

Wanaka Community Board
13 April 2016

Report for Agenda Item: 1

Department: Property & Infrastructure

Cardrona Wastewater Upgrades

Purpose

The purpose of this report is to seek a recommendation from the Board to Council to proceed with the recommended wastewater treatment and reticulation upgrades; modelling of the Cardrona Valley Pipeline (CVP) and, subject to outcomes of modelling, ongoing detailed design of the CVP.

Recommendation

That the Wanaka Community Board:

1. **Note** the contents of this report;
2. **Recommend** that Council proceed with the proposed upgrades to the Cardrona Wastewater Treatment Plant (subject to ORC's response) to meet the requirements of current development with the exception of Benbrae Resort.
3. **Recommend** that Council proceed with delivery of the Cardrona Township's wastewater reticulation. The detailed design contemplates a staged delivery of the reticulation to meet the needs of development.
4. **Recommend** that Council proceed with modelling of the Cardrona Valley Pipeline and, subject to the outcomes of modelling and negotiations with key stakeholders, ongoing detailed design of the Cardrona Valley Pipeline.

Prepared by:



Rob Darby
Project Manager

31/03/2016

Reviewed and Authorised by:



Peter Hansby
GM Property & Infrastructure

31/03/2016

Background

- 1 The Cardrona Wastewater and Water Supply Options Report was considered by Council in June 2015. The Council resolved to:
 1. Note the contents of this report and in particular:
 - a. Further work may be required to get Public Health South to accept the interim solution proposed.
 2. Adopt Wastewater Option 5 (Cardrona Valley Pipeline, with purchase of Baxter2009 in the interim) as the preferred way forward for wastewater treatment and disposal for Cardrona.
 3. Adopt Water Option 1 (Purchase of Village Water Supply) as the preferred way forward for managing the provision of potable water in Cardrona.
 4. Authorise Council staff to:
 - a. Enter into a sale and purchase agreement with Baxter 2009.
 - b. Enter into a sale and purchase agreement with Cardrona Water Supply Limited.
 - c. Begin negotiations with Mt Cardrona Station and Cardrona Alpine Resort to agree delivery options and funding arrangements in respect to the Cardrona Valley Pipeline.
 - d. Take the detailed business case to the community for consultation and indication of support.
 5. Approve the following funding changes:
 - a. Bring forward capex of \$580k into 2015/16.
 - b. Bring forward capex of \$858k into 2016/17.
- 2 The sale and purchase agreement for Baxter 2009 was completed in September 2015, the facility is now known as the Cardrona Wastewater Treatment Plant. (CWWTP). The facility was subject to immediate upgrades to meet Council's infrastructure standards. These upgrades were mainly related to SCADA. The facility is now being managed by Veolia for Council.
- 3 The treatment capacity of the CWWTP needs to be increased to service the existing developed properties in the Cardrona Township with the exception of the Benbrae Resort. It is proposed that the disposal field of the facility is doubled in size from 576m² to 1152m², this will increase the capacity of the facility from 20m³/day to 34m³/day. An application has been made to the Otago Regional Council to extend and increase the discharge permit for the CWWTP based on the proposed upgrade of the disposal field. At the time of writing the Otago Regional Council has not formally responded to Council's application.

- 4 Detailed design of the Cardrona Township's sewer mains has been completed inclusive of tender documentation. The detailed design contemplates a staged approach to delivery of the reticulation to match the needs of development. The design also allows for a number of operational scenarios that could eventuate given the unknowns with the Cardrona Valley Pipeline (CVP). Agreement with major stakeholders is dependent not only on the practicality but also the estimated cost of the CVP. Should the CVP not come to fruition then the design allows for either:
 - a. Pumping the Township's future wastewater flows to the CWWTP site. The site covers 2ha and is hydraulically capable of receiving the Township's future wastewater flows. This option would require major upgrades of the treatment plant and disposal systems; or,
 - b. Pumping the Township's future wastewater flows to the previously proposed Snow Farm WWTP site opposite the access to the Cardrona Alpine Resort.

Comment

- 5 Consideration needs to be given to proceeding with upgrading the treatment capacity of the CWWTP. The recommended upgrade, of doubling the disposal field size, will provide sufficient capacity for existing development as an interim measure prior to delivery of the CVP. The engineer's estimate for the upgrade is \$35,000 inclusive of design, Management, Surveillance and Quality Assurance (MSQA) and physical works. The cost is modest and is appropriate for an interim measure. However, it is proposed to ring fence \$100,000 of the 2016/17 budget for delivery of the upgrade because:-
 - a. The ORC has yet to formally respond to Council's application to extend and increase the CWWTP discharge permit. There is a risk that the ORC may require further or differing upgrades.
 - b. The existing disposal field may be in need of an extensive overhaul due to a history of poor maintenance. Potentially it may be cost effective to completely replace the existing disposal field as part of the upgrades rather than try to renew the existing asset.
- 6 Further consideration needs to be given to continuing with delivering the Cardrona Township's wastewater reticulation. The engineer's estimate for delivery of the recommended 2016/17 stage is \$477,668 inclusive of contingency. In addition to physical works costs it is proposed that an additional 15% (\$72K) be provided to address MSQA, legalisation, survey and any other Council overheads. Therefore it is proposed to ring fence \$549,000 of the 2016/17 budget for delivery of this stage of the reticulation. Delivery of the recommended 2016/17 stage of the reticulation mains will allow all existing development within the township, with the exception of the Benbrae Resort, to connect to the reticulation.
- 7 There are approximately \$45,000 residual funds remaining from this year's budget. This amount is insufficient to complete any additional physical works this financial year. However there are sufficient funds to complete modelling of the

CVP this financial year. The fee proposal to undertake the modelling is \$45,000 and includes a practicality assessment, infrastructure requirements, cost estimate, operating methodology and risk assessment for both the CVP and connection by the Cardrona Alpine Resort. Modelling is required to establish the practicability of the CVP and to develop costing for comparison to on-site treatment either at the CWWTP site or at the previously proposed Snow Farm WWTP site. The practicality assessment and cost comparisons will be essential for negotiations with key stakeholders.

- 8 Subject to the outcomes of the CVP modelling and negotiations with key stakeholders, it is proposed that design of the CVP is continued in 2016/17 and to ring-fence \$43,000 of the 2016/17 budget for this.

9 Financial Summary Table:

Financial Summary Table	2015/16 Budget \$662,000 (\$580,000 brought forward \$82,000 original budget)		2016/17 Budget \$858,000 (Brought forward)	
	Wastewater \$421,000	Water Supply \$241,000	Wastewater \$692,000	Water Supply \$166,000
2015/2016 Costs to Date and Commitments	\$376,321	\$15,251		
CVP Modelling	\$45,000			
Purchase Cardrona Water Supply Limited and Upgrades		TBC		TBC
Proposed Construction of Reticulation 2016/2017			\$549,000	
Proposed Upgrade to the CWWTP Disposal Field			\$100,000	
Ongoing Negotiations and Design of the CVP			\$43,000	

Options

- 10 This report identifies and assesses the following reasonably practicable options for assessing the matter as required by section 77 of the Local Government Act 2002.
- 11 Option 1 Do not proceed with upgrades to the CWWTP, upgrades to the Cardrona Township's reticulation and modelling of the CVP.

Advantages:

- 12 If no further investment was made in the Cardrona Wastewater Scheme then Council's expenditure would be reduced by \$737,000 over the 2015/16 and 2016/17 financial years.

Disadvantages:

- 13 The current needs of development are not met. Council's investment objectives as described in the projects business case are not addressed.
- 14 Option 2 Approve proceeding with upgrades to the CWWTP, upgrades to the Cardrona Township's reticulation and modelling of the CVP.

Advantages:

- 15 The current needs of development are met. Council's investment objectives as described in the project's business case are addressed.

Disadvantages:

- 16 The proposed program of works over the 2015/16 and 2016/17 financial years total \$737,000 of investment into the Cardrona Wastewater Scheme.
- 17 Option 3 Approve to proceed with upgrades to the CWWTP and upgrades to the Cardrona Township's reticulation but no further investment in the Cardrona Valley Pipeline inclusive of proposed modelling.

Advantages:

- 18 The current needs of development are met.

Disadvantages:

- 19 Council's investment objectives as described in the project's business case are not addressed.
- 20 This report recommends **Option 2** for addressing the matter.

Significance and Engagement

- 21 The matter is of low significance, as determined by reference to the Council's Significance and Engagement Policy, because the project is already provided for within the Annual Plan and 10 Year Plan.

Risk

- 22 This matter relates to the strategic risk SR1: Current and future development needs of the community (including environmental protection), as documented in the Council's risk register. The risk is classed as high. This matter relates to this risk because the project deliverables are fundamental to the future performance of the Cardrona Wastewater Scheme.
- 23 The recommendations of this report addresses this risk because proceeding with the upgrades to the CWWTP, upgrades to the Cardrona Township's reticulation and modelling of the CVP ensures the current needs of development are met and that Council's investment objectives, as described in the projects business case, are pursued.

Financial Implications

24 The recommendations of this report can be delivered within the budgets provided for both the 2015/16 and 2016/17 financial years. There are no operational and capital costs or other budget expenditure implications resulting from the decision.

Council Policies, Strategies and Bylaws

25 The following Council policies, strategies and bylaws were considered:

- QLDC District Plan.

26 The recommended option is consistent with the principles set out in these documents.

27 This project is included in the 10 Year Plan with budgets having been brought forward to both the 2015/16 and 2016/17 financial years.

Local Government Act 2002 Purpose Provisions

28 The recommended option:

- Will help meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses by addressing growth with a staged approach that focuses the community to one common solution with shared public health benefits for all;
- Can be implemented through current funding under the 10-Year Plan and Annual Plan;
- Is consistent with the Council's plans and policies; and
- Would not alter significantly the intended level of service provision for any significant activity undertaken by or on behalf of the Council, or transfer the ownership or control of a strategic asset to or from the Council.

Consultation: Community Views and Preferences

29 The persons who are affected by or interested in this matter are stakeholders both within and external to the Cardrona Township but within the Cardrona Valley.

30 The Council has provided ongoing updates to a number of key stakeholders both within and external to the Township and minor stakeholders within the township who require clear guidance on how to address their wastewater disposal issues.

Attachments

- A Schematic for the Cardrona Township's wastewater reticulation
- B Engineer's estimate for the CWWTP upgrades
- C Engineer's estimate for the Township's wastewater reticulation upgrades

Cardrona Waste Water Schematic – Proposed Works 2016/17 and General Arrangement of Gravity, Pressurised Sewer and Rising Mains

MEMORANDUM

To: Rob Darby

From: Rob Potts

Date: 23 March 2016

Subject: Cardrona Effluent Disposal Field Construction Cost Estimate

Dear Rob,

Please find attached our cost estimate for the construction of the extension of the Cardrona Effluent Disposal System. Please note the following:

- Margin of error associated with the cost estimation is $\pm 30\%$.
- Currently, no detailed design been prepared (only cross sections of the trenches) showing the submains run from the wastewater treatment plant, to the new disposal area. We consider a suitable approach would be to run a second submain from the treatment plant, around the existing disposal field, to the mid-section of the new disposal area. Both the existing submain (to existing field) and the second new submain (to new field) will both have valves fitted at the treatment plant outlet (we have suggested ball valves). The valves will allow for greater control of both disposal fields, with regards to maintenance and resting.
- We have allowed 30% for contingency and 15% for design and supervision.
- We have assumed that excavated soils will be suitable for re-use as top soil material within the disposal trenches and the submain pipe trench, thereby negating the requirement for additional top soil to be imported.
- We consider bidum filter cloth is a suitable barrier between the drainage aggregate and top soil layer and have costed for this based on 1 m wide rolls.
- We have limited information on the dosing frequency to the existing disposal field; however, we did carry out flow/velocity calculations based on a peak flow of 34 m³/day. We investigated a flow rate range of between 1.5 L/s to 10 L/s and consider that 50 DN uPVC pressure pipe is suitable (we have not specified a pressure rating). However, during the detailed design phase there is scope for PE piping to be used or for the 50 DN to be reduced to 40 DN; this can be determined when more information on the actual pumping flow rate is available.

If you have any questions or would like to discuss further, please do not hesitate in contacting me.

Rob Potts

Queenstown Lakes District Council
Cardrona
Discharge of Municipal Wastewater to Land

SCHEDULE OF PRICES
Mar-16

Item	Description	Unit	Quantity	Rate	Amount
	Notes:				
	1 The quantities given are believed to be accurate within the limits of ordinary engineering computation but no guarantee is given as to their correctness.				
	2 Prices do not include GST.				
	3 Prices are to an accuracy of +/- 30%				
1.0	PRELIMINARY AND GENERAL				
1.1	Site establishment	LS	1	\$ 1,250.00	\$ 1,250.00
1.2	Provide for insurances, bonds, fees	LS	1	\$ 800.00	\$ 800.00
1.3	Health and safety provisions, including site inductions and site specific Health & Safety Plan.	LS	1	\$ 150.00	\$ 150.00
1.4	As built information and Producer Statement	LS	1	\$ 800.00	\$ 800.00
1.5	Site disestablishment	LS	1	\$ 1,250.00	\$ 1,250.00
	SUB TOTAL FOR P and G				\$ 4,250.00
2.0	PHYSICAL WORKS				
2.1	Strip top soil, excavate trenches and stockpile	m ³	110	\$ 40.00	\$ 4,400.00
2.2	Supply and lay trench drainage aggregate	m ³	65	\$ 45.00	\$ 2,925.00
2.3	Supply, lay and test 32 DN class D uPVC distribution lateral within trench drainage aggregate, including connection of laterals to	m	360	\$ 20.00	\$ 7,200.00
2.4	Supply and lay bidum cloth (1 m wide rolls)	L	360	\$ 3.00	\$ 1,080.00
2.5	Supply, excavate, lay, bed, test, backfill and reinstate new 50 DN pressure pipe submains from treatment plant to new trenches	m	90	\$ 40.00	\$ 3,600.00
2.6	Supply and install 2 x 50 DN uPVC ball valves on each submains at the treatment plant outlet	ea	2	\$ 200.00	\$ 400.00
	SUB TOTAL FOR PHYSICAL WORKS				\$ 19,605.00
3.0	SUBTOTAL				\$ 23,855.00
	Contingency			0.30	7,156.50
	Design and supervision			0.15	3,578.25
4.0	TOTAL				\$ 34,589.75

Cardrona Township
WATER SUPPLY & WASTEWATER RETICULATION

Schedule of Prices - 31/03/2016

Activities prepared on the basis of rates provided by QLDC. Rate information relates to a previous QLDC tender which may imply artificially low cost rates and no geotechnical investigations undertaken (30% contingency added). Rates and quantities may represent financial value but H&S aspects (working in the highway etc) should be questioned further to ensure safe working practices and appropriate levels of traffic management are achieved. QLDC rates provided (for 0-1.5m provided) extrapolated for variation in installation depth. No allowance for dewatering has been included. Estimate assumes no inflation or changes to contractor availability or materials prices to those within the 2013 QLDC rates provided. However we would recommend that an allowance for inflation is included by QLDC. The estimate relates to construction of the scheme in two phases (Current Scope and Balance to Completion). Pricing for Current Scope assumes:
- 150m sewer and two manholes in Miners Rise (Provisional quantity - design to be finalised)
- 5qty 7m laterals in Miners Rise (Provisional quantity - design to be finalised)
- 260m 63mm OD PE wastewater pressure main in Berm
- Utilise existing pressure sewer in River Gold Way and Soho St
- approx 365m of common trench (sewer and two pressure sewers between Cardrona Pub and QLDC toilets)
- Temporary pumping station adjacent to QLDC toilets including power, telemetry, water supply submain and backflow preventer
- Extend Watermain from Ch635 to Ch695
Balance to completion is remaining works identified in Detailed Design drawings 139167-01-000 to 458.

Summary of Schedule				Current Scope (Stage 1)	Balance to Completion (Stage 2) (over Current Scope)
Item	Description			Estimate	Estimate
100	Preliminary and General			\$52,080	\$52,240
200	Wastewater (gravity and pressure)			\$170,175	\$274,118
300	Water Supply			\$10,182	\$83,470
400	Pumping Station			\$135,000	\$200,000
500	Contingency (30%)			\$110,231	\$182,948
	Total			\$477,668	\$792,777

		Current Scope (Stage 1)				Balance to Completion (Stage 2)			
Item	Description	Unit	Quantity	Rate	Amount	Unit	Quantity	Rate	Amount
100	PRELIMINARY AND GENERAL								
101	Establishment and disestablishment	LS	1	\$350.00	\$350.00	LS	1	\$350.00	\$350.00
102	Setting out the works	LS	1	\$100.00	\$100.00	LS	1	\$100.00	\$100.00
103	As-built documentation to council standard	LS	1	\$100.00	\$100.00	LS	1	\$100.00	\$100.00
104	Location of existing services	LS	1	\$300.00	\$300.00	LS	1	\$300.00	\$300.00
105	On-going Contract Management	Wks	12	\$40.00	\$480.00	Wks	16	\$40.00	\$640.00
106	Project Health and Safety	LS	1	\$100.00	\$100.00	LS	1	\$100.00	\$100.00
107	Insurance, permits, fees	LS	1	\$650.00	\$650.00	LS	1	\$650.00	\$650.00
108	Traffic Management (Provisional Item)	PS	1	\$50,000.00	\$50,000.00	PS	1	\$50,000.00	\$50,000.00
	Subtotal 100 - Preliminary and General:				\$52,080.00				\$52,240.00

		Current Scope (Stage 1)				Balance to Completion (Stage 2)			
Item	Description	Unit	Quantity	Rate	Amount	Unit	Quantity	Rate	Amount
200	Wastewater (gravity and pressure)								
201	Saw cut twice - allow first cut for excavation and second cut for seal repair with 100mm set-back on either side of the trench on the road formation	m	553	\$1.60	\$884.80	m	785	\$1.60	\$1,256.00
202	Supply and install wastewater 150mm SN8 pipe including excavation (0 to 1.5m deep), disposal of excess material, dewatering, bedding haunching, backfill placing. (including connections to existing network and air test of line).	m	185	\$99.57	\$18,420.45	m	183	\$99.57	\$18,221.31
203	Supply and install wastewater 150mm SN8 pipe including excavation (1.5 to 3m deep), disposal of excess material, dewatering, bedding haunching, backfill placing (including connections to existing network and air test of line).	m	368	\$159.31	\$58,626.82	m	552	\$159.31	\$87,940.22
204	Supply and install wastewater 150mm SN8 pipe including excavation (3m to 4m deep), disposal of excess material, dewatering, bedding haunching, backfill placing. (including connections to existing network and air test of line).	m	0	\$258.88	\$0.00	m	65	\$258.88	\$16,827.33
205	Supply and install 1050mm dia manhole (0-1.5m deep) complete with CI HD cover. Including haunching and grouting of new FS line - allow for 100mm stub for future connection outlet (with cap as required)	ea	1	\$2,850.00	\$2,850.00	ea	1	\$2,850.00	\$2,850.00
206	Supply and install 1050mm dia manhole (1.5m to 3m deep) complete with CI HD cover. Including haunching and grouting of new FS line - allow for 100mm stub for future connection outlet (with cap as required)	ea	5	\$4,560.00	\$22,800.00	ea	6	\$4,560.00	\$27,360.00
207	Supply and install 1050mm dia manhole (3m to 4m deep) complete with CI HD cover. Including haunching and grouting of new FS line - allow for 100mm stub for future connection outlet (with cap as required)	ea	0	\$7,410.00	\$0.00	ea	1	\$7,410.00	\$7,410.00
208	Supply and install two or either 40mm OD HDPE100 SDR11 PN16, 63mm OD HDPE100 SDR11 PN16 or 90mm OD HDPE100 SDR11 PN16 wastewater pressure mains and associated fittings in common trench (as required by design) including oversizing gravity excavation (0-1.5m deep), disposal of excess material, dewatering, bedding haunching and backfill placing (including connections to existing network and air test of line).	m	365	\$49.79	\$18,171.53	m	775	\$49.79	\$38,583.38
209	Supply and install 63mm OD HDPE100 SDR11 PN16 wastewater pressure sewer and associated fittings in berm including excavation (0-1.5m deep), disposal of excess material, dewatering, bedding haunching and backfill placing, berm reinstatement (including connections to existing network and air test of line).	m	260	\$65.00	\$16,900.00	m	445	\$65.00	\$28,925.00
210	EO item 202 and 203 Trench reinstatement, allow for 200mm AP40 compacted base layer with 30mm asphalt seal.	m	553	\$57.00	\$31,521.00	m	785	\$57.00	\$44,745.00
	Subtotal 200 - Wastewater				\$ 170,174.59				\$ 274,118.24

		Current Scope (Stage 1)				Balance to Completion (Stage 2)			
Item	Description	Unit	Quantity	Rate	Amount	Unit	Quantity	Rate	Amount
300	Water Supply								
301	Supply and install 180mm OD HDPE100 SDR11 PN16 water main including excavation (0 to 1.5m deep), disposal of excess material, dewatering, bedding haunching, backfill placing. (including connection to existing network, test and commissioning of line).	m	60	\$164.29	\$9,857.43	m	430	\$164.29	\$70,644.92
302	Supply and install 63mm OD PE80 SDR 11 PN16 watermain sub-main and associated fittings in berm including excavation (0-1.5m deep), disposal of excess material, dewatering, bedding haunching and backfill placing, berm reinstatement (including connection to existing network, test and commissioning of line).	m	5	\$65.00	\$325.00	m	5	\$65.00	\$325.00
303	Supply and install DN150 fire hydrants, including boxes, marking (line and posts), lids and physical works (excavation, backfill etc) to QLDC standards	ea	0	\$3,000.00	\$0.00	ea	3	\$3,000.00	\$9,000.00
304	Supply and install DN150 sluice valves including boxes, marking (line and posts), lids and physical works (excavation, backfill etc) to QLDC standards	ea	0	\$1,750.00	\$0.00	ea	2	\$1,750.00	\$3,500.00
	Subtotal 300 - Water Supply				\$10,182.43				\$83,469.92

		Current Scope (Stage 1) (Temporary Pumping station at QLDC Toilets)				Balance to Completion (Stage 2) (Future permanent Pumping Station (opposite PCR))			
Item	Description	Unit	Quantity	Rate	Amount	Unit	Quantity	Rate	Amount
400	Wastewater Permanent or Interim/temporary Pumping Stations								
401	Supply, install and commission package pumping station (including potable water backflow preventer) (provisional item)	PS	1	\$95,000.00	\$95,000.00	PS	1	\$150,000.00	\$150,000.00
402	Supply, install and commission telemetry compatible with QLDC Asset Management System (Hansen Data) (provisional item)	PS	1	\$25,000.00	\$25,000.00	PS	1	\$25,000.00	\$25,000.00
403	Electricity supply (provisional item) - RED comment regarding current scope SPS: Existing proprietary WWPS at School site, assume power available. New WWPS to 1.9l/s/ option for up to 34m3/day.	PS	1	\$15,000.00	\$15,000.00	PS	1	\$25,000.00	\$25,000.00
	Subtotal 400 - Pumping Stations:				\$135,000.00				\$200,000.00

		Current Scope (Stage 1)				Balance to Completion (Stage 2)			
Item	Description	Unit	Quantity	Rate	Amount	Unit	Quantity	Rate	Amount
500	CONTINGENCY								
501	Contingency Sum (30%) - Rates supplied by QLDC used for estimate (rates recognised to be low). Includes contingency for unforeseen conditions since no geotechnical investigations undertaken.	PS	1	\$110,231.11	\$110,231.11	PS	1	\$182,948.45	\$182,948.45
	Subtotal 500 - Contingency:				\$110,231.11				\$182,948.45

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