cost of construction is difficult to determine at this stage of planning which has only seen concept designs developed. A Preliminary assessment carried out by Quantity Surveyors identified Location 1 was likely to be 34.6% more expensive than Location 4.[1]

A Quantity Surveyors report on Location 4[2] and a more developed concept suggested around $15 M would be an approximate cost of construction (excluding any significant disposal cost of contaminated fill or other issues as yet unknown regarding the site). To allow for the uncertainty of the site issues for Location 4 a margin of around 20% could be applied to the approximate cost of construction. This would give an estimated cost range as follows:

- Location 4 $15 M- $20 M
- Location 1 $20 M- $27 M

1.4.6 LOCATION ASSESSMENT MATRIX

The results of the location assessment using the multiple factors explained in Section 6 provided the following total scores (out of a possible 120).

- Location 1: 54
- Location 2: 75
- Location 3: 65
- Location 4: 87

On the basis of total score, Location 4 is found to be most favourable in this assessment.

[1] Preliminary estimates from Mitchell Brandtman.

[2] Altus Page Kirkland- advice prepared on a more detailed scope and concept prepared for the preferred site.

1.4.7 ACHIEVABILITY

The environmental impacts associated with both Locations 1 and 3 and the difficulty in gaining development approval means that Location 4 would be viewed as a far more achievable proposition. In addition there is likely to be some community opposition to Location 1 due to visual, environmental and physical impact on Dickson Inlet.

Discussions with State and Federal Agencies that would be consenting authorities for any lagoon development (and in particular a development in the tidal zone that impacts on Marine Park and the GBR World Heritage Area) returned the consistent advice that Location 1 would not get approval. In particular the level of impact and uncertainty of impact issues such as changes to the main channel, siltation of the beach area and risk of environmental harm from pool plant and chemicals was raised repeatedly. An extensive planning and impact study would be required before any consideration of such a development.

Agency advice also consistently pointed out that no approval for filling in the tidal zone would be likely given there were alternative locations with substantially less impact and risk. Location 4 was viewed as the most feasible and achievable site.

1.4.8 REVIEW OF LOCATION ASSESSMENT BY FLANAGAN CONSULTING GROUP

A review of the methodology and outcomes of the Location Assessment was undertaken by Flanagan Consulting Group. This review found that:

> *Based on consideration of compliance with the Draft SPP for Coastal protection it is considered that construction of a lagoon at Site 1 by reclamation in the tidal zone would have no prospects of approval. It is therefore considered that Site 1 could be excluded from the comparative analysis of alternate sites as it does not represent a feasible location for such a facility based on potential environmental impacts and non-compliance with regulatory provisions. If Site 1 is excluded from the analysis it would not change the ranking of the other 3 sites based on the factors adopted for the comparative analysis.*
>
> *The comparative analysis confirms that Site 4 South of Sugar Wharf is the preferred location.*

The full advice can be found in Appendix 4.

1.5 Demand and Usage

Demand analysis was undertaken using comparisons with similar facilities (Mackay, Cairns and Airlie Beach) and likely usage estimates were generated based on a number of scenarios. Consideration of influencing factors highlighted that Port Douglas had significant competition for demand in the nearby Four Mile Beach and high level of provision of large leisure pools in tourist accommodation and resort developments.

The amount of water required was projected using possible peak demand figures and provision rates taken from the existing facilities. A diverse range of possible demand outcomes arose and median figures were adopted to identify a possible case. Possible “attendance” numbers for the lagoon precinct (lagoon and surrounding

parklands) were generated along with estimates of "in-water" users (that proportion of precinct visitors who actually swim or use the water play elements).

The following table summarises the comparison and the adopted projection.

Table 1 - Summary of Comparison Data and Usage Projections

LOCATION	POPULATION	ESTIMATED LAGOON PRECINCT VISITS	WATER AREA PROVIDED	TOURISM- VISITOR NIGHTS (DEC QUARTER 2010)
Cairns (excludes part B and Douglas)	131,636	430,000	4,800	377,213
Whitsundays (excludes Bowen)	18,220	260,000 - 312,000	4,300	103,362 (excludes estimate of Island only visits)
Mackay part A (excl Mirani and Sarina)	77, 523	300,000	2,700	112,054
Projection for Port Douglas (based on median values)				
Douglas (whole of Douglas SLA)	**10,906**	**148,856**	**2,000**	**97336 (Excludes estimate of non-Port Douglas stays)**

1.6 Financial and Operational Aspects

1.6.1 ECONOMIC BENEFITS– SUMMARY OF FINDINGS

The Economic Benefits Analysis was undertaken by Cummings Economics who used broad user projections and a generally conservative case to analyse possible benefits accruing form the development.

The Port Douglas area has a relatively small residential population of about 8,000 but a large overnight and day visitor flow that generates expenditure of over $300 M a year.

1.6.1.1 Benefit/Cost Analysis

Capital and net operating costs of the swimming lagoon project to the Cairns Regional Council (CRC) are high and based on an estimated number of users of 70,000 to 140,000, range from $16 to $33 per estimated user per annum (with capital costs amortised over a 30-year period at 7% real). At these levels, 'direct' benefits of 'amenity' to users are unlikely to justify the project.

However, it has been identified the project is likely to generate significant 'secondary' or 'wider' benefits through stimulating increases in visitor numbers and length of stay in the Port Douglas area. Even at modest levels of increases of 1.2% in visitor numbers or of 0.07 days in length of stay, the benefits from each could justify the project.

The swimming lagoon project is also likely to have some 'catalytic' effects in stimulating further developments in the area, but these are difficult to quantify with any certainty.

The combination of:

- some level of 'direct' 'amenity' benefits to residential and visitor users,
- the 'secondary' benefits in increased visitor numbers and length of stay, and
- some 'catalytic' developmental benefits,

is likely to result in the ratio of benefits being definitely positive compared with the costs.

1.6.1.2 Economic Activity Generated

The CRC expenditure in the area on construction and on-going net payments for operation will generate economic activity in the area, along with expenditure generated in retail and in expected increase in visitor numbers and length of stay.

During the construction period, the project's cost of $14.2[3] M is estimated to 'value add' about $13.3 M to the regional economy and create about 150 annual jobs including 'flow-on' effects.

On an on-going basis, largely as a result of expected increases in tourism numbers (+1%) and length of stay (+0.1 days), the project is estimated to 'value add' $7.15 M per annum (or about 2%), to Gross Regional Product for the Douglas area and create at least 70 annual jobs.

1.6.1.3 Location

Given that any loss of parking will be attended to and user numbers are the same as other sites, the Dickson Inlet locations and particularly Location 4 south of St Mary's by the Sea and the Sugar Wharf, seems likely to produce the most benefits in terms of access, associated additional spending, and 'catalytic' developmental effects.

1.6.2 CAPITAL COST ESTIMATE

An estimate of the capital cost to construct the lagoon at Location 4 was prepared by Altus Page Kirkland based on the developed concept prepared for this location. (This was the concept that went out for community review along with the location assessment).

The cost to develop the lagoon as shown in that concept was around $14.2 M. Given that the analysis made some assumptions about the site and that the revised concept following the community review has a slightly larger water area it is prudent to revise the initial estimate and to make allowance for other uncertainty's, therefore an escalation of 20% has been used.

Estimated Construction Cost $15 M - $20 M

[3] Lower order cost estimate as per a conservative case for benefits assessment.

1.6.3 Operating Cost

Operating cost estimates have been prepared by direct comparison with the operations of the Cairns Esplanade Lagoon. It is envisaged that Inner City Facilities will be managing the Port Douglas Lagoon as they have the experience and the data collected by them is directly relatable to a Port Douglas application.

Some revenue to off-set operational cost is envisaged from kiosk rental, programs and hire of event space. This was estimated at around $69,000 p.a.

The operating cost for the Lagoon only as an isolated unit is not able to be extracted- thus the estimates include the costs of managing the surrounding parklands precinct and facilities which host the lagoon.

The estimated net operating cost (before depreciation) is estimated at around $1.5 M per year.

On median visitation figures of 148,856 to the lagoon precinct this equates to around $10.33 per visit .

On a Council wide population this equates to around $9.32 per resident.

And across the regional councils ratepayers it equates to approximately $23.56 per ratepayer.

On a per "swim" basis (based on the median of 89,314) the cost per visit is $17.21, this compares with a comparative cost of $3.85 per visit for the operation of an outdoor pool in a median catchment population within a 5 km radius which was 38,000 (based on CERM PI data for 2010 across 117 pools over a 3 year average).

This is contrasted with a potential $7,150,000 per year added to the Gross Regional Product for the Douglas Area.

1.7 Draft Concept and Community Review

The Location Assessment Report, Economic Benefits Analysis and the Draft Concept prepared for the preferred location were released for community review during March and April.

The results of this detailed consultation phase and the proposed design and other responses to the feedback received are contained in the Consultation Report (See Appendix 7)

1.7.1 Key Observations from Feedback

The key observations arising from analysis of the feedback are:

- The need for a lagoon is supported by the majority of the community however there is some opposition to the lagoon as well.
- The Lagoon will remain a contentious issue within the community. A decision to proceed with a lagoon will experience some opposition. In addition the choice of location will be unpopular with a section of the community.
- There was some expressed support in the social media for the alternative promoted by a local architect after the consultation period had closed. This support did not outweigh the strong support for the preferred location emerging from the bulk of consultation and appears to be mostly based on the alternative case presented which arguably ignored the environmental impacts and issues making Location 1 unviable.

- The only alternative location to receive any meaningful support during the consultation period was Location 2 (Jalunbu Park).
- One of the concerns, amongst those opposed to the proposed lagoon location, was about the level of impact on gatherings held at Old St Mary's By the Sea.
- The main elements of design were well supported with the exception of the timber bridge over the lagoon and possibly the snorkel trail.
- The mounds received support particularly for the idea of screening built form and attenuating any visual or noise impacts on Old St Mary's, but received negative comments from some sectors mostly associated with the proposal to partially embed buildings.
- Other design concerns raised were that sufficient play and picnic facilities be provided and that the lagoon would be able to support training activities (e.g. for nippers).

Overall there is majority support for a lagoon in Port Douglas and the consultation results indicate that a majority supports the proposed lagoon at Location 4. However, the proposed lagoon is and will remain a contentious project. The need for a lagoon, the design and the location are likely to be contested by some sectors in the community. While the evidence is clear that Location One would not obtain development approval from the relevant State Agencies, there is still likely to be some in the community who will continue to push for that location, just as there will be those who oppose any lagoon. This ongoing division in the community would need to be a consideration in any decision to proceed with the project.

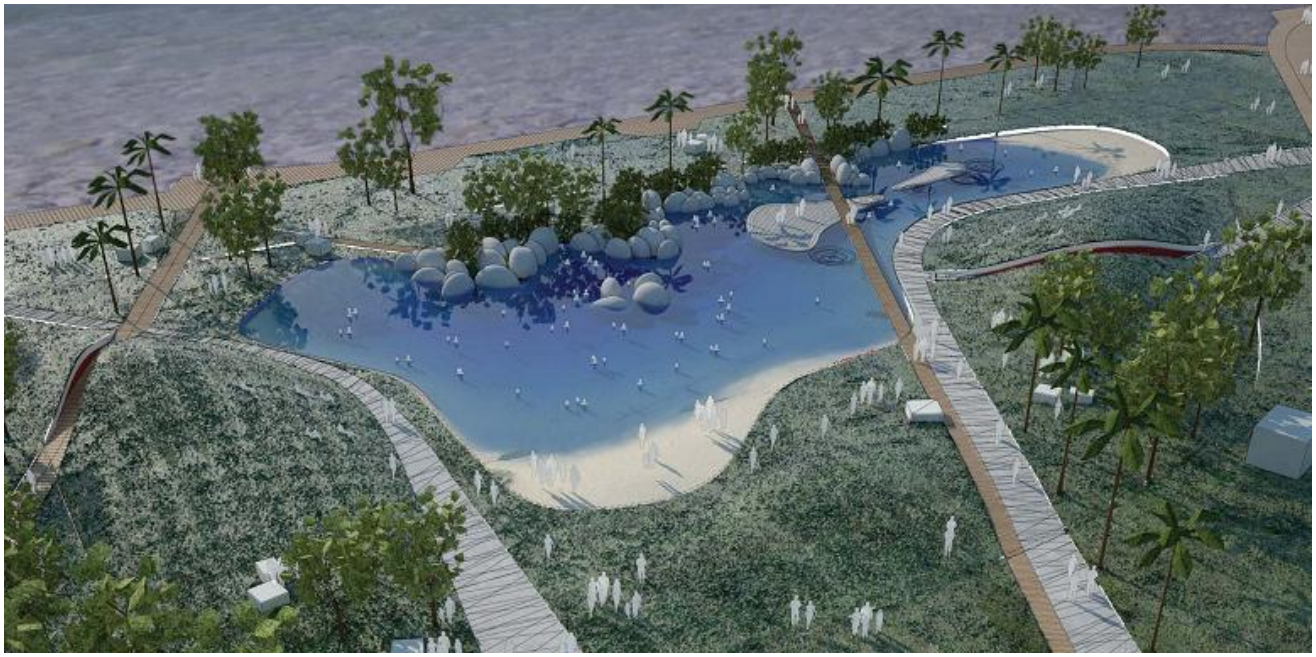


Figure 1 Original Concept Image

1.7.2 SUMMARY OF RECOMMENDED CHANGES TO LAGOON CONCEPT

The preferred location remains as proposed (Location 4). This is the most feasible location for the lagoon and represents an environmentally responsible approach.

The lagoon should be designed with around 2000 m2 of water overall. An area of about 500 m2 should be applied to splash and water play.

Design changes should be made to decrease the potential for impacts on Old St Mary's. These include:

- Relocating the entry road leading to Old St Mary's so that arriving traffic has increased separation and screening from the lagoon and a greater sense of arrival at Old St Mary's.
- Relocating the proposed splash play area to the end of the lagoon furthest from Old St Mary's (i.e. the combined club end).
- Retaining the mounds and vegetation screening.
- Reviewing the shape of the lagoon and options for reconfiguring to further increase separation from Old St Mary's.
- Placing the lap swimming section of the lagoon at the end closest to Old St Mary's.

A number of other changes are proposed for Council's consideration. The changes arise from the feedback received, consideration of UDAB's comments and overall review of the lagoon concept.

1. Relocate the splash play to the southern end of the lagoon.
2. Relocate the lap swimming area to the northern end of the lagoon.
3. Move the edge of the lagoon west to increase proximity to the edge of the rock wall and manage levels so that the board walk is lower than the pool edge.
4. Remove the change and toilets and other buildings from the mounds and consider design solutions for locating all the buildings adjacent to the southern end or using the mounds to partially screen built elements (without embedding building within the mounds)
5. Retain the mounds as a key feature to frame views and support shade structures and shade trees. Reduce mound heights to less than two metres.
6. Remove the boulders and proposed "grotto" but retain design intent for a youth space and investigate options in the next stage of design.
7. Consider design possibilities for all buildings and facilities to be at the southern end adjacent to the parking area but located so as to minimise impact on the view lines through the site and to minimise footprint of buildings. Use of underground locations for plant and chemical storage should still be considered as long as vehicle access is retained to plant and subsequent engineering investigation supports.
8. Relocate the vehicle entry path to Old St Mary's nearer to Warner St, so as to increase separation from the lagoon area and increase screening. This will also further enhance the sense of arrival at Old St Mary's.
9. Reconfigure the lagoon to increase the water area to around 2000m2 and to reduce the extension of the water area to the north.
10. Reduce hardened paths leading to the site but retain a combination of treatments around the lagoon including possible use of timber board walk, concrete path and paving should be retained to provide a concourse. The use of beach entry with sand surfacing should be retained in key sections.
11. Options for increasing the area of water and grassed surrounds under shade should be explored. This will need to consider impacts on views and the use of appropriate trees species as well as flat "skillion" roofs which minimise impacts on view lines.

12. Decrease the amount of car parking provided between the Combined Club and the Lagoon so as to enhance the waterfront area and provide for reconfiguration of the lagoon and relocation of the built facilities.
13. Include a kiosk in the design and show a possible location as part of the facilities and amenities hub.
14. Consider extension of the northern mound to the east to assist in creating screening for entry to Old St Mary's.
15. The proposed snorkel trail should be reviewed with further design discussion in regard to appropriate elements to activate the lagoon and provide for possible interpretation of the reef environment.
16. Depending on the extent of the development of the "maritime precinct" theme and the further interpretation of the maritime history of Port Douglas, the lagoon design could identify further with this theme and explore opportunities for greater interpretation of this history. The play areas and key locales of the lagoon precinct could be designed around this objective.

1.8 Conclusion

Our conclusions regarding the feasibility assessment of the proposed Port Douglas Lagoon are provided below:

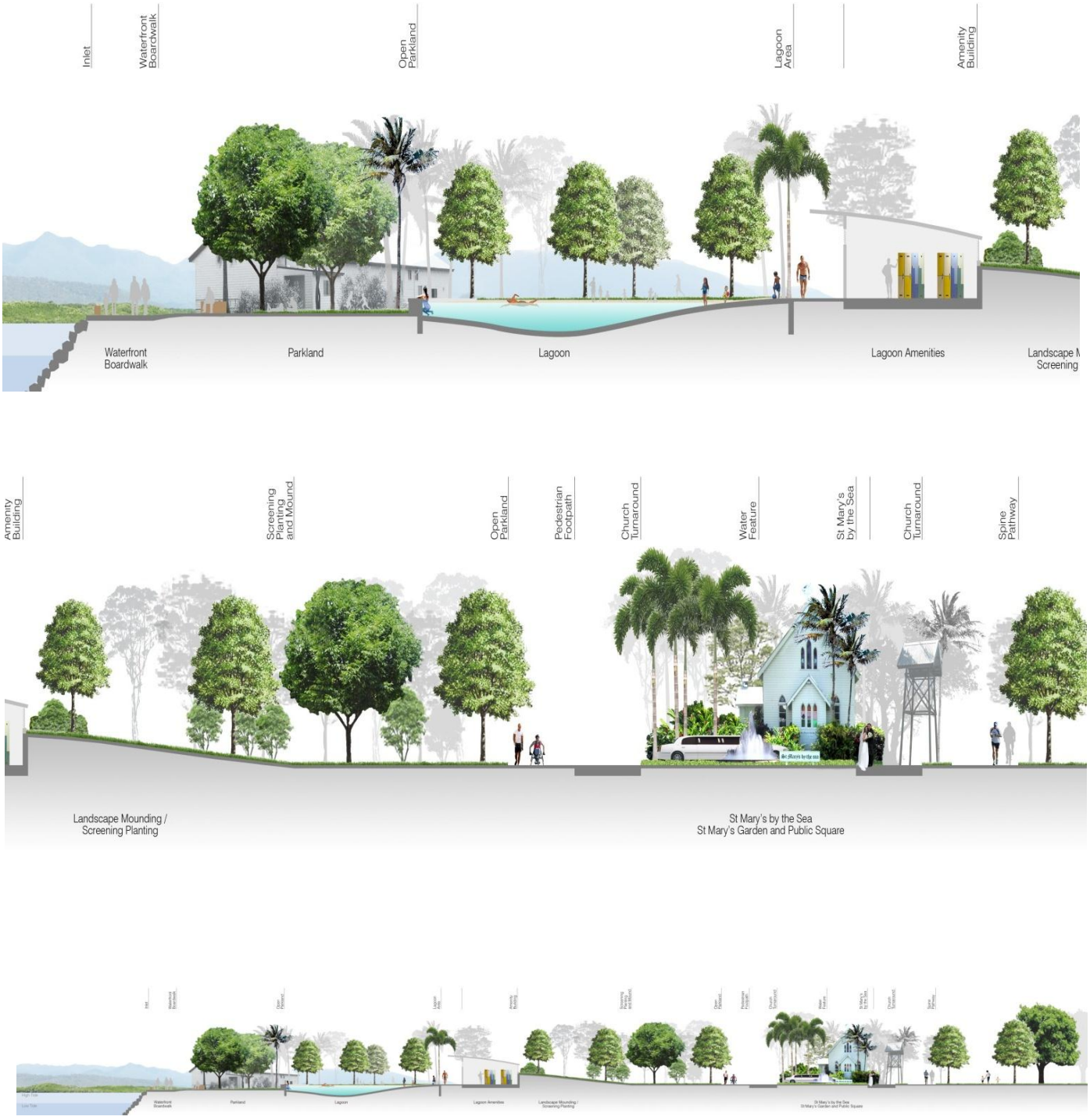
1. The most feasible location and the location which provides the best economic, social and environmental outcome is Location Four- within the new parklands south of Old St Mary's which are proposed as part of the Waterfront Parklands envisaged under the master plan.
2. Based on our assessment of likely demand and comparisons with other lagoons in Queensland a total water area of around 2000 m^2 is recommended. Approximately 500 m^2 of this should be dedicated to splash and shallow depth play.
3. The proposed lagoon will deliver a net economic benefit to Port Douglas and is estimated to 'value add' $7.15 M per annum (or about 2%), to Gross Regional Product for the Douglas area and create at least 70 annual jobs.
4. The construction cost is currently estimated at between $15 M and $20 M exclusive of the cost of developing the surrounding parklands.
5. The annual operating cost is estimated at around $1.5 M per year. This includes an estimated return of $69,000 p.a. and is before depreciation.
6. Council has the staff expertise and systems in place to run the lagoon and surrounding parklands effectively.
7. If proceeding with the project the next stage should undertake developed design and investigation of options in regard to use of sea water to supplement the lagoon supply (using salt conversion technology) and opportunities for storage and reuse of backwash water.
8. There are some divisions in the community regarding the need for a lagoon, design features and the choice of location. Proceeding with the project, while broadly supported by the community, will involve some minor risk associated with the consideration of this ongoing division.

1.9 Final Concept

Figure 2 – Summary of Main Design Revisions

Figure 3 – Final Lagoon and Waterfront Parklands Concept- Revised after Community Feedback

Figure 4 Cross Section of Lagoon and Parklands



2. Preliminary Analysis and Generic Specification

2.1 Introduction

This section summarises the preliminary analysis undertaken prior to the detailed site selection and demand assessment process. The main purpose of this phase of the project was to generate enough information to establish an idea of a possible lagoon design that could be tested against the four candidate sites.

2.2 Community Attitudes

The Master Plan has been developed with extensive community input and has formed a vision for the redevelopment of the waterfront precinct. However the issue of the swimming lagoon is one that generates divergent views in the community.

Those supportive of the pool and involved in the waterfront Master Planning have expressed a desire to not "manufacture" a plastic environment which would be visually incompatible with the existing natural vista of the proposed sites.

At this stage of the project consultation involved targeted efforts with key stakeholders and focus groups to enable the development of the "generic" design for the lagoon. The consultation activities undertaken at this stage included:

- Press releases on the commencement of the project and promoting the email address and upcoming sessions
- Email address for feedback and enquiries pdlagoon@strategicleisure.com.au
- Community focus session/ drop in session (print and radio advertised)
- Workshop with industry stakeholders (retail, tourism, chamber of commerce, lifesaving, media)
- Workshop with the Port Douglas Master Plan Advisory Group

The following dot points summarise the initial feedback received in regard to the lagoon proposal (more detail can be found in Appendix 1):

- The dominant perception in the community is that the lagoon is proposed for the tidal zone (as shown in the Master Plan- see Figure 6) or within the parkland between "Markets" Park and Rex Smeal Park.
- Many of the concerns expressed about the lagoon stem from the proposed location adjacent to Rex Smeal Park
- The lagoon proposal is seen by many in the community as part of the waterfront Master Plan and as such there are concerns and comments about the overall context of the proposal and decisions made in the Master Plan as opposed to the lagoon proposal itself. In addition several comments were received regarding appropriate priorities for the master plan implementation.
- The major concerns regarding the "perceived" location are:
    - Impact on the naturalness and undeveloped feel of the area
    - Environmental impacts

- Impact on public access to the space
- Impact on the operation of the markets
- Impact on the "serenity " of St Mary's By the Sea
- The location is wrong/ inappropriate for the space

- Several email submissions have expressed doubt over the need for the lagoon and that it is not feasible or too costly for the community. In general the comments focused on:
  - Lagoon is not needed as all the tourist accommodation has pools
  - Cost of building the lagoon should be spent on implementing other elements of the Master Plan.
  - The operational cost of the lagoon is too much
  - The lagoon won't be for residents and will just be for tourists and backpackers
  - Mossman has a pool and is only 15 minutes away

Figure 5 Approximate Locations for Investigation (1-4)

Figure 6 Port Douglas Waterfront Master Plan (shows nominal location of lagoon within the tidal zone)

2.2.1 LAGOON DESIGN AND COMMUNITY DEMAND

While the community may be divided on the need for a pool they have a number of ideas and concerns regarding the design of any leisure water.

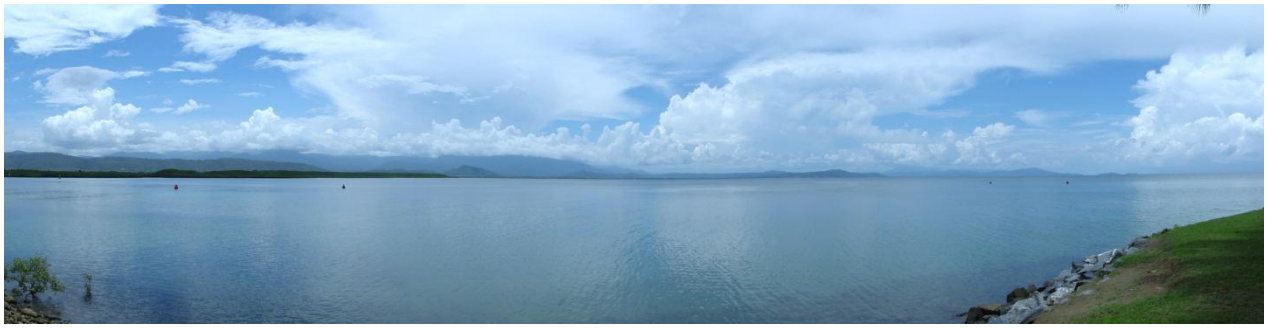
The community session provided a robust discussion regarding the pool. A summary of comments is provided below:

Why do we need a lagoon?

- To encourage a flagging tourism market
- For everyone to use especially the four months of the year when you cannot use the ocean
- We need a multi-use pool like waterslide and tunnel to cater for kids, teenagers, locals, adults and disabilities.
- The climate of Port Douglas makes water activities very attractive but not always possible on the existing beach. A lagoon overcomes this problem.
- To expand our activities for community and tourists.
- We don't want a lagoon - Lap Pool
- We don't need a lagoon pool. A lap pool with an adjoining toddler/ children's pool.
- We don't need a lagoon. We have four miles of beach and every resort has a pool. The Mossman pool is underused. Will the locals use it or just backpackers?
- We don't need a lagoon spoiling the natural beauty.
- Yes we need a lagoon to tie in with our market adjacent to Rex Smeal Park - a sense of community.
- Prevailing south-easterly winds make beach visits very undesirable, particularly in the afternoon.

Additional thoughts on need for the lagoon raised in the Industry and Advisory Committee sessions include:

- Pool/ lagoon will be a good place for older people to exercise
- Need something for older children/ teenagers
- Lagoon will demonstrate confidence in Port Douglas and encourage more investment in the tourism industry.



What activities should it provide?

- Facility for sporting groups to train. However, it is essential that the elderly and frail have facilities there.
- Water features and games to interest children.
- A natural free form uncluttered that does not impose on our surrounding natural beauty.
- A fenced landscaped pool with playful water features and shade at the surf club will extend the water culture there.
- Natural, healthy, educational, safe
- Nothing that resembles 'water world'. Keep it simple & natural.
- Aquatic activities for all ages - swimming, wading, water sports etc.
- Slippery slide for kids to slide into
- Adult's lap areas
- Toddlers section ("no p's")
- Tunnel for kids to swim under
- Family focussed to encourage a sense of community awareness and "the reef"
- If it was possible to incorporate swimming lanes, this would be good for schools etc.
- This project has an element that is about a 'social' location - a meeting place, or centre of the community.
- Educational i.e. information about local wildlife etc.
-

The Workshop with the Port Douglas Master Plan Advisory Committee identified the following:

What will the Lagoon be Used for and By Whom

- Social space (space, entertainment, BBQs, shade-natural,
- Children and teenagers recreation
- Exercise (lap swimming)
- Cooling off
- Safe swimming (no stingers no crocs patrolled)
- Protected swimming
- Splash, soak and swim
- Creating ambience in the park
- Lagoon must be Accessible
- Consider Kiosk/ cafe
- Must be Sustainable
- Protect and contribute to Cultural Heritage
- Iconic image of Port
- Meet local community needs
- Provide for less wealthy residents and accommodate the expected increase in families

Design Suggestions

- Maybe Jalunbu Park is better location due to less impact on Rex Smeal Park and Historic precinct- this could be combined with a redesign of the whole surf club precinct.
- Using the carpark area (south of St Mary's) which will be converted to parkland is a good location as it minimises any impact on existing park

- Could put the lagoon where the proposed "cut-out" in the master plan was going to expose the old rock wall under the pier to the Sugar Wharf.
- Using the "cut out area" could recreate a sense of water and would create a real sense of place in this area
- Needs space to allow for growth and change
- Need to manage noise from the lagoon and integrate treatment into tree planting and other landscape features

A 2006 survey of waterfront[4] users reported the following:

> *Part C: Your aspirations*
>
> *Q 11: Please circle the item(s) that you would like to see be part of the Port Douglas strategic plan*
>
> - *645 of the 806 respondents (approximately 80%) wanted to see a 'stinger-free swimming pool' implemented.*
> - *544 respondents (approximately 67%) wanted to see 'landscape upgrades'.*
> - *More than 20% of respondents would like to see the following included as part of the strategic plan:*
>   - *'get wet children's play area';*
>   - *'waterfront dining/entertainment';*
>   - *'arts & cultural centre';*
>   - *'food sales precinct at the Sunday markets';*
>   - *'night food market';*
>   - *'a dedicated marine industry precinct'; and*
>   - *'marine research facilities'.*
>
> *In contrast less than 20% of respondents wanted to see a connection (walkway) from the football fields to the waterfront, shopping or a small vessel lift implemented in the strategic plan.*
>
> *Of the 23 respondents who chose 'other', items that were chosen by respondents for inclusion into the Strategic Plan included 'adequate parking for cars and boats' and 'native vegetation'.*
>
> ***Of the 645 respondents who wanted a swimming pool implemented within the study area, 563 nominated a location for the pool. 282 respondents (approximately 50%) preferred to see the swimming pool located at 4 Mile Beach. 272 respondents (approximately 48%) identified the waterfront as the best location.***

[4] Port Douglas Waterfront: Report on Waterfront Users Survey. June 2006.

2.3 Initial Review of Sites and Issues

An initial assessment of the four locations based on observed positives and negatives was developed to assist in defining those factors which would be useful in undertaking the detailed assessment of the locations.

2.3.1 Location 1: Adjacent to Rex Smeal Park – within the tidal zone

This is the initial location that was shown on the Master Plan. This location was only "nominal" and reflected a desire to show the lagoon in the Master Plan but was not the result of an extensive analysis of locations or any assessment of feasibility.

Positives:

- Would reclaim additional space from the tidal zone
- Does not consume any existing parkland
- Adds a strong visual feature to the waterfront and creates a new destination area

Negatives:

- Would require significant environmental impact assessment and approvals and there is a high degree of uncertainty as to success
- Will need to be designed to cope with predicted storm surge peaks
- Requires filling into the tidal zone
- Would need to fill to a height above the existing ground level of the park so might have flooding and other implications
- Likely to be difficult to integrate visually due to fill heights required
- Difficult construction due to underlying marine sands and instability of ocean hydraulics
- Could have impacts on the channel
- Will require services to be extended through the park
- Location of plant room and other buildings will be difficult to keep close to the lagoon if no impact on views is to be maintained
- Some initial opposition from residents to the location and potential impacts on adjacent marine environment and existing parklands

2.3.2 Location 2: Adjacent to the Surf Life Saving Club;

Positives:

- Has no impact on Rex Smeal Park and adjacent parklands
- Creates a unique feature in a different part of the town
- Potential synergies with the adjacent Lifesaving Club and savings on infrastructure
- Close to beach area and can complement in summer
- May add value to tourism accommodation in the area

Negatives:

- Will require removal of several large melaleuca trees
- Potential impacts on surrounding residential area
- Will require some filling and significant modification of the site
- doesn't contribute to the Markets Park waterfront area
- space is limited and profile of the site is not as strong as other locations
- not exposed to cooling summer breezes

2.3.3 LOCATION 3: ADJACENT TO REX SMEAL PARK – OUTSIDE OF THE TIDAL ZONE;

Positives:

- Doesn't require filling in the tidal zone
- Could create a new focus point for the precinct and provide a linking element from Rex Smeal Park to the Markets Park area
- Adds a strong visual feature to the waterfront and creates a new destination area
- Could provide an over water view to the ocean

Negatives:

- Space available is constrained
- Police houses are very close
- Will be difficult to place the lagoon and keep a sense of open pedestrian linkage from Markets Park to Rex Smeal Park
- Will probably require filling and have some impact on local hydraulics
- Will have to be designed for predicted peak storm surges
- Considerable community concern regarding the location and the impact on the park
- Underlying soil is fill of unknown quality

2.3.4 LOCATION 4: SOUTH OF ST MARY'S BY THE SEA AND THE SUGAR WHARF.

Positives:

- Would be constructed on land that is already developed and "sterilised" – and is planned for conversion to parkland
- Does not consume any existing parkland and contributes to creating a focus for the proposed new parkland
- Land is already filled and raised to a more favourable level
- Services are already on site
- Could be used to create a unique visual element linking the sugar wharf to other waterfront features to the south
- Potential to create a themed approach that links with local history and could represent the historical water that had been part of the area.

Negatives:

- Will require progression of other elements of the Master Plan to create the total Waterfront Park from the existing non-park use.
- Design will need to provide for good separation from St Mary's to reduce noise impacts
- Underlying soil is fill of unknown quality
- Will still need to design for storm surge peaks

Figure 7 - Looking South across the Tidal Zone (Location 1)- Fill would extend across most of this area and cover the current mangrove stands.

2.4 Early Facility Mix Recommendations

Based on the 'Initial findings' and the Port Douglas Port Douglas Master Plan Advisory Committee's feedback it appeared likely that Location 4 (the car park land to the South of Old St Mary's by the Sea and the Sugar Wharf) could be the most favourable location. However it was important to develop the generic specification for the lagoon to enable an objective assessment of the four locations. It should be acknowledged that effective design can only commence once a site is selected as there are different issues and opportunities with each site that influence design.

2.4.1 Overall Design Objectives:

1. The "water space" should have a natural look and feel and integrate visually into the surrounding parkland
2. The design must be unique and reflect the Port Douglas "vibe"
3. The ancillary facilities such as plant building and amenities should be located and designed to minimise impact on views across the water and within the park.
4. The highest level of environmental sustainability is desired
5. Water temperatures are a key issue and summer will be peak demand. A number of strategies will be needed to keep the water cool. Built shade should be minimised where possible due to visual impact
6. The water space must integrate into the surrounding parkland as public space and not inhibit flow of users.
7. The overall precinct should be designed as a destination for residents and visitors and provide for large and small groups.
8. Play opportunities for young children are essential but must be provided in a way that isn't visually "loud" and also minimises noise impacts on quieter areas such as St Mary's. Water based play is desirable but using more natural forms and stream/spray elements as opposed to large brightly coloured structures.
9. Provision for older children/ youth is also critical but should be about defining a place for them and linking that with water space.
10. Ongoing sustainability is a key element and cost of operation is a critical factor. The facility should:
    a. Be able to run efficiently and at low lifeguard numbers
    b. Be environmentally sound reducing power and water use
    c. Have low maintenance requirements
    d. Be an appropriate scale for the community and its resources

2.4.2 Lagoon Area– Water Space

A maximum of 2400 m^2 of leisure water was considered to be suitable for the preliminary analysis of sites. This was an initial assessment based on:

- Current perceptions of size (as shown on Master Plan)
- Providing approximately ½ of the esplanade water area
- Initial assessment of likely space needed to accommodate the mix of uses and allow for low depth play areas/ beach entries.
- Comparison with other similar developments and consideration of the size and scale of Cairns Lagoon and the population catchment served by that facility

The generic concept was defined as a water space that could incorporate features similar to below:

- Beach entry to at least 35% of the water space with low level water features and wet play that will appeal to toddlers and young families; (Target group(s) Families and Under 5's). Beach area could be linked to shaded zero depth play area with random water spouts and small channels feeding into the pool
- Featured 'natural grotto like area on the side at the midpoint of the lagoon on the western side and water falls' replicating natural rock formations to provide internal shade (and protection from afternoon sun), excitement and possibly including a water slide feature 'disguised' in the (Target group(s) Tween and Teenagers). The waterfall will provide localised cooling for adjacent park space and could link to an area designed for youth and young people.
- Area that can be defined for lap swimming providing for 3 x 2.5 wide x 25 (or possibly less) metres long. This would form part of a program space with a 600 mm teaching ledge at shallow end. Depth would be 1200 mm – 1800 mm and the space would allow for a range of possible programs or community activities. (Target group(s) Recreational swimmers, water fitness classes, Learn to swim, schools)
- Suggested internal surface "natural" pebblecrete or Quartzon
- Shade over as much of the pool edge and water as possible to reduce sun exposure of users and solar heating of water. Depending on location shade can be a combination of natural shade and sails or other structures.
- Pool alignment and narrower deeper areas will be important to minimise heating from sun
- Snorkel trail that would be a feature for schools and young visitors featuring tiles that reproduce the natural sea-life and aquatic icons of the Port Douglas region

2.4.3 PLANT AND FILTRATION ROOM

- Submerged plant room so that it does not feature on the immediate 'lagoon horizon' sized to comply with State Government Health Public Swimming Pool requirements and SLSA Pool Plant Operating Guidelines
- Investigate potential to draw water from natural waterfront without health and safety issues- possible use of salt water chlorination or investigate Magna Pool and other similar options.
- Investigate option to use underground balance and backwash storage to assist in cooling pool water. Backwash should be able to be recycled into grey water or irrigation for parklands

2.4.4 PARKLAND EMBELLISHMENTS– SUPPORT FOR LAGOON

- Landscaping consistent with the Master Plan and related documentation (currently being developed)
- 4 x BBQ pavilions strategically located around the site
- 4 x other picnic shaded structures in keeping with the simple ambiance of the waterfront
- Parkland seating for parents watching their children and visitors to the lagoon
- A sunbaking and informal gathering area with shade trees throughout.

2.4.5 ADMINISTRATION AND AMENITY AREAS

- Administration office area with direct line of site over the entire water area 30 m^2
- Staff room with kitchen and meeting space 30 m^2
- First Aid Room 10 m^2
- Parkland and lagoon storage areas 20 m^2
- Change Rooms and Amenities for up to 200 persons (male, female and families say circa 150 m^2)
- External unisex 'rinse' showers to be provided
- Raised "tower like" location for lifeguard to have full visibility of all water areas

2.4.6 CAR PARKING

- Car parking will be in accordance with Council's parking requirements.

2.4.7 SAFETY EMBELLISHMENTS

- CPTED[5] approved landscaping and design throughout
- Floodlighting for safe lagoon and parkland operations up until 10.00 pm at some times throughout the year.
- CCTV stations to monitor security of buildings and key facility locations (subject to needs of Council's facility manager).

2.4.8 CONNECTIVITY REQUIREMENTS

- Clear and safe connectivity to pedestrian and cycle ways at:
    - Adjacent shops and CBD retail sector
    - The rest of the water front parkland as defined by the Waterfront Parkland Master Plan
    - The natural waterway and waterfront features
    - Other designated connectivity nodes as defined by the Master Plan
- Visual connectivity as per the Master Plan

2.4.9 COMMERCIAL AND REVENUE ELEMENTS

- Kiosk and Cafe facility integrated into location as standalone feature or part of administration building
- Events/ ceremonies area for hire
- Group use areas for gatherings, parties etc. adjacent to the water space but able to be defined or cordoned off.
- Potential program provision both water and land based using program area of pool or adjacent events area in parkland.

[5] Crime Prevention Through Environmental Design

3. BENCHMARKING OF SIMILAR FACILITIES

Similar "lagoon" facilities were benchmarked to assist in a projection of demand and size needed as well as to document learnings in regard to design, use and management. The benchmarking is discussed in the Location Assessment Report and a detailed summary is contained in Appendix 2. It should be noted that the Benchmarking process started in December 2010 and responses from various councils was severely impacted by the extreme weather events of the following months. Strategic Leisure Group appreciates the efforts of those officers who were able to provide information and understands completely for those who did not respond.

3.1 Overview of Benchmarked Facilities

FACILITY	COUNCIL	APPROX AREA ^{2}	POPULATION 2006 ERP[6]	EST ANNUAL ATTENDANCE	APPROX-ANNUAL COST
Cairns Lagoon	Cairns Regional Council	4800	131636 (excl Cairns part B and Douglas SLA	430,000 to lagoon precinct Of which 130,000 use the lagoon	$1.4 M ($2M per year including services to surrounding parklands)
Bluewater Lagoon	Mackay Regional Council	2700	77,523 (excl Mirani and Sarina)	300,000 to precinct	$1M +
Airlie Beach	Whitsunday Regional Council	4,300	18,220 (Excl Bowen SLA)	No estimate but Discussions with WRC indicate around 260,000- 312,000 is a reasonable range	$1.24 M (this is net of significant earnings of $179,000)
The Strand Rockpool	Townsville City Council	4,600	137,772	unknown	$100,000 plus lifeguards (est $300,000) Does not include parks staff
Settlement Cove	Moreton Bay Regional Council (formerly Redcliffe)	3000	51,000 (immediate district)	Winter visitation low-Summer peaks 900-1500 per day. Est 70,000 p.a.	$500,000 plus
Leanyer	Darwin – Note owned by NTG and managed by YMCA	2000 plus waterslides	71,000	NA	NA- 12 full time employees and 6 casuals

[6] Estimated Residential Population

4. GOVERNMENT AGENCIES ADVICE

The Lagoon proposal was reviewed with Cairns Regional Council Planners and State and Federal Agencies that would be likely to play a concurrence or direct approval role.

4.1 Cairns Regional Council

Development Assessment Planners from Cairns Regional Council were asked to provide some pre-lodgement advice on the lagoon proposal. They were asked specifically to look at both Location 1 and Location 4.

In summary, the planners would recommend against the proposed development of Location One. Both Locations 1 and 4 trigger a number of assessable codes and would require operational works permits and a material change of use application. However Location 1 is likely to trigger both state and federal agency concurrence/ consent and would require substantial investigation before any consideration by these agencies.

From advice received from Council's Manager Development Assessment it appears that the Waterfront Park, lagoon in Location 4) is consistent with the DEO's of the Planning Scheme.

However, the same cannot be stated for a lagoon located in the tidal zone (Location 1) as it does not comply with the DEO's:

> *It is noted that proposed Location 1 involves the reclaiming of land. Based on the information provided, the proposed development at Location 1 is unlikely to be supported by Council officers. By its very nature, reclaiming land under tidal water can result in the degradation and loss of coastal resources including foreshores, wetlands and water bird habitats. Reclamation can also adversely affect coastal processes and scenic landscape values. An application would need to provide justification as to why Council should support the lagoon at location 1, when there may be equally suitable locations that would not require reclaiming of land.*
>
> *Throughout the Douglas Shire Planning Scheme the retention and protection of the natural features of Dicksons Inlet are emphasised. Any application would need to demonstrate compliance with the Douglas Shire Planning Scheme. Applicable Desired Environmental Outcomes which underpin the Douglas Shire Planning Scheme include:*
>
> *DEO 3 – Natural waterways such as the Daintree River, the Mossman River, the Mowbray River and Dicksons Inlet, all wetlands but particularly those on the Directory of Wetlands of Importance in Australia (…) and all catchments in coastal areas within the Shire, are managed to protect their ecological processes, enhance water quality, conserve riparian ecological values and landscape/scenic quality, while acknowledging nature based recreation opportunities.*
>
> *DEO 4 – The unique environmental character of the Shire comprised of internationally renowned landscapes, ecologically significant rainforest systems, sensitive coastal systems and areas of*

> *unsurpassed natural beauty, are maintained in association with sustainable development practices, which seek to minimise the effects of development on the natural environment.*
>
> *The Port Douglas and Environs Locality Code contains a Purpose Statement which reads that the purpose of the Code is to facilitate the protection of "…sensitive environments and natural features which give Port Douglas its distinctive character and identity, in particular Four Mile Beach, Dicksons Inlet and Flagstaff Hill".*

4.2 State and Federal Agencies

A number of state and federal agencies would be involved in any proposal to develop a lagoon at Location 1 (filling in the tidal zone). Some of these would also be involved in review or assessment of a proposal to develop in Location 4 (the preferred location).

Discussions were held with several agencies regarding the lagoon and the consistent advice from these agencies is that they would be unable to consider a proposal for Location 1 when a viable alternative (Location 4) with far less impact or environmental risk exists.

Table 2 State and Federal Agency Interest

AGENCY	JURISDICTIONAL INTEREST	ITEM OR TRIGGER
Location 4- South of Sugar Wharf and in the new Waterfront Park		
DERM	Coastal development, management & protection. Cultural heritage management & protection Land management.	▪ Impact around or adjoining heritage listed places ▪ Impact of redevelopment in erosion prone area
Location 1 – In the tidal zone (front of Rex Smeal Park)		
DERM	Coastal development, management & protection Cultural heritage management & protection Land management Marine Park Protection	▪ Impact of reclamation of tidal land & construction of revetment wall resulting in loss of intertidal & tidal coastal landforms and ecosystems ▪ Impact on Marine Park ▪ Impact of development in erosion prone area ▪ Impact on loss of scenic amenity of the coast ▪ Impact on loss of area of general ecological significance & value ▪ Impact around or adjoining heritage listed places ▪ Impact on Native Title ▪ Impact on loss of public access to the coast ▪ Amalgamation of reserve land

AGENCY	JURISDICTIONAL INTEREST	ITEM OR TRIGGER
DLGP	Land use is within urban footprint of FNQ Regional Plan	▪ Development is partly outside the urban footprint
DEEDI (Fisheries & Marine Plants)	Fish habitat and marine plant management & protection	▪ Impact of reclamation of tidal land & loss of fish/ marine plant habitat
DSEWP&C (Common-wealth)	·Protection of World Heritage properties, national heritage places, GBR marine park & threatened species	▪ Impact of partial loss of GBR marine park area ▪ Impact on world heritage properties & national heritage places ▪ Impact on threatened species
DTMR (Maritime Safety)	Maritime Operations	▪ Impact of filling/ reclamation on shipping activity and the main channel (siltation and dredging concerns)

4.2.1 DEPARTMENT OF ENVIRONMENT AND RESOURCE MANAGEMENT

The Coastal Plan, State Planning Policy and legislative amendments are expected to commence in mid-late 2011. Once commenced, these requirements will be utilised by the Department in its assessment of applications in coastal zones throughout the State. The revised State Planning Policy will significantly reduce the capacity for a broad range of development, including reclamation works, to be undertaken in coastal zones. Works in tidal zones that are for maritime development, port or airport development, essential community service infrastructure, minor public maritime infrastructure or coastal protection work will continue to be permitted. The proposed lagoon is not appropriately captured within any of these definitions. Works that do not satisfactorily fall within those definitions must demonstrate that not only is there tremendous public benefit to potentially be derived from the work proposed, but also that the work cannot be undertaken on any other site that would not undermine State Planning Policy objectives.

The lagoon is not capable of meeting the tests provided for within the State Planning Policy. Therefore, guided by its Coastal Plan and associated State Planning Policy, **it is anticipated that the Department will direct Council to refuse any application for a tidal lagoon in Port Douglas. In these circumstances, Council must comply with the direction given by the Department, notwithstanding Council's own assessment and decision in regard to same.**

Native Title

DERM advice is that preliminary investigations have confirmed that Native Title is not extinguished for Location 1 (Tidal zone) which would then require dealing with Native Title for any development. Location 4 investigations indicate the Native Title has been extinguished.

4.2.2 Department of Employment, Economic Development and Innovation (DEEDI)

DEEDI advises that it prefers Location 4 on the basis that it has the least impact on fish habitats. Location 4 would not require any approvals from DEEDI Fisheries. Location 1, however, would require operational works approvals from DEEDI for marine plant disturbance and for waterway barrier works (excluding fish movement to fish habitat). An application from Council for an approval **would need to demonstrate that there are no viable alternatives to lagoon at Location 1 to achieve the long term goals of the Port Douglas Master Plan**. Council would also need to offset the loss of fish habitats as required under the Queensland Government Environmental Offsets Policy.

4.3 Prospect of Development Approval

Based on the advice from CRC and government agencies a summary of likely prospect of development approval has been prepared comparing Locations 1 and 4. Please note this is a preliminary assessment only based on early advice and is subject to change. No certainty can be reached until an application is lodged.

Table 3 – Prospect of Development Approval for Waterfront Park Elements

Government Agency	Waterfront Park	Lagoon	
		Location 4	Location 1
Cairns Regional Council (officers recommendation)	**Yes**	**Yes**	**No**
DERM	**Yes**	**Yes**	**No**
DTMR *(incl Maritime Safety)*	**Yes**	-NA	**-**
DLGP	**-NA**	-NA	-NA
DEEDI *(Fisheries)*	**Yes**	-NA	**No**
DSEWP&C (*incl GRMPA*)	**-NA**	-NA	**No**

Figure 8 - View North to Rex Smeal Park from the area included in Location 3

5. DEMAND ASSESSMENT

5.1 Forecast Usage Estimates

5.1.1 BENCHMARK COMPARISONS – BROAD PROJECTION BASED ON POPULATION

Early project forecasts used an approach involving a broad projector by extrapolating a simple correlation of catchment population using 10% of Cairns and 30% of Airlie Beach populations. The early forecasts were useful in defining the initial generic specification for site analysis.

The population figure used for Airlie was based on advice from Whitsunday Regional Council that the whole council area used the lagoon and that they considered it reasonable to include the LGA population. Concerns expressed by TPDD and others that this overestimates the catchment have been considered and revised population base of 18,220 for the Whitsunday SLA (i.e. excludes Bowen SLA) has been used. This means the Port Douglas catchment of 10,906 (Based on the whole Douglas SLA) equates to around 60% of the Airlie catchment.

Detailed projections contained in this section have been developed considering a broad range of factors and expand the initial analysis considerably. It should be noted that the feasibility numbers range across a broad spectrum of possibilities due to the differing opinions about the likely catchment of the proposed venue, sources of comparison data (Cairns Esplanade Lagoon, Airlie Beach Lagoon Mackay Bluewater Lagoon), views on usage from the likely tourist market, the competing facility (natural swimming area) of Four Mile Beach and the proximity of Cairns and the Esplanade Lagoon. Throughout the project there were strong local opinions expressed regarding lagoon size, location and overall demonstrated need.

Further the projections consider that there is a split in precinct attendances between those that use the parklands surrounding the lagoon and those that actively enter the lagoon to participate in 'water based activities'. This is reinforced in discussions with managers of all similar facilities. Only Cairns had documented counts in regard to this split and advised that around 30% of total precinct visits are actual water users or "swimmers".

To allow for a possible higher rate of water use in Port Douglas this split could be doubled to 60%. In addition the Cairns Esplanade as an overall destination enjoys around 1.4 M visits a year and the proposed Waterfront Parkland and Lagoon at Port Douglas may well attract many more users than just those interested in swimming. So a broad projection based on this upper figure may also be warranted when considering overall use.

However, as argued by some and not acknowledged by others in the community, comparisons with Cairns and Airlie Beach must consider that none of those destinations have a highly appealing beach within a short walk of the lagoon. This means that there could well be a lower rate of water use in the winter which is peak season due to the competition of the beach. To an extent, this may also apply during summer with overall precinct attendances diminished by those who prefer to walk on Four Mile rather than around the proposed lagoon precinct.

Table 4 Broad Projection of use based on Population Comparison and estimate of Bather rates (Cairns and Airlie)

LOCATION	RESIDENTIAL CATCHMENT POPULATION (ERP2006)	PRECINCT ATTENDANCES	LAGOON ONLY ATTENDANCES
Cairns Lagoon 4800 m^2	131,636	430,000 Lagoon Precinct (1,400,000 – overall for Esplanade)	130,000 bathers (30% of precinct)
Airlie Beach Lagoon 4300 m^2	18,220	"Up to" 10,000 persons/ week [7] (peak only) Equates to 260,000 – 312,000/ year	78,000- 93,600 (using 30%) 156,600- 187200 (using 60%)
Port Douglas Lagoon based on Cairns Lagoon data (10% of Cairns population)	10,906	43,000 (140,000 overall Parklands)	13,000 (at 30%) 25,800 (at 60%)
Port Douglas Lagoon based on Airlie Beach Lagoon data (60% of Whitsundays)	10906	156,000 - 187,200	78,000 – 93,600 (at 30%) 93,600 – 112,320 (at 60%)
Median Values of Airlie Based Projections		*171,600*	*85,800- 102,960*
Median values of Cairns and Airlie medians		*107,300*	*49,400 – 64,380*

5.1.2 DETAILED PROJECTIONS USING POPULATION AND VISITATION DATA

For the purposes of modelling possible forecast attendances comparisons with Airlie Beach, Cairns and Mackay have been used. The modelling has been based on the following data and assumptions:

i. Cairns City SLA (excluding Cairns part B and Douglas SLA) had a 2006 Estimated Residential Population (ERP) of 131636[8]

ii. Cairns "visitors" nights for the December quarter 2010 were reported to be 377,213 [9]

iii. The Whitsunday SLA (which excludes Bowen SLA) ERP had a 2006 ERP of 18,220

iv. Whitsunday "visitor nights" for the Dec 2010 quarter were reported at 141,592.

v. The Mackay SLA (excludes Mirani and Sarina SLAs) ERP for 2006 was 77,523

vi. Mackay visitor nights for the December 2010 quarter were 112,054

[7] Source: Council staff advice is that is peak time (Xmas and Schoolies periods) but assume yearly average of 50 – 60%
[8] Population Data sourced from ABS 2006 census Estimated Resident Population by SLA
[9] Source: ABS Tourist Accommodation Small area Data, Qld Dec 2010 (establishments over 15 rooms)

vii. Douglas SLA had a 2006 Estimated Residential Population of 10,906

viii. Port Douglas and Daintree "visitor nights" for the Dec 2010 quarter was reported at 108151.

ix. TPDD advise that approximately 10% of visitor nights will be outside the Port Douglas Area. This means the effective visitor nights could be estimated at 97,336.[10]

x. Advice received from TPDD was that Whitsunday Tourism estimate about 27% of visitor nights are consumed with direct Island visits without an Airlie Beach stopover. This means that effective visitor nights are around 103,362.

a. Cairns Regional Council staff have indicated that:

b. Peak bather loads (using the lagoon water) are reported to be 500 – 550 per hour which occurs on 5 to 6 days a year [11]. This equates to 8.72 m2 of water per person at maximum bather load capacity.

c. The peak load equates to around 0.42% of actual bather load (130,000) or 0.13% of Lagoon precinct attendance (430,000)

d. Historically tourists have made up 60% of lagoon attendances with 40% being local residents

e. In the past 12 – 18 months 80 - 90% are reportedly local residents, with tourists making up approximately 10% - 20% of users. This is attributed to a downturn in tourist activity due to the global financial crisis.

f. Actual Lagoon Precinct based activities such as bathers and sun bathing represents approximately 430,000 persons per annum (excluding the greater Esplanade Parklands use such as events and markets which account for approximately another 1,000,000 visitations per annum [12].

xi. Whitsunday Regional Council staff advise that:

a. Maximum bather loads (using the lagoon water) are reported[13] to be 600 persons per hour which equates to 7.2 m2 of water per person at capacity. The peak load only occurs a few times a year.

b. The peak load equates to around 0.19% of annual precinct attendance (using the upper estimate of 312,000).

c. While "up to" 10,000 people can visit the Airlie Beach lagoon per week, these are peak loading periods only (Christmas and Schoolies) and the actual estimated weekly attendance is reported to be much lower. Council staff estimate that attendance on an annual basis would be around 50%-60% of a projected 10,000/ week by 52 weeks. Therefore an estimated annual attendance is approximately 260,000- 312,000 (50 – 60% of 520,000)[14].

d. Attendance figures are for the entire lagoon precinct and staff did not have data on the split between actual bathers from users of the surrounding parklands.

xii. Mackay Regional Council advise that:

a. Peak load reported for Mackay is around 400 people for 2700 m^2 of water which equates to 6.75 m^2 per person.

b. The peak load equates to around 0.13% of annual attendance.

c. Estimated annual attendance is estimated to be 300,000 for the lagoon precinct. No estimate was available for the actual "in water" (bather) load compared to the use of surrounding land.

[10] Estimates supplied by Doug Ryan TPDD

[11] Source: CRC staff advises bather loads are monitored and recorded every 2 hours and this has been done since 2003.

[12] Source: Council Inner City Facilities Management staff advice

[13] Source: WRC staff advises user numbers are monitored and recorded daily.

[14] Source: WRC staff advice

d. Attendance at the lagoon reduces significantly in winter and the council now closes the upper part of the lagoon for two months of the year.

5.2 Possible Use Projections

Anticipating demand for these types of facilities is always difficult which is why comparison with other known facilities has been used. In any projection we also need to consider local differences for the subject population and the uncertainty in the comparisons used. The demand assessment and overall consideration of design issues looked at benchmarking data from a range of other (public lagoon) facilities.

Assessing likely demand is something that can not be an exact science due to the influence of so many uncontrolled factors. It requires consideration of a range of factors not just a comparison with a single other similar facility. Benchmarking was undertaken with facilities in Airlie Beach, Mackay, Townsville, Redcliffe and Darwin. A comparison model was developed using Cairns, Airlie and Mackay data as they more accurately reflect the tropical context and the catchment of the proposed lagoon which has a mix of tourism and residential demand.

Developing projected use figures has considered these three comparisons and reviewed the results in the light of averages and medians generated.

Other influences and considerations that can be considered of when developing or considering the forecasts include:

- Demographic profiles
- Proximity to competing facilities (such as beaches, natural waterways, resort pools and public pools)
- Competing leisure attractions (such as destinations which may appeal more during a limited time available)
- Ease of access (car, pedestrian, cycle, public transport)
- Level of community support ad likely use by the host community
- Ease of car parking for families
- 'Tourism mix within the destination (e.g. resort oriented or backpacker?
- Local climate and exposure to seasonal winds and other weather
- Sense of public safety and sense of place (e.g. safe and welcoming)
- Design and general appeal of the destination (i.e. the setting in which the lagoon is located)

Allowing for these variables and the complexities of accurately forecasting use and attendance figures for the proposed Port Douglas Lagoon means that no definitive answers are possible and that many variables will remain difficult to trend for a projection. While a number of assumptions are made, the overall assessment of likely use has been tempered with the following considerations:

1. Possible use can be projected by comparing use rates against population catchment and tourism demand figures. This projection can be made in the form of a correlation between population or visitor nights.
2. The correlation seen in existing facilities can be used to project numbers for Port Douglas. This can be expressed as a percentage of population or visitor nights..

3. Likely use also needs to consider probable competing facilities. In the case of Port Douglas, this would include free informal swimming opportunities close to the proposed facility such as 4 Mile Beach and "private" facilities at resorts (several resorts and tourist accommodation facilities have large leisure pools, Mirage has around 5000 m^2 of leisure water.

4. For Port Douglas several residents have already raised the availability of the beaches (Four Mile) and that winter use of the beach will compete significantly with lagoon demand. Further, peak tourism demand occurs in the winter/ dry season months. This means that likely peak demand for the lagoon (which would coincide with peak tourism loads) will likely be impacted more significantly by the availability and attractiveness of Four Mile Beach. Four Mile Beach is reportedly a well marketed and acknowledged feature of a stay at Port Douglas.

5. The impact of Four Mile Beach as a competing "facility" may be confined more to decreasing peak bather loads than actual precinct use numbers. The lagoon as a 'core' attractor or feature of the new waterfront parklands (which will also have a range of other "attractive" features will still generate visits to "see" the locale and to walk through the parklands.

6. Cairns city visitors have limited alternative options for free informal swimming as there are no beaches near the city centre. This could indicate a higher propensity for visitors to use the current lagoon at the esplanade. However visitors staying at the Northern Beaches may be less likely to visit the city to use the lagoon.

7. Usage data for Airlie Beach and Mackay do not separate out the "dry" users from the "wet". In Cairns it is reported that the usage of the lagoon and surrounds is 430,000 per annum of which only 30.2% (130,000) reportedly actually use the lagoon water spaces. It is probable that "split for actual "in water" bather loads are similar for Airlie and Mackay and it is *possible* that (due to some unknown factor) the split is higher at either one or both of these destinations. A split of double that seen in Cairns (i.e. 60% of precinct users use the water) could then be adopted to provide some additional forecast range.

8. The ratio of peak load to available water area at each of the three compared locations provides 8.72 m^2 for Cairns, 7.16 m^2 for Airlie and 6.75 m^2 for Mackay. The average of these is 7.5 m^2 and the median (middle value) is 7.16 m^2.

9. If we consider the information from Cairns regarding the respective use of the lagoon water versus the lagoon parklands, this could broadly indicate a need for a "notional" parkland to water ratio of 2:1 (depending on the area of parkland planned per user). This means, for example, that 2000 m^2 of water area would need at least 4000 m^2 of land around it to service the needs of all visitors.

The following table summarises the possible range of demand projections arising from consideration of the above information.

Figure 9 – Projections of Lagoon Precinct Use Based on Visitor and Residential Data and Comparison with Existing Facilities

Note: Projections based on the Airlie Beach data show the lower range in brackets (Use estimate provided by WRC were given as a range)

AREA	POPULATION- 2006 CENSUS COUNT ERP BY SLA	VISITOR NIGHTS DEC QUARTER 2010 (ABS)	USAGE- OF LAGOON AND PRECINCT- ANNUAL ATTENDANCE
Cairns (excludes part B and Douglas)	131,636	377,213	430,000
Whitsundays (excludes Bowen)	18,220	103362 (141592 x 73% to allow for Island only visits)	260,000 - 312,000
Douglas (whole of Douglas SLA)	10,906	97336 (108151x 90% to allow for non- Port Douglas stays)	
Mackay part A (excl Mirani and Sarina)	77523	112,054	300,000
Comparison Douglas to Cairns	8.28%	25.80%	
Comparison Douglas to Whitsunday	59.86%	94.17%	
Comparison Douglas to Mackay	14.07%	86.87%	
Projection using population (Cairns)			35,625
Projection using population (Whitsunday)			186,755 (155,629)
Projection using population (Mackay)			42,204
Projection using visitor nights (Cairns)			110,957
Projection using visitor nights (Airlie)			293,810 (244,841)
Projection using visitor nights (Mackay)			260,596

5.2.1 PROJECTION OF WATER USERS IN THE LAGOON PRECINCT

If we consider the likely range of demand from the above analysis we get 35,625 – 293,810 as a possible range of annual visits. However this projection looks at "precinct" use as opposed to "in water" lagoon users. In Cairns we know that approximately 30 % of precinct users actually swim. Therefore we could revise the range to 10,759 - 88,731. If a 100% escalation on the Cairns data is assumed then a 60% proportion of precinct users as actual

bathers could deliver a range of 21,375 – 176,286. The median or middle value for these number ranges would give the following forecasts for Port Douglas Lagoon users:

Table 5 Projected Actual Bather (in water) Demand using median Value of Forecast Range

Overall Precinct Use	Annual Bather Load on 30% split	Annual Bather Load on 60% split	Possible weekly load	Possible Peak Demand
148,856	45,000	89,314	Precinct - 2,863 Bather @30% - 865 Bather @60% - 1,718	Precinct x 0.15% - 225 30% Bather x 0.42% - 189 60% Bather x 0.42% - 375

The above table uses the median values from forecasts generated from combined comparison analysis with Cairns, Airlie and Mackay facilities.

Peak demand can be calculated as a % of the precinct attendance. The average across Mackay, Cairns and Airlie is 0.15%. However if the higher rate of bather load (e.g. using 60%) is adopted then peak demand could be projected as a percentage of bather load. This is estimated at 0.42% (Cairns peak/ recorded annual bathers) of annual bather load.

Using the above projections and the estimated "split" of users between overall precinct use and actual "in-water" use we can refine the projections further to develop some possible projections for lagoon water area required based on forecasts drawn from known (Cairns) and projected possible peak loads. From this we can project possible provision rates per person at estimated peak load multiplied by an average area of water per bather. For Mackay the provision rate was 6.75 m^2, for Cairns - 8.72 m^2 and for Airlie Beach – 7.16 m^2 . This provides an average provision rate of 7.5 m^2

Table 6 – Lagoon Water Area to Meet Possible Peak Loads (using 7.5 m^2)

Peak Load Estimate	Peak Load of 225	Peak Load of 189	Peak Load of 375	*Average*	*Median*
Water Area Required M^2	1,688	1,418	2,813	***1,973***	*1,688*

For the reasons explained earlier there needs to be some caution if considering any high end projections such as those based on 60% bather split when Cairns had recorded data evidencing a 30% split. Port Douglas has significant competition for the facility in the form of Four Mile Beach which has known appeal during peak tourism seasons (and has numerous leisure pools provided in private resort accommodation). In addition, considering that the proportion of "Backpackers" that make up the Port Douglas visitor market is considerably lower than that of Airlie Beach, this report considers the likelihood of a sustained 60% split very unlikely.

Therefore the average result of a water area of 1973 m^2 is preferred and a general allowance for 2000 m^2 of water has been adopted for the purposes of developing the final lagoon concept.

6. SITE ANALYSIS – LOCATION ASSESSMENTS

A detailed location assessment process was undertaken to determine the most feasible location for the lagoon. This process was not designed to determine the most popular location, rather it sought to determine which locations were feasible for the project and which location, on balance, met the multi-criteria analysis in the most favourable way. This analysis is detailed in the Location Assessment Report.

The following section provides an overview of the location assessment as well as updated advice from state and federal agencies.

A review of the multi-criteria analysis was undertaken by Flanagan Consulting Group who found that the determination of Location 4 as the most feasible and viable option was a valid outcome (see Section 6.7) .

Four "candidate" sites were specified in the project scope for investigation:

- Location 1: Adjacent to Rex Smeal Park – within the tidal zone
- Location 2: Behind the Surf Life Saving Club in Jalunbu Park
- Location 3: Adjacent to Rex Smeal Park – outside of the tidal zone;
- Location 4: South of St Mary's by the Sea and the Sugar Wharf.

The Waterfront Master Plan did not specifically endorse location 1 or any particular site. It recognised that there were many factors to consider and recommended that further investigation be undertaken on the issue of location and analysis of cost and benefit of developing a swimming lagoon.

Figure 10 Location of Candidate Sites

The short-medium term priority action identified in the Master Plan was:

> *Conduct a feasibility study to understand whether a swimming lagoon can be established in the proposed and/or alternative location, including a cost analysis to establish and maintain the facility. Identification of other alternatives to a swimming lagoon may be identified and subsequent consultation undertaken to identify whether deviation from the lagoon is appropriate.*

The following section provides an overview of each site and the location assessments.

6.1 Location 1: Adjacent to Rex Smeal Park – Filling within the tidal zone.

This is the "nominal" location shown in the Master Plan. It reflected a desire to show the lagoon in the Master Plan but was not the result of an extensive analysis on locations. This location proposes a new area is created by filling in the tidal area and reclaiming land.

6.1.1 Location Features

- Construct the lagoon in land reclaimed from tidal zone
- Construction would require a new sea wall and filling may be required to exceed a possible storm surge inundation (this could be up to 4m AHD)[15].
- Creates new space adjacent to the existing park corridor between Anzac and Rex Smeal Park
- High visibility from Wharf St, existing parks and end of Macrossan St.
- High visibility for arriving boats who will see the new sea wall and lagoon area.
- Substantial environmental challenges in regard to reclaiming tidal land and building a lagoon on the reclaimed land
- Will create a new outlook from Markets Park, Anzac Park, St Mary's By the Sea, Sugar Wharf and Rex Smeal Park

[15] The Environmental Constraints Report for the Waterfront Masterplan (2008) identified potential storm surge levels of 4 m AHD and referenced State Coastal Management Policy 2.2.4 which identifies that areas subject to coastal hazards should remain undeveloped where possible. While consideration for critical waterfront activity is provided it is unlikely the lagoon would be seen as critical waterfront infrastructure. The constraints report also recommends an expert review of storm surge and coastal protection.

6.2 Location 2: Adjacent to the Surf Life Saving Club.

This Location is the "other side" of Port Douglas and proposes the lagoon be developed in a location closely associated with Four Mile Beach. The proposed site is within Jalunbu Park which is an informal parkland with numerous mature *melaleuca* trees and some tables. The park is located right behind the Port Douglas Lifesaving Club and is close to the main swimming (patrolled and netted) area of the beach

6.2.1 Location Features

- Has no impact on Rex Smeal Park and adjacent parklands
- Creates a unique feature in a different part of the town
- Potential synergies with the adjacent Lifesaving Club and savings on infrastructure
- Requires the removal of some *melaleuca trees*
- Location Two has no existing formal car parking end
- Mostly residential area
- Is not visible from key areas such as retail district and would have no or limited visibility from Four Mile foreshore area
- Is not on or adjacent to the sea and would not have views of the ocean.

6.3 Location 3: Adjacent to Rex Smeal Park – outside of the tidal zone.

This location proposes the use of the parkland between Anzac/ Markets Park and Rex Smeal Park. This would see the lagoon constructed behind the existing police residences and Courthouse. Due to the low level of the park, filling would be required and some modification/ raising of the sea edge (e.g. a new sea wall) would be required.

6.3.1 Location Features

- Doesn't require filling in the tidal zone but will require some filling and a new "edge" to the ocean. Filling still likely to be to 4 m AHD or more
- Potential to create a feature linking Rex Smeal and Markets Precinct
- Adds a strong visual feature to the waterfront and creates a new destination area
- Would have good views into the site from surrounding parklands and great views over the water.
- Will require clearing of some shoreline vegetation and modification of the edge.
- Fill elevations will be visible from St Mary's and adjacent parklands
- Very "tight' location .

6.4 Location 4: South of St Mary's by the Sea and the Sugar Wharf.

This location proposes that a portion of the future parkland to be created as part of the Master Plan implementation, be used for the lagoon. The area proposed is south of Dixie St and currently supports car parking and some buildings. The implementation of the Master Plan will return this area to parkland regardless of presence or not of a lagoon. The overall Master Plan has identified additional parking space so that overall parking in the precinct will be increased.

6.4.1.1 Location Features

- Location 4 is on existing developed and filled land
- Will not require any loss of foreshore vegetation
- Closer to St Mary's and will need to design to screen noise impacts
- Has good visibility from surrounding parks and business area.
- Close to the car parking hub proposed in the Master Plan
- Cannot proceed without cessation of the existing uses and development of new parkland around Location Four.

6.5 Assessment Factors used in Comparing Sites

Assessment of the four locations was undertaken using analysis of multiple factors. These Factors are grouped into Assessment Classes: Access; Environmental Impact; Design; Site Impacts; Social; Economic; Construction; Geotech; general advantages/disadvantages.

As the candidate sites have many similar characteristics it was determined that the best approach was to use a "forced ranking" of each factor. Forced ranking means that each site is ranked against the particular assessment factor as being "most favourable- least favourable". In this way a ranking of 1 (least favourable) to 4 (most favourable) is awarded against each site. In some cases where two sites could not be separated they both scored the lower ranking. The process seeks to identify the most favourable site through the highest ranking score. The factors used are summarised in the table below:

Table 7 Assessment Factors Used In Site Ranking.

Access	Possible Maximum Score (12)
Visual	▪ Visibility into the site. Visibility from the site
Physical	▪ Distance from a defined central point in the precinct. ▪ Potential for access linkage to other public space
Construction	▪ Ease of access to each location for construction. ▪ Impact on surrounding land use to create construction access
Environmental Impact	**Possible Maximum Score (20)**
Coastal	▪ Impact on tidal areas, coast line or foreshore areas.
Vegetation	▪ Impact on existing vegetation.
Heritage	▪ Impact on heritage sites. ▪ Anzac Park and Sugar Wharf.
Adjacent land use	▪ Impact on adjacent land uses. ▪ Particular consideration of any residential areas.
St Mary's BTS	▪ Particular consideration of impact on St Mary's by the Sea
Design	**Possible Maximum Score (20)**
Wow factor	▪ Ability to create a stunning/ iconic visual result. Contribution to destination "Port Douglas"
Difficulty of design solution	▪ Consideration of likely design difficulties and challenges. ▪ Consideration of likely complexity of design issues
CPTED	▪ Crime Prevention through Environmental Design. ▪ Considers issues such as casual surveillance from surrounding public areas and lighting.
Integration with Master Plan	▪ How well the location could integrate with the master plan and complement key objectives.
Exposure to wind and weather	▪ Consideration of exposure to dominant SE breezes , poor weather and cooling summer winds
Site Impacts	**Possible Maximum Score (16)**
Space available	▪ Area of existing land that can be used. Consideration of issues around obtaining sufficient land.

Fill levels- height impacts	▪ Consideration of how much fill will be required and impact on finished ground levels.
Vegetation Loss	▪ Amount of vegetation that needs to be removed for construction
Construction Impacts	▪ Impact on adjacent land use.
Social	Possible Maximum Score (12)
support for location	▪ Telephone Survey results supporting location[16]
stated opposition to location	▪ Survey results opposing location
creates new space vs. converts exist	▪ Consideration of loss of existing park Vs creation of new.
Economic benefits	Possible Maximum Score (12)
Enhances existing tourism/retail precinct	▪ Consideration of potential impact on existing tourism/ hospitality business. ▪ Consideration of proximity.
Location could stimulate tourism/ "destination Port Douglas"	▪ Potential to stimulate tourism overall. ▪ Contribution to visual image and marketing.
Stimulate growth of commercial/ tourism business in locale	▪ Potential to encourage new business in locale or to add support to existing business.
Construction	Possible Maximum Score (16)
Approvals and planning costs	▪ Consideration of the amount and complexity of approvals required. ▪ Consideration of the likely cost of planning studies required for approvals.
Building costs	▪ Consideration of likely Building Costs in comparison across the four locations
Construction time	▪ Likely time construction would take- including time for approvals
Service Infrastructure impacts	▪ Proximity to services. ▪ Possible impacts on existing services (e.g. sewer lines)
Geotech Report	Possible Maximum Score (12)
PASS	▪ Existence of Potential Acid Sulphate Soils
Groundwater	▪ Proximity to groundwater and impact on excavation levels.
Other	▪ Fill class from Geotech report and observations on suitability.
Advantage/ Disadvantage	Non -ranked observations about each location

[16] Telephone survey results have been used as they survey was a controlled sample and balanced for age, gender and residence so it reflects a more reliable sample than the on line survey. The other survey influence is discussed in Section **Error! Reference source not found.**.

6.6 Location Assessments

The detailed location assessment is contained in the Location Assessment Report (Appendix 5).

In summary:

The recommended location for Port Douglas lagoon is Location 4 – South of the Sugar Wharf, as part of the Waterfront Park proposed for that area.

The reasons for this recommendation are summarised below.

Decision for Dickson Inlet

The community and visitor preferences were clear that Dickson Inlet is the preferred location. In addition to this, part of the motivation for the Port Douglas Waterfront Master Plan is to stimulate the economy by the location of the lagoon as an anchor for the Waterfront Parklands and business precinct.

Environmental Concerns

Location 1 (filling in the tidal plain - reclamation) received strong support in the on-line survey and was ranked 3rd in the telephone survey. The visitor survey was inconclusive save for showing very little support for Location 2 at Jalunbu Park. However key concerns regarding all locations expressed in the surveys were; environmental impact, amenity of the proposed location and loss of existing car parking. The issues associated with environmental impact and approvals for Location 1 cannot be understated. By its very nature, reclaiming of land within a tidal area can result in degradation and a loss of coastal resources including foreshores, wetlands and habitats. Reclamation can also adversely affect coastal processes and scenic landscape values. **Pre-lodgement advice from Council's development assessment planners is that they would not support development of a Port Douglas lagoon in Location 1.**

Location 3 (parkland between Rex Smeal and Anzac Park) also will have some significant environmental impacts as it will require modification of the coastline and clearing of coastal vegetation.

The location on Dickson Inlet with the least environmental impact is Location 4 (south of Sugar Wharf).

Need for a Parkland Setting

The community feedback on use and design made clear that the lagoon as an isolated body of water is not desirable. The location of the lagoon within a park land setting with extensive capacity for surrounding 'dry' activities is critical to providing a successful facility. Location 4 provides the greatest opportunity for Port Douglas Lagoon to be provided within a surrounding parkland setting as it is proposed within the Waterfront Park.

Access

Overall the most accessible location when considering car parking, disabled access and centrality to the Waterfront Precinct is Location 4.

Cost of Construction

The real cost of construction is difficult to determine at this stage of planning with a concept design developed for the proposed lagoon at Location 4. Preliminary assessment identified Location 1 was likely to be 34.6% more expensive than Location 4.[17]

A Quantity Surveyors report on Location 4[18] suggested around $15 M would be an approximate cost of construction (excluding any significant disposal cost of contaminated fill or other issues as yet unknown regarding the site). To allow for the uncertainty of the site issues for Location 4 a margin of around 20% could be applied to the approximate cost of construction. This would give an estimated cost range as follows:

- Location 4 $15M- $20M

Location Assessment Matrix

The results of the location assessment using the multiple factors explained in Section 4 and 5 provided the following total scores (out of a possible 120).

- Location 1: 54
- Location 2: 75
- Location 3: 65
- Location 4: 87

On the basis of total score, Location 4 is found to be most favourable in this assessment.

FACTOR	SITE AND SCORE				
	POSSIBLE TOTAL	1	2	3	4
Access	12	6	5	7	11
Environmental Impact	20	8	15	12	13
Design	20	10	9	8	12
Site Impacts	16	5	10	8	15
Social	12	8	9	7	5
Economic benefits	12	9	3	9	11
Construction	16	4	15	8	12
Geotech Report	12	2	8	4	6
Totals	**120**	**54**	**75**	**65**	**87**

[17] Preliminary estimates from Mitchell Brandtman.

[18] Altus Page Kirkland- advice prepared on a more detailed scope and concept prepared for the preferred site.

Achievability

The environmental impacts associated with both Locations 1 and 3 and the difficulty in gaining development approval means that Location 4 would be viewed as a far more achievable proposition. The clear advice from Council Planners and State Agencies is that approval for Location 1 could not be achieved when alternative locations exist.

6.7 Peer Review of Location Assessment

A review of the methodology and outcomes of the Location Assessment was undertaken by consulting engineers Flanagan Consulting Group. This review found that an alternative approach could have been used which filtered sites according to suitability or compliance criteria. The opinion of the peer review is that Location 1 could not meet suitability and compliance criteria and that the conclusion of the Location Assessment that Location 4 was the most feasible location was sound. An extract is provided below and the full advice is contained in Appendix 4.

> *Notwithstanding this Site 1 is distinctly different from the other 3 possible locations due to its potential for impacts on coastal processes and marine plants. It is likely that the Queensland Coastal Plan and Draft SPP Coastal Protection (SPP) will be in force by the time that the project would be required to be assessed and approved.*
>
> *Given that development of a Lagoon at Site 1 will involve reclamation works into the tidal zone the ability of Site 1 to comply with the SPP calls into question whether this site is a feasible location. Under the SPP, and Marine Parks Act, 1994 reclamation of tidal land is defined as "...raising the land above high water mark , … by carrying out works, including dredging and the depositing of solid material".*
>
> *Reclamation complies with the SPP only if it is necessary for:*
>
> *a) maritime development within a designated maritime development area; or*
>
> *b) development in a port or airport where supported by a statutory land-use plan; or*
>
> *c) development of essential community service infrastructure; or*
>
> *d) development of a minor public maritime infrastructure; or*
>
> *e) coastal protection work.*
>
> *A lagoon at Site 1 would not meet any of these definitions. Notwithstanding the non-compliance with definitions, the SPP does provide for "acceptable" circumstances for not fully achieving the policy outcome however the proposed development must:*
>
> *a) provide an overriding need in the public interest in accordance with the factors outlined at Annex 5 of the SPP; or*
>
> *b) is a development commitment; or*
>
> *c) is for a public benefit asset.*
>
> *In order for Site 1 to be considered as a feasible location it would need to meet the criteria set out in Annexure 5 to the SPP which requires that the applicant for the development must establish:*
>
> *a) the overall social, economic and environmental benefits of the development outweigh:*

i) any detrimental effect upon the natural values of the site and adjacent areas; and

ii) conflicts with the policy outcome of this policy; and

b) the development cannot be located elsewhere so as to avoid conflicting with the policy outcome of this policy.

The availability of alternate locations for a lagoon (that do not conflict with the policy outcomes of the SPP), means that it would be unlikely that Site 1 could be established as meeting the criteria for Annexure 5 and therefore SPP outcomes.

Site 1 does not represent a development commitment as it has not been subject to a development application. It could be argued that a lagoon at Site 1 is a public benefit asset so it is necessary to consider the definition of such an asset under the SPP.

The SPP defines a Public Benefit Asset as follows:

a) transport infrastructure described in the definition of community infrastructure in Schedule 2 of the Sustainable Planning Regulation 2009 (excluding wharves, public jetties, ports, port facilities and navigational facilities) and transport infrastructure described in the definition of development infrastructure in Schedule 3 of the Sustainable Planning Act 2009 (excluding ferry terminals)

b) Aeronautical facilities of State significance described in SPP 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities, and associated facilities

c) emergency services facilities

d) domestic gas pipelines

e) operating works under the Electricity Act 1994

f) storage, works and administrative facilities associated with the provision or maintenance of the essential community service infrastructure.

A lagoon and outdoor recreation facility would not fit into any of these definitions of a Public Benefit asset.

Based on consideration of compliance with the Draft SPP for Coastal protection it is considered that construction of a lagoon at Site 1 by reclamation in the tidal zone would have no prospects of approval.

It is therefore considered that Site 1 could be excluded from the comparative analysis of alternate sites as it does not represent a feasible location for such a facility based on potential environmental impacts and non-compliance with regulatory provisions.

If Site 1 is excluded from the analysis it would not change the ranking of the other 3 sites based on the factors adopted for the comparative analysis.

The comparative analysis confirms that Site 4 South of Sugar Wharf is the preferred location.

7. FINANCIAL AND ECONOMIC ANALYSIS

7.1 Operational Costs, Revenue and Management

The estimated operational budget is based on the actual cost of the Cairns Esplanade Lagoon. It should be noted that there may be changes to this based on the assessment of Council staff who the report recommends be responsible for the venue to maximise the synergies and some of the costs linked with the overall parklands precinct. The figures are cited in 2010/11 dollars and no allowance has been made for escalations due to future price increases

COST ELEMENT	notes	PORT DOUGLAS LAGOON Full Year Estimated 2010/11Budget
OPERATING REVENUE		
Kiosk Lease Revenue	1	$36,400
Lagoon based Programs and Activities	2	$23,400
Event Space Hire (Lagoon specific area)	3	$10,000
Total Operating Revenue		**$69,800**
OPERATING EXPENDITURE- Staffing		
CRC Employee Costs (Duty Officer, Water testing, 24 hour cleaning)	4	$400,000
Protective Clothing & Equipment	5	$3,000
Employment Agency/Temporary Staff	6	$23,400
Total		**$426,400**
MATERIALS		
Chemicals	7	$36,000
Cleaning Supplies	8	$9,000
R&M Materials - General	9	$50,000
Electrical Supplies	10	$6,000
Floating Plant and Loose Tools Purchase	11	$2,000
Fuel	12	$4,900
Office Stationery and Supplies	13	$1,800
Plumbing Supplies	14	$3,000
Mobile/Pager Equipment <$1000	15	$600
Parkland/Playground Equipment <$500	16	$6,000
Total		**$119,300**

EXTERNAL SERVICES		
Cleaning Services	17	$30,000
Garbage Collection Services	18	$6,500
Lifeguard Services	19	$300,000
Static Security Guards (allow 1.5 per night)	20	$189,363
Repairs & Maintenance Services	21	$20,000
Toilet Services & Supplies	22	$2,500
External Hire - Minor Plant & Equip	23	$6,000
Total		**$554,363**
OTHER SERVICES		
Electricity - Non FBT	24	$150,000
Postage	25	$1,200
Telecommunication Usage Charges	26	$3,800
Total		**$155,000**
INTERNAL CHARGES		
Internal Charges - Job Charging	27	$166,500
Internal Fleet Hire - Yellow & Major	28	$19,200
Internal Charges - Laboratory Testing	29	$40,400
Internal Fleet Hire - Small Plant O	30	$7,600
Internal Fleet Hire - Long Term/Ded 1	31	$24,000
Internal Fleet Hire - Long Term/Ded 2	32	$119,400
Internal Charges - Pool Vehicles	33	$300
Total		**$377,400**
Internal Revenue - Job Charging	**34**	**-$25,200**
OPERATING COSTS BEFORE DEPRECIATION		**$1,537,463**

On median visitation figures of 148,856 to the lagoon precinct this equates to around $10.33 per visit and a **cost per "swim" of $17.21. This compares with a comparative cost of $3.85 per visit for the operation of an outdoor pool** in a Median catchment population within a 5 km radius was 38,000 (based on CERM PI[19] data for 2010 across 117 pools over a 3 year average). CERM benchmarking for pools in smaller catchments of around 11,000 residents in 2008 found an average subsidy per visit of $3.61.

[19] CERM Performance Indicators is an applied research project based at University of SA and undertakes national benchmarking of leisure facilities on an annual basis.

On a Council wide population the cost of operating the lagoon equates to around $9.32 per resident.

And across the region it equates to approximately $19.22 per ratepayer. (approximately 80,000 rate assessments).

7.2 Potential Management Structure

There are three main options used in managing aquatic facilities owned by Local Authorities.

1. Management by Lease
2. Contract Management
3. 'In house' Council employees

It is not considered likely that any private operator would 'lease' the proposed lagoon as there is no significant revenue being generated by the free access formula.

Council could consider contract management as an alternative option to staffing with Council employees. For example this is done at Brisbane's Southbank and Leanyer Recreation Park in Darwin. Under this model Council pays a fee for service and contracts a suitably qualified organisation to provide management and staffing of the facility in accordance with a contract and performance indicators initially developed by Council. A Council officer would still be required to supervise and check the contractors' performance and compliance with the terms of the contract. This may be a viable option if Council was building its first lagoon and did not already have the 'in house' expertise of the current Inner City Facilities Unit which, among other things, manages the Cairns Esplanade Lagoon.

Accordingly it is recommended Council operate the Port Douglas Lagoon 'in house' and this will provide consistency in the application of procedures, operational standards and general synergies associated with managing two similar venues. Further this approach will realistically provide better value for money based on the likely economies of scale and resulting savings flowing on from the existing Council works undertaken by its staff in the adjacent parklands.

Specialised services that are currently not Council core business such as kiosk operations, lifeguarding and out of hours security should be contracted out as is currently the case at the Esplanade venue, however it will be necessary to ensure the key expected results are clearly articulated, including a method of tracking performance.

7.2.1 Recommended programs & services

The lagoon's free use policy limits the programming that can be done without creating issues or conflicts between users and commercially driven programs and activities in terms of competing water space. There will likely be limited opportunities for programming. However as the lagoons patronage patterns are established there will be identified off-peak times when the lagoon may align with potential programming opportunities such as aqua aerobics and fitness. (e.g. off season early mornings and early evenings). A feature of the proposed lagoon that has been incorporated into the concept design stage is a snorkelling trail and there would be scope to do introductory courses in the lagoon for tourists prior to venturing out to snorkel on the Reef.

Allowance has been made in the budget to test the need and the community's support for such services to be delivered from the lagoon.

The expansion of the markets and introduction of other 'dry land' community events would be a positive initiative as it adds to the exposure of the lagoon parklands as a community destination. There is scope to licence personal trainers and exercise groups to operate from the lagoon parkland as this would be a popular way of encouraging greater awareness and use of the lagoon, particularly by locals.

7.2.2 STAFFING REQUIREMENTS

In keeping with the recommendations for Council management of the lagoon, a central pool of casual and part time lifeguards needs to be established with appropriate numbers being drawn from the Port Douglas catchment to ensure that enough qualified lifeguards are available to be rostered across 7 days a week. Under current arrangements this service would be contracted to SLSQ who would have to ensure sufficient staff are available. Current policy requires a minimum of two life guards to be on duty at any time and a staff to swimmer ratio of 1:75 persons in the water is recommended.

While rosters and strategic management planning would remain based out of Cairns Facilities Unit, there will be a need for a duty officer to be engaged to support the establishment and operational requirements of the Port Douglas Lagoon.

It is envisaged that up to 11 equivalent full time operational and security positions will be created if a lagoon is built.

It is recommended that like the Esplanade Lagoon, the kiosk rights be leased out to a private operator and the concession be allowed to retail food and beverage, swimwear, goggles etc. and possibly to hire out appropriate equipment (deck chairs, umbrellas, snorkelling gear etc.) to generate the level of business required to attract and retain a suitable lessee.

7.2.3 MARKETING STRATEGY REQUIREMENTS

The professional marketing of the lagoon and waterfront parklands will be essential to achieving the levels of attendance and use of the precinct to justify the capital investment required to construct a lagoon. The Esplanade Lagoon is considered an anchor destination that provides significant 'spin off' to the CBD and shops fronting the lagoon and the associated parkland.

The same strategy is driving the push for the Port Douglas lagoon and in the opinion of many local business operator spoken to during the community engagement stage, a lagoon and the overall waterfront parklands development will help re-invigorate "destination Port Douglas" or 'kick start' a new era of tourism driven prosperity.

Fundamentally, the lagoon, once built will need to be a destination facility and featured as a new facet of the Port Douglas destination and the attendant promotion of lifestyle and the naturally relaxed ambience the region has been known for.

Different strategies need to be delivered to maximise both residential and tourist visitation to the waterfront and lagoon precinct. These will need to target inbound tourists as well as "local" tourism. Activation strategies (such as events and free programs) should be considered to help promote the destination and encourage visitation.

Locals who do not have access to the larger pools associated with most of the resorts need to see the lagoon and parkland precinct as an open air 'community centre' with something for everyone including families, teenagers, fitness enthusiasts and the elderly.

From the perspective of tourists from outside the region, the lagoon design and operation needs to differentiate itself from what is already available in Cairns and this will be the core challenge for Council and the community itself. This can most likely be achieved by developing an event strategy that offers uniquely Port Douglas experiences that are anchored by the lagoon and waterfront parklands.

7.3 Economic Benefits Analysis

Cummings Economics were engaged to prepare an analysis of potential economic benefits accruing form the proposed lagoon development. This analysis was undertaken based on some early use projections, initial capital cost and operating cost estimates and the results of surveys and investigations undertaken for the study. It should be noted that the final estimates for operational cost, users and capital cost contained in the Feasibility report differ. This is due to the continued refinement of data and updated cost advice from CRC following a new budget year. These minor changes would not change the broad outcome of the economic analysis nor the overall assessment that there would be a significant benefit to GRP for the Douglas region as a result of the proposed lagoon.

7.3.1 BACKGROUND

The major background reference document is the Port Douglas Waterfront Master Plan: Economic Analysis, December 2008, prepared by Economic Associates for the Cairns Regional Council.

The report found a need for year round public bathing facilities sympathetic to the tropical environment and heritage value of the waterfront.

7.3.2 METHODOLOGY

Apart from general research, the Strategic Leisure Group carried out an online survey of businesses in the Port Douglas area with responses from 51 during February/March 2011, the results of which are in a separate report and were referred to in preparing this report.

Information from a survey of visitors by Strategic Leisure Group was also referred to.

Estimates of numbers of likely users is taken from the initial demand assessment prepared by the Strategic Leisure Group.

7.3.3 ECONOMIC BACKGROUND

The 2008 report provides a detailed description of the economy of the Port Douglas area and its key economic drivers. Over time, Port Douglas' historic role as a cargo port has disappeared. Tourism has come through as the major industry with remnant roles of the port in Dickson Inlet being:

- A base for 'reef fleet' operations including passenger ferries, diving, charter fishing and the like.
- Recreation boating for local regional population.
- Commercial fishing operations.
- Marine servicing and repair including slipways.

Apart from tourism accommodation and related facilities including restaurants and visitor oriented shopping aimed at clientele from outside the region staying overnight, Port Douglas acts as:

- A significant recreation, entertainment and shopping centre for the population in the immediate Mossman/Douglas area but also for visitors from within the Far North Queensland region.
- An attraction in its own right for visitors from outside Far North Queensland on day trips from accommodation elsewhere in the region, especially from Cairns and Cairns beaches including substantial bracketing with -
  - Visits to the reef from Port Douglas on Quicksilver and other tours.
  - Visits to Hartley's Creek Zoo, Mossman Gorge and the Daintree.

The foregoing activity supports a service sector of retailing, business and government services especially in the main town area, but also construction, and industrial type services located especially in the nearby Craiglea area.

Port Douglas' tourism expanded very strongly over the 1980's- 1990's but has been experiencing little growth since about 2005.

Port Douglas' tourism depends very heavily on the domestic tourism market and includes a heavy component of resort, holiday flat traffic and a significant return visitation.

International visitors attracted are predominantly from western overseas markets of UK, New Zealand, USA and Europe. Penetration of the Japanese market is low and seems to be mainly associated with the resort golf facilities. (Note: The Japanese market mainly stays in Cairns and tours to Green Island, Kuranda and to a lesser extent, the Tablelands/Innisfail. The Chinese market is very short stay and bases itself in Cairns.)

There is a UK/Europe backpacker element, but it is smaller than Cairns.

Estimated expenditure by overnight visitors in the Douglas area is of the order of $350 M a year. However, not all is in the Port Douglas area. On the basis of 80% being in Port Douglas, total is probably around $280 M for Port Douglas itself.

Available information indicates that day trippers to Douglas run at about 200,000 per annum. Recent per capita spending figures are not available but total accruing to the Douglas area is likely to be over $120 M. A large part of this accrues to the Daintree/Cape Tribulation area.

Almost certainly, addition of day tripper income would take the total tourism income for the Port Douglas area up over $300 M a year.

7.3.4 MEASURING ECONOMIC IMPACTS

Different Measures

There are a number of ways of evaluating the economic impact of a project.

Internal Cost/Benefit of the Project for the Council

The first is the normal accounting revenue and expenditure flows for the operating organisation. In this case, the enterprise will operate at an annual operating loss and not repay the capital invested. The following works through a cost of the project per likely user.

Public Benefit Cost

The second seeks to carry out a benefit cost analysis of the project as a public good. This is the main methodology used in assessing the worth of public investments by bodies like the Queensland Treasury and Infrastructure Australia.

Discounted flows of benefits and costs are rendered into a Net Present Value over a project period and compared to ascertain a benefit cost ratio.

In this case, there is a major problem in that unlike infrastructure like roads, where there are accepted measures available of resulting transport efficiencies generated in terms of vehicle operating costs and travel time savings, there is no acceptable dollar measure of the 'amenity' efficiencies of using the lagoon as a public good.

In this case however, there are significant measurable wider secondary benefits in terms of extending lengths of stay of visitors and encouraging additional visitation that will offset the costs. In addition, there are also possible 'catalytic' developmental benefits.

Economic Activity Generated

The third measure is impact on the level of economic activity through calculation of the impact on regional gross regional product and employment. A problem with this approach is that higher cost and less efficient projects will create a larger result than smaller projects and it is really necessary to compare the end result with what would have happened if Council had spent the money on some other project or service.

Parameters Used

In the following analysis, a project period of 30 years is used, values are all in 2010/11 prices, i.e. without inflation.

Infrastructure Australia works discount rates at 4%, 7% and 10%. Calculations in the following report are carried out at the 7% level.

7.3.5 INTERNAL COST BENEFIT OF THE PROJECT FOR THE COUNCIL

The following analysis is based on parameters:

Capital Cost ..... $14.200 M

Gross Operating Cost ..... $1.181 M

Operating Revenues..... $0.026 M

Net Operating Cost ..... $1.155 M

User Numbers ..... 70,000 – 140,000

Net Present Value (NPV) of Net Operating Cost of $1.155 M over a 30-year project period with discount rate of 7% comes to $14.3M.

Total project NPV is thus $28.5M. (Capital Cost $14.2 M plus NPV Net Operating Cost $14.3 M.)

This represents an annualised stream of total costs of $2.297 M composed of Net Operating cost of $1.115 M and $1.182 M being the annualised cost of a capital expenditure of $14.2 M over 30 years at 7% real.

Cost per user is thus estimated at:

User level	Cost per user
70,000	$32.80
140,000	$16.40

The Council is likely to benefit from the impact of secondary benefits of increased tourism activity on the economy. Ratio of Council operating revenues of about $280 M in 2009/10, to estimated Gross Regional Project (GRP) for the Council area of about $8 Bn, is 0.035 or 3.5%. As a rough approximation, the increase in GRP attributable to the swimming lagoon project could generate additional Council revenue of the order of at least $270,000 per annum. Because an increase in economic activity will generate demand for other Council services, only part of this could be justifiably regarded as reducing per user costs.

7.3.6 PUBLIC BENEFIT COST ANALYSIS

Direct Impacts

Direct costs are in the form of capital and net operating costs and are estimated in the previous section to have a Net Present Value (NPV) of $28.5 M.

Direct benefits to the community will be in the form of the 'amenity' this will provide to users. The following gives the 'amenity' value per user that would be needed for the project's direct benefits alone to equal the costs.

User level	Amenity value needed for benefits to match costs if no other benefits
70,000	$32.80
140,000	$16.40

Note: This equals the cost per user shown in the table in the preceding section.

It is difficult to see the 'amenity' value of the swimming lagoon being this high per user. For instance, it is unlikely that many individual users would value their 'amenity' at, and implicitly be prepared to pay, $32.80 for each use of the lagoon.

The following section however, identifies substantial secondary benefits.

Secondary Impacts

Experience in other areas indicate that the lagoon project is likely to have significant secondary impacts, especially through its use by visitors and the degree to which it can influence length of stays and help attract a higher level of visitation.

This will be particularly important in the case of Port Douglas because of its high visitor population compared with residential population.

However, assessing what the level of additional visitor numbers and length of stay is not easy.

Both the visitor survey and the survey of businesses addressed the question.

Some 79% of the visitors interviewed thought that the development of a swimming lagoon was important or somewhat important, especially during the summer months marine stinger season.

The survey of businesses asked them to estimate what percentage of their clientele they thought would use the lagoon. Some 78% nominated a percentage over 50% and the average of all was 59%.

Thus, there is a widespread belief that the lagoon is important for visitors and would be heavily used by visitors.

The belief in the business community is that this use will not just be by backpackers but heavily by families and indeed, some believe it will be used by almost all overnight visitors. Only a few mentioned day visitors and this seems to be mainly in the context of Cairns' residents on recreation day visits.

Some 59% of the visitors interviewed indicated that the existence of a lagoon would influence a decision to visit Port Douglas in the future and 78% said it would contribute to their recommending Port Douglas as a destination.

The business survey results indicate an overall belief that the lagoon would result in increases in visitors to Port Douglas of the order of 15 – 20%.

There is thus a widespread belief that the existence of the swimming lagoon would result in a significant increase in visitor numbers.

In addition, some 30% of visitors interviewed indicated availability of a lagoon would have extended their length of stay and these indicated an average of 2 days. This means that across this visitor sample, the average would have been an extension of stay by 0.6 days.

The results of the business survey calculate to a similar estimate that the increase in length of stay on average would be about 0.6 days.

In evaluating the preceding, it is necessary to recognise that about 40% of the visitors interviewed were day visitors from Cairns. It also needs to be recognised that businesses responding in Port Douglas have an interest in seeing the swimming lagoon proceed and figures might have been lower if responses had been received from all businesses.

Clearly, from the evidence available, it is important to add secondary benefits in this field of increased visitation as a result of the swimming lagoon development and longer lengths of stay.

However, it is not possible to be precise about actual level of increases that would occur. To gain some sense of implications for the economy and benefit cost analysis, the following estimates the impact of a range of outcomes in terms of increased visitor income generated and 'value added' impact to the Douglas economy.

Table 8: Calculation of Impact of Additional Visitor Numbers

Increase percent	Est visitor nights (1)	Increase in visitor nights	Avg (2) spending per visitor night	Total increase in expenditure	Est (3) increase in value added Douglas economy
1%	1,705,000	17,050	$190	$3.24 M	$1.94 M
5%	1,705,000	82,250	$190	$16.20 M	$9.70 M
10%	1,705,000	170,050	$190	$32.40 M	$19.44 M

Note:

(1) Taken as 80% of the 5-year average of 2,131,000 visitor nights in Douglas SLA.

(2) Latest published data by Tourism Research Australia (TRA) for average expenditure per visitor night for Douglas area. Average 3 years to 2007.

(3) The 'value added' multiplier for tourism for Far North Queensland region as a whole works out at about 0.95, ie. a $1 expenditure in tourism will result in initial value added and flow on value added of $0.95. The smaller Douglas area would have a lower figure and subject to further research a figure of 0.6 is used.

Table 9: Calculation of Impact of Additional Length of Stay

Increase days	Est visitor numbers (1)	Increase in visitor nights	Av (2) spending per visitor night	Total increase in expenditure	Est (3) increase in value added Douglas economy
0.1	290,000	29,000	$190	$5.51 M	$3.31 M
0.3	290,000	87,000	$190	$16.53 M	$9.92 M
0.6	290,000	174,000	$190	$33.06 M	$19.84 M

Note:

(1) Taken as 80% of the 5-year average of 362,000 visitor nights in Douglas SLA.

(2) See Note 2 previous table.

(3) See Note 3 previous table.

The following illustrates how the Net Present Value of the above benefit flows compare with NPV capital and operating costs over a 30-year project period with a discount rate of 7% real.

Table 10: NPV of Benefits Compared with NPV of Operating Costs

% increase in visitors	Annual benefit	Project cost supported	NPV capital project & operating cost	Benefit cost ratio
1%	$1.94 M	$24.07 M	$28.50 M	0.84
5%	$9.70 M	$120.35 M	$28.50 M	4.22
10%	$19.44 M	$240.70 M	$28.50 M	8.44
Av increase in length of stay				
0.1	$3.31 M	$41.07 M	$28.50 M	1.44
0.3	$9.92 M	$123.22 M	$28.50 M	4.32
0.6	$19.84 M	$246.42 M	$28.50 M	8.65

Note:

(1) A stream of benefits of $1 over a 30-year project period discounted at 7% pa. will have a net present value of $12.4.

(2) For a project to be regarded as viable, it needs to have a benefit cost ratio of at least 1.0, i.e. that the NPV benefits exceed the NPV of costs.

With actual capital cost plus NPV of operating cost at $28.5 M, it is clear that the secondary benefits of only a marginal impact on visitor numbers of 1.2% would be needed for the project to achieve a positive benefit cost ratio or an increase in average length of stay of only .07 days.

Feedback from the visitor and business surveys indicate an expectation of substantially more.

Developmental Benefits

The survey of businesses in Port Douglas indicated that the swimming lagoon project could provide a 'catalyst' to stimulate investment in a number of projects.

An increase in tourism flows and stays would result in a flow through of demand for accommodation and other facilities in the normal course of events.

The responses indicate that the highest 'catalytic' impact is likely to be on the marina, waterfront renewal and boardwalk development.

This was followed by private investments in sporting complexes and entertainment/performing arts facilities.

We have not been able to quantify these with any precision.

7.3.7 BENEFIT COST ANALYSIS

The foregoing indicates that the level of 'direct' benefits in terms of the value of amenity for users would need to be very high in the range of $16 to $33 per user to justify the project alone.

However, there are significant 'secondary' benefits likely in the form of increased visitor numbers and length of stay that in themselves would justify the project and the project seems likely to act as a catalyst for additional developmental benefits of private investment, especially associated with the marina, and indoor, low land usage sports facilities.

Given the combination of some 'amenity' values for users plus the likely secondary and developmental benefits, we believe the sum of benefits will prove to be definitely positive compared with the cost.

7.3.8 ECONOMIC ACTIVITY GENERATED

The construction phase will involve expenditure of $14.2 M. Based on the North Australia Research Group input output tables[20], this is likely to generate direct annual employment of the order of 40. Including value added flow on effects, total 'value added' to the regional economy is likely to be of the order of $13.3 M and total employment generated including flow on benefits is likely to be of the order of 150.

For the operating phase, the direct expenditure and employment generated is estimated as follows.

[20] Source: Calculated from North Australia Research Group, Input Output Modelling of the Regional Economies of Northern Queensland – Modified National Data Model – (Accommodation, cafes, etc. 17.2; Air transport 9.5; Recreation services 16.9). www.cummings.net.au/recentreleases.

Table 11: Estimate of Direct Expenditure & Employment

Direct	Est expenditure	Est employment
Council	$1.181 M	10
Est kiosk expenditure (1)	$0.300 M	1
Est other expenditure generated (1) related to the visit (e.g. fuel, purchases away from the kiosk)	$0.300 M	1
Total	**$1.781 M**	**12**

Note:

(1) Based on 100,000 at an average expenditure of $3 per visitor.

Impact on Far North Queensland Gross Regional Product and Employment from the above is estimated using the following multiplier ratios:

Table 12: Impact on FNQ Gross Regional Product & Employment

Item	Classification	Type 2 value added	Employment
Council	Community services	1.601	1.37
Kiosk & other purchases	Retail	1.165	**1.65**

Estimated total FNQ regional impact including flow on derived from the above is as follows.

Table 13: Est. Total FNQ Regional Impact

Item	Regional value added	Employment
Council	$1.89 M	14
Retail	$0.70 M	3
Total	$2.69 M	17

This is Far North Queensland regional impact and can be expected to be marginally higher than impact on Cairns Regional Council area and substantially higher than the impact on Douglas area only. Estimated impact, Douglas, is estimated at 0.6 of the regional figures at $2.3 M and employment 15.

Wider Impacts

The previous section estimated level of secondary impacts on the Douglas economy from increases in visitor numbers and length of stay in Port Douglas as a result of the project.

The following estimates are based on a 1% increase in visitors and a 0.1 days increase in length of stay.

Increase in Gross Regional Product

1% visitor number increase ..... $1.94 M

0.1 days increase in length of stay ..... $3.34 M

Total ..... $5.28 m

Estimated employment multiplier at a regional level for tourism including flow on impacts is about 16 jobs for each $1 M of expenditure[21] (1). This would translate into about 80 jobs at regional level and an estimated 50 jobs at Douglas SLA level (estimated at 0.6 of regional level).

Developmental impacts have not been estimated.

Table 14: Total impacts on GRP & Employment - Douglas

Item	GRP	Employment
Direct	$2.3 m	17
Wider	$5.3 m	50
Total	**$7.6 m**	**67**

It should be noted that these are order of magnitude estimates based on available information and ratios.

7.3.9 Analysis of Locations

The following provides comment in relation to the various locations from an economic impact point of view.

Direct 'amenity' of the different locations will depend a great deal on the 'ambience' created at the site. It is beyond the scope of an economic analysis to make any judgements on this except to record that 'ambience' created will not only be important in determining the level of usage, it will be important also for the level of secondary impact it has in attracting visitors to Port Douglas and extending length of stay.

In terms of access, impacts on additional spending away from the lagoon itself and catalytic effects, it would seem that the Dickson Inlet locations and especially location 4 south of St Mary's by the Sea and the Sugar Wharf would have the highest level of interaction with and influence on local businesses and activities and the highest beneficial effects. However, this is given that any loss of parking will be attended to, and user numbers are equivalent to other sites.

[21] Input Output Analysis & Modelling of the Regional Economies of Northern Queensland – North Australia Research Group modified National Data Model, September 2010. www.cummings.net.au/recentreleases.

7.4 Capital Cost Estimate

A capital cost estimate was prepared by Altus Page Kirkland based on the draft concept prepared for community consultation in March and April. (See Appendix 3 in the Location Assessment Report)

The estimated Capital Cost for construction of a lagoon in Location 4 and as proposed in the concept was $14.03 m. This figure is based on concept only and limited site investigations.

An escalation factor to identify a likely cost range is recommended of around 20%.

Estimated Construction Cost is $15 M - $20 M.

APPENDIX 1 – INITIAL CONSULTATION REPORT– PRELIMINARY INVESTIGATION

Stakeholder Engagement Overview

FRAMEWORK

Stage 1:

- Initial Meetings and discussions - Elected members, Government agencies and Council staff.
- Stakeholder workshops - Port Douglas Advisory Committee; industry representatives; user groups.

Stage 2:

- Workshop with Port Douglas Advisory Committee.
- Two focus groups with Industry groups and user groups.
- Resident survey.
- Visitors survey.
- School and Community Group Survey.
- Business survey.

Stage 3:

- Stakeholder meetings - elected members, Council staff
- Stakeholder Workshops - General community, Port Douglas Advisory Committee, Industry and User Groups.
- Public displays.
- Public comment period.

Initial Residents Survey

The survey of residents was conducted in two ways:

- Telephone survey
- Online survey

TELEPHONE SURVEY

A telephone survey of 200 households throughout the Port Douglas/ Mossman area was conducted between 24th January and 8th February 2011 b y Compass Research. The survey was carried out using a set questionnaire and included a random sample of households, structured to reflect an appropriate balance by gender, age and location in the area, of residents 18 years and over.

Respondent Characteristics

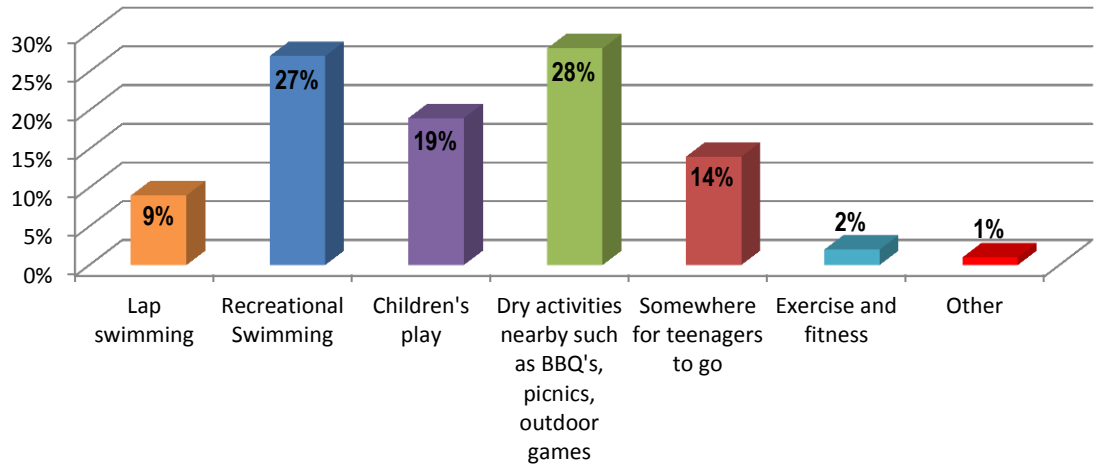
- 51% male; 49% female
- Age group most represented was 35-44yrs (25%); age group least represented 18-24yrs (6%)
- 30% of households had children aged 0-9yrs and 29% had children/young people aged 10-19yrs
- 47% of respondents live in Port Douglas/Craiglie/Mowbray/Killaloe areas; 53% of respondents live in Mossman/Cooya Beach, Newell, Wonga, Miallo, Wyambee, and Rocky Point areas.

Lagoon Activities

Respondents were asked *"What activities would your household be most likely to use the lagoon for"*. For those activities not mentioned, they were then asked *"Do you think your household would use the lagoon for any of the following?"*

The most popular response was 'Dry activities nearby' (28%) followed by 'recreational swimming' (27%). These were followed by 'children's play' (19%) and 'somewhere for teenagers to go' (14%).

Figure 11: Residents Telephone Survey: Activities households would use the lagoon for



Analysing a breakdown of responses by respondent characteristics (age, gender, household composition) shows a tendency for a higher proportion of females, those in the Port Douglas area, those with children and youths up to 19 years, young family age respondents (35-44 years) and those 18-24 years interviewed to say their household would use the lagoon.

Interestingly, 29% of the sample indicated they would not use the lagoon for any activities. This means that 71% said they would use the lagoon. Those most likely to use the lagoon were hose in the Port Douglas area, those with children and youths up to 19 years and main young family age respondents (35-44 years) and those 19-24 years.

Lagoon Design Elements

Respondents were asked how important a series of design elements are considering their household's use of the lagoon. Combining 'very important' and 'somewhat important' responses, the element considered most important was 'shade' (98%), followed by 'change and shower facilities" (95%) and 'water play features for children' (89%), 'beach style pool entry' (85%) and 'space for young people' (84%). The highest 'somewhat unimportant and unimportant' features were 'entry from beach', 'deep enough to dive into'; and 'long enough to allow lap swimming'.

When applying an overall average rating scale (very important +2, Important +1, Neither 0, Somewhat unimportant -1, and unimportant -2), the most popular design element is 'shade' with a score of 2.87 followed by 'water play features for children' (2.42), 'change and shower facilities' (2.56), 'beach style pool entry' (2.26), and 'space for young people' (2.12).

How a lagoon should look

There was a strong level of mentions of the Port Douglas lagoon being like Cairns, but also some mention of it being like Townsville, Southbank and at least one mention of Airlie Beach.

The dominant 'general' theme is that it be in keeping with surroundings and the environment, natural and tropical.

The first two 'features' most mentioned were 'catering for children, etc.' and 'shade'. Next most mentioned related to 'beach look/sand', 'landscaped/grass', and 'social area/picnic area/BBQ'.

A variety of depths is envisaged by those who mentioned this aspect, probably deeper and possibility of a number of interconnected pools was raised.

Ranking of Potential Lagoon Sites

Respondents were asked to rank each of the four locations under consideration for the lagoon. The locations being considered include:

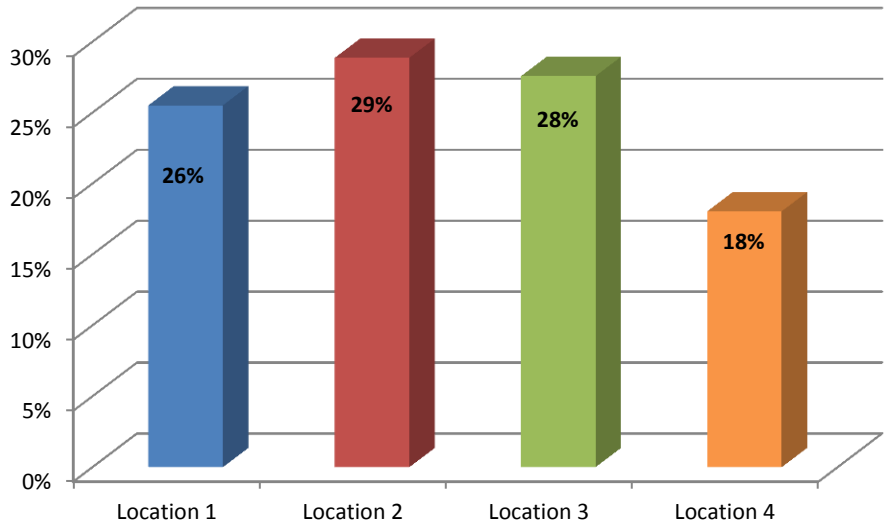
- Location 1: Adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area
- Location 2: Adjacent to the Surf Life Saving Club in Jalunbu Park
- Location 3: Adjacent to Rex Smeal Park within parkland between Rex Smeal Park and the markets
- Location 4: South of St Mary's by the Sea and the Sugar Wharf

The site with the most support was location 2: 'adjacent to the Surf Life Saving Club' followed by location 3: 'adjacent to Rex Smeal Park within parkland between Rex Smeal and the markets' and location 1: 'adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area'. The site with the lowest support was location 4: 'South of St Mary's by the Sea and the Sugar Wharf'.

Table 15: Residents Telephone Survey: Site Support

SITE	TOTAL SUPPORT (Strongly support + Support)	TOTAL DON'T SUPPORT (Do not support + Strongly do not support)	DON'T KNOW
Location 1: Adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area	49.5%	46.5%	4%
Location 2: Adjacent to the Surf Life Saving Club in Jalunbu Park	56.0%	40.5%	3.5%
Location 3: Adjacent to Rex Smeal Park within parkland between Rex Smeal Park and the markets	53.5%	44.5%	2.0%
Location 4: South of St Mary's by the Sea and the Sugar Wharf	35.0%	61.5%	3.5%

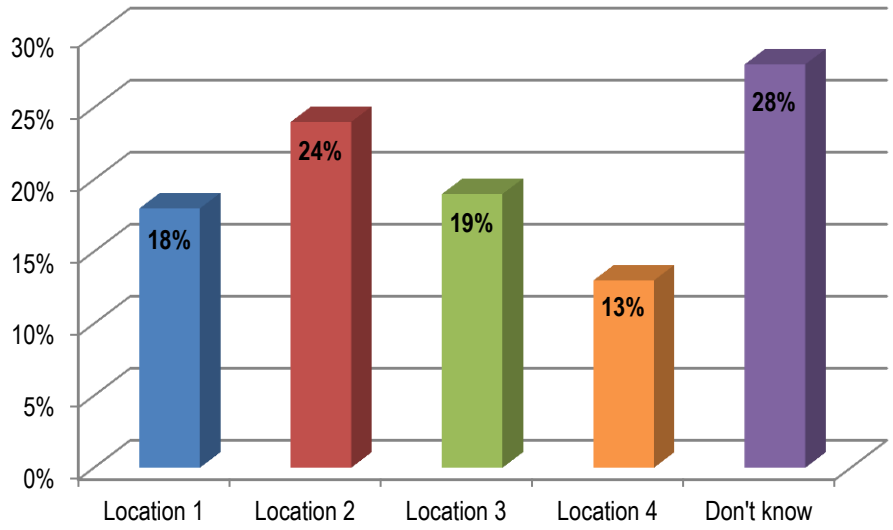
Figure 12: Residents Telephone Survey: Support for Sites: Percentage of respondents indicating 'strongly support' or 'support' for locations



Overall best location

When asked which option was the best option, 24% indicated location 2 was the best option, following by location 3 (19%), location 1 (18%), and location 4 (13%). About a quarter (28%) of respondents indicated no preference and none of the sites emerged with a majority preference. Location 2 is clearly the most favoured, but still only 24% of total respondents. Location 4 is clearly the least favoured.

Figure 13: Residents Telephone Survey: Best Location



Best Option by Residential Area

Preferences by area of residence show a division of opinion with Port Douglas area residents favouring the 'adjacent to Rex Smeal Park/ mangrove area' option and the other residential area residents favouring the 'Adjacent to the Surf Life Saving Club' location.

Table 16: Resident Telephone Survey" Best Location Option Responses by Residential Area

	Port Douglas Area	Mossman Cooya	Northern area
Location 1	24%	12%	14%
Location 2	20%	26%	28%
Location 3	15%	21%	24%
Location 4	14%	13%	7%

This leaves a question as to whether, if the alternatives were narrowed to one of the 'Adjacent to Rex Smeal Park' sites and 'Adjacent to the Surf Life Saving Club' site, which would be preferred.

Reasons for Site Support

Respondents were also asked to provide reasons for their level of support for each site. Reasons for opposition for each site are provided in the following points:

- Location 1: largely related to removal of mangroves with sub themes of worries about passing boat traffic and crocodiles
- Location 2: there is already a beach there and the site is located on the wrong side of town

- Location 3: largely relates to the loss of parkland area, too small and impact on the other activities e.g. markets, weddings etc.
- Location 4: relates to loss of par parking space.

The following provides a summary of reasons for level of support for each site.

Site 1 – Adjacent Rex Smeal Park – tidal mangrove area	No.
Support	
▪ Underutilised/better used/more useful	18
▪ General/good location/best/nice	15
▪ Accessible/central to town, markets	14
▪ Inlet location/view of water, beach/backdrop/watch b oats/link with waterfront development	14
▪ More natural/park area/away from everything/quiet charm	13
▪ More space/biggest area	4
▪ Plenty of parking	4
▪ Mangrove not a problem/will get rid of mozzies	4
▪ Sheltered	4
▪ Better than seeing markets/parking go	3
▪ Easiest/not as costly	2
▪ Good end Port Douglas	2
▪ Where last stinger pool	2
Negatives: Mangroves, crocodiles - 4, boat traffic/other - 8	12
Not Support	
▪ Mangroves	45
▪ Spoil natural/take heart away/nice now	11
▪ Negative for marine life/hydrology/environment/approval delay	11
▪ Leave alone/nice now/reduce parkland	8
▪ Insect nuisance/mangrove smell/not nice area/muddy water	6
▪ Crocodiles	4
▪ Boats in and out of mouth	3
▪ Cost reclaiming land	2
▪ Tidal pool/tidal flow	2
▪ Too far away	2
▪ Social/attitudes people in area/too close pubs	2
▪ Elsewhere better	2
▪ Other	**8**
Site 2 – Lifesavers	
Support	
▪ Near Lifesavers/security	24
▪ Close to beach/stinger net/children play sand	21
▪ Already swimming area with facilities/kiosks, etc/where locals go/adds to activities	21
▪ Big/open area/not used/not damaging other areas	11
▪ General good/best/better	11
▪ Allow year round swimming	7
▪ Fit in esplanade development/improve/keep down that end	7
▪ Close accommodation/good for tourists	5
▪ Access good/parking	5
▪ Close to main street	4
▪ Not interfere mangroves/markets	3

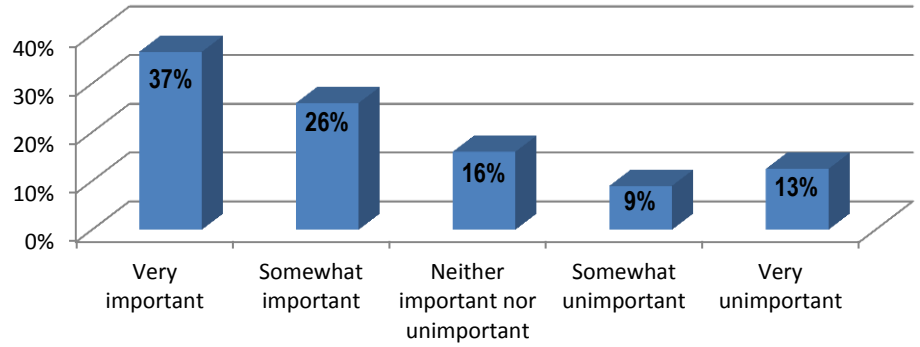
▪ Other	12
Negatives - Tidal surge, too exposed, crocs, not enough room/parking	6
Not Support	
▪ Already beach/facilities/stinger nets already there/4 mile already attraction/for beach swimming	28
▪ Not in main part of town/poor end of town/not convenient tourists	14
▪ Prefer elsewhere	11
▪ Not sheltered/tidal threat/cost to protect	7
▪ General not good	4
▪ Cross road to beach/not linked to sea	4
▪ Leave as is/already nice	3
▪ Other	**8**
Site 3 – Between Rex Smeal Park & Markets	
Support	
▪ Central to heart/accessible	12
▪ Good views/nice/green area	12
▪ Community meeting area/utilized functions/picnic area	11
▪ Ready to go/not encroaching/big space/no-man's land	11
▪ General good/better/best	10
▪ Preferable to other options	10
▪ Planned previously/stinger pool	4
▪ Sheltered/airflow/cool	3
▪ Near markets/attract people to activities	2
▪ Other	9
Not Support	
▪ Affects park	23
▪ Already busy/utilized/too close other things/weddings	19
▪ Encroaching markets	11
▪ Leave alone/too much destruction	7
▪ Needs to be on waterfront/water	5
▪ Not big enough/need to relocate police or museum	4
▪ Prefer other	4
▪ Parking problems	3
▪ Out of way	3
▪ Drainage problems/into river	2
▪ Mangroves, crocs	2
▪ Other	**5**
Site 4 – Car Park	
Support	
▪ As long as still car park/Car park needed	18
▪ Location, central, close to town, tourist precinct, more people there, utilized more	14
▪ Area needs fixing/ ugly/ crowded/ restore/needs to be made more natural/not well used at present	13
▪ Good outlook, views	5
▪ Protected location	3
▪ Close to water/inlet/little bay	3
▪ Easier access/access from boardwalk/already car park there	4
▪ What happens to Marina/Boat ramp	2
▪ Good area general/best option	10
▪ Others better	4
▪ Depends on how developed	2
▪ Keep park free/leave area alone	2

Not Support	
▪ Carpark needed/for ramp/for markets	69
▪ Already used, crowded, ugly, congested, building surrounding, dangerous busy season	10
▪ Boat ramp/slip/access to inlet	8
▪ Too close/affects St Marys by the Sea, markets, Marina development, sugar wharf	6
▪ Closer crocs and boats	5
▪ Out of way/too far from central	3
▪ Better elsewhere/Ocean side	5
▪ Delays/leases been extended, major upheaval, lot of development	4
▪ Leave parkland/natural/other	**3**

Importance of lagoon to household

Respondents were asked to indicate how important the lagoon is to their household. In total, 63% of respondents indicated it was 'very important' or 'somewhat important', while 22% indicated it was 'somewhat unimportant' or 'very unimportant'.

Figure 14: Residents Telephone Survey: Importance of lagoon to household

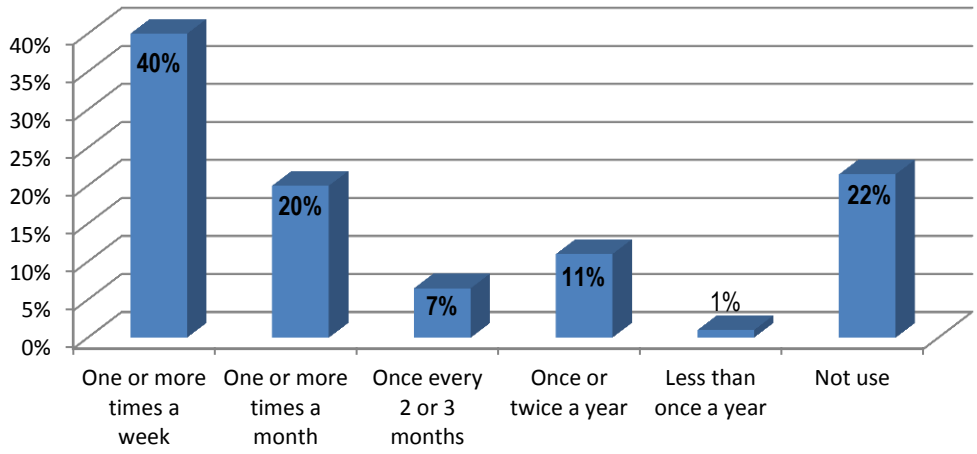


Use of lagoon

Respondents were asked if anyone from their household would use the lagoon. 74% of respondents indicated 'yes' and 19% indicated 'no' with a further 7% indicating 'maybe/ don't know'.

When questioned on their likely frequency of use, 60% of respondents indicated they would use the lagoon one or more times a month. 40% of respondents indicated they would use the lagoon one or more times a week. 22% indicated they would not use the lagoon at all.

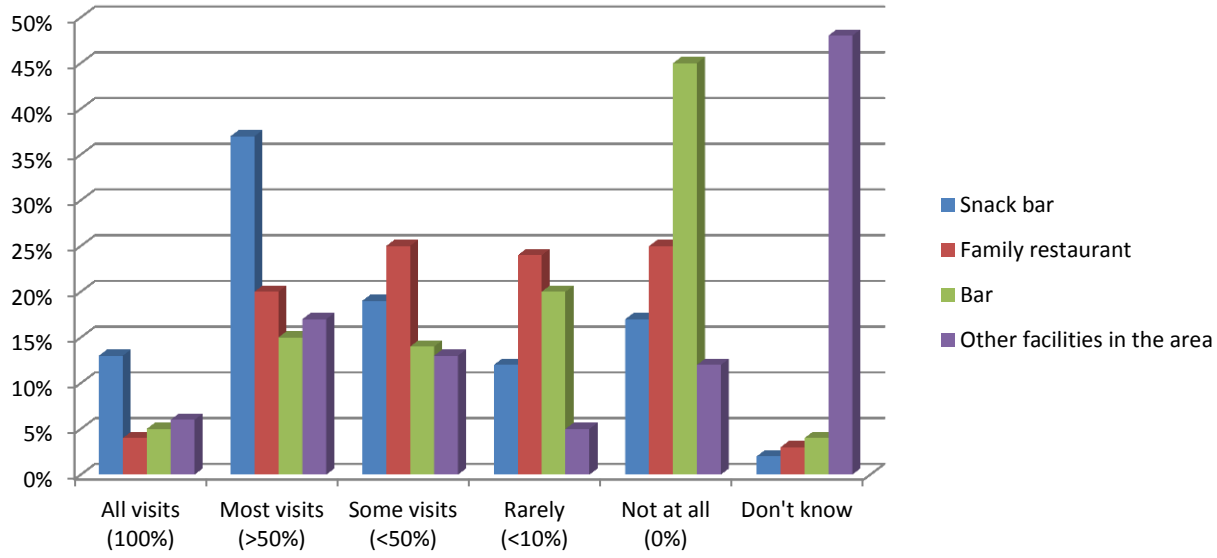
Figure 15: Residents Telephone Survey: Likely frequency of use



Use of nearby facilities

Respondents were asked if they were likely to use nearby facilities in conjunction with visits to the proposed lagoon. The highest ranking of the options was 'snack bar' with 50% of respondents indicating they would visit a nearby snack bar either 'all visits' (13%) or 'most visits' (37%).

Figure 16: Residents Telephone Survey: Frequency of use of nearby facilities



ONLINE SURVEY

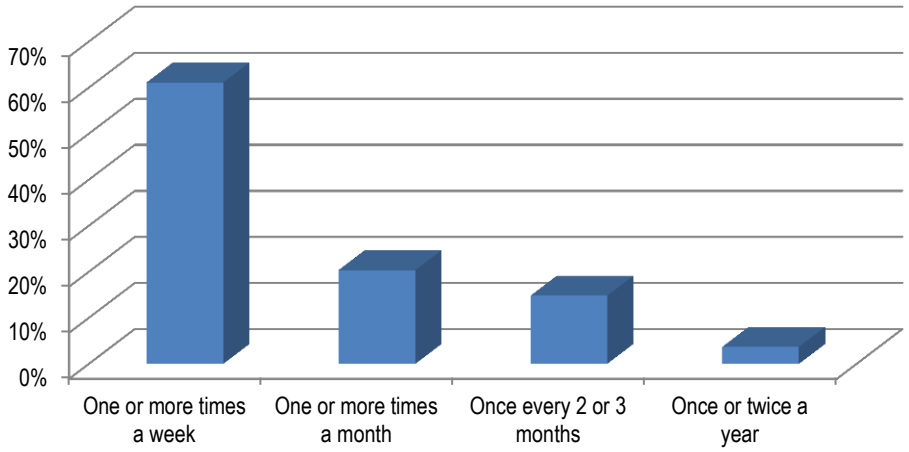
126 residents completed an online survey using the same set questionnaire as the telephone survey. The survey was promoted through local media, on Council's website, and through meetings and workshops.

Use of a lagoon in Port Douglas

Respondents were asked if they or anyone from their household would use a swimming lagoon in Port Douglas. 87% of residents indicated they would use a lagoon and 13% of residents indicated they wouldn't use a lagoon.

When asked how often respondents anticipate they or a member of their household would use a swimming lagoon, 61% of respondents indicated they would use a lagoon one or more times a week, and 20% indicated they would use a lagoon one or more times a month.

Figure 17: Residents Online Survey: Anticipated frequency of household use of lagoon in Port Douglas

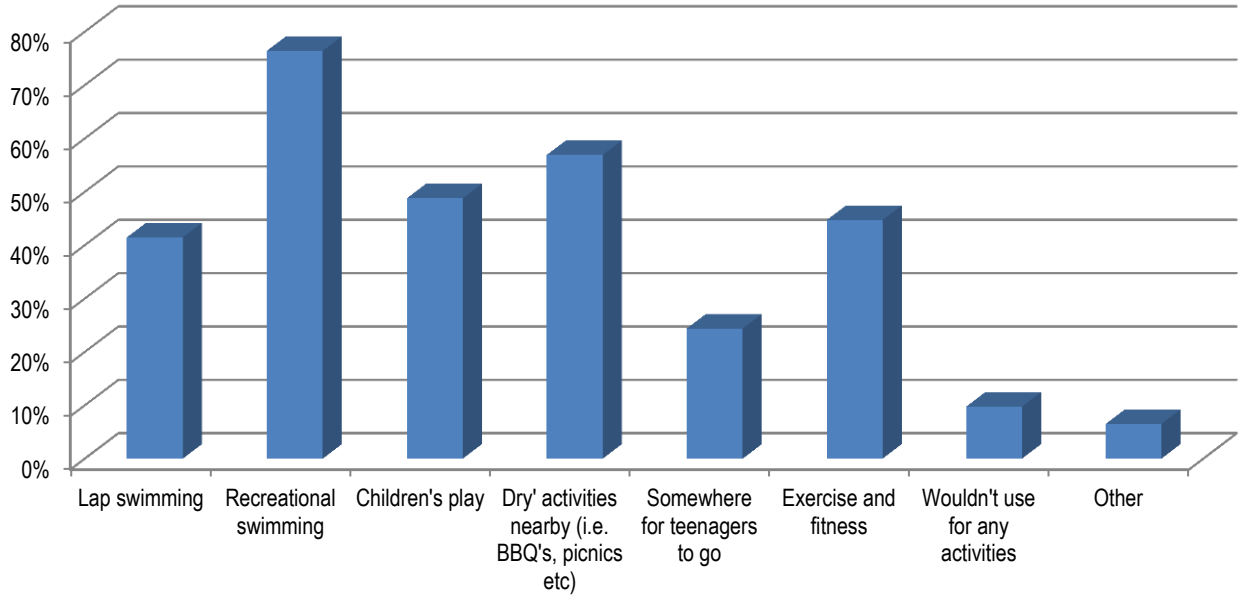


Lagoon Activities

Respondents were asked to indicate the activities which they or members of their household would use the lagoon for. Respondents were able to make multiple selections for this question, and as such, the results of the question can be analysed in two ways - by the number of total responses (frequency of response) and by the number of respondents that indicated they would use the lagoon for each activity (proportion of respondents).

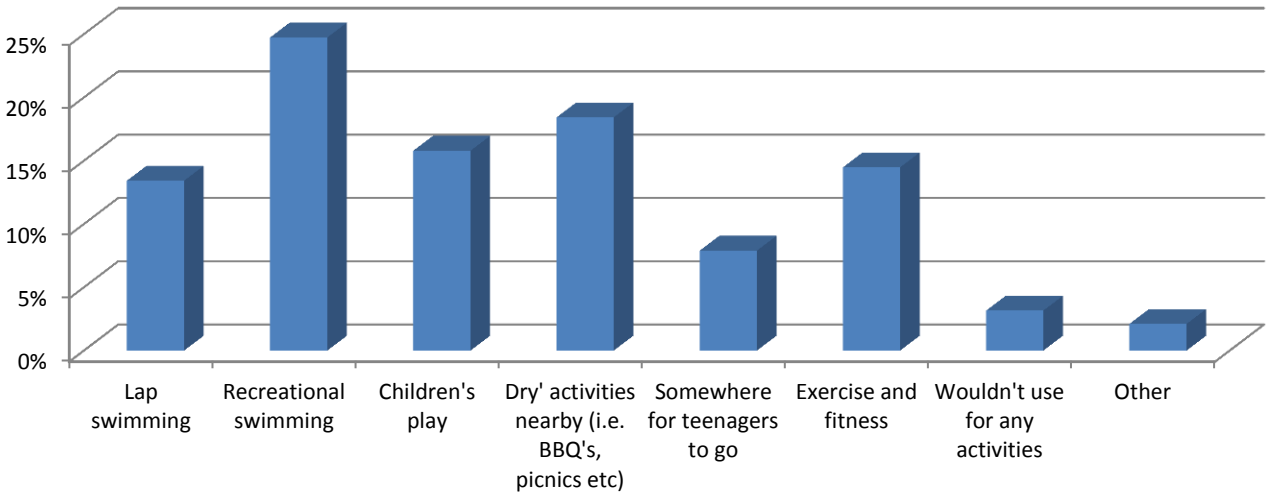
When considering the proportion of respondents that answered this question (123 respondents), 76% indicated they would use the lagoon for 'recreational swimming', 57% indicated 'dry activities nearby', 49% indicated 'children's play' and 45% for 'exercise and fitness'.

Figure 18: Residents Online Survey: Activities household would use lagoon for - by proportion of respondents



When considering the frequency of responses received for all activities, 25% of responses were 'recreational swimming, 18% of responses were for 'dry activities nearby', 16% for 'children's play', 14% for exercise and fitness' and 13% for 'lap swimming'.

Figure 19: Residents Online Survey: Activities household would use lagoon for - frequency of response



Both of these analyses show that the top three lagoon activities are 'recreational swimming', 'dry activities nearby' and 'children's play', followed by 'exercise and fitness' and 'lap swimming'.

How a lagoon should look

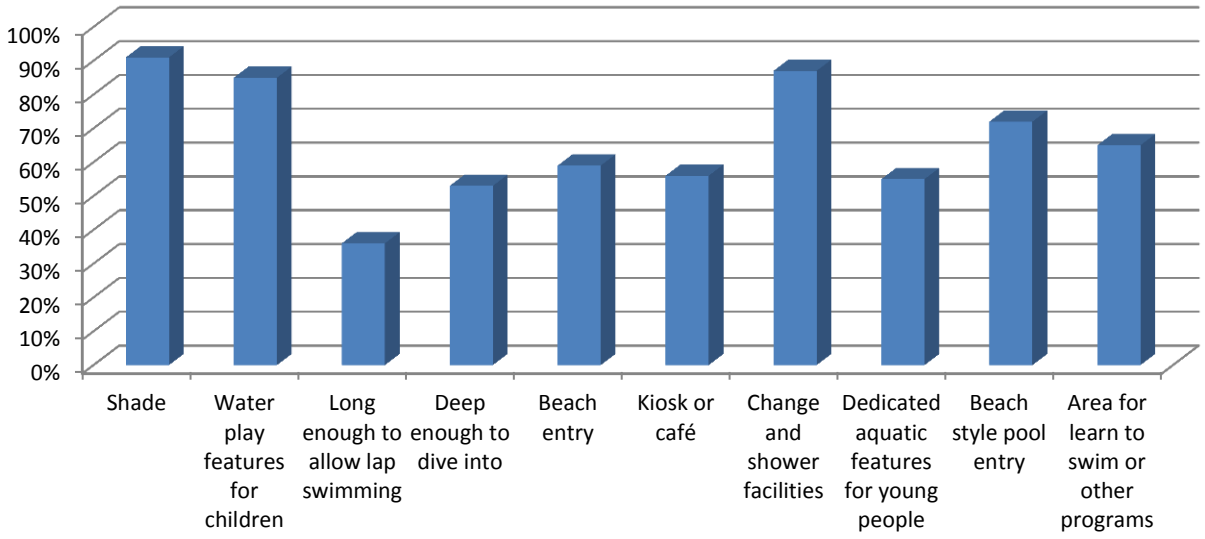
Respondents were asked an open-ended question about their thoughts on how a lagoon in Port Douglas should look. The most common response to this question was that the lagoon should look natural, and complement the existing environment and development in Port Douglas. Following this, was a desire for the lagoon to look similar to the Cairns lagoon. Other popular responses included provision for children's play, shade, and a spacious lagoon particularly for lap swimming.

Lagoon Design Elements

Respondents were asked to indicate the level of importance a series of design elements on a scale from unimportant to very important. The design element regarded as most important to respondents was 'shade' with 77% of respondents indicating 'Shade' is very important and a further 14% indicating 'shade' is somewhat important (combined 'very important' and 'somewhat important' 91%). Other important design elements include 'water play features for children' and 'change and shower facilities'. 'Beach style pool entry' and 'area for learn to swim or other programs' were also relatively important features to respondents.

The following figure provides each design element and the percentage of respondents that believed that feature was important for the design of the lagoon.

Figure 20: Residents Online Survey: Importance of lagoon design elements - percentage of respondents indicating very important/ somewhat important levels of importance.

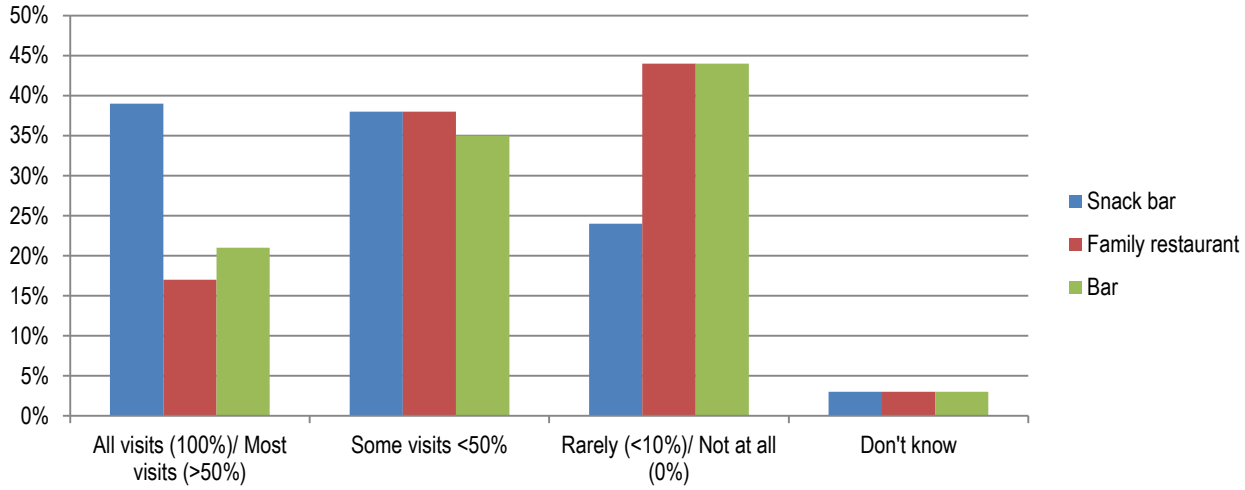


Use of nearby facilities

Respondents were asked to indicate whether they would use nearby facilities in association with visits to the lagoon. Four options were given - snack bar, family restaurant, bar and 'other'. 82% of respondents indicated they would use a nearby snack bar, 63% indicated they would use a nearby bar and 62% indicated they would use a nearby family restaurant.

Respondents were further asked how often they would use these nearby facilities. 39% of respondents indicated they would visit a nearby snack bar on most or all visits (more than 50% of visits) and 44% of respondents indicated they would rarely or not at all visit nearby family restaurants or bars (less than 10% of visits). The following figure demonstrates these results.

Figure 21: Residents Online Survey: Frequency of use of nearby businesses

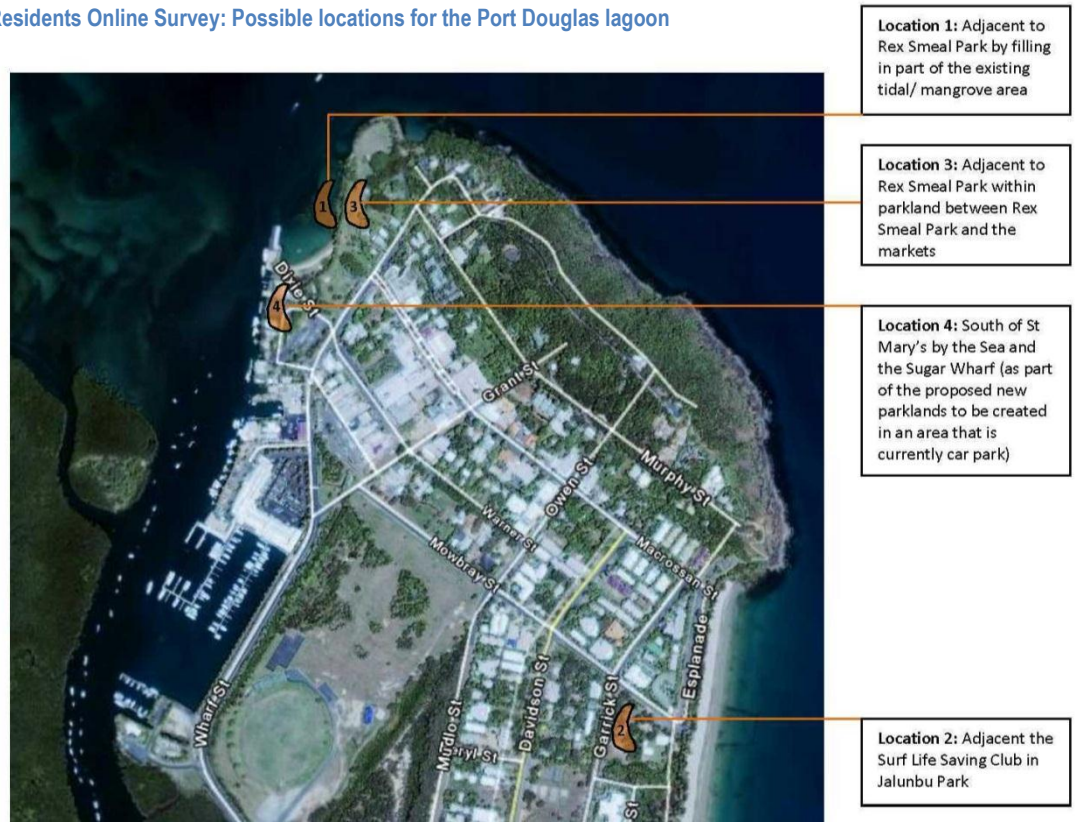


Support for proposed locations

Respondents were asked to indicate their level of support for each of four locations under consideration for the Port Douglas lagoon. The locations being considered include:

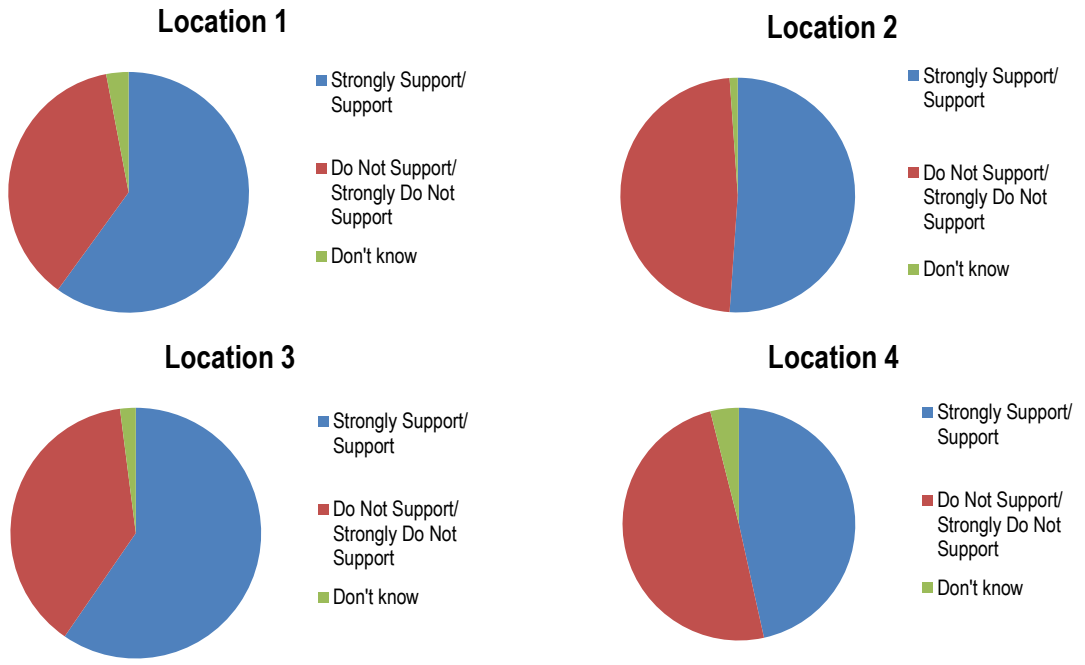
- Location 1: Adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area
- Location 2: Adjacent to the Surf Life Saving Club in Jalunbu Park
- Location 3: Adjacent to Rex Smeal Park within parkland between Rex Smeal Park and the markets
- Location 4: South of St Mary's by the Sea and the Sugar Wharf

Figure 22: Residents Online Survey: Possible locations for the Port Douglas lagoon



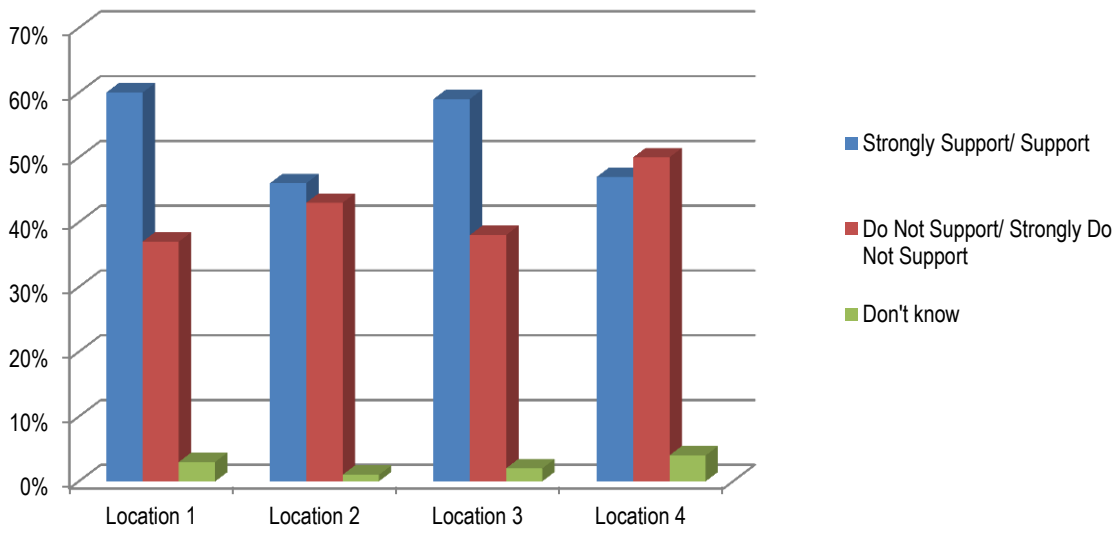
Location 1 received the highest number of 'strongly support' responses with 36% of respondents strongly supporting this site. Location 2 received the highest number of 'strongly do not support' responses with 38% of respondents strongly not supporting this site. The following images show the level of support for each individual site. From these figures, it is clear that locations 1 and 3 have the greatest level of support, and that locations 4 and 2 have the least support.

Figure 23: Residents Online Survey: Possible locations for Port Douglas lagoon - level of support for each site



When combining the results to show general levels of support, it is clear that locations 1 and 3 are the most supported options. Location 4 is clearly the least supported option, and further, it is the only option where the percentage of 'do not support/ strongly do not support' responses is higher than the 'strongly support/ support responses.

Figure 24: Residents Online Survey: Level of support for location options - categorised into support and do not support



Reasons for level of support

Respondents were asked to provide the reasons for their level of support for each of the locations under consideration. This was an open-ended question, and therefore responses have been groups where appropriate. The following table outlines the positive and negative key reasons for support/ lack of support for each proposed location.

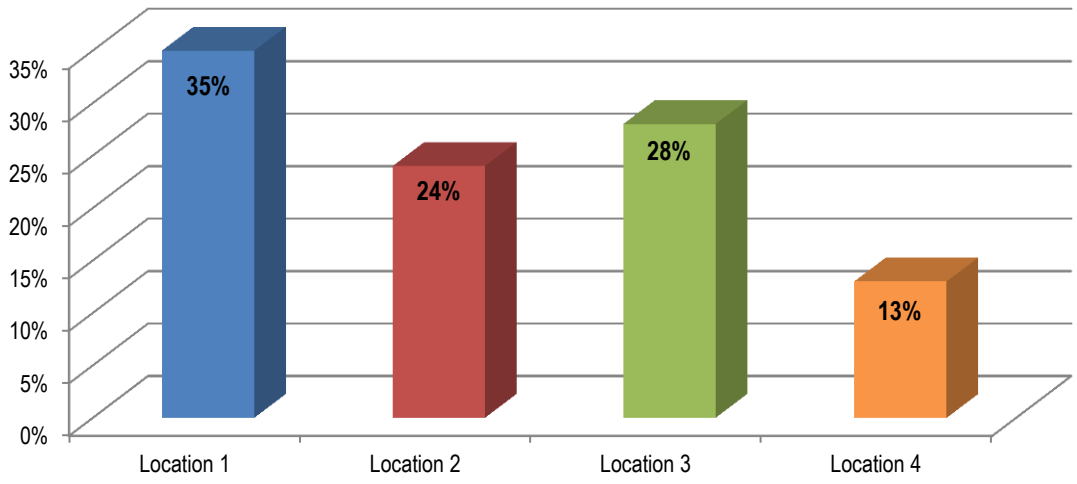
Table 17: Residents Online Survey: Reasons for level of location support

Site	Reasons - Positive	Reasons - Negative
Location 1	▪ Aesthetics/ views (26) ▪ Central location/ close to CBD (15)	▪ Negative environmental impact (23)
Location 2	▪ Close to beach (15) ▪ Surf Club/ Life savers are nearby (11)	▪ Not a central location (22)
Location 3	▪ Central location/ close to CBD (14)	▪ Loss of parkland (15)
Location 4	▪ Central location/ close to CBD	▪ Lack of ambience/ aesthetics/ views (12) ▪ Loss of car park/ car parking is needed (10) ▪ Negative impact on St Mary's by the Sea/ Sugar Wharf precinct (7)

Overall best location

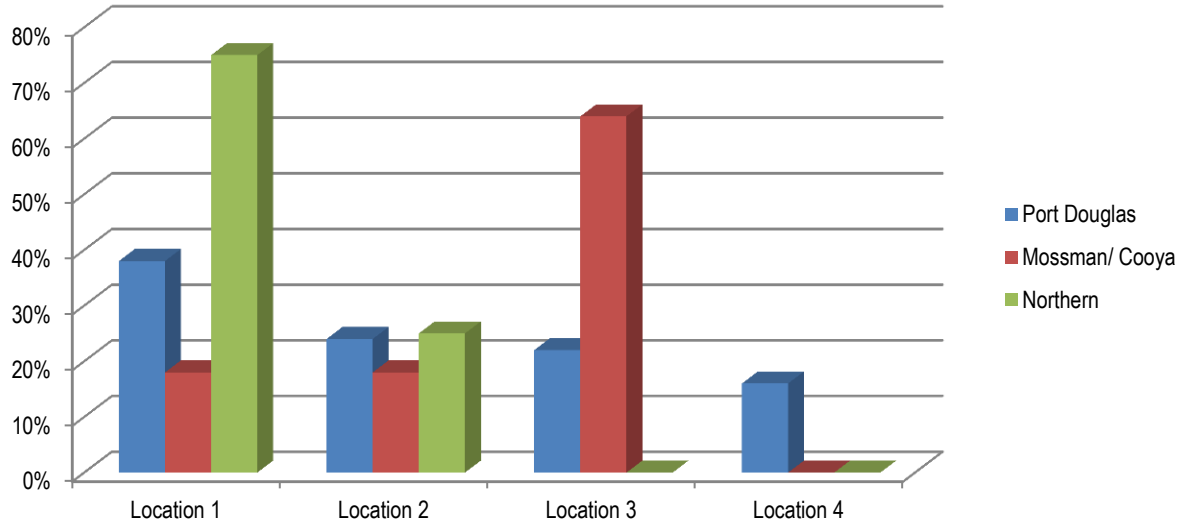
Respondents were asked to indicate which site was the overall best option. Overall, location 1 is the most favoured option, followed by location 3. Location 4 is the least favoured option.

Figure 25: Residents Online Survey: Overall Best Location



When investigating the best location responses provided by respondents from different localities, location 1 is considered the best location by the most number of Port Douglas[22] and Northern area[23] residents whilst location 3 is considered the best location by most Mossman area[24] residents. Location 4 is considered the best location by the least number of residents across all three areas.

Figure 26: Online resident survey: Best location by residential area



Visitor Survey

The visitor survey was conducted as an intercept survey at the Port Douglas markets, and was also available online. 49 surveys were completed.

Characteristics of respondents

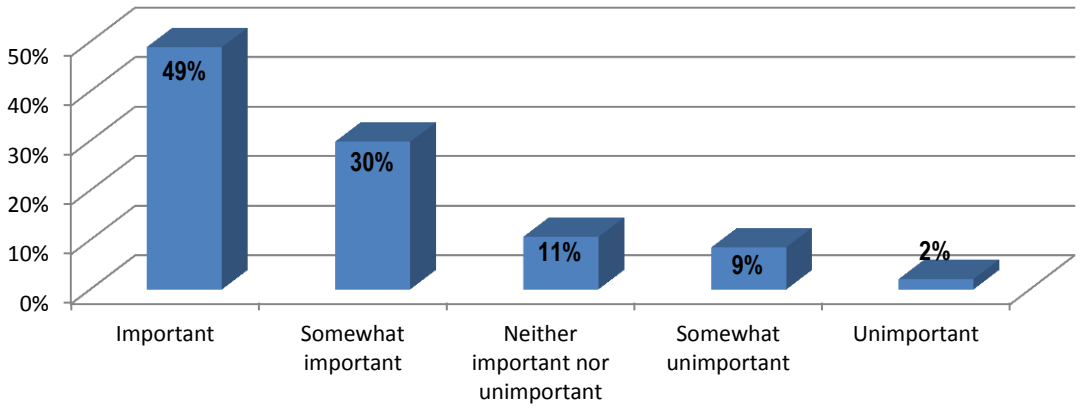
- Age: 31% of respondents were aged 60 years and over, with an additional 42% in the 40-59 year age group. Only 13% of respondents were under the age of 30.
- Travelling party: The average travelling party size was 3 people[25]; the largest age group represented in travelling parties was 50-59 years (28%), followed by 40-49 years (18%).
- Accommodation: 42% of respondents were day visitors to Port Douglas and of those staying in Port Douglas overnight, 24% were staying in a resort and 11% in a serviced apartment.
- Purpose of visit: 92% of respondents were in Port Douglas on holiday, while 8% were on business

[22] Port Douglas, Craiglie, Mowbray, Killakoe
[23] Newell, Wonga Beach, Miallo, Wyambee, Rocky Point
[24] Mossman, Cooya Beach
[25] This calculation excluded a particularly large group of 55 people. When including this large party, the average size was 4

Importance of a lagoon to tourism industry

Respondents were asked how important the provision of a swimming lagoon is the to tourism industry in the region. 79% of respondents indicated the lagoon was important or somewhat important and 11% of respondents believe the lagoon is either unimportant or somewhat unimportant.

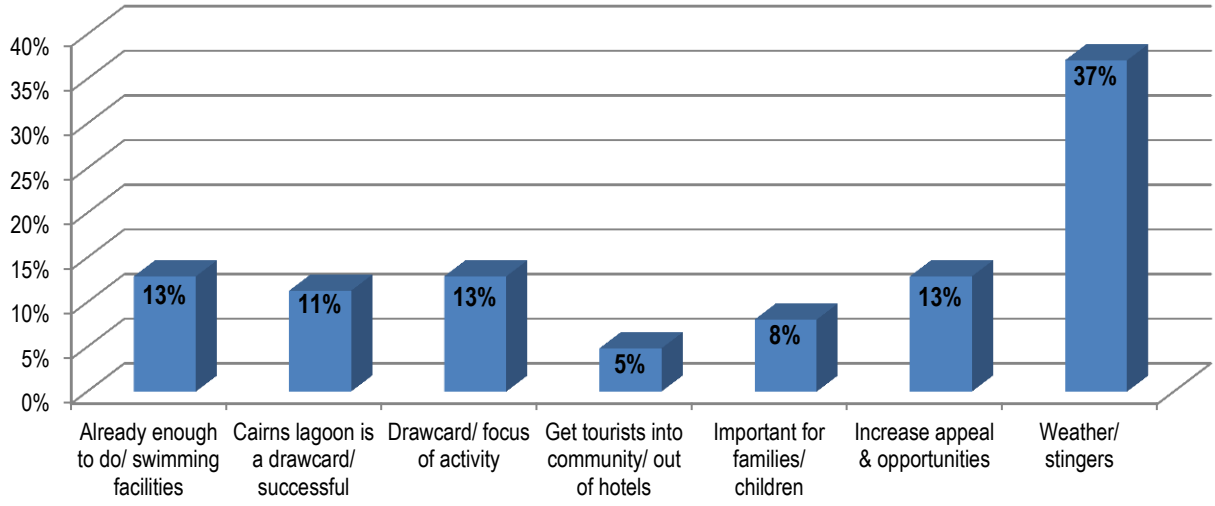
Figure 27: Visitors Survey: Importance of a lagoon to the region's tourism industry



Reason for level of importance

Respondents were asked to indicate reasons for why they believe the proposed lagoon is important/ not important. Most responses were relating to support for the lagoon. The most prominent reasons related to the presence of marine stingers and the region's weather. Other common responses related to the lagoon being a drawcard and focus of activity and also increasing the appeal of and opportunities in Port Douglas. The most prominent responses for not supporting a lagoon related to the existence of other swimming facilities and activities in Port Douglas.

Figure 28: Visitors Survey: Reasons for level of importance to tourism in the region



Activities most likely to use lagoon for

Respondents were asked to indicate what activities they would use the proposed swimming lagoon for. Respondents were able to nominate as many of the activities they liked. Recreational swimming was the most popular response, with 84% of respondents indicating they would use the lagoon for this activity. This was followed by 'dry' activities around the lagoon (71%), exercise and fitness (39%) and children's play (36%).

Impact of lagoon on length of stay

Respondents were asked whether or not the presence of a swimming lagoon in Port Douglas would have resulted in them staying longer in Port Douglas during their current visit. 70% of respondents indicated a lagoon would not have resulted in their current trip being extended, and 30% indicated it would have.

Of those that indicated that a lagoon would have resulted in their current trip being extended, when asked by how many days, and average of two additional days.

Impact of lagoon on future visits

Respondents were asked whether the presence of a swimming lagoon would contribute to a decision to visit Port Douglas again in the future. 59% of respondents indicated a lagoon would contribute to a decision to visit Port Douglas again in the future, 41% indicated it would not.

Impact of lagoon on recommending Port Douglas as a destination

Respondents were asked whether the presence of a swimming lagoon would contribute to the respondent recommending Port Douglas as a holiday destination to others. 78% indicated a lagoon would contribute to the respondent recommending Port Douglas as a holiday destination to others, 22% indicated it would not.

Support for proposed locations

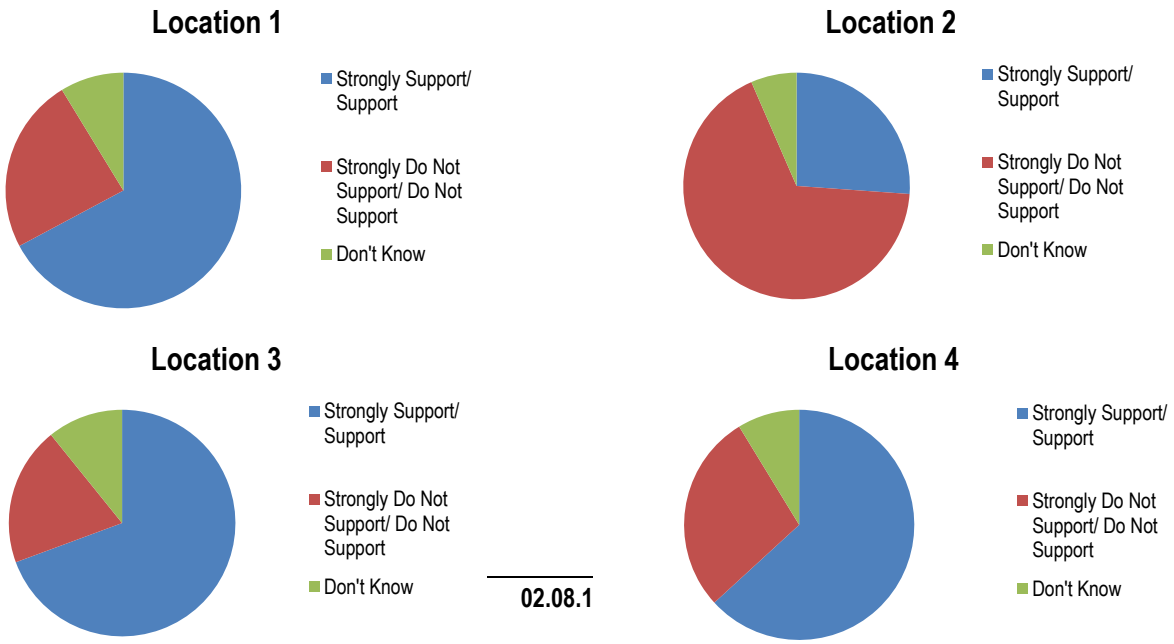
Respondents were asked to indicate their level of support for each of four locations under consideration for the Port Douglas lagoon. The locations being considered include:

- Location 1: Adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area
- Location 2: Adjacent to the Surf Life Saving Club in Jalunbu Park
- Location 3: Adjacent to Rex Smeal Park within parkland between Rex Smeal Park and the markets
- Location 4: South of St Mary's by the Sea and the Sugar Wharf

Figure 29: Visitors Survey: Possible locations for the Port Douglas lagoon

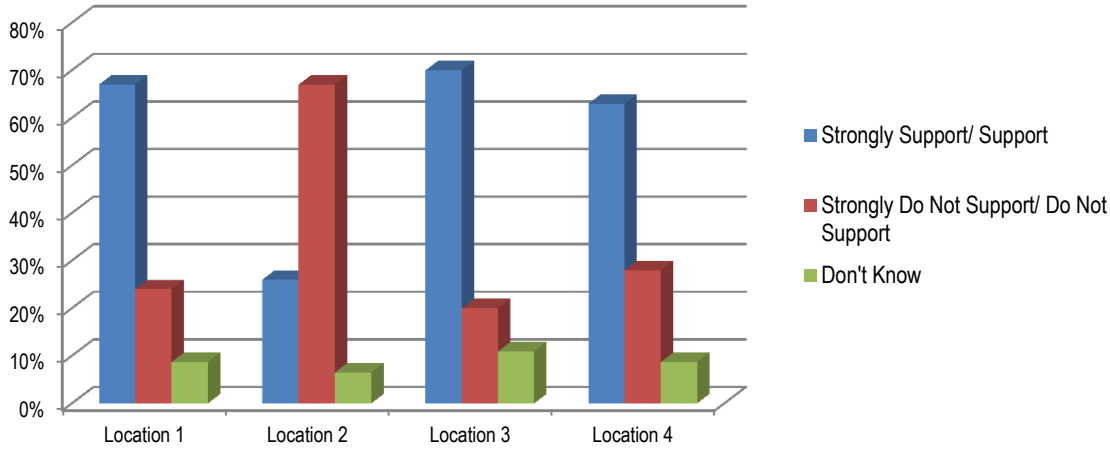
Location 3 received the highest number of 'strongly support' responses with 28% of respondents strongly supporting this site. Location 2 received the highest number of 'strongly do not support' responses with 35% of respondents strongly not supporting this site. The following images show the level of support for each individual site. From these figures, it is clear that locations 3, 1 and 4 have the greatest level of support, and that location 2 has the least support.

Figure 30: Visitors Survey: Possible locations for Port Douglas lagoon - level of support for each site



When combining the results to show general levels of support, it is clear that locations 3, 1 and 4 are the most supported options. Location 2 is clearly the least supported option, and further, it is the only option where the percentage of 'do not support/ strongly do not support' responses is higher than the 'strongly support/ support responses.

Figure 31: Visitors Survey: Level of support for location options - categorised into support and do not support



Reasons for location support

Respondents were asked to provide the reasons for their level of support for each of the locations under consideration. This was an open-ended question, and therefore responses have been grouped where appropriate.

The following table outlines the positive and negative key reasons for support/ lack of support for each proposed location. The most frequent responses relate to the 'central location' of Locations 1, 3 and 4 and 'not a central location' for location 2.

Table 18: Visitors Survey: Reasons for level of location support

Site	Reasons - Positive	Reasons - Negative
Location 1	▪ Central location (15) ▪ Views (8)	▪ Environmental concerns (5)
Location 2	▪ Close to beach (4)	▪ Not a central location (35)
Location 3	▪ Central location (18) ▪ Views (6)	▪ Too far from beach (2) ▪ Environmental concerns (2)
Location 4	▪ Central location (15)	▪ Impact on existing activities - marine, car parking, St Mary's by the Sea (5)

Other comments

Respondents were offered the opportunity to make any other comments regarding the proposed development of a swimming lagoon in Port Douglas. 24 respondents made additional comments. Comments were most frequently made along the lines of the following points:

- A swimming lagoon is important for families/ children
- A swimming lagoon is needed because of the local climate and stingers
- The provision of support facilities will be important
- Most resorts have pools already

Business Survey

As part of the feasibility assessment of the proposed Port Douglas Swimming Lagoon for Cairns Regional Council, a web based survey was sent out to approximately 200 businesses in the Port Douglas area. The following analyses and reports on the 51 responses received. It should be noted that while the sample represents a quarter of the total, it is not a random sample.

Sample Characteristics

Location of businesses:

49% of respondent businesses are located in the Main tourist & business area (Marina, Macrossan St through to Esplanade). 20% are located in Port Douglas away from main tourism & business area. Only 6% of respondent are located out of Port Douglas. 25% of all respondents declined to specify business location.

Category of Businesses:

37% of respondent businesses identify as 'accommodation' businesses and 26% are tourist services.

Clientele Usage

Businesses were asked to estimate what percentage of their visitor clientele they expected to use the swimming lagoon. The average response for the sample was 59%.

Businesses were further asked whether they thought their clientele would use various facilities located nearby and what proportion of the times they visited. Respondents indicated that a snack bar would be the most frequented facility.

Table 19: Business Survey: Use of Nearby Facilities by Clientele

	Proportion would use (a)	Proportion of visits (b)	Net usage (a) x (b)
Snack bar	96%	55%	53%
Family restaurant	71%	33%	23%
Bar	78%	41%	32%

Resident Usage

Businesses were asked to estimate how often they thought residents would use nearby facilities during trips to the swimming lagoon. Again, a snack bar was nominated as the facility type that would be most frequented.

Table 20: Business Survey: Use of Nearby Facilities by Residents

	Proportion would use (a)	Av proportion of visits (b)	Nett usage (a) x (b)
Snack bar	92%	53%	49%
Family restaurant	28%	28%	8%
Bar	82%	38%	31%

Impact on Visitor Numbers

Businesses were asked what impact they believed the lagoon would have on visitor numbers. 82% of respondent businesses indicated they believed the lagoon would have some impact on visitors.

Further, businesses were asked to indicate the impact of the lagoon on particular sectors. The highest rankings were 'Backpackers', 'All sectors' and 'Families'.

Respondents were asked to give their estimated per cent impact. The responses were analysed by sector with estimates of composition of families 30%, couples 30%, backpackers 15%, other 5%, not impacted 80%. Thus, if a respondent said that they thought Backpacker trade would grow by x%, this response was taken as applying to 15% of visitors to Port Douglas.

The analysis indicates that overall, the respondents believed that the lagoon would have an impact of increasing visitor numbers to Port Douglas by about 19%. It should be noted that this response was from 51 businesses. If those that didn't respond were scored at zero, the percentage increase would be 5%.

Impact on Length of Stay

Businesses were asked whether the swimming lagoon would influence length of stay, which sector, and average number of days.

Some 65% of respondents said they thought it would influence length of stay (cf Visitor Survey 30%).

The following sectors were mentioned.

All/or Backpackers, Families & Couples	18
Backpackers & Families	10
Families	4
Backpackers	4
Day trippers	1

Estimated increase in length of stay has been allocated to the sector. Thus, if someone said an extra 2 days for Backpackers, this was scored as 2 days x 15% i.e. 0.3 days. Overall average was 0.6 days which is very similar to the outcome of the Visitor Survey.

Catalyst for Other Projects

Businesses were asked whether they believed the lagoon would be the catalyst for other projects in Port Douglas. Some 49% indicated they thought the swimming lagoon would act as a catalyst for other projects in Port Douglas. Some 9 (18%) in effect indicated it would improve image, bring more visitors, create more retail trade, and general development.

Specific mentions were as follows:

Marina development	3
Waterfront renewal/Waterfront boardwalks/Boardwalks inlet and point	3
Sporting complex/mini golf/competitive beach volley ball court	3
Entertainment complex/performing arts	2
Walkways/bike paths	2
Resort/hotel development	2
Recreation improvements Four Mile Beach	1

Marine and waterfront development led followed by sporting and entertainment developments. Two mentioned resort and hotel development.

School & Community Group Survey

This online survey was completed by 9 organisations. A small sample size means the accuracy of the data is limited in terms of its reflection of schools and community groups is general, however it gives some indication of the level of support and types of anticipated uses. A summary of the results is provided below:

- The following schools/ community organisations completed this survey:
  - Mossman Junior Rugby League
  - Port Douglas Neighbourhood Centre
  - Julatten State School
  - Port Douglas State School
  - Port Douglas Academy of Performing Arts
  - Tropical North Family Day Care
  - Port Douglas Community Centre
- 8 of the 9 respondents indicated they would use a lagoon for student/ participant activities.
- 5 of the 9 respondents indicated they would use the lagoon one or more times a month (3 indicated they would use the lagoon one or more times a week)
- When asked how the lagoon should look, prominent responses included water play for children as well as natural looking/ natural elements.
- When asked to indicate the level of importance of specified design elements, 'shade', 'water play features', 'beach entry' and 'change and shower facilities' were regarded as important by all respondents. These elements were followed 'Area for learn to swim or other programs' and 'long enough to allow lap swimming' in their level of importance rating.
- Respondents were asked whether they would use the lagoon for a series of specified design elements, and 'Recreational swimming', 'children's play' and 'exercise and fitness' were the most common selected, followed by 'lap swimming' and 'dry activities nearby'.
- Respondents were asked to indicate whether their community group/ school would use nearby facilities in association with their visit to the lagoon. 50% indicated they would visit a nearby snack bar, while only 25% indicated they would use a nearby family restaurant, and 12.5% indicated they would use a bar.
- When further asked how often their community group/ school would use these facilities, only 29% indicated they would use a snack bar during most visits (>50% of visits), and 43% indicated they would use a family restaurant on some visits (<50% of visits).
- When questioned on level of support potential locations for the lagoon, Location 3 received the highest level of support, followed by Location 4. When specifically asked to indicate which location is the best option, location 3 was again the most popular with 5 of the 9 respondents nominating this location, followed by Location 1 (2

respondents), Location 2 (1 respondent). Location 4 was not selected by any respondents as the best location. [26]

- When asked to indicate how important the provision of a swimming lagoon is to the respondent school/ organisation, 7 of the 9 respondents indicated it was very important or somewhat important, while one respondents indicated it was very unimportant.
- Five of the respondent school/ organisations is located in Port Douglas, two in Mossman and one in Julatten.
- Six of the respondent organisations predominantly service 0-12 year olds, two predominantly service 13-18 year olds and one organisation each predominantly services 19-24, 25-59 and 60+ age groups.

Summary of Preliminary Survey Results

In order to get an idea of the overall results of surveying conducted, the following encapsulate the main points for consideration:

Anticipated use of a lagoon

The majority of residents indicated they are likely to use a swimming lagoon in Port Douglas. The majority of community groups/ schools indicated they would use a lagoon. The majority of visitors indicated the development of a swimming lagoon was important to Port Douglas.

More than two thirds of residents indicated they would use a swimming lagoon one or more times a month. Almost half of residents indicated they would use a lagoon one or more times a week.

The most popular types of use anticipated include recreational swimming, dry activities around the lagoon (e.g. BBQ's) and children's play.

Location and design of a lagoon

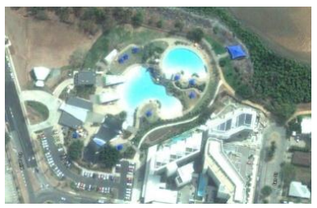
The most desired design characteristics include shade, children's play and shower and change facilities.

The most desired locations for the swimming lagoon are locations 1 and 3. The most prevalent reasons of support for location 1 included aesthetics/ views, followed by central location. The most prevalent reason given for support for location 3 was the central location.

The least favoured location is location 4, followed by location 2. The most prevalent reasons for lack of support for location 4 was a lack of ambiance/ aesthetics/ views, followed by loss of car park and the negative impact on the surrounding precinct (St Mary's by the Sea/ Sugar Wharf precinct).

[26] Location 1: Adjacent to Rex Smeal Park by filling in part of the existing tidal/mangrove area; Location 2: Adjacent to the Surf Life Saving Club in Jalunbu Park; Location 3: Adjacent to Rex Smeal Park within parkland between Rex Smeal Park and the markets; Location 4: South of St Mary's by the Sea and the Sugar Wharf

APPENDIX 2 SUMMARY OF BENCHMARKING RESULTS

QUESTION	CAIRNS ESPLANADE LAGOON	BLUEWATER LAGOON	AIRLIE BEACH LAGOON (DRAFT INFO- FULL DATA NOT RETURNED YET)	THE STRAND ROCKPOOL	LEANYER RECREATION PARK	SETTLEMENT COVE
Local Government/ Agency	Cairns Regional Council 	Mackay Regional Council 	Whitsunday Regional Council ▪ Built 2000. Approx cost 9 million 	Townsville City Council 	Owned by Northern Territory Government/ Managed by YMCA 	Moreton Bay Regional Council 
Area of water (m^2)	Surface 4800 m^2; Volume 3.85 mega litres	2,732m^2 with a total volume of 1,980m^3	4,300m^2; 4.5 Ml	Approx 4600 m2	Approx 2000 m2 plus waterslides	Approx. 3,000m2; Vol 1.5 Ml
Footprint of whole site (m^2)	▪ Total parklands approx. 4.1 hectares. ▪ Grassed areas approx. 3.5 hectares.	11,681m^2		16567		
On-site facilities	Three buildings adjacent to lagoon: ▪ Male and female change room facilities ▪ Disabled toilet, ▪ Parenting room, ▪ Kiosk, ▪ Police beat, ▪ First aid room, and ▪ Lagoon plant room (prohibited access to the public) Esplanade facilities and services: ▪ 20 Barbeques situated in 5 structures (free for public use), ▪ 5 shaded tables and seats, 10 tables and seats without cover, ▪ 6 public telephones, ▪ Coin operated lockers ▪ Bicycle racks ▪ Outdoor showers There is also a pay-for-use public carpark immediately adjacent to the facility, catering for around 380 vehicles.	▪ Amenities block - approx 5% ▪ Kiosk and Administration Block - approx 5% ▪ Barbecue facilities - approx 5%	▪ 10 toilets, 2 showers, ▪ Accessible toilets ▪ Infant change rooms, mens urinal, surrounding parklands landscaped and grassy areas ▪ Sandy beach areas and entry to lagoon ▪ 4 shaded picnic sites with tables and seats and 6 x BBQs ▪ Play grounds and play spaces both wet and dry ▪ Proximity to a wide range of retail facilities including tour booking outlets, coffee and snack bars, clothing retailers and other tourism related retailers and services. ▪ Proximity to the main "high street" of Airlie Beach	▪ Restaurant, ▪ Ladies and Gents and Disable Showers Toilet, open shower, ▪ Two Shelters. ▪ Four BBQs, ▪ Ten Picnic Settings, ▪ Two Park Seats, ▪ Fishing Jetty with filleting table, ▪ Four Rubbish Bins, ▪ Three Recycle Bins, ▪ Car Park ▪ Forty Six Parking Bays, ▪ KOMPAN Flying Fox. ▪ Five Way Swing, ▪ Combination Play System, ▪ Lookout Tower.	▪ 3 x water slides ▪ Beach entry pool ▪ Cascade pools ▪ Water playground ▪ Dry playground ▪ Skate park ▪ Kiosk ▪ Toilets x 2 ▪ BBQ facilities ▪ Management office ▪ First aid ▪ 50% of total site.	▪ 2x Amenities blocks ▪ 3x BBQ areas ▪ Food van on site over summer ▪ 20%

QUESTION	CAIRNS ESPLANADE LAGOON	BLUEWATER LAGOON	AIRLIE BEACH LAGOON (DRAFT INFO- FULL DATA NOT RETURNED YET)	THE STRAND ROCKPOOL	LEANYER RECREATION PARK	SETTLEMENT COVE
Type of construction and materials used in construction	Concrete shell on Pile base. Stainless steel reinforcing.	The pools are constructed with concrete (steel reinforcing), with Quartzon pool interior render on the surface. The render is slip resistant and complies with the Australian Standards.	▪ Concrete shell, beach entry	▪ Rock Wall Concrete Base		Concrete free form pool/ pebble Crete
Name of architect and manufacturer	Construction Project Management - GHD, subcontractors Seymour Whyte / Tract Architects / Stephenson & Associates Pool Water Treatment/ Cox Raynor architects for Buildings / DotDash signage / Lincoln Scott Electrical / McPherson, McLean, Wargon, Chapman Civil & Structural	Overseen by RCP (Resource Coordination Partnership) with Woollam Constructions building the facility. Others: EDAW, Opus Qantec McWilliam, Bassetts, Oceanis, Swimplex, and Rider Levett Bucknall.				
Type of pool e.g. source water, type of pumping/ chlorination etc	Sea water from Trinity Inlet, filtered through Four (4) x 9.8 tonne "medium rate sand filters". Salt water chlorination process. Fresh water makeup as required from town supply.	There are 3 'pools' and a children's water play area with a zero depth. The two main 'pools' operate on the one system, with the children's pool and water play operating separate. The design criteria is as follows:- ▪ Pool Surface Area: Lagoon Pools (2360m2); Children's (372m2) ▪ Water Volume: Lagoon Pools (1870m3); Children's (110m3) ▪ Turnover Rate: Lagoon 1.7hours avg ; children's 0.5hour avg ▪ Recirculation Rate: lagoon 1100m3/hour; children's 220m3/hour ▪ Process Treatment: Regenerative Pre-coat ▪ Primary Disinfection: Sodium Hypochlorite ▪ pH Control: primary CO_2 gas, ▪ pH Control – secondary hydrochloric acid ▪ Design Bather Load: lagoon 900 bathers; children's 150 bathers Regenerative media type filters are used, allowing all media to be used in the trapping of dirt particles before being backwashed out and re-charged with new media. Residual disinfection and pH control of the pool is achieved via injection into filtered water return piping. Acid dosing is by manual operation.	▪ Lagoon style pool with two main use areas : shallow children's pool to 1.5 m; deeper pool to 2 m . ▪ Inclusion of swimming lanes in larger pool. ▪ Town water, Salt conversion chlorine plus Anti Bio Electromagnetic sound frequency water treatment process, this reduces need for chemicals, in particular chlorine.	▪ Pumped, screened but not filtered Sea Water	▪ Beach entry chlorine pool. ▪ Chlorinated Water Play ground. ▪ Chlorinated waterslides x 3	▪ The facility, built circa 1993, was originally built as a 'fill and draw pool' where it operated by exchanging and refilling sea water. ▪ In 1995 the pool was upgraded and sand filtration and automated disinfection systems were added. ▪ Four G.R.P. high-rate sand filters where installed during this upgrade with associated water pump sets. Two 900 amp salt chlorination units where also installed to provide disinfection by means of electrolysis. ▪ The pool was again refurbished in 2003 which included the upgrading of the existing filtration and disinfection systems. The original four sand filters and two salt chlorination units were retained and additional four similar type sand filters and a smaller 600 amp salt chlorination unit was installed. An automated sodium hypochlorite (liquid chlorine) dosing system was also added to provide back-up disinfection for high bather loading periods. ▪ The pool shell was modified to include larger skimmer boxes and a balance tank. Four new pump sets replaced the original two along with a new automated mechanical services switchboard and disinfection control system. ▪
Estimated annual demand/ usage e.g. no. of visits	Around 1.4 million people attending programmed events and activities annually 130k swimmers use the Lagoon annually	Approximately 300,000 based on figures provided by Surf Life Saving Queensland.	Approx (up to) 10,000 visit precinct each week	Unknown		The Lagoon precinct is accessible to the public twenty four hours a day, seven days a week. The complex is extremely popular with all age groups and experiences particularly high visitation rates during the

QUESTION	CAIRNS ESPLANADE LAGOON	BLUEWATER LAGOON	AIRLIE BEACH LAGOON (DRAFT INFO- FULL DATA NOT RETURNED YET)	THE STRAND ROCKPOOL	LEANYER RECREATION PARK	SETTLEMENT COVE
	– avg length of stay at facility 2 hrs. 300k sunbathers using immediate surrounds annually. 500k people are recorded using the Promenade Boardwalk annually 600k people using the shared path annually					October to March period. Visitation levels are primarily dependant on the particular season, plus the prevailing weather conditions. During the warmer months of October to February daily attendances of 900-1500 persons are common with up to 500-600 persons present at any one time. Weekend visitation levels, particularly on Sundays during December and January, can increase significantly with fine weather conditions
Who are the main users?	Varies dependent upon national / international market . For first six years around 60% tourist / 40% local, currently around 30% tourist / 70% locals.	The community and tourists to the region.	Tourists and locals	General Public	Schools, groups, public	
Management arrangements (In house, contractor, lessee)	Managed in-house. Kiosk under commercial lease, contracted Lifeguard and security services. Some contracted cleaning services.	All services are contracted out, including Pool Plant Operations, Landscaping, Cleaning, Security, and Lifeguard Services. The Microbiological Water Testing is undertaken by the Mackay Regional Council Water Services Department.	▪ Lifeguards from 9am – 7pm during winter and 8am – 9pm during summer. ▪ Security after hours ▪ First Aid trained staff; ▪ 24-hour CCTV monitoring; ▪ Easy-to-understand signage/rules using universal symbols; ▪ Sensor-operated lighting on pathways that goes on and off at dusk/dawn. ▪ 24 hour security	In House	Contract management = YMCA of the Top End	Contracted Lifeguard Services. In house pool plant operators
Number of staff employed (not Lifeguards)	Permanent staff of 12, working on 4x4 shifts to give 24/7 staffing. This team assisted by grounds maintenance and general maintenance staff.	Only 1 full-time Council employee is on site, who is responsible for overseeing the contractors and the facility as a whole.	Council: ▪ Manger (1) ▪ Parks staff (3) ▪ Security – contract (2) ▪ Pool maint contract (1) ▪ Cleaning contract (1)	Does not have staff dedicated to it's maintenance, three staff drain and clean every Thursday. The rest of the maintenance is as needed.	12 Full Time Employees - 6 Casuals	2
Lifeguard Services (in house or contracted and Number of FTE's employed)	Contracted. Minimum of 2 lifeguards on duty at any time. Ratio of 1 lifeguard per 75 bathers, numbers of lifeguards increased as demand requires.	Contracted out to Surf Life Saving Queensland.	Contracted SLSQ 7 FTE	Contract, 1		Contracted- 12
Annual cost of operation	▪ Total costs around $2 million per annum but services extend to surrounding parklands. ▪ Lifeguard services cost around $320,00 per annum ▪ $200k on electricity per annum ▪ $50k spent on chemical annually.	Over $1,000,000.	▪ Total cost 1.244 M per year ▪ Lifeguards $335,238 ▪ Contract pool maint $107,556 ▪ Landscape maint $111,221 ▪ Security $157,198 ▪ Chemicals $133,420 ▪ More detail provided.	Between 80-100k without lifeguards		$500k +

QUESTION	CAIRNS ESPLANADE LAGOON	BLUEWATER LAGOON	AIRLIE BEACH LAGOON (DRAFT INFO- FULL DATA NOT RETURNED YET)	THE STRAND ROCKPOOL	LEANYER RECREATION PARK	SETTLEMENT COVE
Access arrangements (is there a fee for use, how is access restricted)	Free for use. Closed every Wednesday until midday. Access restricted by signage and security on site.	There is no fee for patrons, however, there are donation boxes at the facility. Access is not restricted to anyone.	Free unrestricted	Free open to the public no restricted access	Free facility	No fee for use open access all hours
Hours of operation	6am – 10pm summer / 7am – 9pm winter	9am - 6pm in the summer months and 9am - 5pm in the winter months.	Lifeguards from 9am – 7pm during winter and 8am – 9pm during summer Open 24 hours with security	24hrs lighting turned down at 10 pm	▪ Park 8am – 9pm, ▪ Pool 10am – 7pm, ▪ slides 3pm – 7pm	Lifeguards on site 8-6pm summer months
Months of operation	Year round	All year round, however, we have closed for a month in August previously to allow maintenance works to be carried out.	Year round	12 months	▪ All year round	12 months
Distance from commercial activity/ major retail precinct	Immediately adjacent to CBD.	Directly across the road from the major shopping centre, and classed as part of the CBD. It is also incorporated in the Bluewater Trail, a walking / biking / jogging track that stretches along the river and provides access to other parts of the city, including town beaches and the Botanic Gardens.	Over the road	2.5km to CBD 4.8km to Castletown Shopping Centre.	2km	500m
Is there a kiosk, cafe, restaurant. (who operates)	Kiosk under lease.	Yes, there is a kiosk on site which is leased out.	no		Kiosk run by YMCA of the Top End	Food van operates on a management agreement/lease
Income streams	▪ $90k per annum from weekly markets ▪ $50k per annum from private / community venue hire of parklands around lagoon ▪ $70k from commercial lease in Lagoon Amenities building.	The donation boxes, a percentage of the café takings, and a percentage of the locker (for patrons to store goods if required) takings.	Carparking fees $176,889 Rental of storage sheds $2,154		Unknown as only in operation 2 months	Nil
Total income	$210,000 per annum	Approximately $1,000 per month.	$179,043 p.a.		Unknown as only in operation 2 months	Nil
Month and year constructed	Opened March 2003	August 2008 was when it was opened to the public, however, construction commenced in September 2007	Opened January 2001			1993
Management issues	Inadequate initial staffing. Operational procedures not in place prior to opening.	In the beginning, there was no Council employee on site. This caused issues as far as contractors not being able to seek immediate guidance when required, and patrons not being able to report issues. Since a Duty Supervisor has been rostered on-site, these problems have been significantly alleviated.	Behaviour of some users at night, alcohol and safety,		Staffing, entry points for user control and estimations	Controlling the site access. Minimising the risk as site is accessible 24/7
Construction issues	Ongoing issues with render surfacing to Lagoon. Issues with all components manufactured out of steel – need to be	No issues aside from the weather causing hold-ups.	Capital upgrades 09/10 of $288,256 (pumps, filter media, chlorinator, amenities expansion)			-

QUESTION	CAIRNS ESPLANADE LAGOON	BLUEWATER LAGOON	AIRLIE BEACH LAGOON (DRAFT INFO- FULL DATA NOT RETURNED YET)	THE STRAND ROCKPOOL	LEANYER RECREATION PARK	SETTLEMENT COVE
	stainless or aluminium.					
Design improvements based on original development i.e. what to avoid?	Ability to section off public toilets / change rooms to allow for partial cleaning whilst pool in use.	The 'pools' were designed with accessibility in mind, however, several surfaces/walkways weren't wheelchair friendly. These have now been replaced with concrete. Walkways to the slide weren't by the most direct route, therefore children were walking through the gardens. A new walkway has been installed in addition to the previous one, providing the most direct route possible. Several balustrades have also been installed on some walkways, preventing children from accessing the foliage.			▪ One entry point. ▪ Ensure Buildings are positioned to ensure best view of facilities. ▪ Ensure appropriate staff facilities are considered.	-
Plans for future development	Nil at this stage	At present, there are no plans to further develop the Bluewater Lagoon site.			Cafe	Fencing options and chlorinator upgrades
What project risks should be considered	Rising sea levels. Water temperature and resultant requirement for disinfectant – water can reach as high as 32 degrees.	A large amount of the equipment suppliers are based oversees. The time constraints should be considered when ordering, thus avoiding unnecessary delays.				
Other comments that should be considered for the Port Douglas project.	▪ Appropriate staffing levels for high profile facility – staff on site 7 days per week. Staff accommodation on site (smoko rooms / lockers / shower / equipment storage). Cleaning of pool – needs daily cleaning, toilets three times per day. Cairns Lagoon is cleaned every night, but still requires detail daylight clean once per week. ▪ Local laws to enable regulation of areas around / in Pool. ▪ Shade for families is crucial. ▪ Sight lines / shade for lifeguards. ▪ Heavy vehicle access to plant room / balance tanks etc.	Our Lagoon is fenced, which is beneficial in many respects. Security is still based on site at night, however, the fence deters people from accessing the premises after hours. As the Lagoon is based in the CBD, the fence keeps out people who have been to the local nightspots, and also prevents young children from entering after hours, thus reducing the chances of drowning incidents.				Consider fencing and public access- 24/7 -

APPENDIX 3 – LITERATURE REVIEW

Cairns Regional Council Corporate Plan 2009 – 2014

Cairns Regional Council's Corporate Plan outlines the overall strategic direction for Council from 2009 - 2014. The **vision** articulated in the plan is as follows:

> ***We will be Australia's greenest region:*** *We will lead in natural resource and environmental management and support individual, practical actions to live sustainably.*
>
> ***We will grow and embrace distinctive and vibrant communities:*** *We value the individuality and character of our rural and urban communities and seek to maintain our relaxed tropical lifestyle. We will work with our diverse community groups to flourish together and plan our communities, suburbs, neighbourhoods and town centres to be attractive places for us to live, work and for tourists to visit.*
>
> ***We will be creative:*** *We encourage and support creativity in all its forms. We undertake this by creating opportunities, new jobs and innovative ways of delivering services or by enriching our communities through art, music, sport, celebrations and festivals.*

The Plan identifies a number of goals. Each of these goals have subsequent objectives followed by a number of key projects, services and actions. The following outlines those with particular relevance to the development of a swimming lagoon in Port Douglas.

Table 21: Summary of Cairns Regional Council Corporate Plan 2009-2014

GOALS	OBJECTIVES	KEY PROJECTS, SERVICES + ACTIONS
Caring for the environment *To ensure that the natural and built environments are managed and protected in a sustainable manner*	Deliver more environmentally sustainable Council operations and facilities.	▪ Manage development in important environmental areas. ▪ Develop and implement sustainability guidelines specific to the construction of new and renewed Council assets and facilities.
Building Vibrant Communities *To build more creative, innovative and self reliant communities where participation in community life is enabled and encouraged.*	▪ Improve the quality and opportunities for use of public space across the region. ▪ Deliver equitable provision of a diverse range of sport and recreation opportunities.	▪ Commence implementation of the Port Douglas Waterfront Master Plan.
Delivering Integrated Planning *To take an integrated planning approach to development that creates a sustainable region reflective of our uniqueness and tropical lifestyle.*	▪ Implement an integrated approach to planning by Council and stakeholders. ▪ Deliver integrated provision of physical and social infrastructure in existing and future parts of the region.	-

GOALS	OBJECTIVES	KEY PROJECTS, SERVICES + ACTIONS
	▪ Promote good urban design outcomes which are responsive to the region's tropical environment and unique character.	
Delivering Services and Infrastructure *To plan, deliver and maintain the region's infrastructure such as roads, drainage and flood mitigation and provide a sustainable high quality water supply to meet current and future needs of the community.*	-	-
Creating a Prosperous Region *To increase the region's capacity for long-term economic growth by supporting opportunities for local businesses and local employment.*	▪ Consolidate and strengthen existing and emerging regional industries.	▪ Strengthen Council's support for economic development including tourism and economic diversification
Striving for Organisational Excellence *To ensure that Council is open, accountable, ethical and financially responsible. Recognise that Council plays a leadership role for our immediate communities and for the wider region and will strive to represent our community's needs and expectations.*	▪ Collect, interpret, manage and capture data and information to inform good decision making. ▪ Be innovative and work in collaboration with key stakeholders, suppliers, partners and in collaboration with Council Boards and Reference Groups.	▪ Benchmark service provision against other Councils.

Port Douglas Waterfront Master Plan (Sept 2009)

The Port Douglas Waterfront Master Plan (WMP) was commissioned by the Cairns Regional Council to foster a more planned approach to development and to contribute to a sustainable future for Port Douglas.

The key objectives of the study were to:

- Document the results of an intensive analysis and interactive community consultation process.
- Set out a vision for a revitalised waterfront that is the civic and economic heart of Port Douglas and to leverage this to encourage wider investment in the town.
- Protect and enhance the environmental attributes and credentials of the town.
- Provide a flexible framework, expressed through several key strategies and scenarios that will assist the Council and community in managing change.
- Return access to the waterfront of the town to residents and visitors.
- Retain key aspects of the working and heritage character of the waterfront by integrating existing maritime activity with new open space and tourism uses.

Nine guiding principles were developed to underpin decisions made during the WMP design process:

11. Acknowledge the importance of sustainability which needs to underpin all aspects of Port Douglas, the success of Port Douglas lies in its commitment to: *Protecting and preserving the natural environment, including the mangroves and marine park; Setting high level sustainability goals in line with the Shire's carbon neutrality policy; Achieving broadly based social sustainability that balances the needs of the business community with key supporting community components such as housing affordability; and Economic sustainability.*
12. Provide a green heart for the town centre from the market area (and St Mary's) to Rex Smeal Park, where the community can gather to celebrate, commemorate and enjoy the uninterrupted vista. Ensure open space areas are usable and celebrate the tropical climate by: *enhancing open space with appropriate landscaping; Retaining mature trees; Providing appropriate facilities and amenities; Improving accessibility; Improving maintenance; Continuing to host a range of outdoor community events and activities; Working with authorities to ensure high levels of safety and security.*
13. Make the waterfront the heard of Port Douglas – a place to be visited, a place that is visually accessible and appealing from both land and water, and an active part of daily life, through: *Improve public access to the waterfront for activities; Maintain a working waterfront with a range of commercial activities; Maintain and promote activities and businesses; Plan for tourism trails; Effectively manage the interaction of public and business activities in the waterfront area; Provide a range of facilities and activities for all; and Ongoing maintenance of existing facilities and infrastructure.*
14. Reflect the tropical, relaxed and unhurried character of Port Douglas in the way people move around the town on foot, in the architecture and in the nature of low scale commercial activities through: *Improved pedestrian access to the waterfront and surrounds; Improvements to road network and parking; Built form to reflect and respect heritage and character of local area, achieves quality and innovative design and sustainability; and Commercial activities that reflect the heritage and character of the local area.*
15. Ensure planning for Port Douglas considers: *The importance of tourism to the local economy acknowledging its seasonal nature; and Supports the growth of diverse industries that are independent of tourism.*
16. Acknowledge the importance of safety for the Port Douglas community – planning needs to ensure that crime and other safety issues are minimised wherever possible through application of Crime Through Environmental Design (CPTED) principles.
17. Ensure any development in the area comprising the waterfront and surrounds: *Complies with the statutory planning framework; Is sympathetic to the local context in terms of height, scale, mass and character; Delivers high levels of design and innovation that meet sustainability objectives; Meets appropriate geotechnical design standards and sustainability criteria; and Respects and enhances local amenity through built form design that increases public access to the waterfront, improves the streetscape through landscaping and provision of setbacks, provides increased visual interest and appeal, incorporates new community facilities.*

18. Thoroughly explore a range of options as part of the master plan process including a 'no development' option for the waterfront and test the social, environmental and economic implications for this for the future of Port Douglas and the Shire.
19. Acknowledge, preserve and reflect the Indigenous and non-Indigenous heritage of Port Douglas through: *Preservation, enhancement and where appropriate reuse, of iconic buildings including the Old Courthouse, Sugar Wharf, St Mary's, Combined Clubs and where appropriate removal of existing buildings from the waterfront; Preservation of items and sites of Indigenous significance including Magazine Island; and Facilities, cultural activities and celebrations that reflect the heritage and character of Port Douglas.*

The WMP present the following **vision** for the Port Douglas waterfront:

> *The waterfront of Port Douglas will be sensitively and incrementally transformed into an exemplar of waterfront design. Improved access, opportunities for economic development and investment, and an extension of the already strong environmental and community values of the town will characterise the experience of the waterfront in the future. A unique blend of maritime activities, tourism opportunities, preservation, sensitive development, and green open space will come together to reinforce the role of Port Douglas as a world class destination and act as a stage set for the rich interplay of local community life.*

Six key themes were identified in the WMP which describe the areas of focus for the master plan:

1. Access
2. Land use and economics
3. Environment and sustainability
4. Physical character
5. Public realm and streetscape
6. Phasing and implementation

Further, a number of key elements were identified as 'defining features' for the master plan:

- Protection and enhancement
- A walkable waterfront
- A new gateway
- A quayside public plaza
- A reshaped quay line
- Increased public mooring
- A transition of heights
- Marina Mirage redevelopment
- Swimming lagoon
- New uses for the Sugar Wharf
- A mobility hub
- Island Point Road lookout
- A sustainable market
- Extended tourism opportunities
- A community sports precinct
- A revitalised Macrossan Street
- Tropical streetscapes

An Enquiry By Design (EBD) workshop produced the following main elements of the master plan:

- **Minimal change to Rex Smeal Park** with the aim of retaining the attractive and relaxed atmosphere of this key green space.
- Within the **waterfront park area, vegetation is to be preserved** and solutions to providing footpaths, access ways and supporting market activity should be as non intrusive, sustainable, and natural as possible.
- Provision of a nearly continuous (with the exception of the existing slipway operational area) accessible waterfront walk and maintenance of berthing areas along the water's edge
- The Indigenous and non-Indigenous heritage of the waterfront should be recognised, enhanced and protected.
- **A pool investigation area to be located in the waterfront parkland area near the markets with an alternative area of investigation in proximity to the surf club**.
- The incremental grading of development heights along the waterfront, moving progressively from a "natural" parkland setting in the north to three story buildings in the area around Marina Mirage.
- The transition and relocation of marine industry from the core of the waterfront over time - with light uses remaining in the north around the current slipway and heavier uses moving further south in the Marano lease area.
- Promoting green design and infrastructure options including the use of wetlands and detention to deal with storm water.
- Extending the community and cultural precinct. Improving visual and pedestrian connections between key destinations (such as Macrossan Street and Marina Mirage) and the waterfront.
- Retention and enhancement of vegetation throughout the study area.
- Consolidated transport and parking solutions that minimise the visual impact of the car and improve the sense of arrival for visitors to the town.

Figure 32: Port Douglas Waterfront Master Plan - Detailed Illustrative Plan

Figure 33: Port Douglas Waterfront Master Plan - Ultimate Illustrative Plan

Environmental Constraints Assessment for Port Douglas Waterfront Master Plan (Aug 2008)

The Environmental Constraints Assessment for the Port Douglas Waterfront Master Plan (the assessment) provides a preliminary assessment of environmental constraints and opportunities in relation to the Port Douglas Waterfront.

The assessment investigates the environmental values of the study area, discusses the physical environment and hazards, presents an overview of consultation results with environmental agencies, provides a gap analysis, and finally a series on conclusions about the environmental constraints and opportunities for the Port Douglas Waterfront. The conclusions of the assessment are provided in the table below:

Table 22: Environmental Constraints Assessment for Port Douglas Waterfront Master Plan - Conclusions

Marine Conservation	The Study Area's proximity to marine and estuarine areas of high conservation significance, as well as the town being a departure point for tours of the Wet Tropics and Great Barrier Reef World Heritage Areas, calls for a sensitive approach to development and careful management of potentially polluting activities.
Local Biodiversity	New information has been obtained based on a survey of native vegetation in the Master Plan Study Area, and its values (see Attachment). Much of this vegetation is within local reserves. The values need to be carefully conserved and where possible enhanced by any Master Plan outcomes. Further attention should be given to environmental weeds, stormwater runoff and other management issues. There are also opportunities for interpretative (nature) trails, eg. in the reserve west of Mudlo Street (Lot 97 on CP896321).
Dickson Inlet Mangroves and Channel	A significant issue to emerge from this preliminary environmental assessment is the need to conserve the mangroves along Dickson Inlet to the south of the Mirage and Closehaven marinas. Their retention is warranted to maintain the productivity of the ecosystem which supports fisheries and other marine life and to avoid sediment movement that could lead to a need for increased dredging of the channel.
Sustainability Measures	Sustainability is a key emphasis in the adopted Guiding Principles for the Master Plan and would help enhance Port Douglas' reputation as an ecotourism destination. Practical sustainability measures need to be identified and incorporated in the design process.
Stormwater Management	Flood mitigation options in the Stormwater Management Plan for Port Douglas (DHI 2006b) may need adapting to address multiple objectives including enhancement of habitat and amenity values and orderly planning in the waterfront environs. This warrants further examination, both from an environmental and general planning perspective, to ensure timely and holistic consideration in the design phase.
Climate Change and Coastal Hazards	Coastal hazard issues identified in this report also need to be addressed, especially if new, expanded and/or intensified urban uses will be placed in areas subject to storm surge impacts. A risk-based assessment of climate change adaptation options in the whole Cairns Regional Council area has commenced. It is important to note that the economic functioning of the historic port and town is

	critically dependent on facilities that are necessarily or optimally located on land subject to storm surges. This cannot be undone, but equally there is a need to increase resilience to extreme events.
Environmental Management Plan	An overall environmental management plan for the port and its environs and operations is desirable.
Potential Need for further assessment	The Master Plan process may generate a need for further environmental assessments. It is important to review this potential need at key stages. This can be based on the following framework and the gap analysis a) Scoping of the main issues and identification/mapping of environmental factors, values and risks (an aim of this report); b) Strategic assessment to inform the conceptual design phase (also an aim of this report but there is a need to incorporate other technical findings and studies); c) Further more specific assessments after the planned Enquiry by Design – perhaps concurrent with preparation of the Master Plan or even later, as required; d) Project-specific assessments if and when required – for example, as a precursor to detailed design of public works.

Port Douglas Waterfront Master Plan: Indigenous Cultural Heritage Assessment (2009)

This study was commissioned by the Cairns Regional Council to provide an assessment of Indigenous cultural heritage of the Port Douglas Waterfront. The report evaluates and verifies previous study findings and identifies opportunities for increased attention on Indigenous cultural heritage of the area. The recommendations to result from this assessment include:

- The Cairns Regional Council should use its Indigenous Advisory Committee to ensure ongoing engagement and discussion with the relevant local Indigenous communities. The Indigenous Advisory Committee should ensure representatives from the Kuku Yalanji, Irikanji and Jabugai peoples are including in their involvement with the ongoing master plan activities.
- Cairns Regional Council should acknowledge the Indigenous community connection with Port Douglas. Future Master Planning should ensure that local Indigenous communities can maintain access to the port Douglas Waterfront area, and have the opportunity to walk their country.
- Proposed major developments or impacts to areas that have minor disturbance within the Port Douglas Waterfront area should include a provision for a cultural survey or assessment, to be carried out by representatives of the local Indigenous Communities as per the Queensland Duty of Care Guidelines for the Aboriginal Cultural Heritage Act 2003. Where necessary, monitoring of groundbreaking activities should be undertaken by community representatives.

- The Dickson Inlet, Doyle's Creek and Magazine Island mangroves are a significant cultural environment and as such, should be retained and conserved as an intact natural environment. The Port Douglas Master Plan should acknowledge this significance.
- Rex Smeal Park contains areas of cultural significance to Indigenous communities and as such, development in the area should consider retention of culturally significant mango tree plantings.
- Interpretation and signage recognising Port Douglas' Indigenous history and the connection of the Kuku Yalanji, Irikanji and Jabugai peoples to the area should be established. Interpretation and signage should be developed in close consultation and negotiation with representatives of the local Indigenous communities.

APPENDIX 4 – PEER REVIEW OF LOCATION ASSESSMENT BY FCG

FLANAGAN CONSULTING GROUP
DEVELOPMENT CONSULTANTS • MANAGERS • ENGINEERS • PLANNERS

CELEBRATING 20 YEARS in 2011

Our Ref: 3078-01
L-PF4044 – REV 1

30 May 2011

Strategic Leisure
PO Box 857
SMITHFIELD QLD 4878

Attention: Martin Lambert

Dear Martin

PORT DOUGLAS LAGOON
REVIEW OF LOCATION ASSESSMENT

Further to your request we have undertaken a review of the Location Assessment Report for the Port Douglas Lagoon. Our review has been undertaken with specific reference to the environmental and engineering aspects.

Overview of the assessment

The site assessment used involved a "forced ranking" of the 4 alternate sites against 8 Factors with each factor containing a varying number of criteria. The analysis "ranked" each site by assessing the best site as 4 and the worst site as 1. The aggregation of the "rankings" across the 28 criteria was used to determine the preferred site. The use of an aggregation may have resulted in reinforcement of the difference between the sites - due to the differing number of criteria under each Factor.

Consideration of ranking based on my review of factors and the relative performance of each site against those factors reveals the following;

Factor (no of criteria)	Site 1 Filling Tidal Zone		Site 2 Jalunbu Park		Site 3 Rex Smeal south		Site 4 South of Sugar Wharf	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Access (3)	6	3	5	4	7	2	11	**1**
Environmental Impact (5)	8	4	15	**1**	12	3	13	2
Design (4)	10	2	9	3	8	4	12	**1**
Site Impacts(4)	5	4	10	2	8	3	15	**1**
Social (3)	8	2	9	**1**	7	3	5	4
Economic Benefits (3)	9	2	3	4	9	2	11	**1**
Construction(4)	4	4	10	2	8	3	12	**1**
Geotech Report (2)	2	4	8	**1**	4	3	6	2
Total Score	54		69		64		85	
Average Rank		3.13		2.25		2.88		**1.63**

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The use of forced ranking scores to rank the sites under each factor does not change the outcome of the assessment however it does reduce the relative difference between the competing sites.

Similarly the use of relative scoring where the best site is scored 4 with the others scored relative to their performance against the criteria would not change the result of the assessment but may indicate that the relative differences between the sites is less explicit.

An alternate consideration would be to apply “high level filters” to determine feasible sites prior to further more detailed consideration of the feasible sites.

Environmental impact or likelihood of approval can be such a high level filter.

It is noted that Site 1 ranked lowest on the following Factors/Criteria:

Environmental Impact
- Coastal
- Vegetation
- Heritage
- Adjacent Land Use
- St Mary’s BTS

Site Impact
- Space available
- Fill levels – Height Impacts
- Vegetation Loss
- Construction impacts on adjacent

Construction
- Approvals and Planning Costs
- Building Cost
- Construction time
- Service infrastructure impacts

Geotech Report
- Groundwater
- Other

For the majority of these criteria the “relative” performance against the criteria has not been reflected in the forced ranking scoring and consequently the relative difference between the sites under some factors may have been overstated in the location analysis, but the result would not change.

Notwithstanding this Site 1 is distinctly different from the other 3 possible locations due to its potential for impacts on coastal processes and marine plants. It is likely that the Queensland Coastal Plan and Draft SPP Coastal Protection (SPP) will be in force by the time that the project would be required to be assessed and approved.

Given that development of a Lagoon at Site 1 will involve reclamation works into the tidal zone the ability of Site 1 to comply with the SPP calls into question whether this site is a feasible location.

Under the SPP, and *Marine Parks Act, 1994* reclamation of tidal land is defined as *"...raising the land above high water mark , … by carrying out works, including dredging and the depositing of solid material*".

Reclamation complies with the SPP only if it is necessary for:

a) maritime development within a designated maritime development area; or
b) development in a port or airport where supported by a statutory land-use plan; or
c) development of essential community service infrastructure; or
d) development of a minor public maritime infrastructure; or
e) coastal protection work.

A lagoon at Site 1 would not meet any of these definitions.

Notwithstanding the non compliance with definitions, the SPP does provide for "acceptable" circumstances for not fully achieving the policy outcome however the proposed development must:

a) provide an overriding need in the public interest in accordance with the factors outlined at Annex 5of the SPP; or
b) is a development commitment; or
c) is for a public benefit asset.

In order for Site 1 to be considered as a feasible location it would need to meet the criteria set out in Annexure 5 to the SPP which requires that the applicant for the development must establish:

a) the overall social, economic and environmental benefits of the development outweigh:
    i) any detrimental effect upon the natural values of the site and adjacent areas; and
    ii) conflicts with the policy outcome of this policy; and
b) the development cannot be located elsewhere so as to avoid conflicting with the policy outcome of this policy.

The availability of alternate locations for a lagoon (that do not conflict with the policy outcomes of the SPP), means that it would be unlikely that Site 1 could be established as meeting the criteria for Annexure 5 and therefore SPP outcomes.

Site 1 does not represent a development commitment as it has not been subject to a development application.

It could be argued that a lagoon at Site 1 is a public benefit asset so it is necessary to consider the definition of such an asset under the SPP.

The SPP defines a Public Benefit Asset as follows:

a) transport infrastructure described in the definition of community infrastructure in Schedule 2 of the Sustainable Planning Regulation 2009 (excluding wharves, public jetties, ports, port facilities and navigational facilities) and transport infrastructure described in the definition of development infrastructure in Schedule 3 of the Sustainable Planning Act 2009 (excluding ferry terminals)
b) Aeronautical facilities of State significance described in SPP 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities, and associated facilities
c) emergency services facilities
d) domestic gas pipelines
e) operating works under the Electricity Act 1994
f) storage, works and administrative facilities associated with the provision or maintenance of the essential community service infrastructure.

A lagoon and outdoor recreation facility would not fit into any of these definitions of a Public Benefit asset.

Based on consideration of compliance with the Draft SPP for Coastal protection it is considered that construction of a lagoon at Site 1 by reclamation in the tidal zone would have no prospects of approval.

It is therefore considered that Site 1 could be excluded from the comparative analysis of alternate sites as it does not represent a feasible location for such a facility based on potential environmental impacts and non-compliance with regulatory provisions.

If Site 1 is excluded from the analysis it would not change the ranking of the other 3 sites based on the factors adopted for the comparative analysis.

The comparative analysis confirms that Site 4 South of Sugar Wharf is the preferred location.

Yours faithfully
FLANAGAN CONSULTING GROUP

PAT FLANAGAN BENG MBA FIPWEWA FIEAUST,
RPEQ No 2170

APPENDIX 5 – LOCATION ASSESSMENT REPORT

Please see document Location Assessment Report (final2).pdf

APPENDIX 6 – DRAFT DESIGN CONCEPTS USED IN MAIN CONSULTATION PHASE

See Document- Port Douglas Lagoon Concept Stage 2 Final.pdf

APPENDIX 7 – CONSULTATION REPORT

Please see document- Consultation Report v9 (final2).pdf