

AGENDA

Ordinary meeting of the

Nelson Regional Sewerage Business Unit

**Friday 24 June 2016
Commencing at 1.00pm
Ruma Mārama, Floor 2A
Civic House
110 Trafalgar Street, Nelson**

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

Guidelines for councillors attending the meeting, who are not members of the Committee, as set out in Standing Orders:

- All councillors, whether or not they are members of the Committee, may attend Committee meetings (SO 2.12.2)
- At the discretion of the Chair, councillors who are not Committee members may speak, or ask questions about a matter.
- Only Committee members may vote on any matter before the Committee (SO 3.14.1)

It is good practice for both Committee members and non-Committee members to declare any interests in items on the agenda. They should withdraw from the room for discussion and voting on any of these items.

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. Public Forum

4. Confirmation of Minutes

- 4.1 11 March 2016 **5 - 8**

Document number M1761

Recommendation

THAT the minutes of the meeting of the Nelson Regional Sewerage Business Unit, held on 11 March 2016, be confirmed as a true and correct record.

5. General Manager's report **9 - 26**

Document number R5962

Recommendation

THAT the report General Manager's report (R5962) and its attachments (A1516705 and A1565151) be received;

AND THAT Contract 3458 Operations and Maintenance with Nelmac be extended on the same terms and conditions for another 2 years to 30th September 2018 at an annual cost of approximately \$1,600,000 excl GST.

6. NRSBU Demand Management

27 - 31

Document number R6063

Recommendation

THAT the report NRSBU Demand Management (R6063) be received.

Minutes of a meeting of the Nelson Regional Sewerage Business Unit

Held in Ruma Mārama, Level 2A, Civic House, 110 Trafalgar Street, Nelson

On Friday 11 March 2016, commencing at 1.03pm

Present: Councillors M Higgins (Chairperson) and B Dowler (Tasman District Council), Councillor R Copeland (Nelson City Council), and Mr D Shaw (Nelson City Council Representative)

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

Apologies

There were no apologies.

1. Confirmation of Order of Business

There was no change to the order of business.

2. Interests

Iwi Representative, Matt Hippolite, advised that he was now a Trustee of the Ngati Koata Trust, and that the Interests Register needed to be updated to reflect this.

There were no further updates to the Interests Register, and no interests with items on the agenda were declared.

3. Public Forum

There was no public forum.

4. Confirmation of Minutes

4.1 11 December 2015

Document number M1643, agenda pages 4 - 9 refer.

An error was highlighted in section 5 of the minutes. The third paragraph should read 'spraying on Rabbit Island' and not 'spraying and Rabbit Island'.

Resolved NRSBU/2016/001

THAT the amended minutes of the meeting of the Nelson Regional Sewerage Business Unit, held on 11 December 2015, be confirmed as a true and correct record.

Dowler/Shaw

Carried

5. General Manager's Report

Document number R5546, agenda pages 10 - 23 refer.

Nelson Regional Sewerage Business Unit Manager, Richard Kirby, explained the process for the accidental discharge consent application. He said a Council officer reviewed the application which was then reviewed by a lawyer. In response to a question, he advised that cultural impact assessments at the site were conducted over a year ago.

The submission to Moturoa/Rabbit Island Reserve Management Plan review was discussed.

It was highlighted that there was a growing issue with people entering into hazard areas on Rabbit Island and pressure was increasing on logging operators. It was suggested that Rough Island could be an alternate area to spread biosolids in the future should conflicts persist.

It was agreed information was to be added to the submission in relation to Rough Island. It was highlighted there were benefits to spreading biosolids such as reduced landfill costs, ecological and economic benefits, no pathogens and no risk to the public.

Wahi Tapu protocols were discussed and in response to a question, Mr Kirby explained the protocols would be included as part of the resource consent conditions.

There was a discussion about Bokashi Logic in that it was beneficial for compost bins and in circumstances where there were anaerobic issues with waste.

In response to a question, Mr Kirby said introducing Bokashi Logic at the Neale Park pump station would not reduce the odour as the pump station was constantly flowing so was already aerobic.

In response to a further question, Mr Kirby explained that there was no evidence to support the use of Bokashi Logic as a solution for sludge in

wastewater ponds and it would cost approximately \$200,000 per annum to introduce this process to all three ponds. He added that a business case was currently being compiled around the removal of sludge from the ponds and one of the options analysed would be the use of Bokashi Logic.

In response to a question, Mr Kirby said there was a budget of \$200,000 in 2016/17 for sludge removal.

In response to a question, Mr Kirby advised the operation and maintenance contract with Nelmac was for a period of three plus two plus two years and that the first three years would expire in September 2016.

In response to a question, Senior Asset Engineer – Solid Waste, Johan Thiart explained the USEPA source referenced in section 4.18 of the report was measured using the average springtime discharge.

It was highlighted that number 4 in the action plan 'Review risk of contributors leaving NRSBU' was complete.

The NRSBU balance sheet as at 31 January 2016 was tabled (A1519221).

In response to a question, Management Accountant, Andrew Bishop, advised that the surplus illustrated in the balance sheet would be best utilised to repay some term debt to both Nelson City and Tasman District Councils.

In response to a question regarding the NRSBU Status Report, Mr Thiart said that in relation to the Bell Island Energy Audit a final decision would be made in the coming months. He added that optimisation of oxygen levels was currently running at 30% power over the summer.

Resolved NRSBU/2016/002

THAT the report General Manager's Report (R5546) and its attachments (A1508800, A452094 and A1432009) be received;

AND THAT the potential future distribution of biosolids at Rough Island be linked to section 2.5 of the Submission to the Moturoa/Rabbit Island Reserves Management Plan (A1508800).

Copeland/Dowler

Carried

Attachments

- 1 A1519221 - NRSBU balance sheet as at 31 January 2016

There being no further business the meeting ended at 2.23pm.

Confirmed as a correct record of proceedings:

_____ Chairperson _____ Date



24 June 2016

REPORT R5962

General Manager's report

1. Purpose of Report

- 1.1 To report on the NRSBU operational activities over the last few months and outline what is proposed over the next few months.

2. Recommendation

THAT the report General Manager's report (R5962) and its attachments (A1516705 and A1565151) be received;

AND THAT Contract 3458 Operations and Maintenance with Nelmac be extended on the same terms and conditions for another 2 years to 30th September 2018 at an annual cost of approximately \$1,600,000 excl GST.

3. Bokashi Logic project proposal

- 3.1 In May 2016 the NRSBU received a proposal from Bokashi Logic to trial the introduction of microorganisms to the sludge treatment process at the Bell Island Wastewater Treatment Plant. Bokashi Logic wants to demonstrate that the introduction of microorganisms will reduce heavy metals in the biosolids as well as reduce the biosolids volume by at least 30%.
- 3.2 Although the Bokashi Logic proposal outlines the trial process, it does not include any details on a testing regime to demonstrate how the biosolids are affected by the introduction of the additive. Specific sampling and laboratory testing would be required to validate the results and it is unclear from the proposal who will be responsible for this cost.
- 3.3 In proposing the trial, Bokashi Logic have requested a financial contribution of \$9,000 to run the trial over a period of approximately 100 days.
- 3.4 The NRSBU needs to know the full costs associated with this proposal as well as the risks to the current operations of implementing this trial. The

5. General Manager's report

proposal as presented is lacking this detail. It has been referred back to Bokashi Logic for further detail.

- 3.5 The NRSBU needs much more certainty before committing to this initiative. Unless this is forthcoming, we will not be recommending that NRSBU progress with this initiative.

4. Pond Sludge Management

- 4.1 In April 2016, Nelmac and its MWH Wastewater specialist produced a report confirming that the three facultative ponds (F1, F2 and F3) have a significant accumulation of sludge. Each pond has between 52,000m³ and 66,000m³ of sludge with an average depth of 0.57m for F1, 0.70m for F2 and 0.58m for F3.
- 4.2 Although the sludge volume is significant the ponds are still performing satisfactorily. However with time their efficiency and effectiveness will deteriorate very quickly.
- 4.3 In anticipation of this the NRSBU has indicated that it will be desludging the ponds over the next 2 years. In its Business Plan the NRSBU has allocated funding of \$200,000 in 2016/17 and \$1,400,000 in 2017/18 for this.
- 4.4 Various desludging options have been considered. It is an expensive operation as it involves removing the sludge, dewatering it, transporting and disposing of it appropriately. A resource consent will also be required specifically for the disposal component of this process.
- 4.5 The NRSBU recently received a proposal from a company outlining the use of specific types of aeration equipment. This equipment purports to improve pond management including the reduction of sludge volumes.
- 4.6 The proposal recommends the installation of Accel-o-Fac aerators in the ponds. These aerators utilising wind speeds in excess of 7km/hr to operate. They purport to improve the dissolved oxygen transfer throughout the water column in the ponds and enhance the conditions required to optimise bacterial activity in the ponds.
- 4.7 The NRSBU has reviewed some case studies involving this equipment and many report that pond sludge is stabilised to the point where desludging is not required. In some instances the ponds have been operational for more than 40 years with no requirement for desludging. A reduction in a 800-900mm deep sludge blanket is reported in some of the case studies.
- 4.8 A representative of the company that submitted this proposal has visited the Bell Island Wastewater Treatment Plant. He has analysed the wind data and has confirmed that there is sufficient wind to effectively operate the Accel-o-Fac aerators.
- 4.9 Whilst the objectives of the case studies presented are clearly different from the NRSBU objectives in regards to sludge management it is

apparent that the gains made at the different locations where Accel-o-Fac aerators were installed is likely to support the NRSBU to achieve its other operational objectives.

- 4.10 There is significant investment required in implementing this proposal. Although the proposal suggests an initial trial with full payment only required once it is proven there is still a significant initial payment to set up the trial.
- 4.11 It is proposed that the NRSBU undertake more research to achieve more certainty around the cost-effectiveness of this proposal and associated investment. Although there may be operational benefits the main focus will be on reducing the current sludge volumes, thereby negating the need to mechanically desludge the ponds. It is proposed that the NRSBU will undertake additional due diligence on this proposal and present those findings to the NRSBU at its next meeting in September 2016.

5. Bell Island Spit Restoration

- 5.1 Planting now covers the entire spit area with some plantings along the estuary margin to the causeway.
- 5.2 The Spit area now has a growing native vegetation cover following the planting of more than 13,300 plants over the past five years.
- 5.3 The Bell Island Spit Restoration project has been recognised as a significant restoration by the Department of Conservation and other environmental organisations.
- 5.4 The Tasman Environmental Trust provided 50 rare native broom plants for planting along the spit as part of its efforts to protect endangered plant species.
- 5.5 The Spit Restoration Group has indicated that it wishes to continue with the management of the spit area to protect and increase the biodiversity of plant species. They are also keen to investigate and extend the programme to include the estuary margin along the Bell Island forestry block up to the Bell Island causeway.
- 5.6 The Spit Restoration Group value the continued financial support received from the NRSBU and request a contribution of \$5,970 for the 2016/17 financial year.

	NRSBU financial contribution
2010/11	\$11,564.39
2011/12	\$19,618.15
2012/13	\$4,996.49
2013/14	\$7,919.55
2014/15	\$7,542.59
2015/16	\$1,964.34
2016/17	\$5,970.00
Total	\$59,575.51

- 5.7 Financial contributions by the NRSBU have been used to procure new plantings and services for pest and weed control (Attachment 1).

6. Sampling and Laboratory Auditing

- 6.1 Last year the Contributors raised some concerns about the sampling results that the NRSBU were using to levy trade waste charges. During this investigation it was decided that the sampling and laboratory testing processes should be audited to ensure integrity in the processes.
- 6.2 The auditing comprised a Cawthron laboratory technician accompanying the operators during the sampling and reported back on the processes followed. A number of process changes were made to the sampling methodology.
- 6.3 The auditing of the laboratory testing involved sending the same representative samples to three different laboratories for testing.
- 6.4 The outcomes of the sampling and laboratory auditing were presented to the Contributor meeting on 16 March 2016. It was agreed that the laboratory auditing methodology would be reviewed by the Contributor group before the next audit is initiated in February 2017.

7. Trade Waste Agreement Amendments

- 7.1 In late 2015 the NRSBU received and considered a request from NPI to amend the Agreement for Disposal of Trade Waste.
- 7.2 NPI presented a case that the current methodology around the timing of the sampling may not necessarily reflect the actual discharges by Contributors.
- 7.3 Currently the methodology utilises the average load concentration for sampling over four random consecutive days. This average daily concentration is then extrapolated over the whole month based on the volume of wastewater discharged over that month.
- 7.4 NPI indicated that this methodology is acceptable if the Contributor's volumes and loadings are consistent each day over the whole month. If this is not the case then one of two scenarios are likely to occur;

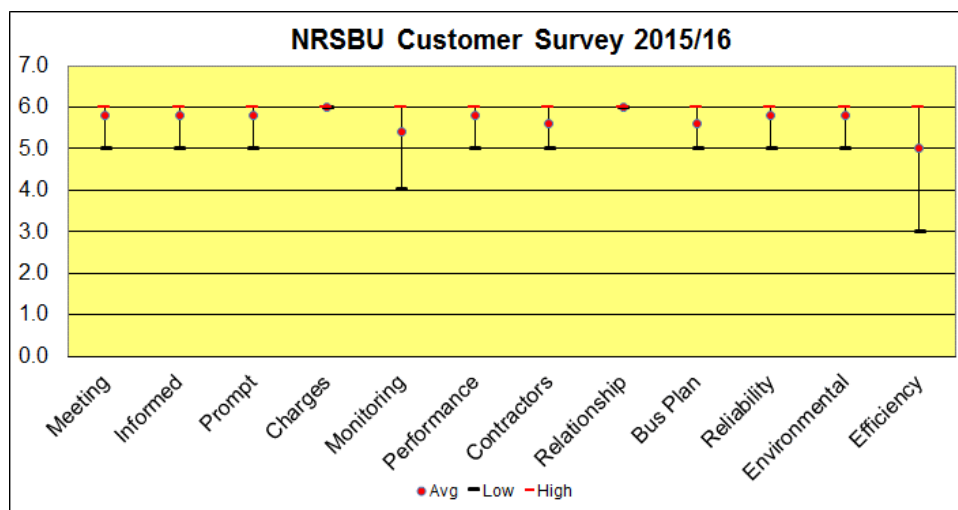
- 7.4.1 The trade waste charges are disproportionately high compared to the cost of treatment when sampling occurs over a 4-day period during when a Contributor discharges a higher concentrated load than normal, or
 - 7.4.2 The trade waste charges do not cover the cost of treatment where the abnormal highly concentrated discharge takes place outside the four day sampling period.
- 7.5 The NRSBU has considered the request and concluded that where a discharge of abnormal concentration is programmed that it is both equitable and prudent to plan the discharge and charge for the discharge based on the following principles:
 - 7.5.1 The Contributor must notify and gain agreement with the NRSBU for the extraordinary discharge.
 - 7.5.2 The Contributor will be charged for the additional load.
- 7.6 This amendment does place the responsibility on the Contributors to manage their discharges and it provides a mechanism for a Contributor to knowingly discharge extraordinary concentrations. The NRSBU will continue to implement the current random 4-day sampling methodology to determine monthly trade waste charges.
- 7.7 Provided the Contributor notifies and obtains approval from the NRSBU any extraordinary load so discharged will not be subject to Excess Discharge provisions as outlined in section 9 of the agreement.
- 7.8 The Agreement for Disposal of Trade Waste has been amended accordingly. This amended agreement is currently being reviewed by the Contributors and once consensus has been reached and it is finalised then all contributors will sign individual agreements with the NRSBU.

8. Annual Customer Satisfaction Survey

- 8.1 A survey containing the following statements were sent out to the five contributor representatives requesting them to rate the performance of the NRSBU on a scale of 1 (poor) to 7 (good).

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

8.2 The results of the survey are reflected in the graph below.



8.3 The following comments were received from contributor representatives.

<u>Comments</u>
In the last year what have we done well?
Complied with resource consents.
Publishing of monitoring data.
In the last year what didn't we do well?
-
What can we do to improve our service in the future?
Consider ways to treat the effluent in a more cost effective manner.
Continue to look at ways to keep costs down while maintaining compliance and reliability
Provide evidence of performance.
Are there any other qualities you think are desirable, and how does the business unit rate on those?
It is an expensive system.
Can we review the fixed and variable costs of operating the NRSBU network and look at how they can be more fairly allocated.

9. Contract 3458 – Operation and Maintenance

- 9.1 The current contract started on 1 October 2013 with an initial contract period of 3 years and the option of extending it for another two years on two occasions - giving potentially a 7-year contract. Any extensions would be offered if the contractor was delivering the services in accordance with the contract to the satisfaction of the Engineer to the Contract.
- 9.2 The Engineer to the Contract has indicated that the Operations and Maintenance Contractor (Nelmac) has generally achieved its obligations under its contract with the NRSBU.
- 9.3 The advice received from the Engineer to the Contract has highlighted that some of the tasks required in the contract are yet to be completed. These are outlined below and the contractor has indicated that they will be completed as detailed;

- 9.3.1 The contractor continue to implement the NRSBU work programme until it has developed the Maintenance Management Plan.
- 9.3.2 The wastewater treatment plant model is under development and it is hoped that the installation of the S::can will speed this work up so that a dynamic model will be available to the NRSBU before the end of this year.
- 9.3.3 The review of the operation and maintenance plans for this year is expected in July 2016.
- 9.4 The annual contract value is approximately \$1.5-\$1.6 million.
- 9.5 The reticulation and treatment operations have continued as normal over the last few months.
- 9.6 The diversion of load away from the aeration basin has been reduced for the winter period resulting in increased run hours for aerators. This diversion started late April.
- 9.7 Sludge stabilisation has increased significantly with all three ATAD trains fully operational since April.
- 9.8 The step screen is back in operation following repairs for damage that occurred during the heavy rain 23/24 March 2016.
- 9.9 A programme was implemented to inspect the first chamber of the inlet structure monthly and after every rain event to check for grit build up in the chamber.

10. Contract 3619 – Biosolids Operation

- 10.1 The monthly average volume of biosolids sprayed is tracking the budgeted amount.
- 10.2 The twelve month rolling monthly average biosolids sprayed has been trending downwards since reaching a peak in December 2016. It is expected that this trend will continue.
- 10.3 The NRSBU needed to spray biosolids on land at the Baltune plantation to conserve available land at Rabbit Island.
- 10.4 With improved understanding of managing sludge and all ATAD tanks available to treat sludge it is projected that land available at Rabbit Island and Bell Island will be adequate to spray all biosolids produced at Bell Island.
- 10.5 The managing of land and sludge processing need intensive management. However, the expertise gained over the past few years will allow the contractor to divert more load to the ponds during warmer months when the ponds have capacity to remove BOD resulting in decreased demand for land to spray biosolids.

11. Key Performance Indicators

The outcomes of key performance indicators for the 3 month period to 31 May 2016.

Environmental: Treatment and Disposal			
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
Environmental: Pump Stations			
Odour complaints from pump stations	Pump station wet weather overflows	Pump station overflows resulting from power failure	Pump station overflows resulting from mechanical failure
	Note 1		
Environmental: Pipeline			
Reticulation breaks	Air valve malfunction		
Capacity: Overloading system capacity			
Treatment & Disposal	Pump Stations		
Reliability: Equipment failure of critical components			
Treatment & Disposal	Pump Stations	Pipelines	
Responsiveness: Speed of response for emergency and urgent maintenance works			
Treatment & Disposal	Pump Stations	Pipelines	
Responsiveness: Speed of response for routine and programmable maintenance works			
Treatment & Disposal	Pump Stations	Pipelines	
Key customer relationships: Overall satisfaction			
Treatment & Disposal	Pump Stations	Pipelines	

Note 1: Overflows occurred at the Beach Road, Saxton Road and Songer Street pump stations during a heavy rain event on 24 March 2016 when the second highest rainfall was recorded in Nelson over a 24 hour period since 2000. Rain gauge at Stoke recorded 138 mm of rainfall for the 24 hour period. The Bell Island rain gauge recorded 127mm between 14h00 - 23 March 2016 - and 6h30 the following morning.

12. Compliance Outcomes

12.1 The compliance outcomes for the 12 months to 31 May 2016 are outlined in the following table:

i)	Resource Consent Compliance (rolling 12 month record)	
	➤ Discharge to Estuary Permit	Not achieved. Overflows occurred at the Beach Road, Saxton Road and Songer Street pump station during the heavy rain event on 24 March 2016. The rainfall event is the second highest rainfall recorded over a 24 hour period recorded for Nelson since January 2000.
	➤ Discharge to Air Permit	100% Compliance
	➤ Biosolids Disposal	100% Compliance
	➤ Discharge treated waste water to land	100% Compliance
ii)	Odour Notifications	
	➤ Past three months	Nil.
	➤ Last 12 months	Nil.
iii)	Overflows	
	➤ Past three months	Three.
	➤ Last 12 months	Three.
iv)	Speed of response for maintenance works	
	<p>In past three months:</p> <ul style="list-style-type: none"> ➤ 11 call outs were associated with treatment plant issues. <ul style="list-style-type: none"> • Milliscreen – 4 events • DAF Poly auger – 3 events • Gravity belt thickener – 2 events • Aerator tripped out in aeration basin. • Foam cutter failure in one of the ATAD tanks. ➤ The three call outs recorded for pump station were associated with heavy rain events. 	
	➤ Response within 30 minutes. Achieved.	

Review of Action Plan Implementation – 2014 Asset Management Plan and 2015/16 Business Plan

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

IP	Business Plan Action	Target Date	Completion Date	Comments
1	Review manuals annually.	31 Jul 2016		Work programmed for completion in July 2016.
2	Consolidate all natural disaster information and review 3 yearly.	Mar 2018		Work will be carried out as part of next asset management review.
3	Internal benchmarking carried out annually.	Jun 2016		Carried out as part of annual report.
4	Review risk of contributors leaving NRSBU.	Jun 2016	1/12/2015	
5	Review capacity of treatment components.	Dec 2016		Expect treatment plant model to be in place in October 2016. Following assessment of S::can results.
6	Programme for pipe inspections.	Jul 2016		Included in annual review of Operation and Maintenance Plan.
7	Annual review of contractor performance.	Dec 2016	8/6/2016	Assessment of O&M contractor included in this report.
8	Screen upgrade.	Dec 2016		Business case needs to be signed off.
9	Review secondary sludge separation.	Dec 2016		Depends on completion of treatment plant model.
10	Construction second sludge storage tank.	Dec 2016		Delayed from June 2016.
11	Develop sludge removal programme.	Jun 2017		Business case developed. Options identified. Report on option 2 included in this report.
12	Review effluent discharge management.	Mar 2016	Jan 2016	Procedures reviewed to ensure that discharge pump is operable. Nelmac instructed to programme one pump discharge per month and report volume of pump down during the discharge in the monthly report.
13	Renewal of effluent discharge permit	Dec 2018		

AP	AMP Action	Target Date	Completion Date	Comments
1	Annual customer survey.	Mar 2016	Apr 2016	Survey result report in this report.
2	Business Continuity Plan review.	Jun 2016	24/6/2016	This has been reviewed. Copy of the Plan to be circulated to Board members.
3	Consider benefits of succession planning and how it might be implemented once governance issues (TDC and NCC) have been resolved.	Jun 2016	June 2016	The revised Terms of Reference have been signed by both Councils and therefore this is not longer required.
4	Review of security required at all facilities.	Mar 2016	17/5/2016	Formed part of 6 monthly Safety Audit.
5	Monitor sludge levels in ponds and ascertain long term removal and disposal requirements.	Mar 2016	Feb 2006	Assessment of options currently being undertaken.
6	Improve reporting requirements for asset condition, performance and maintenance from maintenance contractor.	Mar 2016	Apr 2016	Consolidated as built received and used to validate Asset Data Base (INFOR).
7	Implementation of internal bench marking (using historical data) of NRSBU network, pump stations, treatment and disposal facilities.	Jun 2016		Delayed until 2017.
8	Develop Demand Management Policy.	Jun 2016		Included in this report.

13. Health and Safety

- 13.1 There have been 12 inductions and 289 visitors to the Bell Island Wastewater Treatment Plant over the past three months.
- 13.2 The six monthly Health and Safety audit was carried out on 17 May 2016.
- 13.3 No Health and Safety accidents or incidents have been reported during the last three months.
- 13.4 Remedial work to the roof in the operation/lab building entrance porch is under consideration following an investigation into the risk of slipping on the porch to the operation/lab building.

14. Financial

- 14.1 Expenditure is generally tracking below budget. A financial report for the period ending 31 May 2016 is attached (attachment 2).

- 14.2 The cost of biosolids spraying is over budget as a result of additional cost of transporting biosolids to Baltune and Bell Island for spraying.

Richard Kirby
Consulting Engineer

Attachments

Attachment 1: A1516705 - Bell Island Spit Restoration

Attachment 2: A1565151 - Financial Report for the period ending 31 May 2016

Bells Island Spit Restoration Project March 2016

Project Overview

This report outlines progress on Year Five of the restoration on Bell Island Spit and provides our plans and budget for planting, maintenance and trapping on the Spit in Year Six (2016)

At the start of the project the Bell Island Spit had recently been logged and was littered with pine slash and bare of vegetation other than emerging weeds. We are pleased to report that we have planted more than 13,300 plants and the Spit now has a growing native vegetation cover.

Planting now covers the whole of the Spit area up to and around the "car park" with some pockets of planting along the estuary margin to the Causeway.

The Bell Island Spit project has been recognised as a significant restoration by DOC and other environmental organisations. The Tasman Environmental Trust provided us with 50 rare native broom plants last year as part of its efforts to protect endangered plant species. We hope to be able to continue to protect and increase the biodiversity of plant species on the Spit.

Expenditure 2015

	Budget (GST incl) \$	Actual (GST incl) \$
Plants	2700	
Titoki PO 218668		2518.50
Mainly Natives PO 218776		741.75
<i>Mowing of the access path along the Spit</i>	<i>2 x 250</i>	<i>0</i>
<i>Spraying or weed control by contractor (1)</i>	2500	704.95
Spray for use by project team & Fert tabs PO 221474	270	262.74
Total	\$5970	4227.94

(1) The Purchase Order for this work allowed for two stages. The invoice received is for the first stage. The follow-up is scheduled for autumn i.e. within the next few weeks. Payment for the second stage (approx. \$1,000) has been included in the budget for 2016.

Plans for 2016

In 2016 we propose continuing planting the area that extends east from the Totara block/car parking area towards the small wetland. The gorse in this area has reached maturity and died back leaving lots of open space for us to plant into. We will extend the planting of this area out to the estuary edge, filling in and assisting the natural colonization process taking place on the edge of the intertidal zone. In addition to this we will need to do a little remedial planting and filling in areas of

previous planting where the plants have died, where we have found the previous planting to be a little too sparse, and where we have had the Marram grass sprayed out on the north facing sand bank.

Due to the growing maintenance schedule associated with the existing plantings we propose to plant 1200 plants in the 2016 planting season. We feel this is the correct balance between extending the native ecosystem developing on the western end of Bell Island and maintaining the existing plantings.

Plant Requirements for Planting in 2016

Muehlenbeckia complexa	(Pohuehue)	50	
Dodonaea viscosa	(Ake ake)	150	
Myoporum laetum	(Ngaio)		100
Coprosma acerosa	(Sand Coprosma)	50	
Cordyline australis	(Cabbage tree)	50	
Plagianthus divaricatus	(Coastal Ribbonwood)		50
Leptospermum scoparium	(Manuka)	300	
Pittosporum eugenoides	(Lemonwood/tarata)		100
Podocarpus totara	(Totara)	50	
Poa cita	(Silver tussock)	200	
Sophora microphylla	(Kowhai)	50	
Atriplex cinerea (Grey Salt Bush), Dacrydium cupressinum (Rimu), Prumnopitys taxifolia (Matai),			
		50	

The Bell Island project plans for 2016 are to:

- Maintain existing plantings
- Replace plants that have suffered rabbit browsing or have died
- Control weeds – gorse, broom, marram, iceplant, pampas grass
- Plant some bigger tree species in the established areas
- Plant along the eastern estuary margin from the “car park area” towards the causeway.

The budget for 2016 for approval by the Board is outlined below (GST incl)

Plants as described above	1200 x \$2.30	\$3000
Mowing of the access path along the Spit	2 x \$250	\$500
Spraying or weed control by contractor (1)		\$2500
Spray for use by project team		\$200
Plant protectors	0	
Fertiliser tabs for new plantings	1,000	\$80
Total		\$5920

(1) See Note to 2015 Expenditure report above.

Maintenance

Maintenance is now crucial to the continuing success of this restoration project with spraying, weeding, fertiliser application and timely removal of plant guards all important tasks to ensure the health of the plants. We have successfully reduced the cover of exotic iceplant with contractor spraying in 2013 and 2014 which has enabled

us to replace the iceplant with suitable native species. The iceplant does however require on-going attention as it re-establishes itself. Three of the Spit Restoration team have completed Growsafe spraying courses in 2015 so we are now certified sprayers. However for some jobs it is advisable to have a contractor do the work. Marram grass is spreading along the Northern side of the Spit. This was sprayed by a professional contractor in 2015 and we will fill in this area with native estuary margin plantings. The control of marram grass, iceplant, gorse, broom and pampas grass will be an ongoing issue until the native species are large enough to suppress the growth of the weed understory. Assistance with the weed control by a contractor is included in the budget.

Pest Management

We are continuing trapping with 10 DoC200 Mustelid traps on the Spit. We commenced trapping in October 2012 and have caught rats, hedgehogs, stoats and weasels. Our trapping efforts are now being complemented by an extensive Waimea Inlet wide trapping programme managed by volunteers through the Battle for the Banded Rail project. This programme has over 500 traps in place from the outskirts of Mapua to Pearl Creek (Cotterill Rd).

Summary

This report describes the work planned for 2016 and requests Board approval for expenditure of \$5920. We appreciate the continued support of the Board for this important Project. We would welcome a visit by the Board at any time.

Gillian Bishop, Verdun King, Kevin McClintock, David Sissons



**Nelson Regional Sewerage Business Unit
Financial Report**

Income Account for the period to 31st May 2016

	Actual Month	Budget Month	Actual YTD	% YTD	% Year	2015/16 Budget		YTD Variation
						YTD	Annual	
Income								
Contributions Fixed	356,746	407,670	3,924,208	88	80	4,484,300	4,892,000	(560,092)
Contributions Variable	323,047	254,920	3,261,672	116	107	2,804,100	3,059,000	457,572
Other Recoveries	11,030	13,830	121,730	80	73	152,200	166,000	(30,470)
Interest	0	80	1,139	127	114	900	1,000	239
Forestry Income	-	830	-			9,200	10,000	(9,200)
Total Income	690,823	677,330	7,308,749	98	90	7,450,700	8,128,000	(141,951)
Less Expenses								
Management	16,535	21,470	200,574	85	78	236,000	257,500	35,426
Electricity	83,355	68,660	634,174	84	77	755,300	824,000	121,126
Contract Maintenance	64,907	59,130	637,532	98	90	650,600	709,729	13,068
Reactive and Proactive Maintenance	61,033	41,560	506,637	111	102	456,900	498,440	(49,737)
Monitoring	6,203	11,900	131,023	100	92	130,700	142,555	(323)
Consultancy	20,200	6,250	46,771	68	62	68,800	75,000	22,029
Insurance	4,896	5,250	53,853	93	85	57,800	63,000	3,947
Sundry	316	7,890	67,283	77	71	86,900	94,770	19,617
Biosolids Disposal	68,618	47,500	609,127	117	107	522,500	570,000	(86,627)
Operating & Maintenance Expenses	326,062	269,610	2,886,975	97	89	2,965,500	3,234,994	78,525
Financial	42,243	73,500	594,230	73	67	808,500	882,000	214,270
Depreciation	145,614	143,830	1,601,754	101	93	1,582,200	1,726,006	(19,554)
Total Expenses	513,919	486,940	5,082,958	95	87	5,356,200	5,843,000	273,242
Net Income before Rebate	176,904	190,390	2,225,790	106	97	2,094,500	2,285,000	131,290
Owners rebate	0		0					
Net Income after rebate	176,904	190,390	2,225,790			2,094,500	2,285,000	131,290
Capital Expenditure								
Renewals	15,707	93,900	679,917			1,033,080	1,127,000	
New Capital Expenditure	10,464	102,900	137,108			1,132,080	1,235,000	
Total Capital Expenditure	26,171	196,800	817,025			2,165,160	2,362,000	

NRSBU Ledger and Financial Report 2015 16 (A1432009).xls15/06/2016

Nelson Regional Sewerage Business Unit

Balance Sheet as at 31st May 2016

	Current	Last Month	June 2015
Equity			
Opening Equity (July)	38,749,766	38,749,766	37,137,636
Plus Net Income YTD	2,225,790	2,048,886	(0)
Plus Revaluation	0	0	1,612,130
Closing Equity	40,975,556	40,798,652	38,749,766
Contingency Reserve	100,000	100,000	100,000
	41,075,556	40,898,652	38,849,766
Which was Invested as follows -			
Current Assets			
Bank	26,773	11,624	359,307
Debtors	12,407	15,117	407,417
NCC Current account	561,002	315,148	459,073
Total Current Assets	600,182	341,889	1,225,797
Fixed Assets	54,790,931	54,910,374	55,575,660
Current Liabilities			
Creditors	(315,557)	(53,611)	(14,950)
NCC Loan	0	(300,000)	0
TDC Current Account	0	0	(560,301)
NCC Current account	0	0	(1,376,441)
Total Current Liabilities	(315,557)	(353,611)	(1,951,692)
Term Liabilities	(14,000,000)	(14,000,000)	(16,000,000)
Derivative Financial Instruments	0	0	0
	41,075,556	40,898,652	38,849,766

NRSBU Ledger and Financial Report 2015 16 (A1432009).xls

NRSBU Demand Management

1. Purpose of Report

- 1.1 To outline the options available to the NRSBU in managing the demand on its reticulation and treatment systems.

2. Recommendation

THAT the report NRSBU Demand Management (R6063) be received.

3. Background

- 3.1 The NRSBU has requested that a review be undertaken on the demand management options that are available.
- 3.2 Demand Management comprises programmes and projects which reduce the volume and/or strength of residential, commercial, and industrial wastewater entering the NRSBU reticulation system and ultimately the Bells Island Wastewater Treatment Plant.
- 3.3 Demand Control focusses on alignment of supply and demand and ensure flexibility when there is an unexpected shift in demand.
- 3.4 Demand Management aims to reduce volumes and loading, reducing the need to increase conveyance and treatment capacity.
- 3.5 Reducing present wastewater flows to the Bell Island Wastewater Treatment Plant frees treatment capacity that could be allotted to planned residential and commercial growth.

4. Discussion

Demand Control

- 4.1 Any shifts in demand are primarily associated with flow volumes and loads discharged into the reticulation system.
- 4.2 Demand control reviews must occur at frequent intervals to improve responses and to pro-actively respond to possible demand or supply imbalances.

- 4.3 Accurate forecasting of demand remains central to the success of Demand Management initiatives.
- 4.4 Improved forecasting depends on reliable historical data and real time monitoring of actual flows and loads that are discharged.
- 4.5 The next step in developing a coherent demand management strategy is to understand what the NRSBU can control and how to deal with that what is outside their control.
- 4.6 The NRSBU has commissioned the development of the wastewater treatment plant model and installed a real time analyser to monitor the incoming loads to the plant.
- 4.7 Planned abnormal or unusual loads are considered by the NRSBU in liaison with its contractor, Nelmac and its wastewater specialist. The discharge is then managed in terms of the arrangement between the NRSBU and the specific Contributor (individual) that needs to discharge that abnormal load.

Demand Management Techniques

- 4.8 The following demand management techniques have been identified that can affect the wastewater flow volume and load.
- 4.9 Water Conservation: Plumbing fixtures and commercial/industrial processes determine wastewater flows.
 - 4.9.1 Over 80% of indoor water use is directly related to fixtures that can be changed to reduced flow devices. (Toilets, shower heads, faucets etc)
 - 4.9.2 Reduced flow devices can save up to 100 litres/person/day and has the potential to decrease the average daily base flow to Bell Island by up to 20%.
 - 4.9.3 The NRSBU should encourage TDC and NCC to implement strategies to motivate residents to migrate towards the use of reduced flow domestic fixtures.
- 4.10 Education: Public information and education programmes inform the public about their role in the operation of the sewer utility.
 - 4.10.1 Customers are more likely to participate in water conservation programmes if they understand where wastewater comes from and the challenges to conveyance and treatment with a growing population.
 - 4.10.2 International experience show that public education programmes are only effective if they are continuous.
 - 4.10.3 Studies by the USEPA have shown that public education contributes from 2 to 10 litres/person/day of increased flow

savings in retrofit programmes. It can therefore be concluded that a decrease in base flow of up to 2% can result from an education programme.

4.10.4 While it is apparent that public information and education programmes that focus on voluntary behaviour change will not meet the objective of long-term conservation, it continues to be important for the NRSBU to encourage NCC and TDC to continue with this work.

4.11 Infiltration and Inflow: Infiltration and inflow (I/I) bear on demand management because they consume useable capacity in the conveyance system and treatment plant, and excessive levels dilute wastewater and cause treatment plant performance to deteriorate.

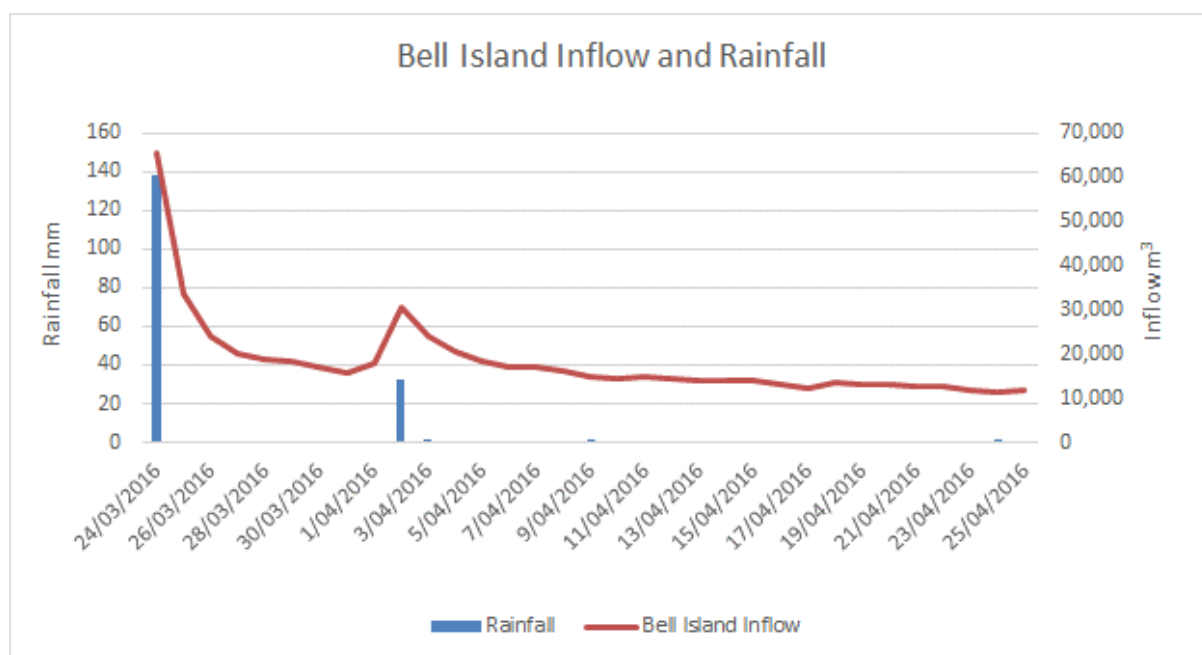
4.11.1 Infiltration is the unintentional entry of ground water into the wastewater collection system from surrounding soil. Common points of entry include broken pipes and defective joints, as well as cracked manholes.

4.11.2 Inflow primarily consists of rain water entering the system through cross connections.

4.11.3 Both NCC and TDC have effected I/I reduction programmes.

4.11.4 Network modelling is used to identify areas of high inflow and infiltration.

4.11.5 Field crews visually inspect suspected problem areas.



Influence of I/I on wastewater flows

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- 4.12 Industrial pre-treatment: A pre-treatment programme works to control what enters the sewer system at commercial and industrial sources so that the wastewater is treatable and does not contain substances that are harmful or toxic.
- 4.12.1 Businesses often use solvents, acids, chemicals, or other materials that have the potential to damage conveyance systems, produce hazardous gases, or interfere with wastewater treatment processes.
 - 4.12.2 Trade Waste Agreements are in place with contributors and these have been very effective but are limited to the three main industrial contributors.
 - 4.12.3 Other industrial discharges are managed by TDC and NCC and well outside the direct influence of the NRSBU.
 - 4.12.4 TDC and NCC must be encouraged to enforce Trade Waste Bylaws.
- 4.13 Demand Based user charges: Demand-based user charges utilise two components; volume based and load based.
- 4.13.1 Volume based rates for sewer and water which increase as volumes increase can encourage wastewater flow reduction.
 - 4.13.2 Loading-based rates are based on wastewater strength. These encourage reduced loadings and more consistent loading strengths.
 - 4.13.3 The NRSBU has implemented this approach through the Disposal of Trade Waste Agreements for the five contributors.
 - 4.13.4 TDC and NCC are responsible for receiving all wastewater discharged in their respective reticulation systems other than the three industrial contributors contracted directly to the NRSBU.
- 4.14 On-site Systems: An alternative to sanitary sewers is use of on-site sewer systems.
- 4.14.1 These systems are outside the control of the NRSBU.
 - 4.14.2 TDC and NCC should be encouraged to consider the most appropriate sanitary system for developments.
- 4.15 Grey Water Reuse: Another method of reducing flows to wastewater treatment facilities is to allow recycling of wastewater within the household.
- 4.15.1 Grey water, water that has not come into contact with toilet or urinal waste. This comprises wastewater from bath tubs, showers, bathroom wash basins, washing machines and

laundry tubs. Grey water can be diverted for other non-human contact use or discharged with brown water to the sanitary sewers.

4.15.2 Of the total wastewater flow, approximately 50%-80% is grey water and 20% to 50% is brown water.

4.15.3 While there are many authorities internationally that emphasise that grey water reuse should not be considered as a substitute for wastewater disposal and treatment, TDC and NCC should be encourage to consider the implementation of these systems as it can contribute to a decrease in base flow.

5. Conclusion

5.1 The NRSBU mainly manages demand through its Disposal of Tradewaste Agreements with the various Contributors.

5.2 The NRSBU can only influence other demand management techniques implemented by NCC and TDC through interaction with both Councils.

5.3 NCC and TDC have initiated and are extending their demand management programmes and it is expected that these will provide benefits over the longer term.

Johan Thiart
Senior Asset Engineer - Solid Waste

Attachments

Nil