ITEM ITEM# ENGINEERING SERVICES
KIRRA WAVE STUDY – A COMPONENT OF THE GOLD COAST SHORELINE MANAGEMENT PLAN
WFB600/420/04

Refer 58 page attachment

1 BASIS FOR CONFIDENTIALITY

Not applicable.

2 EXECUTIVE SUMMARY

(Only required if report is more than 10 pages)

3 PURPOSE OF REPORT

To present options the findings and recommendations of an investigation into surf quality at Kirra.

4 PREVIOUS RESOLUTIONS

Ex Council Minute No ES06.1017.012

1 That the contents of this report on the Gold Coast Shoreline Management Review be noted.

Ex Council Minute No ES05.1129.013

1 That the contents of this report on the Gold Coast Shoreline Management Review be noted.
2 That the proposal by GCCM for works on the Shoreline Management Plan in 2005/06 be accepted and all costs charged to F251.9930.
3 That it be noted that consultation and research has begun on the review of surfing at the Southern Gold Coast. Due to the scale of the requested works a full report is not available by December 2005. A follow up report will be presented to Council June 2006.

Ex Council Minute No CD05.0808.006

1 That the Chief Executive officer report to Council by the end of December 2005 on the recreational value of the multiple point surfing breaks on the southern Gold Coast.
2 That the report identify options to improve the surfing banks and crowd conditions at the southern points by changing the effects of the Tweed Bypass sand pumping. This could include, but not limited to, techniques such as repumping sand north from Kirra and dredging Coolangatta bay to allow the northward flow of sand during big swell conditions.
3 That during the investigations, Council officers consult with organisations such as Surfing Queensland, Surfing Australia, the Association of Surfing Professionals and local board riding clubs for their input.

Ex Council Minute No W03.0130.004

1. That the contents of Report No 18 – January 2003 on the status of the Tweed River Entrance Sand Bypassing Project be noted.
2. That the TRESBP Working Group to be advised that Council does not wish to pursue the proposal to extend an outlet to Miles Street Kirra, at this time.

3. *That the following funding for the TRESBP be considered in the 2003/04 Five Year Capital Expenditure Programme:*

2003/04	*2004/05*	*2005/06*	*2006/07*	*2007/08*
$2,200,000	*$2,200,000*	*$2,000,000*	*$2,000,000*	*$2,000,000*

4. *That Council note that as of December 2002, the Project Manager for the TRESBP is Mr Ian Taylor of the NSW Department of Lands & Water Conservation.*
5. *That the 15% administration fee associated with the private works job for hydrographic surveying on the TRESBP project be waived.*

5 DISCUSSION

5.1 Background

Over the past 10 years, a combination of factors has resulted in the decline in surf quality at Kirra Beach. A modification to the Kirra Point Groyne combined with the effects of the Tweed River Entrance Sand Bypassing Project has significantly altered the local geomorphology resulting in improved coastal security but at the same time a loss of a significant recreational asset.

The 'Kirra Wave Study' has investigated options that are anticipated to lead to improved surf quality at Kirra and the surrounding surf breaks whilst maintaining coastal integrity and is part of the stakeholder engagement process within the Gold Coast Shoreline Management Plan (GCSMP). The goal of the GCSMP is to develop coastal protection measures to deal with current erosion issues and forecasted effects as a result of both natural trends and climate change predictions without compromising our way of life.

The project had three primary tasks:
1) Run a series of community meetings to canvass ideas and options that those in the community believed would lead to an anticipated improvement in surf break amenity and safety on the southern Gold Coast, specifically Kirra beach. Two public meetings were held in July 2006 to develop the options to be investigated and a public meeting was held in January 2007 to report back on the finding of the investigation.
2) Undertake computer modelling based on the shortlisted options to see which would be the best possible approach while at the same time not having a detrimental affect on coastal protection.
3) To document the process through a short film (15-25 mins) and to make the documentary available for education and publicity purposes, including screening on television.

A final report documenting this process has been received from GCCM (see Attachment 1). The purpose of this report is to describe the community engagement process used and to present recommendations on how surfing amenity might be improved in Coolangatta Bay, with a specific focus on Kirra Point. These recommendations need to be considered against the expected condition of the bay in a few years time, the time it might take for an intervention to have any effect and the possible economic, management and liability considerations around these issues.

5.2 Options

Council and GCCM have worked with the local community to investigate a series of options that may lead to an improvement in surf quality in Coolangatta Bay, with a specific focus on Kirra Point. The central focus of the research was to determine if any extra works above the current Tweed River Entrance Sand Bypassing Project (TRESBP) would lead to an improvement in wave quality within a given time period.

The range of options investigated include:
1. Modifications to Kirra Point Groyne.

2. Supplementary outlet to the north.
3. Extend the 'grid system' for dredged sand to be placed further to the north.
4. Realign the beach profile at Kirra.
5. TRESBP operates according to current management plans.

Combinations of these five options were also investigated.

5.3 Findings

Major findings are as follows:

- A supplementary outlet to take at least 75% of the bypass slurry to the north / west of North Kirra SLSC is most likely to assist in returning and maintaining favourable surf quality to Kirra Point in the shortest period of time.
- When the Kirra Point groyne was shortened in the mid-1990s not all of the foundation stones were removed. Removing these stones or adding a short length to the end of the groyne will create a 'smoother' end to the groyne, which will allow sand to flow more smoothly around the point.
- Moving the dredge sand deposition locations further to the north will assist in reducing sand volumes in the bay.
- The extension of Kirra Point Groyne to its pre-1996 length (+30m) will have little effect on surf quality in the short to medium term if the sand bypass and dredging operations continue as they currently are.
- Realigning the beach profile at Kirra, which may involve beach scraping and the construction of a 'lagoon' type hole that would encourage the shoreline to erode landwards, is likely to have a high short-term effect but is unlikely to hold over the longer term. Further, this strategy will not assist greatly in deepening the nearshore sand banks, a critical component needed to improve wave quality.
- Turning off the sand bypass system would, in the short term, achieve a similar result for improved wave quality at Kirra, to redirecting the sand through a supplementary outlet to the north. Ceasing operation of the TRESBP will create erosion problems for the southern Gold Coast in the medium term and for the northern Cold Coast in the long term. This is not seen as an appropriate course of action.
- A large storm event or sequence of storm events would assist in moving sand further to the north and out of Coolangatta Bay but this would also see a loss in the sandbanks for a period of time.

5.4 GCCM Technical Recommendations

1. GCCC investigate options and costs associated with extending the location for dredge spoil deposits to the north of the current grid system.

   An agreement would need to be reached between the two state governments, Council and the contractor to make changes to existing contractual arrangements. It would cost approximately $500,000 - $800,000 p.a. to ship 200,000 m^3 of sand (amount dredged in 2006) further north, between Bilinga and Tugun. An alternative option is for the TRESBP project EIS to be revised with the intention of expanding the grid system.

2. An investigation into the feasibility of constructing a supplementary sand bypass outlet and booster station should be undertaken, including the acceptability of this option to the NSW Government, Qld Government and Gold Coast City Council.

   Such a system would cost approximately $4,000,000 to construct and approximately $100,000 p.a. to operate and maintain based on at least 75% of the sand volume (excluding the sand being pumped to Duranbah) being discharged at this new outlet for approximately 2 years. In consultation with the community, the TRESBP Working Group could make a decision to readjust the volumes of sand being pumped to the various outlets. An extra benefit of a supplementary outlet is the potential for a 'new' wave or series of waves to be created in the vicinity of the outlet, similar to the benefit of the outlet at South Stradbroke Island. A supplementary outlet would give the project the scope to

adjust volumes over time and maximise the benefit of the project, not just for safe navigation of the Tweed but also with a stronger concern for an improvement in safety and recreational amenity on the southern Gold Coast beaches.

3. Kirra Point Groyne will need to be addressed. As part of this investigation, the value of cleaning up the end of the groyne or in time removing the groyne altogether should be considered.

5.5 Community based recommendations

At the public meeting on the 30th January 2007, there was a strong consensus on recommendations 1 & 2. The community consensus was that recommendation 3 be modified to specifically call for Big Groyne to be extended to its pre-1996 length (+30m).

A fourth recommendation from the community was that GCCC commission the Griffith Centre for Coastal Management to continue its investigations.

5.6 Tweed River Entrance Sand Bypassing Project

GCCC is represented on the TRESBP Advisory Committee by Cr Chris Robbins and on the TRESBP Working Group by Mr Greg Stuart. Council makes a significant investment of $2M p.a. to the operating costs of the bypassing system so that we can ensure the supply of the natural rate of sand to the southern Gold Coast beaches.

This is an essential component of our Ocean Beach Management Service to the community. Without an ongoing supply of sand into this region we will return to the heavily eroded beach condition of the 1970's and 1980's, and increase our level of vulnerability to erosion.

Appendix 2 includes the most recent survey data from the TRESBP that was presented at a workshop with TRESBP State Government officials, GCCC representatives and GCCM researchers held on 15 December 2006. Figure A2.6 shows that a significant amount of sand in excess of 400,000 m^3 has accumulated between Kirra Point and Miles St groyne in the time between the beginning of the pumping operations and August 2006. Note that this figure also shows that in the past year the sand levels have been slowly decreasing. Figure A2.7 shows that much of this reduction in sand volume has occurred in the nearshore zone under the water without much reduction in the visible upper beach area.

The rapid increase in sand volumes between 2001 and 2004 were predominantly related to the need to significantly recede Letitia Spit to increase the efficiency of the sand bypassing system. The maximum level of recession for Letitia Spit has now been reached and sand delivery rates are expected to reduce.

This data would seem to indicate that given enough time the sand volumes within Coolangatta Bay would naturally reduce to a new equilibrium level. It is expected that this level will include significantly more sand than during previous eroded decades, resulting in different surfing conditions.

It is important to remember that the sand volumes and surf conditions will be determined by the weather patterns. There is no way of predicting how long it will take for the current excess volumes of sand in Coolangatta Bay to be reduced, leading to an improvement in surf quality at Kirra.

5.7 Supplementary Sand Bypassing Outlet

A major finding of the GCCM investigation was that a supplementary outlet to take at least 75% of the bypass slurry to the north / west of North Kirra SLSC is most likely to assist in returning and maintaining favourable surf quality to Kirra Point in the shortest period of time.

The estimated construction cost for this outlet is $4M and initial discussions with the TRESBP indicate that there is little possibility of this being considered as a project cost. It is also unlikely that the Queensland Government would provide a subsidy. This means that the costs would likely be borne entirely by Gold Coast City Council.

In order for a supplementary outlet to be successful it needs to deliver sand into the surf zone so it can be distributed further along the coast. At Pt Danger this is easily achieved through a pipe outlet across the rocks in an unused part of the shore. If another outlet was put in place at Bilinga/North Kirra it would require a pipe on a trestle across the beach to deliver sand into the surf zone.

This would have a long term impact on views and beach access as well as beach safety when the outlet is in use.

To create a new outlet for the TRESBP would require approval under the Coastal Protection and Management Act and Integrated Planning Act and possibly alterations the TRESBP Act. Environmental impact assessments and significant technical investigations will also be required.

The investigations required to achieve these approvals would cost approximately $200,000 and include:

1. Detailed system design
2. Public Information / Consultation Strategy
3. Physical Modelling - Wave Breaking Characteristics at new outlet
4. Numerical Modelling of Wave Breaking Characteristics at new outlet
5. Numerical Modelling of Sediment Movement and Budget
6. Numerical Modelling - Nourishment Profiles / Quantities and Erosion due to Storms and Sea Level Rise
7. Assessment of Impacts of new outlet on Water Quality and Marine Ecology
8. Economic and Social Impacts due to Changes to Beach and Surf Amenity
9. Action plan and decision support tool for how to deal with erosion south of the new outlet
10. Assessment of impacts of new outlet on Desalinisation plant (probably negligible but needs confirmation)

Gold Coast City Council considered a new outlet for the TRESBP at Miles St groyne in 2003 (W03.0130.004). It was decided at this time that the benefits did not outweigh the costs.

Based on past experience, attaining approvals for such a large change to the TRESBP is likely to take a very long time. It is expected that it would take at least 3 years between starting the investigation and constructing the outlet. During this time it is possible that weather conditions may have changed and some of the sand in Coolangatta Bay which is negatively affecting surfing conditions will have moved out of the bay.

5.8 Six Point Plan

On 23 February the State Member for Currumbin, Jann Stuckey, the Tweed Nationals candidate Geoff Provest and the Coastal Alliance released a six point plan aimed at addressing changes to the beaches from Duranbah to Kirra resulting from the TRESBP.

The plan calls on the NSW and Qld Governments to:

1. Return the 30 metres of rock wall removed from Kirra Point groyne

2. Remove penalties if quota of sand is not delivered or over delivery happens

3. Monitor sand delivery by a more hands-on team

4. Create new dredged sand deposition areas north and west of Coolangatta Bay

5. Create new dredged sand deposition areas south of the by-pass system

6. Create an outlet at north Kirra

Of these six points, the GCCM Kirra Wave Study has recommended two (points 4 and 6). Council has previously been involved in organising community based monitoring of the TRESBP (point 3) that ceased in 2004.

Community representatives and state opposition members are supporting a petition to further these six points. The focus of the petition is to convince the NSW and Queensland Governments to review the project. As official members of the TRESBP Working Group, GCCC needs to continue to monitor this situation.

5.9 Coolangatta Bilinga Oceanway

The Draft Coolangatta Bilinga Oceanway master plan has undergone a public consultation phase in late 2005. This master plan calls for some limited extension of turfed area seaward of the oceanfront boulder wall. Given the large volumes of sand available at Kirra currently it is possible to remove sand from the intertidal beach area at Kirra and placement on the dunal / boulder wall area. This sand would then be covered with turf or dune vegetation and fencing to stabilise the area.

While the Kirra Wave Study showed it would have limited effect on surf quality, the Kirra SLSC and members of the surfing community support this option. A similar program of works was completed successfully last year at Coolangatta at a cost of approximately $800,000 funded through community benefits contributions from development adjacent to the foreshore. While further design work is required to develop the project at Kirra it is expected that the works would cost approximately $400.000. This funding is available in the Planning and Development Contributions trust fund.

6 STATUTORY MATTERS

Two separate approvals processes may be required if we are to progress with the recommendations in the GCCM report. One involves moving the deposition area of the dredged material and the other involves the construction of a new outlet.

Moving the deposition site for dredged sand outside of Coolangatta Bay would require changes to contractual arrangements. This has been done before to allow sand from the Tweed River to be deposited at Palm Beach. At that time the contractual variations required approval at the ministerial level from NSW and Qld governments, which took 9 months to achieve.

To create a new outlet for the TRESBP would require approval under the Coastal Protection and Management Act and Integrated Planning Act and possibly alterations the TRESBP Act. Environmental impact assessments and significant technical investigations would be required, as described in section 5.7 and take substantially longer than 9 months.

7 CORPORATE/OPERATIONAL PLAN

Focus area 11.3.7 of the current operational plan discusses the development of the Gold Coast Ocean Beach and Foreshore Plan (now renamed Ocean Beaches and Foreshores Strategy) with the aim of creating a shared vision and producing an integrated management plan for the area, which addresses:

- Coastal processes, shoreline and disaster management;
- Current and future usage of the area;
- Infrastructure Requirements;
- Regulation, safety and activity control; and
- The value of the beach (economic, social, environment)

The GCSMP is a sub plan of the Ocean Beaches and Foreshores Strategy that focuses on managing the City's sandy beach environments.

8 COUNCIL POLICIES

Not Applicable

9 DELEGATIONS

Not Applicable

10 BUDGET/FUNDING

Funding currently exists in the Planning and Development Contributions trust to shift sand from the intertidal to the dunal area as described in the Coolangatta – Bilinga Foreshore Master Plan. Based on the recent experience with a similar job at Coolangatta, this is expected to cost approximately $400,000.

No funding currently exists in whole of city budgets to undertake investigations for or to construct a new outlet. Similarly, no funding currently exists for transporting dredged sand outside the TRESBP site and would need to be considered in the 2008/09 budget process.

11 COORDINATION & CONSULTATION

The following groups have been consulted during the Kirra Wave Study.

- Councillors Robbins and Betts
- Qld EPA
- NSW Dept of Lands
- GCCM
- Surfing Queensland
- Association of Surfing Professionals
- Kirra Boardriders
- Surfrider
- General southern Gold Coast surfing community

12 TIMING

The shifting of sand from the intertidal to the dune area at Kirra can be completed this calendar year.

Based on previous experience, negotiations to move dredged sand further to the north of Kirra will take many months. Based on current monitoring it is unlikely that any dredging will be done in this calendar year but the negotiations for next years dredging program should begin as soon as possible.

13 STAKEHOLDER IMPACTS

Beach users: Some beach users have complained about the width of the beaches at Coolangatta and Kirra. Shifting sand from the intertidal to the dune areas and moving the dredge deposition area would see a reduction in beach width to a more acceptable level for beach users. A new outlet sand-pumping outlet may raise new issues relating to safety and access that would need to be addressed in the detailed investigation.

Surf users: The return of consistent, high quality waves to Kirra Point would provide another world-class surf break on the Gold Coast. This would help to reduce congestion on the waves at Duranbah and Snapper Rocks. It would also enhance the recreational amenity for the surfing community.

Environmental groups: The suggested changes to the pumping and dredging regimes would see the earlier exposure of more of Kirra Reef. Environmental and diving groups support this outcome.

14 CONCLUSION

Surfing quality at Kirra has changed over the years as a result of different climate patterns, construction of training walls on the Tweed River, the groyne at Kirra Point and Miles St, beach nourishment activities and the TRESBP. The GCCM report states that the current most significant impact on wave quality at Kirra is the volume of sand present in Coolangatta Bay.

Given enough time it is likely that some large storm events will move the large volume of sand out of the Coolangatta Bay area and the system will reach a new equilibrium. Unfortunately, it is not possible to predict when this will occur.

A new outlet between North Kirra and Bilinga would have the greatest impact on improving surfing quality at Kirra. Preliminary estimates suggest that this would involve a capital cost of approximately $4M that is unlikely to be supported financially at the state government level. It would also involve significant impacts to coastal views, beach access and safety. A series of investigations as outlined in section 5.7 would need to be undertaken to secure approvals for this option.

Modifications to the Kirra Point groyne would have minimal impact unless accompanied by another outlet and therefore should not occur in isolation.

Moving the sand deposition site further north is an expensive option that would have limited short-term benefits for surfing on it's own. This might only be feasible if the sand was to be deposited at a heavily eroded location such as Palm Beach. This would increase the costs due to the increased distance for the dredge to travel.

The removal of sand from the intertidal beach area at Kirra and placement on the dunal / boulder wall area is supported by the Coolangatta – Bilinga Foreshore Master Plan. While this technical review showed it would have limited effect on surf quality, the Kirra SLSC and members of the surfing community support this option. Infrastructure Charges can be used to undertake these works. A similar program of works was successfully completed last year at Coolangatta.

15 RECOMMENDATION

It is recommended that Council resolves as follows:

1 That the report by GCCM into the wave conditions at Kirra be noted.

2 That the CEO be delegated the authority to begin negotiations with the TRESBP to change the site for the deposition of the sand dredged from within the TRESBP area to north of North Kirra.

3 That monitoring of the sand volumes and surfing conditions in Coolangatta Bay continue through the TRESBP.

4 That a project to widen the park and dune areas at Kirra in line with the Draft Coolangatta to Bilinga Foreshore Master Plan, funded through developer's contributions be endorsed.

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