

10. TENDER FOR DIGESTERS 5 AND 6 - CHRISTCHURCH WASTEWATER TREATMENT PLANT

General Manager responsible:	General Manager City Environment
Officer responsible:	City Water & Waste Manager
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PURPOSE OF REPORT

1. The purpose of this report is to seek additional funding for and approval to let the tender to G&T Construction Limited for the construction and commissioning of Digesters 5 and 6 at the Christchurch Wastewater Treatment Plant (CWTP).

EXECUTIVE SUMMARY

2. The final component of the planned upgrade of the CWTP involves the Council installing two additional thermophilic sludge digesters, with construction commencing in 2005/06 and commissioning planned for late 2007.
3. The additional digester capacity is required to meet the increasing solids loads at the plant. The digesters have been sized to meet predicted loads and flows through to 2026. The current four digesters are often overloaded at present and this can cause foaming of the units with subsequent process and odour problems. The current digesters are also in need of maintenance and this cannot be undertaken until new capacity is available to allow one existing unit to be taken off line. The additional process capacity cannot be delayed without significant ongoing risk of partial process failure at the treatment plant.
4. The capital cost for this project was originally estimated at \$6.2m (in 2002) and this was re-evaluated in December 2004 (in conjunction with several other projects) at \$10.0 million. This revised figure had the normal estimated level of accuracy of -10% +25%. Tenders have been received from four selected tenderers. Three tender prices were received, \$15.4m, \$16.9m and \$17m. The lowest tender (G&T Construction) is \$15.52 million giving an overall project cost of \$18.59 million.
5. City Water and Waste therefore requires the allocation of another \$8.59 million in capital funding to allow this project to proceed to the construction phase.

FINANCIAL AND LEGAL CONSIDERATIONS

6. Tenders were received from four tenderers for the construction and commissioning of two thermophilic digesters. City Solutions, CWW staff and CH2M Beca Consultants undertook a review of the tenders and evaluated the responses against a weighted attribute scoring system. The normalised tender results are indicated below:

Tenderer	Total Score	Adjusted tender sum	Comments
G&T Construction	64	\$15,520,104	
Fulton Hogan	56	\$16,944,612	
Brian Perry Civil (Fletcher Building subsidiary company)	56	\$17,096,975	
Hopkins Engineering	NA	NA	Withdrew from tender owing to resources.

7. G&T Construction scored the highest evaluation points and had the lowest tender sum. G&T Construction have undertaken a number of large civil projects for Christchurch City Council over the last few years including construction of Pump Station B at CWTP, deepening of oxidation ponds and site work for construction of Clarifiers 1 to 4 at CWTP. They are currently building Pump Station 11 as part of the Major Sewer Upgrade project.

8. The revised project sum utilising G&T Construction's tender sum is illustrated below:

Project Component Descriptions	Project Costs post tender Oct 2005	Project Estimate Nov 2004
1. Construction Contract – a. Tender sum (incl construction contingency of \$ 600k).	\$15,520,104	\$6,237,790
2. CCC supplied equipment *	\$1,244,278	\$1,704,000
3. CCC Staff costs and consents	\$110,000	\$105,000
3. Staff Costs and Professional Fees	\$1,313,087	\$832,878
4. Project contingency Sum	\$400,000	\$1,120,332
Project Total	\$18,587,469.00	\$10,000,000.00

* Note that these items are sourced overseas and will be subject to movement in foreign exchange rates at time of purchase. **\$10,000,000**

9. The phasing of expenditure under this project is currently projected as follows:

Description	Financial Year				Project Total (\$m)
	2003/05 (\$m)	2005/06 (\$m)	2006/07 (\$m)	2007/08 (\$m)	
Digesters 5 and 6	0.656	3.20	8.271	6.46	18.587

10. The 2004/14 LTCCP (Volume 3 Page 62) refers to the additional digesters being funded solely through rates. Approximately 80% of this project is related to growth of loads and thus could be recovered via a contribution fee over time. Staff recommend that this project be integrated into the new contributions policy currently being developed in time for the 2006-16 LTCCP. This will allow a large proportion of the project sum to be recovered over time through developer contributions and minimise the impact on the rating base.

STAFF RECOMMENDATIONS

It is recommended that the Council:

- (a) Approve additional capital funding of \$8.59 million to allow award of the contract for the construction of Digesters 5 and 6. This will revise the project total budget to \$18.587 million.
- (b) Approve awarding the contract for the construction of digesters 5 and 6 to G&T Construction Ltd for the lump sum figure of \$15,520,104 plus GST.
- (c) Note LTCCP programme will need to be amended to reflect this change.

BACKGROUND ON THE DESIGN AND TENDER EVALUATION OF DIGESTERS 5 AND 6

11. Integral to the upgrade of the CWTP is the installation of two additional thermophilic digesters to provide increased process capacity for the solids inventory at the plant and to provide allowance for load growth through to 2026.
12. The need for additional digesters was identified following the commissioning of clarifiers 1 and 2 in 2002. The new clarifiers reduced the solids in the treated effluent but increased the treatment load on the digesters. The current four mesophilic digesters are at capacity and risk of overloading and subsequent process failure (as happened in 2002). The 2003/04 annual plan provided funding of \$6.2 million to allow the digester project to proceed. In December 2004 this figure was re-estimated at \$10 million as part of a revision of cost of several other key water and waste projects.
13. The design of the project has been undertaken in two components:
 - (a) Process design by CH2M Beca Limited based in Christchurch.
 - (b) Civil design by City Solutions.
14. The project team (comprising CWW staff, City Solutions and CH2M Beca) has spent the last six months working through detailed design reviews, HAZOP (hazardous operations) workshops and value engineering sessions. The value engineering workshops are designed to look for opportunities to reduce project cost without affecting operability and maintainability (ie remove the "gold plating"). The culmination of the intense design studies was an efficient design that all parties were satisfied met the operational requirements whilst representing a value engineered solution.
15. Four main contractors have shortlisted for the tender process after an open Registration of Interest process had been conducted and responses evaluated. One tenderer (Hopkins Engineering Ltd) pulled out of the tender owing to current work commitments.
16. It was noted that Fulton Hogan and Brian Perry's tenders were significantly higher than G&T Construction and this is thought to be due to their full "order books" at present. These major civil contractors have large infrastructure projects currently underway and are currently pricing accordingly.
17. G&T Construction is a Christchurch based organisation with considerable experience in the heavy civil engineering construction market. G&T Construction is very familiar with the treatment plant and its operational requirements. This is a very important factor on a brown field site. G&T Construction was awarded the Pump Station 11 Construction contract in December 2004 (\$7.2m) and has been progressing this project in a satisfactory manner.
18. It is worth noting that the increase in costs is primarily in the civil construction component of the project. Whilst this is the largest single element it is also predominantly locally sourced although materials such as cement and steel are priced on the world commodity markets. The booming construction market is reflected by the fact that while the lowest price was significantly higher than the budget, the two higher prices were very similar and \$1.5m more than the lowest price.

OPTIONS

19. The Council has two options with respect to this project tender:

Option 1 – Approve Increased Capital for Project and Award Tender

- (a) Increase capital funding available to the project to \$18.587 million and award construction contract to G&T Construction for immediate start. The project will be fully commissioned by the end of 2007 and the CWTP will have the enhanced process capability needed to handle the current solids inventory and predicted growth through to 2026.

Option 2 – Defer Project

- (b) Defer the project for several years in the hope that construction prices stabilise and the project can be built for a lower cost. This option incurs the following major risks:
 - (i) That CWTP loads will not increase any further and that no load incidents will occur over the next 4-5 years which could overload the current digester capacity and cause process and odour incidents. Such incidents can take several months for the plant processes to recover from. The likely outcome of such a process failure would be reduced biogas production, increased polymer consumption and associated dewatering issues, and production of a sludge that is not fully digested and as such would require special disposal at Kate Valley. The operational cost of this would be very significant until the digesters recovered.
 - (ii) That construction prices will change from those currently received in the latest tender. Current market indications are that infrastructure spending in New Zealand over the next 10 years is going to be maintained or increased due to impending work on roading systems and power generation. These major civil projects will impact on the cost of Council civil projects given the level of engineering resources available in New Zealand.

PREFERRED OPTION

20. The preferred option is to increase the project capital funding to \$18.587 million from the current \$10 million and award the construction contract to G&T Construction for the lump sum of \$15.520 million plus GST. This will allow the digesters to be commissioned by December 2007.

ASSESSMENT OF OPTIONS

The Preferred Option

Increase the capital funding for the construction and commissioning of Digesters 5 and 6 from \$10 million to \$18.587 million and award the construction contract to G&T Construction Limited for \$15.520 million.

	Benefits (current and future)	Costs (current and future)
Social	Less risk of process failure at the CWTP. Capacity will meet future needs of the city	Some increase in maintenance costs due to more assets on site. Expected increase in biogas production which will decrease reliance on any imported electricity and may produce some additional income through power export.
Cultural	Increase in treatment capacity maintains alignment with Maori goals for treatment of wastewater	Nil
Environmental	Digestion reduces the harmful effects of biosolids and opens up routes for reuse of the product other than disposal to Kate Valley (ie capping of Burwood Landfill)	Nil
Economic	Reduced risk of process failure and subsequent related odour events process failure and subsequent related odour events. Process failures also adversely affect plant operating costs.	Capital cost of project. Large portion should be recoverable through Contributions Policy.

Extent to which community outcomes are achieved:

Primary alignment with community outcome a Healthy City
Also contributes to a city of people who value and protect the natural environment.

Impact on Council's capacity and responsibilities:

Council is responsible for the collection and treatment of wastewater.

Effects on Maori:

Maori have a very strong interest in the treatment and disposal of biosolids. The installation of Digesters 5 and 6 improves the Council's processing of biosolids. There is no proposed change to the disposal of biosolids at Burwood under this project.

Consistency with existing Council policies:

This project is currently identified in the 2004/14 LTCCP as a key project contributing to community outcomes.

Views and preferences of persons affected or likely to have an interest:

Public consultation was conducted through previous LTCCP and annual plan processes.

Other relevant matters:

This is a key process step at the CWTP and this capacity enhancement is needed now due to current loads reaching the plant.