

# AGENDA

**Ordinary meeting of the**

**Nelson Regional Sewerage Business Unit**

**Friday 19 June 2015  
Commencing at 1.00pm  
Ruma Mārama  
Level 2A, Civic House  
110 Trafalgar Street, Nelson**

Membership: Nelson City Councillor Ruth Copeland, Mr Derek Shaw, Tasman District Councillors Barry Dowler and Michael Higgins

Representatives: M Hippolite (Iwi Representative) and P Wilson (Industry Customers Representative)

**Apologies**

**1. Confirmation of Order of Business**

**2. Interests**

2.1 Updates to the Interests Register

2.2 Identify any conflicts of interest in the agenda

**3. Confirmation of Minutes**

3.1 13 March 2015

**4 - 7**

Document number M1268

Recommendation

***THAT the minutes of the meeting of the Nelson Regional Sewerage Business Unit, held on 13 March 2015, be confirmed as a true and correct record.***

**4. Status Report - Nelson Regional Sewerage Business Unit - 19 June 2015**

**8 - 9**

Document number R4405

Recommendation

***THAT the Status Report Nelson Regional Sewerage Business Unit 19 June 2015 (R4405) and its attachment (A1370036) be received.***

**5. General Manager's Report**

**10 - 36**

Document number R4409

Recommendation

***THAT the report General Manager's Report (R4409) and its attachments (A1359066, A1346866, A1369953 and A1314700) be received.***

**6. Financial Report**

**37 - 39**

Document number R4410

Recommendation

***THAT the Financial Report (R4410) and its attachment (A1370497) be received.***

## **Minutes of a meeting of the Nelson Regional Sewerage Business Unit**

**Held in Ruma Marama, Civic House, 110 Trafalgar Street, Nelson**

**On Friday 13 March 2015, commencing at 1.02pm**

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Present: Councillors M Higgins (Chairperson) and B Dowler (Tasman District Council)

In Attendance: M Hippolite (Iwi Representative), P Wilson (Industry Customers' Representative), Nelson Regional Sewerage Business Unit General Manager (R Kirby), Senior Asset Engineer – Solid Waste (J Thiart), Management Accountant (A Bishop), and Administration Adviser (G Brown)

Apologies: Mr D Shaw and Councillor Copeland

### **1. Apologies**

Resolved

***THAT* apologies be received and accepted from Mr Derek Shaw and Councillor Copeland.**

Dowler/Higgins

Carried

### **2. Confirmation of Order of Business**

There was no change to the order of business.

### **3. Interests**

Councillors Higgins and Dowler declared an interest in item 5 General Manager's Report in relation to the Tasman District Council (TDC), Coastal Occupation Charges draft Plan Change.

### **4. Confirmation of Minutes – 28 November 2014**

Document number A1281366, agenda pages 4-9 refer.

Resolved

***THAT the minutes of a meeting of the Nelson Regional Sewerage Business Unit, held on 28 November 2014, be confirmed as a true and correct record.***

Dowler/Higgins

Carried

## **5. Status Report**

Document number A452094, agenda pages 10 refers.

General Manager, Richard Kirby advised there was an error in the status report under number 5 the date should read 26 March 2015 and not 16 March 2015.

In response to a question, Senior Asset Engineer – Solid Waste, Johan Thiart advised that the capacity review would be discussed at the meeting scheduled for the 26<sup>th</sup> March 2015 and that he would resend a copy of the Capacity Review to the business unit.

In response to a further question, Mr Kirby advised that the ultimate aim would be a reduction in plant charges at the Bells Island Wastewater Treatment Plan. He added that revenue was trending down.

It was noted that Nelson City Council, Council officer, Andrew Bingham should join the meeting scheduled for the 26 March 2015.

Resolved

***THAT the Status Report dated 13 March 2015 (A452094) be received with the amendment of the date to 26 March 2015 under number 5.***

Dowler/Higgins

Carried

## **6. General Manager's Report**

Document number A1313458, agenda pages 11-60 refer.

General Manager, Richard Kirby presented the report.

It was noted that Councillor Higgins and Dowler had a conflict of interest with the draft Plan Change Coastal Occupational Charges and this needed to be recorded in the Nelson Regional Sewerage Business Unit (NRSBU) Interests Register.

There was a discussion that iwi and industries would be making a submission in relation to the draft Plan Change.

It was discussed that utilities under Tasman District Council (TDC) would be rated for the first time in the Long Term Plan (LTP) and it was

mentioned that Nelson City were proposing to rate 50% of stormwater on Capital Value.

In response to a question, Senior Asset Engineer – Solid Waste, Johan Thiart advised that the linings that were installed in the ATAD's in 2013 and 2014 had failed. Mr Thiart added that there was adequate capacity with only two sludge tanks and the costs per tank was \$80,000.

In response to a further question, Mr Thiart said that the increase of boundaries in the ko-iwi areas did not materially affect operations. He added that trees would be cut to ground level to reduce disturbance of these areas. However he believed that the biosolids trail had run its course.

Peak tide maximum loads were discussed in relation to the Load Agreement – ENERNOC and it was suggested that further investigation was required to identify whether peals could be shaved. It was suggested that a further conversation with ENERNOC was needed in relation to these efficiencies.

In response to a question, Mr Thiart said the non compliance within the Key Performance Indicators table was due to operator error and confirmed that a checklist system was already in place. It was asked why iwi were not informed about this overflow, and Mr Thiart advised that he would investigate and report back at the next meeting.

There was a discussion regarding the pump stations power use in relation to the graph shown in Figure 10.2 and it was highlighted that the peaks were from storm events.

Resolved

***THAT the report General Manager's Report (A1313458) and its attachments (A1319962, A1320206 and A1324144) be received.***

Dowler/Higgins

Carried

## **7. Finance Report**

Document number A1263549, agenda pages 61-62 refer.

Management Accountant, Andrew Bishop presented the report.

In response to a question, Mr Bishop said that calculations were underway in relation to charges on stakeholders for fixed and variable contributions. He said that customers would pay variable costs based on the previous year's usage.

In response to a further question, Mr Bishop advised that the NRSBU fixed contract was still relevant and it was beneficial to have this contract in-house.

It was requested that Mr Bishop provide an indication of the time spent on this contact and inform the business unit.

There was a discussion regarding the two pump stations which could potentially overflow into the Maitai River and a question was asked as to when was the last time this had happened. General Manager , Richard Kirby advised he would need to investigate and then pass this information on to the business unit.

Resolved

**THAT the Nelson regional Sewerage Business unit  
Financial report for the period ending 31 January  
2015 (A1263549).**

Higgins/Dowler

Carried

There being no further business the meeting ended at 2.17pm.

Confirmed as a correct record of proceedings:

\_\_\_\_\_ Chairperson \_\_\_\_\_ Date



19 June 2015

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REPORT R4405

## Status Report - Nelson Regional Sewerage Business Unit - 19 June 2015

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### 1. Purpose of Report

1.1 To provide an update on the status of actions requested and pending.

### 2. Recommendation

***THAT the Status Report Nelson Regional Sewerage Business Unit 19 June 2015 (R4405) and its attachment (A1370036) be received.***

Shailey McLean  
**Administration Adviser**

### Attachments

Attachment 1: A1370036 - Status Report - Nelson Regional Sewerage Business Unit - June 2015



<b>NRSBU STATUS REPORT - 19 June 2015</b>							
<b>No</b>	<b>Meeting Date</b>	<b>Document Number</b>	<b>Report Date</b>	<b>Report Title / Item Title</b>	<b>Officer</b>	<b>Resolution or Action</b>	<b>Status</b>
A	14/03/14	A1163334 and A1552561	14/03/14	Minutes	Johan Thiart	A short report be developed quantifying the benefits to both councils of the biosolids application at Rabbit Island.  That a press release will follow the circulation of the report to the two councils.	
B	14/03/14	A1163334 A1145728	14/03/14	Minutes and officer report	Johan Thiart	Biosolids and effluent discharge reports.	TDC has indicated that they continue to consider the reports submitted last year. Also item included in GM reprrt.
C	5/07/13	1552561		Minutes of meeting	J Thiart	TDC Parks and Reserves Review/Rabbit Island Management Plan. Rough Island to be considered as potential Biosolids spraying area.	Met with representatives of Otago University who are working on reserves planning for TDC and NCC.
D	22/06/12		22/06/12	Minutes	J Thiart	Energy audit at pump stations	Programmed for 2015
E	14/12/12			Bell Island power supply	J Thiart	Improvement of power supply by Network Tasman	Network Tasman activity. Reported on in this agenda. Network Tasman now working with Greenacres to go through the golf course.
1	31/01/14	A681693	31/01/14	Staff Report	J Thiart	<u>THAT</u> a further benchmark report be submitted to the Board in December 2014.	Report will be included in Draft Annual Report.
2	23/08/13	1582359	23/08/13	Nelson Regional Sewerage Business Unit Resopurce Consent Monitoring: Discharge Permit	J Thiart	<u>AND THAT</u> the increase in suspended solids and biological oxygen demand be investigated as part of the operation and maintenance contract and a further report be submitted to the Board regarding this matter in March 2014.	Reported in March 2014. Waiting for further assessment by consent authority.
3	22/06/12	1307226	22/06/12	Bell Island Energy Audit	J Thiart	<u>AND THAT</u> the removal of the time of use meter at the dewatering building will be considered once the deferment of the thickening upgrade is confirmed; <u>AND THAT</u> the optimisation of O <sub>2</sub> levels in the aeration basin will be considered as part of the waste water treatment capacity review; <u>AND THAT</u> the cost of changing the point of supply for the ponds and irrigation pump station will be investigated in order to establish the return on capital investment.	Deferred until review of secondary sludge separation completed.
4	9/03/12	1042662	9/03/12	Staff report	J Thiart	<u>AND THAT</u> the NRSBU continue supporting the tree trials and that the monitoring continues until the trees are harvested.	Ongoing. Reported on in this agenda.
5	16/09/11	11497595	16/09/11	NRSBU BIWWTP Capacity and commissioning report	J Thiart	<u>AND THAT</u> an independent review be undertaken of the charging mechanism and user contracts once the capacity review in 2012/13 is complete;	General Manager: Meeting scheduled for 18 June 2015. Draft report by MWH received 5 June 2015 and will be reported on at next Board meeting.
6	15/02/11	1042982	3/02/11	Bell Island Spit Restoration	J Thiart	<u>AND THAT</u> the project committee submit a progress report to the NRSBU on a Quarterly basis	Report included in this agenda.



19 June 2015

REPORT R4409

## General Manager's Report

### 1. Purpose of Report

- 1.1 To outline NRSBU operational activities over the last few months.

### 2. Recommendation

***THAT the report General Manager's Report (R4409) and its attachments (A1359066, A1346866, A1369953 and A1314700) be received.***

### 3. Correspondence Received

#### Contributors Quota

- 3.1 Notifications were received from the three industrial contributors advising that they wish to amend their quotas as from 1 July 2015. The quota amendments relate to BOD, COD and TSS. The terms of the Agreement for Disposal of Trade Waste state that any spare capacity created should be offered to the other contributors. Consequently the spare capacity created by the decision of the three industrial contributors will be offered to the two Council contributors. At this stage both councils have indicated that they wish to share the spare capacity 50:50.

#### Biosolids Trial Area

- 3.2 Following the identification of Koiwi areas within the biosolids trial site the NRSBU requested comment from SCION regarding the effects of this on the biosolids application trials. SCION has stated (Attachment 1) that biosolids spraying on the trial site needs to be discontinued for the remainder of the rotation of the trees in this block. This is to maintain the integrity of the research to assess the long-term and residual effects of repeated biosolids application on tree growth, health, and soil and groundwater qualities. SCION has estimated the continued cost of this trial at \$180,000. With most of the proposed work focussed on tree growth, wood properties and foliage sampling, it is difficult to justify NRSBU funding the total amount of \$180,000 for the continuation of this project over the next 6 years. However the NRSBU may want to

consider a contribution towards these trials as it would be useful in the longer term disposal of biosolids.

- 3.3 It is recommended that the NRSBU consider offering to contribute an amount of \$30,000 for the completion of the research by SCION payable on receipt of the final environmental report.

### **Recommendation**

***THAT NRSBU contribute an amount of \$30,000 for the completion of the research by SCION payable on receipt of the final environmental report.***

## **4. Recent Actions**

### **Accidental Discharge Consent Application**

- 4.1 The NRSBU needs to apply for a resource consent for accidental sewage discharges. Accidental discharge is a permitted activity in Nelson City and a prohibited activity in Tasman District. NRSBU has engaged Landmark Lyle to manage the process to obtain the resource consent for this activity.
- 4.2 Landmark Lyle has circulated the supporting documents to the identified stakeholders on 2 March 2015 for pre-consultation and after minor modifications all parties other than "Friends of Nelson Haven and Tasman Bay" and the Nelson Marlborough District Health Board have signed off on the documentation.
- 4.3 Once the letter in support of the application is received from the Nelson Marlborough District Health Board the application will be lodged with the Nelson City Council. It is expected that the application will be lodged before the end of June 2015.

### **Saxton Pump Station Dry Weather Overflow December 2014**

- 4.4 This comprised a 5m<sup>3</sup> overflow of wastewater into the estuary as a result of operator error. This was reported to the March 2015 NRSBU meeting. As stated then, unfortunately the dry weather overflow procedure was not followed and consequently the overflow was not reported to Iwi. However it was reported to the Nelson Marlborough District Health Board. The procedure is currently being reviewed following this event as well as another event that occurred within the NCC reticulation in Wakefield Quay.

### **ATAD Tank Linings**

- 4.5 Downer has accepted responsibility for the remedial works required to reline the A-train tanks. The remedial work is expected to be completed in June/July 2015.

- 4.6 While details need to be confirmed we have been told that the manufacturer of the lining material has accepted responsibility for the four tanks in A-Train and B-train that are lined with their products. The manufacturer has specified a different product for the lining of these four tanks.
- 4.7 A review of the rehabilitation work on the B and C-train tanks will be delayed until after a condition assessment of the remedial works on the A-train tanks. This condition assessment should be completed in December 2015 after the A-train tanks have been commissioned and operated for 6 months.

### **Biosolids Trial**

- 4.8 The volume of biosolids being sprayed has exceeded the estimated and contracted quantity for the 12 month period to 31 July 2015. Consequently the cost to dispose of this additional amount could cost an additional \$80-\$100,000. We have investigated other options to reduce the volume of biosolids to be sprayed. The most cost-effective option is to divert biosolids to geobags located on the sludge drying platform. The cost to establish this option is around \$21,000 with an operating cost of \$16,000 for the volumes estimated.
- 4.9 The business case for this decision is Attachment 2. The geobag option is expected to generate a saving of about \$50,000 on the biosolids application contract. It should also demonstrate whether this process can be used to manage the overflow of biosolids in future. In addition it will demonstrate whether treated biosolids can be diverted away from Rabbit Island during extended periods of heavy rain or where treated biosolids do not comply with Class A quality requirements.

## **5. Contract 3458 – Operations and Maintenance**

- 5.1 The reticulation and treatment operations have continued as normal over the last few months.
- 5.2 Investigations by the contractor into the decrease in efficiency of the duty pumps at the Airport and Saxton pump stations have revealed no issues. However, remote monitoring of pump performance by NRSBU officers has indicated that the duty pumps are not working efficiently at lower frequencies.
- 5.3 Once duty pumps at the Saxton and Airport pump stations were replaced, with reconditioned pumps, the pump efficiencies improved. The kWh power used per m<sup>3</sup> wastewater displaced has returned to more moderate levels as shown in figure 3.

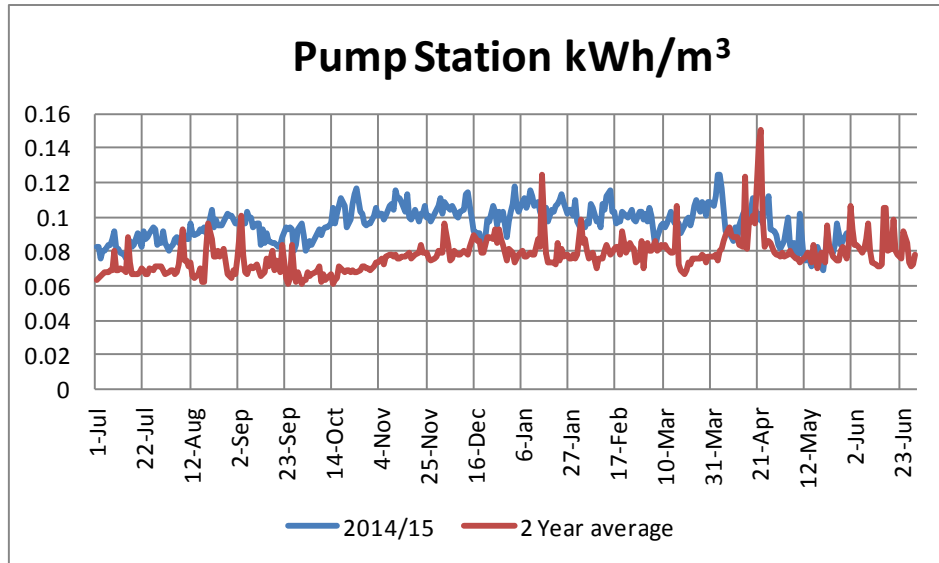


Figure 5: Sum of power use at regional pump stations

- 5.4 We are experiencing significant delays when pumps are decommissioned for servicing as many pump parts need to be imported from Europe. Once the Maintenance Management Plan is in place it is expected that these issues will be addressed.
- 5.5 A conditional assessment of the secondary clarifier carried out by a specialist has indicated that the expected life of the secondary clarifier gearbox can be extended by 20 years. The recommendation in the report will be implemented over the next two years during programmed maintenance down time for the secondary clarifier.

## 6. Key Performance Indicators

The outcomes of key performance indicators for the last 3 months to 31 May 2015 are outlined as follows:

<b>Environmental: Treatment and Disposal</b>			
RMA consent - wastewater Discharge to Coastal Marine Area	RMA Consent - Discharge of Contaminants to Air (Odour complaints)	RMA Consent - Discharge of Contaminants to Land	Equipment failure of critical components within treatment and disposal system
<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>
<b>Environmental: Pump Stations</b>			
Odour complaints from pump stations	Pump station wet weather overflows	Pump station overflows resulting from power failure	Pump station overflows resulting from mechanical failure
<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>	<b>Non compliance <sup>1</sup></b>
<b>Environmental: Pipeline</b>			
Reticulation breaks	Air valve malfunction		
<b>100% compliance</b>	<b>100% compliance</b>		
<b>Capacity: Overloading system capacity</b>			
Treatment & Disposal	Pump Stations		
<b>100% compliance</b>	<b>100% compliance</b>		
<b>Reliability: Equipment failure of critical components</b>			
Treatment & Disposal	Pump Stations	Pipelines	
<b>100% compliance</b>	<b>Non compliance <sup>1</sup></b>	<b>100% compliance</b>	
<b>Responsiveness: Speed of response for emergency and urgent maintenance works</b>			
Treatment & Disposal	Pump Stations	Pipelines	
<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>	
<b>Responsiveness: Speed of response for routine and programmable maintenance works</b>			
Treatment & Disposal	Pump Stations	Pipelines	
<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>	
<b>Key customer relationships: Overall satisfaction</b>			
Treatment & Disposal	Pump Stations	Pipelines	
<b>100% compliance</b>	<b>100% compliance</b>	<b>100% compliance</b>	

Note <sup>1</sup>: The incident last week resulting in an overflow was caused by equipment failure. The air pressure monitoring probe governing the pumping rate developed a small air leak. The leak was small enough not to reduce pressure significantly and consequently the alarms assumed everything was operating normally, whereas in reality the wetwell level was gradually rising to overflow. The incident resulted in a raw sewage overflow of approximately 60m<sup>3</sup> at Saxton pump station. 6.1 The compliance outcomes for the 12 months to 31 May 2015 are as follows:

<b>i)</b>	<b>Resource Consent Compliance (rolling 12 month record)</b>	
	➤ Discharge to Estuary Permit	Not achieved. Two discharges of raw sewage occurred at Saxton pump station during this period.
	➤ Discharge to Air Permit	100% Compliance
	➤ Biosolids Disposal	100% Compliance
	➤ Discharge treated waste water to land	100% Compliance
<b>ii)</b>	<b>Odour Notifications</b>	
	➤ Past three months	Nil.

	➤ Last 12 months	Nil.
<b>iii)</b>	<b>Overflows</b>	
	➤ Past three months	Nil
	➤ Last 12 months	Nil.
<b>iv)</b>	<b>Speed of response for maintenance works</b>	
	In past three months:	
	➤ One treatment plant power outage call out	
	➤ Three call outs related to Songer Street pump station	
	➤ Response within 30 minutes. Achieved.	

## 7. Review of Action Plan Implementation – 2013 Asset Management Plan

The following table indicates the draft time lines for the individual action items:

AP	Action	Target Date	Completion Date	Comments
<b>Levels of Service</b>				
1.1	Annual customer survey.	March 2015	April 2015	Attachment 3
<b>Demand Management</b>				
2.1	Extending/renewing the Memorandum of Understanding that expires in 2010.	2014/15		Await outcomes of review by shareholders (Nelson City Council and Tasman District Council)
2.2	Review Improvement Plan, consider and if appropriate prioritise and move to action.		Ongoing	Continuing.
2.3	Flow and load analyses.	July 2015		
<b>Risk Management</b>				
3.2	Annual calibration. (Flow meters)	June 2015		
<b>Financial</b>				
4.1	Valuation.	August 2015		
4.3	Internal review of customer charging model.	June 2014		Initial meetings held with contributors.
<b>Asset Management</b>				
5.3	Treatment Plant Capacity Review.	August 2014	30 June 2015	The draft modelling report was reviewed and returned to the contactor for further development.
<b>General</b>				
6.1	Board Workshop.	April 2015		No workshop subject was identified.

## 8. Health and Safety

8.1 There have been 4 Health and Safety inductions and 168 visitors to the Bell Island site over the past three months.

8.2 No further Health and Safety incidents are outstanding.

## 9. Financial

9.1 Operational expenditure is tracking lower than budget.

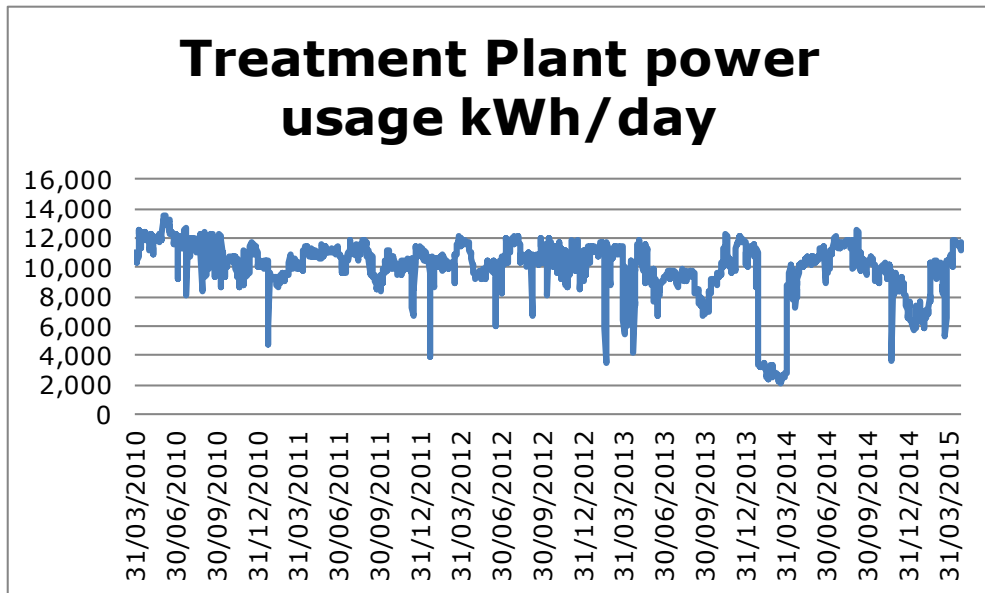


Figure 10.1 Treatment plant power use

9.2 Power usage at the treatment plant will stay at these higher levels until early summer.

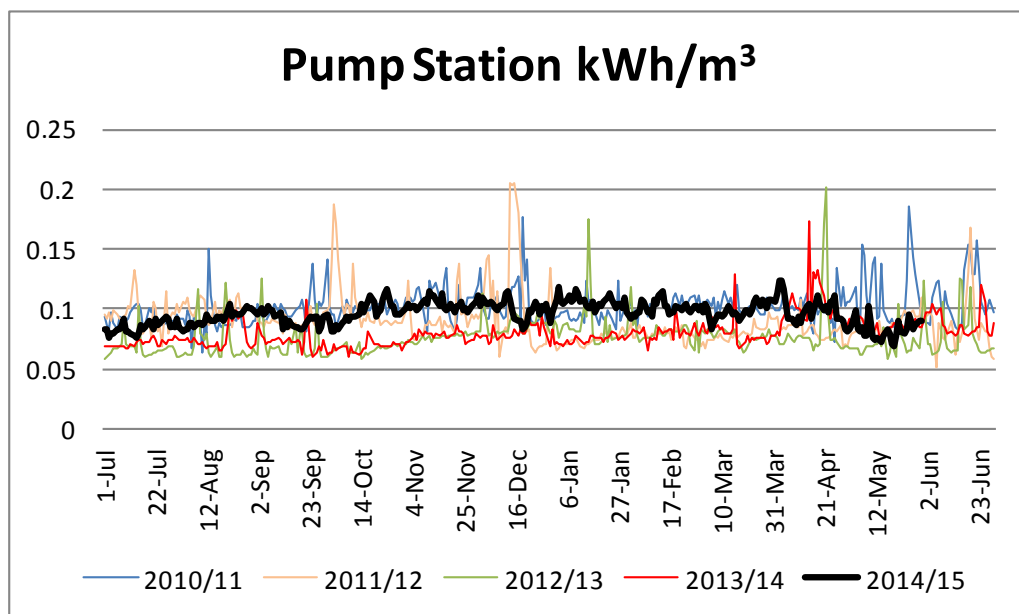


Figure 10.2 Pump station power use



- 9.3 Following the replacement of the duty pumps at the Saxton and Airport pump stations with the spare duty pumps the efficiency of the pump stations returned back to long term trends.

## **10. Second Storm Pump At Airport Pump Station**

- 10.1 A project was identified during the development of the ten year strategy, included in the NRSBU Asset Management Plan and Business Plan for 2015/16 to upgrade the Airport pump station to mitigate the effects of the storm pump being out of commission during times of high inflow resulting from heavy rain events.
- 10.2 To mitigate the issues with the delivery of a replacement storm pump it is considered prudent to procure a replacement storm pump similar to the existing storm pump for this pump station as a critical spare. The specified pump is also similar in size to the storm pumps in use at the Saxton pump station and will be interchangeable. (Attachment 4)
- 10.3 The funding for this project is included in the 2015/16 Business Plan.

### **Recommendation**

***THAT a spare storm pump at an estimated cost of \$210,000 be purchased for the Airport Pump Station.***

## **11. P&ID Drawings**

- 11.1 The Bell Island wastewater treatment plant has developed over a period of over 30 years. As built information is now located in four primary sets of as built plans. A consolidated P&ID as build of the wastewater treatment plant will provide easier reference of process linkages and will allow for improved maintenance and asset management.
- 11.2 Three options were considered and it was decided that the project will be run in house in parallel with the further development of the asset and valuation register.
- 11.3 A consolidated set of P&ID drawings is being compiled and targeted for completion by January/February 2016.

## **12. Revaluation 30 June 2015**

- 12.1 The asset register contains asset components owned by the NRSBU. This has been utilised in previous valuation calculations. Previously some of the specific components were lumped together in the valuation. Over recent months these components have been individually identified and scheduled. However it is unlikely that these components will be priced in time for the 30 June 2015 valuation.
- 12.2 The next independent valuation is due 30 June 2016. It is therefore proposed that for the 30 June 2015 valuation that the following indices be applied to the 30 June 2014 valuation;

Pipeline:	4.33%
Electrical:	1.9%
Mechanical:	0.9%
Civil:	2.13%
Structural:	0.73%

Richard Kirby  
**Consulting Engineer**

**Attachments**

- Attachment 1: A1359066 - Rabbit Island Biosolids Spraying Trial Site (SCION)
- Attachment 2: A1346866 - Business Case for Biosolids Diversion
- Attachment 3: A1369953 - Customer Survey 2015
- Attachment 4: A1314700 - Business Case for Second Storm pump at Airport pump station

23 March 2015  
Scion  
Box 29237  
Christchurch 8540

Johan Thiart  
Senior Asset Engineer - Solid Waste  
Nelson City Council  
Nelson

Dear Johan,

Scion scientists, now working under the umbrella group called the Centre of Integrated Biowaste Research (CIBR) with expertise in soil science and all areas of wastewater reuse, established the biosolids research trial at Rabbit Island in 1997. We have monitored the trial and provided analysis and reports for Nelson City Council (NCC) and Tasman District Council (TDC) since that date. The support of NCC, TDC and PF Olsen has been gratefully received by all involved.

We have recently become aware of a koiwi issue, which affects part of the biosolids trial. We discussed the trial and its future with Peter Wilks and CIBR colleagues and would like to reiterate that **the long-term biosolids research trial at Rabbit Island is not compromised by koiwi, and monitoring and data collect should continue. The trial is still of excellent research science value and there is considerable merit in continuing to conduct scientific studies to assess the long-term and residual effects of repeated biosolids application on tree growth, health, and soil and groundwater qualities.**

We understand the koiwi issue will prevent any future applications of biosolids onto some plots of the research trial. While this is disappointing, there is a scientific value **in leaving the entire trial area protected and untreated from now on.** We justify continuing monitoring the research trial based on the following aspects.

#### **Importance of the research trial**

Treated biosolids from the Nelson Regional Sewage Treatment Plant have been applied to a 1000-ha *Pinus radiata* forest plantation at Rabbit Island near Nelson City since 1996. With the excellent collaboration and financial support of the Nelson Regional Sewerage Business Unit (NRSBU)/NCC, TDC, PF Olsen and Scion, a long-term research trial was established on the site in 1997. The objectives of the trial are to monitor the ecological and environmental

impact of repeated application of biosolids on the pine plantation ecosystem, and to determine sustainable application rates with minimum impact on the receiving environment. **This trial is unique both nationally and internationally due to the comprehensive and long-term assessment.** Since the establishment of this research trial, tree nutrition, growth and wood properties have been assessed along with a number of environmental variables, such as soil and groundwater quality over the 18-year period. The research findings from this long-term forest field trial have supported and informed management practices for sustainable land application of biosolids, and provided direct evidence for regional councils to make informed decisions during the resource consent application process. Up to date, 11 national and international publications, 17 annual progress reports and 6 biosolids newsletter articles have been produced from this long-term research trial. In addition, one manuscript has been submitted and two manuscripts are being drafted for publication in international journals. Currently, a PhD study on the effects of long-term biosolids application on soil microbial community structure and functions in relation to soil carbon and nitrogen transformation is being completed by Minhuang Wang, a student from Fujian Normal University in China who has spent the last year working at Scion.

#### **Science component of future research**

There is merit in leaving the entire biosolids trial area protected, without further application of biosolids to any of the trial. It is important that the all biosolids treatments in combination with different stocking rates (4 replications) are treated in the same way to maintain the statistical robustness of all 36 plots. To continue to answer the research questions on the effects of repeated biosolids applications on the trees and the environment, it is recommended that Scion scientists take measurements less frequently than previously from November 2015 to the end of rotation, estimated to be in 2022. A proposed strategy is provided below. This should provide robust data on the long-term effects of biosolids applied to trees from ages 6-30.

The important future research questions that need to be addressed and can only be tested in this unique long-term biosolids research trial include:

1. What will be the influence of long-term biosolids application on soil microbial community structure and enzymatic functions? How will these changes affect the carbon (C) and nitrogen (N) transformations and storages in the soil and tree biomass, and their impact on forest soil fertility and productivity?
2. Will the repeated application of biosolids enhance the stability of soil organic matter in sandy soil and increase the long-term C sequestration in the soil for beneficial reuse of biosolids in forest land?

3. How can we predict the long-term fate of biosolids-derived heavy metals and organic contaminants in the receiving environment and their ecological and environmental consequences?

We plan to use an integrated approach to investigate how long-term application of biosolids to unproductive land can enhance soil fertility and functions, pine forest productivity and ecosystem functioning. The impact of biosolids application on environmental quality (soil and groundwater) will also be assessed based on the long-term forest trial on unproductive land at Rabbit Island. More specifically,

- We plan to determine the beneficial impacts of long-term biosolids application on soil quality, carbon sequestration and the net global warming potential in the forest ecosystem, and investigate the ecological processes that shape microbial composition and function and microbial mechanisms mediating C and N cycling in the coupled plant-soil-microbial system and increased soil C storage.
- Tree growth and nutrition will be measured biannually and economic return associated with the fertiliser value from biosolids offset against impacts on wood quality will be modelled. Sustainability of land application of biosolids will be assessed in consideration of economic and ecological values.
- We will identify biological risk factors associated with long-term application of biosolids to pine forests. Chronic effects arising from the cumulative impacts of multiple biosolids application will be assessed and included in environmental models to address land managers' concerns about the sustainability of forest application of biosolids.

Results from this long-term trial will help waste managers/land owners in Nelson in particular and other regions in general to make informed decisions on sustainable biosolids application and resource consent application, and will be applied to the case-study sites nationally due to the science excellence. We see this as particularly important in the resource consent reapplication which the NCC must consider in a few years' time.

#### **Agreed on-going work**

The following work will go ahead based on the signed Agreement between PF Olsen and Scion.

#### ***Foliage sampling and analysis, March 2015***

The foliage samples are collected from this research trial every two years, with the most recent one in March 2013 and next one will be due in March 2015.

Scion and PF Olsen signed a Professional Services Agreement dated 11 March 2013 (QT3088, Contract Ref 361004) for "Growth monitoring and reporting of the biosolids research trial at Rabbit Island for 2012-15". Based on the agreement, Scion will do the foliage sampling and analysis and reporting on behalf of PF Olsen. The costs are detailed in the original Agreement with agreed cost variation of the foliage sampling (\$4,620) and chemical analysis (\$980) for March 2015 in a supplementary email to PF Olsen.

The foliage sampling costs include labour, accommodation, vehicle, etc. Scion will co-fund this sampling as per the agreement. Except as expressly stated in this letter all other terms and conditions remain unchanged and of full effect. **Scion will need prompt acceptance of the cost of foliage sampling and analysis as samples should be taken by the end of March.**

#### ***Tree growth measurement, July 2015***

Based on the current Agreement, PF Olsen will measure tree height and DBH again in winter (July) 2015 and send the data to Scion, who will complete tree data entry and quality checking.

#### ***Reporting, November 2015***

Based on the Agreement, Scion will complete the collation and statistical analysis of tree growth and foliar nutrient data up to 2015. A report with recommendations and presentation will be prepared and delivered by the end of November 2015.

#### **Recommended future work, post November 2015**

Based on the justification mentioned above, the entire biosolids research trial area will be protected and no further biosolids applied from now on. However, it is advised that the trial will be monitored and measured less frequently than previously from November 2015 to the end of rotation to investigate the residual effects of previous 6 applications of biosolids.

The following work is recommended in consideration of koiwi issue.

#### ***Tree growth measurement***

Tree height and DBH should be measured from this research trial every 2 years to the end of rotation, with the measurements in winter (July) 2017, 2019 and 2021 (if harvesting is delayed further measurement should be considered). Annual trial maintenance will still be required including maintaining tree marking, corner pegs, and access.

#### **Estimated Cost:**

- 2017 measurement - \$6,435 (including labour, vehicle, accommodation, etc)

- 2019 measurement - \$7,100 (including labour, vehicle, accommodation, etc)
- 2021 measurement - \$7,825 (including labour, vehicle, accommodation, etc)

### ***Foliage sampling and analysis***

The foliage samples should be collected and analysed from this research trial every 2-3 years to the end of rotation, with the next ones in March 2017 and the following one in March 2020 (if harvesting is delayed further measurement should be considered).

#### Estimated Cost:

- 2017 foliage sampling and analysis - \$6,960 (including labour, vehicle, accommodation, analysis cost)
- 2020 foliage sampling and analysis - \$7,900 (including labour, vehicle, accommodation, analysis cost)

### ***Wood core sampling and analysis, and estimation of carbon and nitrogen stocks in pine***

To investigate the long-term effects of biosolids application and stocking rates on wood formation and quality, and carbon and nitrogen sequestration in pine, the wood core samples should be collected from 144 trees of this research trial in 2016 for time series analysis of varying wood density and radial growth, chemical and isotope composition of wood, carbon and nitrogen stocks in above- and below-ground biomass of pine forests.

#### Estimated Cost:

- **Option 1:** 2016 core sampling and analysis - \$10,740 (including labour, vehicle, accommodation, tool hire, analysis cost) for the pre and post treatment core sample lengths and core heartwood %, and wood density
- **Option 2:** 2016 core sampling and analysis - \$28,020 (including labour, vehicle, accommodation, tool hire, analysis cost) for annual growth ring density, early- and late-wood ring width and their proportions.
- Extra \$11,664 for analysis of total carbon (C) and nitrogen (N) (\$4,320) and isotope composition (\$7,344) to quantify C and N stocks in pine forests and biosolids-derived C and N uptake by trees.

### ***Soil sampling and analysis***

The soil samples should be collected and analysed from this research trial every 3 years to the end of rotation to measure the long-term and residual effects of biosolids application, with the sampling dates in September 2016, 2019 and 2022.

#### Estimated Cost:

- 2016 Soil sampling and analysis - \$27,434 (including labour, vehicle, accommodation, and analysis costs)

Chemical analysis of soil (4 layers – 0-25, 25-50, 50-75 and 75-100cm) and litter samples, including pH, total C, total N, Olsen P, and exchangeable cations, CEC, and total extractable heavy metals (i.e. As, Cd, Cr, Cu, Ni, Pb, Zn, and Hg)

- 2019 Soil sampling and analysis - \$29,638 (including labour, vehicle, accommodation, and analysis costs)

Chemical analysis of soil (4 layers – 0-25, 25-50, 50-75 and 75-100cm) and litter samples, including pH, total C, total N, Olsen P, and exchangeable cations, CEC, and total extractable heavy metals (i.e. As, Cd, Cr, Cu, Ni, Pb, Zn, and Hg)

- 2022 Soil sampling and analysis - \$30,890 (including labour, vehicle, accommodation, and analysis costs)

Chemical analysis of soil (4 layers – 0-25, 25-50, 50-75 and 75-100cm) and litter samples, including pH, total C, total N, Olsen P, and exchangeable cations, CEC, and total extractable heavy metals (i.e. As, Cd, Cr, Cu, Ni, Pb, Zn, and Hg)

**Wood structure and properties at harvest**

Wood disks should be collected at the end of rotation (e.g. 2022) to characterize wood anatomical and fibre properties by SilviScan. Pith to bark variations will be assessed for wood density and stiffness, microfibril angle, fibre width, wall thickness and coarseness. Annual rings and their earlywood and latewood parts will be identified and property averages, number of cells and other features can be calculated for each ring and part.

Estimated Cost:

- 2022 wood disk sampling and analysis - \$32,434 (including labour, vehicle, accommodation, tool hire, wood disk preparation and analysis costs)

Wood and fibre properties include wood density, wood stiffness, fibre dimensions, microfibril angle, annual rings and wood stiffness. Detailed information is obtained on radial variations through the integration of three measurement principles.

**Summary of annual cost for the future work from 2016 to 2022**

Year	Description	Costs
2016	Wood core sampling and analysis	Option 1: \$10,740; Option 2: \$28,020
	Wood total C and N and isotope analysis	\$11,664
	Soil sampling & analysis	\$27,434
		Sub-total: <b>\$49,838 or \$67,118</b>
2017	Tree growth measurement	\$6,435



	Foliage sampling & analysis	\$6,960
		Sub-total: <b>\$13,395</b>
2019	Tree growth measurement	\$7,100
	Soil sampling & analysis	\$29,635
		Sub-total: <b>\$36,735</b>
2020	Foliage sampling & analysis	\$7,900
2021	Tree growth measurement	\$7,825
2022	Soil sampling & analysis	\$30,890
	Wood structure and properties	\$32,434
		Sub-total: <b>\$63,324</b>
	Total	<b>\$179,017 or 196,297</b>

### Final note

Scion and CIBR will ensure that all future activities at Rabbit Island, whether for access or measurements will follow strict work plans that cover the requirements of the koiwi status of the trial.

It is important that iwi will be notified either by NRSBU or PF Olsen on the on-going and future tree growth measurement and sample collection of soil, foliage, wood core, biomass and wood disks from this biosolids research trial.

We are happy to discuss any aspects of the current and proposed future research, and look forward to continuing our contribution to the research on the long-term biosolids trial.

Yours sincerely,



Jianming Xue  
Senior Scientist  
Scion

## Initial Business Case for Biosolids Diversion

Prepared by: Johan

### SUMMARY

The volume of biosolids being sprayed at Rabbit Island has increased significantly over the last few months. The cost of biosolids disposal is tracking well above budget.

The business case is aimed at

- considering an alternative treatment process for biosolids exceeding the directly contracted volume;
- determining if this could be an alternative method to treat biosolids that exceed the capacity of Rabbit Island;
- determining if this is an alternative treatment process to divert biosolids where the required VS reduction has not been achieved.

Implementing the project could potentially generate a saving of around \$50,000 for NRSBU annually (about \$20,000 this financial year) and demonstrate if the alternative treatment process can be used in future to mitigate the overflow of biosolids to contain costs and available space in biosolid spaying areas.

### REASONS

Manage the cost of biosolids application and conduct a trial to determine the effectiveness of an alternative approach to treat the overflow of biosolids in the event that we run out of capacity to dispose of biosolids in the Rabbit Island spraying area.

<b>BUSINESS OPTION 1 - do nothing different</b>	
Describe the option for what "making do" could do to reduce the problem or introduce an opportunity	
<b>Benefits</b>	Continue status quo.
<b>Dis-benefits</b>	No different from current. The annual cost of managing biosolids will increase for this financial year by \$80,000 to \$100,000.
<b>Costs</b>	Additional operation cost which is already a liability.
<b>Timescale</b>	No implications.

<b>Risks</b>	No different from current.
<p><b>BUSINESS OPTION 2 – Implement the biosolids diversion trial using geobag located on sludge drying platform next to Chamber C3.</b></p> <p>Construct a level bunded area where the geobag can be placed.</p> <p>Install an impermeable sheet covered with pea metal to provide drainage of effluent to sump.</p> <p>Use existing algae transfer pumps to pump effluent into chamber C3 to divert the effluent back into the facultative ponds.</p> <p>Place geobag within bunded area and divert biosolids into geobag.</p> <p>Allow the biosolids to dewater.</p>	
<b>Benefits</b>	<p>Demonstrate the effectiveness of an alternative method to treat biosolids.</p> <p>Diverting biosolids away from Rabbit Island will decrease the cost of spraying biosolids by \$20 per tonne.</p> <p>Diverting all the biosolids that exceed the contracted cap will decrease the cost of the Biosolids contract by \$80,000 to \$100,000.</p>
<b>Dis-benefits</b>	<p>Odour development. (Dewatering treated biosolids in geobags will have less of an effect than the raw sludge that was treated in the bags at Nelson North.)</p> <p>Spill of biosolids.</p> <p>Effects can be monitored and the biosolids can be diverted back to the biosolids tank at low operating cost in the unlikely event that the trial is unsuccessful.</p> <p>Time to obtain resource consent if required by consent authority.</p>
<b>Costs</b>	<p>Cost of geobag: \$5,829.39 per bag.</p> <p>Estimated cost of preparing geobag platform: \$8,000</p> <p>Cost of impermeable layer: \$2,500</p> <p>Diversion pipeline: \$4,000</p> <p>Cost of diverting supernatant using existing portable algae pumps: \$1,500</p> <p>Contingency: \$5,000</p> <p>Including polydosing: \$10,000</p> <p>Total estimated cost for initial trial on biosolids: \$36,829.39</p>

	Annual cost of operation: \$2,500
<b>Timescale</b>	The project can be implemented within months of approval.
<b>Risks</b>	If consent authority require a resource consent for the activity.
<b>BUSINESS OPTION 3 - do something</b>	
Locate the geobag in the old aeration basin.	
<b>Benefits</b>	<p>Benefits are the same as for option 2.</p> <p>No resource consent required.</p> <p>Bag failure will be mitigated by contained area.</p> <p>Leaked biosolids will dry out naturally in aeration basin.</p> <p>Supernatant can be pumped into facultative pond F1 with existing setup.</p> <p>Retrofitting poly doing will be easy.</p> <p>Installed geobag will allow for trials that will be required to demonstrate that ponds can be desludged as an operational activity.</p> <p>Trials can be affected to see how whether geobags can be used without adding poly to secondary and primary sludge.</p> <p>All three geobags can be installed to compare outcomes.</p> <p>Bags can be continued to be used to treat overflow biosolids for an extended period.</p> <p>The filtrate can be diverted to the aeration basin or ponds depending on load conditions.</p>
<b>Dis-benefits</b>	Slightly higher cost of installation.
<b>Costs</b>	<p>Cost of geobag: \$5,829.39</p> <p>Cost of drainage layer: \$2,500</p> <p>Connecting and diverting biosolids return pipeline to geobag: \$5,500.</p> <p>Polydosing: \$12,000</p> <p>Total cost: \$25,829.39</p> <p>Operation cost: \$1,500 per annum</p>

<b>Timescale</b>	Benefits will accrue from the day after the geobag is installed. Installation is expected to be completed by 5 June 2015.
<b>Risks</b>	That the biosolids will not dewater properly and that the bags will have to be located in the old aeration basin for a considerable period of time. That the biosolid particles are so small that there will be excessive loss of biosolids. A trial will be carried out early next week to determine the capacity of the bags to filter the solids.

### **"Science"**

We have observed biosolids separation in the biosolids storage tanks at Rabbit Island.

Tests have shown that biosolids concentrations of up to 15-14% dry solids have been observed after less than 5 to 10 days residence time in the storage tanks. (Biosolids is sprayed at 2 to 3.5% dry solid concentration)

One can therefore expect similar results inside a geobag.

The potential of the bag to filter the filtrate is uncertain and can be affected by the clogging of fabric and thereby decreasing the permeability of the bag to allow the supernatant to be displaced.

The separated biosolids of low concentration will migrate to the top of the bag and can be removed by pumping if required. This will only be required if sufficient dewatering does not occur. It is considered likely that dewatering will occur as the material in the bag separates under gravity and the overburden that will be the result of filling the bag with biosolids. (The bag can be pre loaded by placing sand bags on the bag before charging the bag)

As time is not a limiting factor for the final dewatering of the product for disposal the trial should show some measure of success.

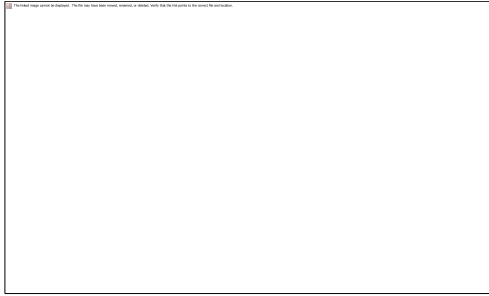
However, if it takes significant time to displace the supernatant this could affect the potential savings that can be accrued from the trial during this financial year.

If all three bags available are used the saving on the biosolids contract will at least pay for the trial during this financial year. However, if significant dewatering does occur in a relatively short period of time there is potential to save up to \$50,000 or more on the operational budget for this 2014/15 financial year.

Dewatering trials on the biosolids carried out in 2010 indicated that significant cost is associated with the dewatering of biosolids. However, these trials were aimed at dewater the biosolids over a short period of time so that the overflow of biosolids that cannot be disposed of through land application can be land filled in bulk.

The filtrate will need to be tested to quantify the colloidal mass that will be discharged back into the process. If the filtrate is found to cause issues with the operation of the ponds it could become essential to develop an alternative detention pond for the filtrate. This will only be required if the alternative dewatering process will become a significant activity.

Sludge dewatering tests indicated that the best results were achieved using an acid coagulant followed by a cationic polymer. A filtrate of 175ml was achieved from a 250ml sample.



The filtrate is expected to have a low pH within the 3.8 to 4.

This will require the discharge of around 70m<sup>3</sup> of filtrate into the daily inflow of around 12,000m<sup>3</sup> and mixed into three facultative ponds with a capacity of 500,000m<sup>3</sup>.

Sulphuric acid coagulant: \$3.20 per m<sup>3</sup>.

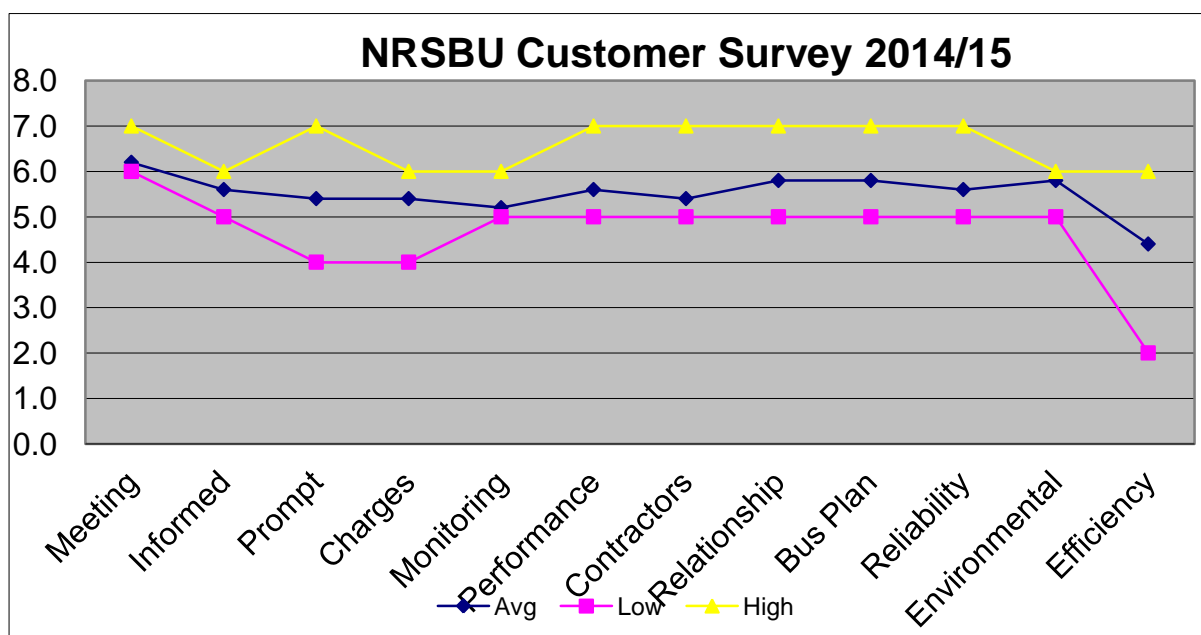
Liquid Crystalfloc ELH12: \$7.69 per m<sup>3</sup>.

Based on the worst case scenario the saving on the budget is expected to exceed \$8 per m<sup>3</sup> of biosolids treated.

Using powder polymer will decrease the cost by approximately \$3 per m<sup>3</sup>.

## NRSBU Customer Survey Results 2014/15

		How do you rate the following:	1	2	3	4	5	Avg	Low	High	Most Critical	Least Critical
1	Meeting	User meetings are a useful forum for the exchange of information between users and staff and for resolving	7	6	6	6	6	6.2	6.0	7.0	1	1
2	Informed	Users are kept well informed of issues relating to the Regional Sewerage Scheme, which may affect them	6	6	6	5	5	5.6	5.0	6.0		
3	Prompt	Feedback to users is prompt and timely	7	6	5	4	5	5.4	4.0	7.0		
4	Charges	Data and information on user charges is accurate and provided in a timely fashion	6	6	6	4	5	5.4	4.0	6.0		1
5	Monitoring	Data and information on monitoring is accurate and provided in a timely fashion	6	5	5	5	5	5.2	5.0	6.0		1
6	Performance	Users are provided with timely and accurate advice on reticulation and treatment plant performances	7	5	6	5	5	5.6	5.0	7.0		
7	Contractors	On site services, advice and follow up provided by the contractors is excellent	7	5	5	5	5	5.4	5.0	7.0		1
8	Relationship	The NRSBU has an excellent working relationship with user representatives	7	6	6	5	5	5.8	5.0	7.0		
9	Bus Plan	The NRSBU business plan provides clear direction for the operation of the scheme and is relevant	7	5	6	5	6	5.8	5.0	7.0		
10	Reliability	The NRSBU provides a reliable system to ensure continuity of service to its Customers	7	5	6	5	5	5.6	5.0	7.0	2	
11	Environmental	The NRSBU's record of environmental compliance is good	6	6	6	5	6	5.8	5.0	6.0	3	
12	Efficiency	The NRSBU runs a cost effective and efficient operation	6	5	5	2	4	4.4	2.0	6.0	3	



Comments					
<b>In the last year what have we done well?</b>					
Reviewed Activity Management plan and capital expenditure					
Compliance					
Ongoing assistance received from NRSBU with tracking down causes for increased					
<b>In the last year what didn't we do well?</b>					
Would like to be informed when over flows are occurring at Beach Road. This is just					
No issues					
<b>What can we do to improve our service in the future?</b>					
No issues					
Encourage off site treatment with users to decrease ongoing costs.					
<b>Are there any other qualities you think are desirable, and how does the business unit rate on those?</b>					
No issues					
<b>Any other comments?</b>					
I think the operation has had a successful year as a customer.					
Cost are our main concern, out of Alliances seven main plants on a lamb equivalent basis we are the least cost effective i.e. We have the most expense to get rid of effluent. Hence we missed the cut for future meat Industry plans (Not just effluent, water in is worse).					
No issues					



## **Business Case for Second Storm pump at Airport pump station**

### **Issue:**

A project was identified during the development of the ten year strategy, included in the NRSBU Asset Management Plan and Business Plan for 2015/16 to upgrade the Airport pump station to mitigate the effects of the storm pump being out of commission during times of high inflow resulting from heavy rain events.

### **Anticipated outcomes:**

Mitigation of risk of overflows due to unavailability of the storm pump while retaining optimised efficiency.

### **Recommendations:**

To mitigate the issues with delivery of a replacement storm pump it is considered prudent to procure a replacement storm pump similar to the existing storm pump for this pump station as a critical spare.

### **Justification:**

Practical experience has shown that it takes up to six months to source a replacement storm pump for this pump station.

A major overhaul of the pump is takes up to 4 months as parts need to be imported.

The pump mounting and pipe work is constructed for this specific pump and it is not practical to swap in a dissimilar pump.

The Regional Pipeline Upgrade design report (A354183) specifies that the storm capacity for this pump station is adequate for the future projected growth in this area. The Songer street pump station was specifically designed to allow the diversion of flow from the airport pump station catchment to the Songer street catchment. This was partly carried out to mitigate the effects of flow from the airport pump station on the capacity of the Saxton Road pump station. Increased flow from the airport pump station would restrain the capacity at the Saxton pump station.

A duty standby arrangement for normal pump duty is more economical than an arrangement where a large storm pump is depowered to back up a duty pump.

There is adequate space available inside the airport pump station to house this critical spare.

The benefit is improved continuity of service following a breakdown of the storm pump or during servicing of the storm pump, preventing a breach of resource consent by discharging raw sewage into the Waimea Inlet.

## Business Case Analysis team

The report will be presented to the NRSBU Joint Committee through the General Manager.

## Supporting Data

Continue to deliver services at a justifiable level of service at an optimised cost.

Number of events and hours stormpump was required												
	2009	Hours	2010	Hours	2011	Hours	2012	Hours	2013	Hours	2014	Hours
Jan									1	28	1	1
Feb												
Mar											1	6
Apr									1	18	1	10
May					2	36						
Jun	1	12	1	1.5			2	53	2	15	1	10
Jul	1	11									2	16
Aug	1	3	1	13			1	8				
Sep	1	40					1	4	2	6.5	2	3
Oct	1	7			1	17	1	12				
Nov					4	17					3	19
Dec			2	25	2	60						

The storm pump is used in instances where the wet well is affected by high inflows during rain events. The low number of events and the relatively short duration where a storm pump is required demonstrate that most flows can be accommodated by the use of lower capacity duty pumps.

Overflows at airport		
	Number	Cause
2005	0	
2006	0	
2007	1	Rain Event
2008	1	Rain Event
2009	0	
2010	1	Programmed upgrade work
2011	1	Rain Event
2012	0	
2013	2	Rain Events
2014	0	

None of the reported overflows experienced at the Airport pump station since 2005 would have been prevented if there was a duty and standby storm pump arrangement at the Airport pump station.

The Cawthron report (A1275566) on accidental discharges has shown that overflows during heavy storm events have little effect on the discharge

environment. The NCC procedures to manage overflow events are implemented following overflow events.

**Business Options:**

<b>8. Option 1 – Do nothing</b>	
<b>9. Benefits</b>	<b>10. No capital expenditure.</b>
<b>11. Dis-benefits</b>	<b>12. Significant risk of long duration sewage overflows. Potential delay of 6 months to maintain agreed service level.</b>
<b>13. Costs</b>	<b>14. Nil.</b>
<b>15. Timescale</b>	<b>16. Nil.</b>
<b>17. Risks</b>	<b>18. Uncontrolled sewage overflows could result in environmental damage, reputational damage, prosecution in terms of RMA. It is likely that overflows of significant durations will occur during times when the storm pump is out of commission.</b>
<b>19. Option 2 – Upgrade the Airport pump station to a dual storm pump and single duty pump configuration</b>	
<b>20. Benefits</b>	<b>21. Maintain level of service. Overflows resulting from operational failure of the storm pump will be reduced.</b>
<b>22. Dis-benefits</b>	<b>23. Increased operational cost resulting from large pump acting as standby for lower capacity duty pump. Due to the work load of the lower capacity duty pump the storm pump will be called on to operate with increased frequency and for longer duration.</b> <b>24. Level of service is higher than at other similar facilities. (Dual storm pumps at Beach Road, Saxton Road and Songer Street to provide additional capacity)</b>
<b>25. Costs</b>	<b>26. \$614,309 plus increased operational cost.</b>
<b>27. Timescale</b>	<b>28. Six months to implement.</b>
<b>29. Risks</b>	<b>30. Increased future capital costs required to match increased level of service in future at other facilities.</b>
<b>31. Option 3 – Procure storm pump as critical spare – Recommended</b>	
<b>32. Benefits</b>	<b>33. Mitigate heavy rain associated overflows that could occur during periods that the pump is out of operation for maintenance purposes. Mitigate down time of the storm pump and retain agreed level of service.</b> <b>34. The spare pump can also be used to replace the storm pumps at the Saxton Pump Station.</b>
<b>35. Dis-benefits</b>	<b>36. Nil.</b>
<b>37. Costs</b>	<b>38. \$220,000</b>
<b>39. Timescale</b>	<b>40. Critical spare should be on site within three months of start of financial year. (September 2015)</b>
<b>41. Risks</b>	<b>42. Uncontrolled sewage overflows could result in environmental damage, reputational damage, prosecution in terms of RMA.</b>

Practical experience has shown that the pump (Critical spare) can be installed within a day.

To mitigate the issues with delivery of a replacement storm pump it is considered prudent to procure a replacement storm pump similar to the existing storm pump for this pump station so that the pumps can be swapped with no physical modification to the mounting and pipe work.

#### Appendix: Cost estimate – Option 2

Preliminary and General	55000
Civil works	50094
Pipework and fittings	112167
Decommission and install new pump	7078.5
Pump	220000
Electrical design	10345.5
Supply and installation Electrical works	69696
SCADA and control installation and integration	9801
15% contingency	80127.3
<b>Total cost estimate</b>	<b>614309.3</b>

Approved budget in NRSBU Business Plan 2015/16 - \$270,000.



19 June 2015

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REPORT R4410

## Financial Report

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### 1. Recommendation

***THAT the Financial Report (R4410) and its attachment (A1370497) be received.***

Andrew Bishop  
**Management Accountant**

### Attachments

Attachment 1: A1370497 - Financial Report - Nelson Regional Sewerage Business Unit - April 2015

**Nelson Regional Sewerage Business Unit  
Financial Report**

**Income Account for the period to 30th April 2015**

	Actual Month	Budget Month	Actual YTD	% YTD	% Year	2014/15 Budget		YTD Variation
						YTD	Annual	
<b>Income</b>								
Contributions Fixed	371,243	386,900	3,712,432	96	80	3,869,200	4,643,000	(156,768)
Contributions Variable	189,728	234,100	1,896,997	81	68	2,340,800	2,809,000	(443,803)
Other Recoveries	14,406	14,800	139,837	94	79	148,300	178,000	(8,463)
Interest	3	80	202	25	20	800	1,000	(598)
Forestry Income	-	830	-			8,300	10,000	(8,300)
<b>Total Income</b>	<b>575,380</b>	<b>636,710</b>	<b>5,749,468</b>	<b>90</b>	<b>75</b>	<b>6,367,400</b>	<b>7,641,000</b>	<b>(617,932)</b>
<b>Less Expenses</b>								
Management	17,956	19,700	168,973	86	72	195,800	235,000	26,827
Electricity	46,250	63,450	587,380	92	77	635,600	762,700	48,220
Contract Maintenance	54,039	65,400	586,993	90	75	653,500	784,200	66,507
Reactive and Proactive Maintenance	23,023	32,150	373,840	116	97	321,300	385,500	(52,540)
Monitoring	5,334	10,000	67,335	68	57	98,800	118,600	31,465
Consultancy	1,110	4,200	29,057	70	58	41,700	50,000	12,643
Insurance	5,023	4,900	50,226	102	85	49,200	59,000	(1,026)
Sundry	7,341	6,150	62,246	91	76	68,300	82,000	6,054
Biosolids Disposal	48,815	43,250	557,072	129	107	433,300	520,000	(123,772)
<b>Operating &amp; Maintenance Expenses</b>	<b>208,892</b>	<b>249,200</b>	<b>2,483,121</b>	<b>99</b>	<b>83</b>	<b>2,497,500</b>	<b>2,997,000</b>	<b>14,379</b>
Financial	68,007	68,650	729,387	106	89	686,700	824,000	(42,687)
Depreciation	145,348	164,500	1,453,488	88	74	1,645,000	1,974,000	191,512
<b>Total Expenses</b>	<b>422,247</b>	<b>482,350</b>	<b>4,665,997</b>	<b>97</b>	<b>81</b>	<b>4,829,200</b>	<b>5,795,000</b>	<b>163,203</b>
<b>Net Income before Rebate</b>	<b>153,133</b>	<b>154,360</b>	<b>1,083,471</b>	<b>70</b>	<b>59</b>	<b>1,538,200</b>	<b>1,846,000</b>	<b>(454,729)</b>
<b>Owners rebate</b>	<b>0</b>	<b>0</b>	<b>0</b>					
<b>Net Income after rebate</b>	<b>153,133</b>	<b>154,360</b>	<b>1,083,471</b>			<b>1,538,200</b>	<b>1,846,000</b>	<b>(454,729)</b>
<b>Capital Expenditure</b>								
Renewals	30,381	59,900	332,527			599,170	719,000	
New Capital Expenditure	898	-	42,553			-	-	
<b>Total Capital Expenditure</b>	<b>31,279</b>	<b>59,900</b>	<b>375,079</b>			<b>599,170</b>	<b>719,000</b>	

## Nelson Regional Sewerage Business Unit

### Balance Sheet as at 30th April 2015

	Current	Last Month	June 2014
<b>Equity</b>			
Opening Equity (July)	37,137,636	37,137,636	36,229,451
Plus Net Income YTD	1,083,471	930,338	(323,397)
Plus Revaluation	0	0	1,231,581
<b>Closing Equity</b>	<u>38,221,106</u>	<u>38,067,974</u>	<u>37,137,636</u>
Contingency Reserve	100,000	100,000	100,000
	<u><b>38,321,106</b></u>	<u><b>38,167,974</b></u>	<u><b>37,237,636</b></u>
Which was Invested as follows -			
<b>Current Assets</b>			
Bank	43,254	9,718	44,983
Debtors	17,944	22,267	178,100
NCC Current account	340,774	133,534	317,468
<b>Total Current Assets</b>	<u>401,973</u>	<u>165,519</u>	<u>540,551</u>
<b>Fixed Assets</b>	<b>54,249,599</b>	<b>54,363,668</b>	<b>55,328,008</b>
<b>Current Liabilities</b>			
Creditors	(80,465)	(11,213)	(199,467)
NCC Loan	(250,000)	(350,000)	0
TDC Current Account	0	0	(800,691)
NCC Current account	0	0	(1,430,765)
<b>Total Current Liabilities</b>	<u>(330,465)</u>	<u>(361,213)</u>	<u>(2,430,923)</u>
<b>Term Liabilities</b>	<b>(16,000,000)</b>	<b>(16,000,000)</b>	<b>(16,200,000)</b>
Derivative Financial Instruments	0	0	0
	<u><b>38,321,106</b></u>	<u><b>38,167,974</b></u>	<u><b>37,237,636</b></u>

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