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12 March 2021

Gore District Council
Civic Avenue
GORE

BY DELIVERY

ATTENTION: RAMESH

OTAMA RURAL WATER SCHEME

Please find attached Plans and Assessments in accordance with Section 8 of the Gore District Council (Otama Rural Water Supply) Act 2019 from the Otama Rural Water Scheme.

Yours faithfully

SHEDDAN PRITCHARD LAW LIMITED

Per:

John Sheddan / Wendy Muir

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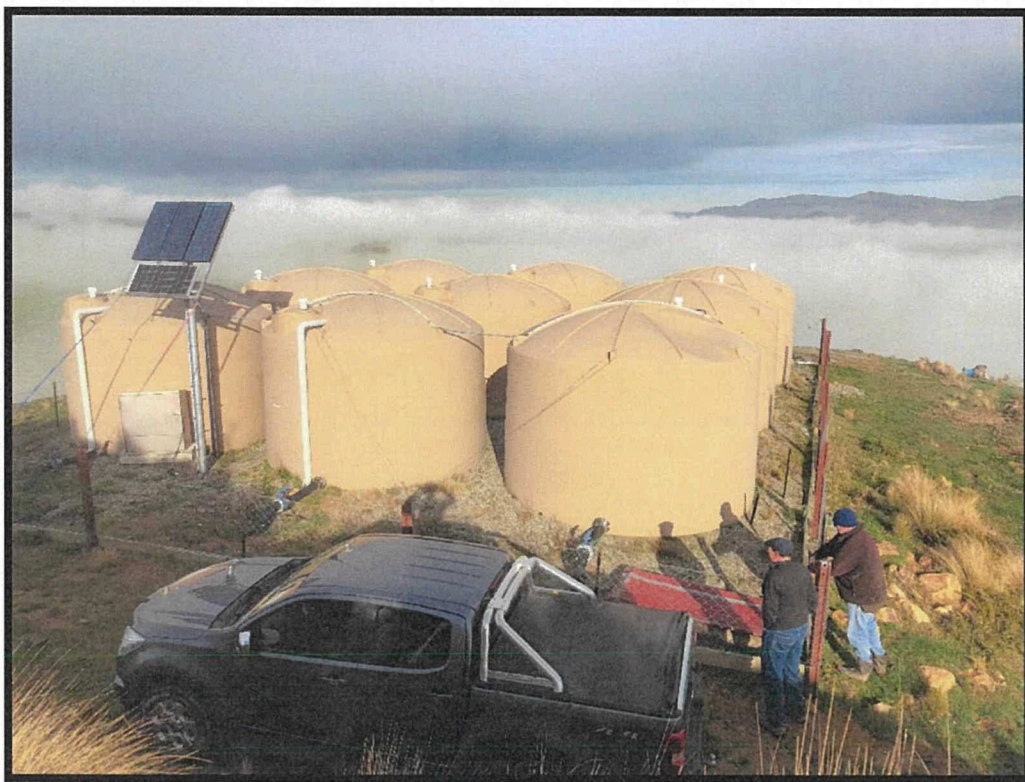
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Otama Rural Water Scheme

Plans and Assessments

**In accordance with Section 8 of
the Gore District Council (Otama Rural Water Supply) Act 2019**



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1. Introduction

The Otama network is a restricted rural water supply servicing over 400 km² of farmland (approximately 220 farms) to the north of Gore. It is currently managed by the Gore District Council in conjunction with the Otama Rural Water Supply Committee. Properties that are connected to the network can buy units of water, however, due to limited capacity, additional units and new connects are considered on a case-by-case basis.

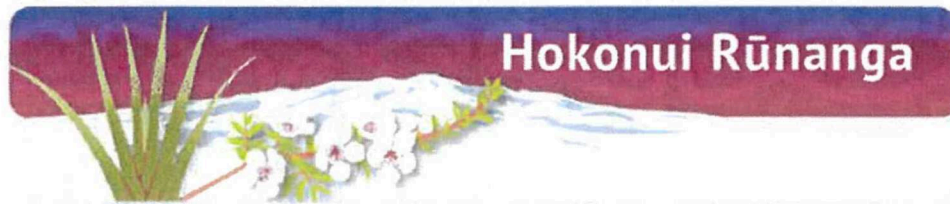
The water source for the scheme is a shallow bore located adjacent to the Mataura River at the Pyramid Bridge. While the scheme was primarily developed for stock water purposes, due to the high quality of water most consumers use the water for domestic purposes.

The scheme was constructed in three stages in the 1970s by farmers who volunteered their equipment and labour. In 2018, following concerns raised over potential contamination of the raw water, chlorination of the raw water was installed as an interim measure. An Options Assessment for the long-term upgrade of the treatment system to meet the requirements of the New Zealand Drinking Water Standards has been completed. Additional monitoring and information gathering are currently being completed before a final decision is made.

In 2019 a Local Member's Bill was passed by parliament allowing ownership of the Otama Rural Water Scheme to be transferred to a new company with directors appointed by the scheme's consumers.

As a result, the Otama Rural Water Limited Company has now been established with the intention of acquiring the water supply system from the Gore District Council to supply water to properties in the Otama Rural Water area.

2. Hokonui Runanga – Support for Ownership



29th June 2020

Tom Affleck
Chair
Otama Water Scheme Committee

Email: tdaffleck@xtra.co.nz

Cc: Tracy Hicks, Mayor, Gore District Council email:
tracy.hicks@gdc.govt.nz

Steve Parry, Chief Executive Gore District Council
steve.parry@gdc.govt.nz

Dear Tom

OTAMA WATER SCHEME SUPPORT FOR OWNERSHIP

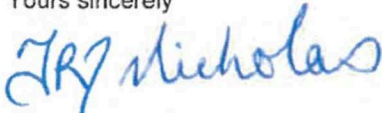
The Hokonui Rūnanga supports the transfer of ownership of the Otama Rural Water Scheme which is currently managed by the committee on behalf of the Gore District Council, to the Otama Rural Water Company. We have full belief and confidence in the future operation by the Otama Rural Water Company Board.

The Hokonui Rūnanga has been consulted about this process, the current operation and proposed ownership structure moving forward- shareholders who are the users of the scheme including a marae within this takiwā.

We have also received documentation relating to the local bill, aide memoirs and information provided to users prior to the preliminary referendum, 2019.

As previously indicated in writing the Hokonui Rūnanga support the ownership transfer and are happy to support this process.

Yours sincerely



Terry Nicholas
Managing Trustee and Executive coordinator Hokonui Runanga
Te Runanga o Hokonui

3. Identified Contractual Requirements for Maintenance and Operation

1. Maintenance Contract for Maintenance and Operation.
The Scheme will be managed pursuant to a service contract by a proven experienced operator who will be responsible for meeting the operations and maintenance servicing of the Scheme supplying stock and households in the Otama Area. Specification of the services to be provided is attached.
2. Telemetering
The operational elements of the Scheme shall be monitored on a 24 hour, 365 days of the year basis by a suitably established and managed control centre which shall be tasked with determining the severity of performance and alarm events and responding suitably as regards the severity of the situation.
3. Employment Agreements
The operation role(s) of the Scheme shall be employed pursuant to statutory fulfilment of employment agreements. It is anticipated that the sole employee shall be a part-time administration role. The Administrator to be responsible for the Scheme's administration including statutory compliance requirements, preparation of invoices, sending of accounts, including handling all queries and complaints, completing GST returns, coordinating meeting agendas and meetings, fulfilling Health and Safety requirements, including requirements for the Medical Officer of Health, preparation work for renewal of Resource Consent, monitoring of the service contracts, including renewals.
4. Accounting Services
Provision of accounting services, including GST and annual accounts. Support services in the provision of budgeting and tender preparations (if required), payroll functions for employee(s), review of funds received and held including expenditure.

10 October 2019

OTAMA WATER SCHEME BOARD

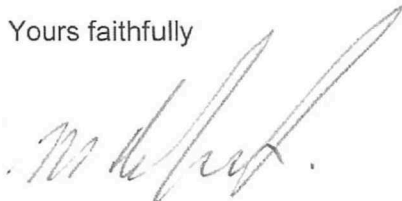
It was good to catch up recently and have Chairman Tom Affleck make time to take Dave Wilson and myself around your rural water scheme.

After reviewing all your documentation and listening to the direction the Board wants to take, Downer would like to be involved in the operation and maintenance of the scheme. I have attached a Level of Service Document produced for the Otikerama Rural Water Scheme, which could act as a template to produce costings for supplying operations and maintenance servicing for your Scheme.

Please take this as a formal expression of interest from Downer NZ Ltd to perform the operations and maintenance of the Otama Rural Water Scheme and upon your direction, Downer would gladly supply some pricing when required.

If you have any queries please do not hesitate to contact me.

Yours faithfully



Murray De Groot
CONTRACTS MANAGER
UTILITY SERVICES - SOUTHLAND

Otama Rural Water Supply – Specifications for Contractor

The contractor shall provide the services set out below. Operations and maintenance services:

1. Daily:

- Respond to and investigate any alarms
- Respond to and investigate/repair any faults notified by consumers as per the procedure for notifying faults agreed with the Contractor

2. Weekly:

Check Plant and Booster Stations:

- Test free available chlorine and pH levels
- Read Water & Power Meters and Record
- Check chlorine and soda ash levels and replenish if necessary
- Monitor coliforms in reticulation
- Monitor general condition of pipes & pumps etc. (leaks, noise, overheating, amps drawn)
- Note and report any abnormal conditions

3. Monthly:

As above, plus:

- Take bacteriological samples for Drinking Water Standards compliance
- Test turbidity with other tests
- Inspect intake well to ensure it is sealed and there are no issues detectable from visual inspection

4. As Required:

- Repair burst/leaking pipework including having after hours on call service for emergency repairs
- Investigate/repair pumps if faulty including having after hours on call service for emergency repairs

5. General services:

- Maintain chemical stocks and fill storage tanks
- Adjust dosage and pumps to maintain water quality
- Operate alarm system with calls coming through the contractor's staff cell phones as notified by contractor, alarm calls should be routed through to the Contractor's office or after Hours call centre, and the Contractor will contact staff as required
- Record plant and equipment outputs including up to date records of pumps hours, meter readings, date and time of notification to the contractor of issue to attend to, and date and time issue attended to which is to be derived from the time a call is logged with after hours/Balclutha office and the attendance/ completion time logged on the specific job sheet.
- Maintain pumping sheds including heating, lighting, vermin control
- Complete the annual Ministry of Health survey on drinking water
- Monthly report with invoice will specify:
 - work undertaken at a high but adequate level for routine tasks and more detailed for specific tasks
 - summary of plant and equipment records, test results, issues notified and attended to including response times, records and readings will be entered into log books situated on site
 - any non-routine maintenance or operational issues with equipment, pipes, pump sheds, bore well or tanks that need attention
 - any temporary repairs

4. Assessment of future capital and operating costs of the Scheme for a period of 30 years

See attached.



19 January 2021

Otama Rural Water Scheme.
123 Frank Street
Gore 9710

Dear Committee

OTAMA RURAL WATER SCHEME 30 YEAR BUDGET

We have completed a 30-year cash flow forecast for Otama Rural Water Supply.

This forecast outlines the expected income, asset renewal and maintenance of the scheme for a period of 30 years. It outlines the ability for you to maintain and operate the scheme in a manner that is satisfactory for a period of 30 years.

You have assessed the future capital costs to the scheme over 30 years which is supported by the operating revenue and short-term bank borrowings. This includes a significant upgrade in the reticulation and capacity of the scheme during the years 2022 – 2030. The short-term bank borrowing of \$339,500 is supporting this upgrade and will be drawn down in 2023 and repaid in full in 2038.

You will see from the cash flow that we are predicting a peak overdraft of \$53,233 for the 2029/2030 year. This will be managed and repaid by 2032.

The cashflow is showing accumulated funds over the 30year period of \$1,258,039. This demonstrates that the scheme is well managed and caters for future contingent liabilities should they arise.

The risk of a contingent liability occurring would likely be a blow out within the scheme. It is unlikely that this would happen during the 2021 – 2030 years due to the extensive upgrade to the reticulation and capacity of the scheme. That said should this eventuate we have outlined below two cost scenarios of this liability and the repayment parameters.

Estimated Cost of Major Blow Out	\$ 500,000.00	\$ 1,000,000.00
Annual repayment cost of a 6% Loan repaid over 10 years	\$ 63,636.00	\$ 127,284.00

Should this happen between the years 2021-2034 this would be paid for by delaying the upgrade to the reticulation and capacity of the scheme to support the blow out costs. If this was to happen post 2034 the accumulated funds in the cash flow would cover the expenditure of the blow out. It is important to note that should a blow out occur due to a fault in goods and/or services in relation to the upgrade to the reticulation and capacity of the scheme the committee would likely seek compensation to cover the cost.

The operating expenditure over the 30 year period is well supported by annual revenue collected by the scheme. We anticipate that with the capacity upgrades this will ensure the existing users will be well supported with a reliable scheme and will allow revenue growth.

The forecast clearly shows that the committee can run the water scheme operations for the next 30 years.

If you have any queries please do not hesitate to contact my office.

Yours faithfully

MACDONALD PERNISKIE LIMITED



Erin Howes

erinh@mpltd.co.nz



OTAMA RURAL WATER SUPPLY SCHEME

30 YEAR BUDGETED CASHFLOW REPORT

Otama Rural Water Supply Scheme Compilation Report

Compilation Report To The Otama Rural Water Supply Scheme

Scope

On the basis of the information you provided we have compiled, in accordance with Service Engagement standard No. 2: Compilation of Financial Information, the special purpose 30 year budgeted cashflows for the Otama Rural Water Scheme.

Responsibilities

You are solely responsible for the information contained in the 30 year budgeted cashflows and have determined that the accounting policies used are appropriate to meet your needs and for the purpose that the 30 year budgeted cashflows were prepared.

The 30 year budgeted cashflows were prepared exclusively for your benefit. We do not accept responsibility to any other person for the contents of the 30 year budgeted cashflows.

No Audit or Review Engagement Undertaken

Our procedures use accounting expertise to undertake the compilation of the 30 year budgeted cashflows from information you provided. Our procedures do not include verification or validation procedures. No audit or review engagement has been performed and accordingly no assurance is expressed.

Disclaimer

As mentioned earlier in our report, we have compiled the financial information based on information provided to us which has not been subject to an audit or review engagement. Accordingly, neither we, nor any of our employees accept any responsibility for the reliability, accuracy or completeness of the compiled financial information nor do we accept any liability of any kind whatsoever, including liability by reason of negligence, to any person for losses incurred as a result of placing reliance on the compiled financial information.



Macdonald Perniskie Limited

Chartered Accountants

3 Fairfield Street

Gore

19/01/2021

Cash Flow Forecast															
	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35
INCOME															
Rates	163,385	179,024	179,024	179,500	179,500	183,090	186,752	190,487	194,297	198,183	202,146	206,189	210,313	214,519	218,809
Water Supply	144,386	145,830	147,288	148,761	150,249	151,751	153,269	154,801	156,349	157,913	159,492	161,087	162,698	164,325	165,968
Unit Connections	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Interest	5,493	6,208	5,422	6,433	2,348	245	219			536			103	475	904
Total Income	318,264	336,062	336,735	339,694	337,097	340,086	345,239	350,288	355,646	361,631	366,638	372,276	378,113	384,319	390,682
EXPENDITURE															
Operating Expenses	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453
Consultants	3,000	3,000	2,000	2,000	2,000	2,020	2,040	2,061	2,081	2,102	2,123	2,144	2,166	2,187	2,209
Short Term Hire	3,000	3,000	3,000	3,500	3,500	3,570	3,641	3,714	3,789	3,864	3,942	4,020	4,101	4,183	4,266
Resource Exp	4,000	4,000	4,500	4,500	4,500	4,590	4,636	4,682	4,729	4,776	4,824	4,872	4,921	4,970	5,020
Rates SDC	604	604	620	660	700	714	721	728	736	743	750	758	766	773	781
Materials	4,000	4,000	4,000	4,500	5,000	5,050	5,101	5,152	5,203	5,255	5,308	5,361	5,414	5,468	5,523
Electricity	90,000	90,000	90,000	90,000	90,000	91,800	93,636	95,509	97,419	99,367	101,355	103,382	105,449	107,558	109,709
Interest - Loan @ 6%			21,000	20,370	19,759	19,166	18,591	18,033	17,492	16,968	16,459	15,965	15,486	15,007	14,557
Interest - Overdraft @ 8%								2,725	1,603		4,259	1,108			
Legal	25,000	4,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Insurance	4,000	4,000	4,000	4,000	4,000	4,080	4,162	4,245	4,330	4,416	4,505	4,595	4,687	4,780	4,876
Administration	35,000	35,000	35,000	40,000	40,000	40,800	41,616	42,448	43,297	44,163	45,046	45,947	46,866	47,804	48,760
Total Cash Expenditure	252,057	231,057	249,573	254,983	254,912	257,243	259,597	264,750	266,132	267,108	274,023	273,605	275,309	278,184	281,155
Operating surplus/Deficit	66,207	105,005	87,162	84,711	82,185	82,843	85,642	85,538	89,514	94,523	92,615	98,671	102,805	106,134	109,527
Tax 28%	18,538	29,401	19,746	7,306	0	0	0	0	0	0	0	0	0	0	0
Capital Expenditure	0	128,000	339,550	339,550	212,500	75,000	125,000	62,500	25,000	175,000	45,000	70,000	70,000	70,000	50,000
Bank Loan (\$350,000 drawn down)			-339,500	10,185	9,879	9,583	9,296	9,017	8,746	8,484	8,229	7,982	7,982	7,503	7,278
Surplus/Deficit	47,669	-52,396	67,365	-272,330	-140,195	-1,740	-48,653	14,021	55,768	-88,961	39,386	20,688	24,822	28,631	52,249
Opening Balance	366,218	413,887	361,491	428,856	156,526	16,332	14,592	-34,062	-20,040	35,727	-53,233	-13,847	6,841	31,663	60,294
Add Surplus	47,669	-52,396	67,365	-272,330	-140,195	-1,740	-48,653	14,021	55,768	-88,961	39,386	20,688	24,822	28,631	52,249
Closing Balance	413,887	361,491	428,856	156,526	16,332	14,592	-34,062	-20,040	35,727	-53,233	-13,847	6,841	31,663	60,294	112,543

2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	Total
223,186	227,649	232,202	236,846	241,583	246,415	251,343	256,370	261,498	266,728	272,062	277,503	283,053	288,714	294,489	300,379	306,386	6,744,861
167,628	169,304	170,997	172,707	174,434	176,178	177,940	179,720	181,517	183,332	185,165	187,017	188,887	190,776	192,684	194,611	196,557	5,022,451
5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	150,000
1,688	2,532	3,373	920	1,921	2,951	4,011	5,854	6,963	8,111	9,299	10,531	11,805	13,124	14,489	15,901	17,361	125,960
397,501	404,485	411,572	415,474	422,939	430,544	438,295	446,944	454,977	463,170	471,527	480,051	488,746	497,615	506,662	515,890	525,304	13,084,466
83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	83,453	2,503,590
2,231	2,254	2,276	2,299	2,322	2,345	2,369	2,392	2,416	2,440	2,465	2,489	2,514	2,539	2,565	2,591	2,616	69,051
4,352	4,439	4,528	4,618	4,711	4,805	4,901	4,999	5,099	5,201	5,305	5,411	5,519	5,630	5,742	5,857	5,974	130,348
5,070	5,121	5,172	5,224	5,276	5,329	5,382	5,436	5,490	5,545	5,601	5,657	5,713	5,770	5,828	5,886	5,945	151,136
789	797	805	813	821	829	837	846	854	863	871	880	889	898	907	916	925	23,354
5,578	5,634	5,690	5,747	5,805	5,863	5,922	5,981	6,041	6,101	6,162	6,224	6,286	6,349	6,412	6,476	6,541	164,128
111,904	114,142	116,425	118,753	121,128	123,551	126,022	128,542	131,113	133,735	136,410	139,138	141,921	144,759	147,655	150,608	153,620	3,390,382
14,120	13,696	13,286															
2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	85,000
4,973	5,073	5,174	5,278	5,383	5,491	5,601	5,713	5,827	5,944	6,063	6,184	6,308	6,434	6,562	6,694	6,828	150,684
49,735	50,730	51,744	52,779	53,835	54,911	56,010	57,130	58,272	59,438	60,627	61,839	63,076	64,337	65,624	66,937	68,275	1,491,836
284,206	287,338	290,553	280,964	284,733	288,577	292,496	296,491	300,566	304,720	308,956	313,275	317,679	322,169	326,748	331,417	336,177	9,106,752
113,296	117,147	121,019	134,509	138,205	141,968	145,799	150,453	154,411	158,450	162,571	166,776	171,067	175,446	179,914	184,474	189,127	3,604,113
0	4,222	13,103	17,762	19,564	21,284	22,938	26,566	27,877	29,185	30,492	31,803	33,121	34,448	35,787	37,140	38,510	498,793
50,000	50,000	50,000	50,000	50,000	50,000	0	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	2,587,100
7,060	6,848	221,426															
56,236	56,077	-163,509	66,748	68,642	70,683	122,861	73,887	76,534	79,265	82,079	84,973	87,946	90,998	94,127	97,333	100,617	891,821
112,543	168,779	224,856	61,347	128,094	196,736	267,419	390,281	464,167	540,701	619,966	702,045	787,018	874,964	965,962	1,060,088	1,157,422	366,218
56,236	56,077	-163,509	66,748	68,642	70,683	122,861	73,887	76,534	79,265	82,079	84,973	87,946	90,998	94,127	97,333	100,617	891,821
168,779	224,856	61,347	128,094	196,736	267,419	390,281	464,167	540,701	619,966	702,045	787,018	874,964	965,962	1,060,088	1,157,422	1,258,039	1,258,039

Otama Rural Water Ltd - CAPEX and OPEX		
Investigations, Design and Tender		Year
Investigations - UVT and Turbidity Sampling	\$ 1,000.00	20/21
Investigations - Bore Capacity and Pump Test	\$ 7,500.00	20/21
Investigations - Downhole Inspection	\$ 1,500.00	20/21
Investigations - Power Supply Confirmation	\$ 1,000.00	20/21
Investigations - Reservoir Flows	\$ 1,000.00	20/21
Investigations - Confirm Flood Levels	\$ 1,000.00	20/21
Detailed Design and Construction Program - Beca	\$ 30,000.00	20/21
Tender Documents, EE - Beca	\$ 10,000.00	20/21
	\$ 53,000.00	
Treatment and Capacity Upgrade		
Capital Works - Security of Supply - Additional Well	\$ 50,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Upgrade Pumping	\$ 100,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - UV Disinfections	\$ 100,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Rising Main	\$ 100,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Building Works	\$ 100,000.00	21/23
Capital Works - Telemetry Upgrade / Compliance Data Acquisition System	\$ 50,000.00	25/26
Capital Works - Treatment To Reservoir Upgrade Works - Electrical	\$ 100,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Management	\$ 14,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Preliminary and General	\$ 20,000.00	21/23
Capital Works - Treatment To Reservoir Upgrade Works - Contingency	\$ 95,100.00	21/23
	\$ 729,100.00	
CAPEX - Additional - Reticulation		
Capital Works - Reticulation - Reservoir Upgrade	\$ 50,000.00	24/25
Capital Works - Reticulation - Res to Ridge Road	\$ 100,000.00	26/27
Capital Works - Reticulation - Res to Otama Valley Line	\$ 150,000.00	29/30
Capital Works - Reticulation - Ridge Road Pump Station Upgrade	\$ 100,000.00	24/25
Capital Works - Reticulation - Zone Flow Metering	\$ 75,000.00	24/25 & 27/28
Capital Works - Reticulation - Reticulation Annual Minor Upgrades Pipelines	\$ 1,250,000.00	Annual 50-100k
Capital Works - Reticulation - Reticulation Upgrades Reservoirs - Wendon	\$ 20,000.00	30/31
Capital Works - Reticulation - Reticulation Upgrades Reservoirs - Blackhill	\$ 20,000.00	31/32
Capital Works - Reticulation - Reticulation Upgrades Reservoirs - Otama Line Tanks	\$ 20,000.00	32/33
Capital Works - Reticulation - Reticulation Upgrades Reservoirs - Blackhills Line Tanks	\$ 20,000.00	33/34
Total Capex	\$ 1,805,000.00	
OPEX - For New Treatment Plant (Additional too Existing Cost - See Financial Report for further costs)		
Treatment - Chlorine	\$ 6,643.00	Annual
Treatment - Power	\$ 1,050.00	Annual
Treatment - UV lamp and sensor Replacement	\$ 2,000.00	Annual
Treatment - Monitoring, Lab costs	\$ 10,000.00	Annual
Treatment - Compliance reports	\$ 5,000.00	Annual
Treatment - Operator Time	\$ 24,960.00	Annual
Treatment - Electrical and instrumentation Maintenance	\$ 5,000.00	Annual
Treatment - Maintenance	\$ 28,800.00	Annual
Water Safety Plan Review	\$ 5,000.00	Annual
	\$ 83,453.00	

Loan Year		2021/22	2022/23	2023/24
		1	2	3
Project CAPEX	Security of the supply - Additional Well	\$ 50,000.00		
Project CAPEX	Capacity and Treatment Upgrade	\$ 53,000.00	\$ 314,550.00	\$ 314,550.00
Project CAPEX	Reservoir Upgrade			
Project CAPEX	Capacity Improvements - Telemetry Upgrade / Compliance Data Acquisition System			
Project CAPEX	Capacity Improvements - Res. To Ridge Road			
Project CAPEX	Capacity Improvements - Res to Otama Valley Line			
Project CAPEX	Capacity Improvements - Ridge Road PS upgrade			
Project CAPEX	Zone Metering			
Project CAPEX	Reticulation Upgrades - Annual Minor Upgrades Pipelines	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00
Project CAPEX	Reticulation Upgrades Reservoirs - Wendon			
Project CAPEX	Reticulation Upgrades Reservoirs - Blackhill			
Project CAPEX	Reticulation Upgrades Reservoirs - Otama Line Tanks			
Project CAPEX	Reticulation Upgrades Reservoirs - Blackhills Line Tanks			
CAPEX - Total	\$ 2,587,100.00	\$ 128,000.00	\$ 339,550.00	\$ 339,550.00
OPEX - Annual	Treatment Plant	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00

2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33
4	5	6	7	8	9	10	11	12
\$ 50,000.00								
	\$ 50,000.00							
		\$ 100,000.00						
					\$ 150,000.00			
\$ 100,000.00								
\$ 37,500.00			\$ 37,500.00					
\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 50,000.00	\$ 50,000.00
						\$ 20,000.00		
							\$ 20,000.00	
								\$ 20,000.00
\$ 212,500.00	\$ 75,000.00	\$ 125,000.00	\$ 62,500.00	\$ 25,000.00	\$ 175,000.00	\$ 45,000.00	\$ 70,000.00	\$ 70,000.00
\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00	\$ 83,453.00

[illegible]

[illegible]

5. Assessment of Otama Rural Water Limited to operate the Scheme for a period of 30 years

See attached.

OTAMA RURAL WATER LIMITED

A report underlying the proposed activities as a supplier of rural and potable water to the stakeholders of the Otama Rural Water Scheme catchment area.

Contents

1	-	Stakeholders
2	-	Water Safety
3	-	Governance, Accounting & Legal
4	-	Reserves
5	-	Operational/Repair & Maintenance
6	-	Directors' Responsibilities
7	-	Management of Property

1. Stakeholders

The water source for the scheme is a shallow bore located adjacent to the Mataura River at the Pyramid Bridge. While the scheme was primarily developed for stock water purposes, due to the high quality of water most consumers use the water for domestic purposes.

All users of the Scheme will become shareholders of the Company and will be invited to be involved in the management of the ongoing operation of the scheme. As stakeholders we feel we have a very clear understanding of the stakeholders and our responsibilities to them, with our values supported by our professional representatives.

Many of the stakeholders who access the scheme are dependent on the water supplied for their livelihoods and for the support of their families. As stakeholders we have a vested and financial interest in the ongoing viability of the scheme and the supply of water.

2. Water Safety

We are aware of the health issues of running a rural water scheme and its utilisation for potable water, as well as the responsibility as suppliers under the Health (Drinking Water) Amendment Act 2007 which aims to protect public health by improving the quality of drinking-water provided to communities. Further we are also following the Three Waters Review currently before Parliament.

As users and drinkers of the water from the scheme, water safety and quality is of extreme importance both to the livelihoods and to the health of the stakeholders and our families.

The Directors, and their replacements operate in a business world of compliance, change and adaption. It is not envisaged that any amendments to the Health (Drinking Water) Amendment Act 2007, Water Drinking Quality Standards or any other replacement or introduced legislation or compliance would create unforeseen difficulties. Change being the only constant that can be shown to exist. The Directors would seek necessary advice to adapt to all environment, statutory or administrative changes that is relevant.

3. Governance, Legal & Accounting

A larger number of the Directors are self-employed businesspeople with multi-generation links to the land and the region. As such they have proven experience in operating businesses and in the importance of water to both the stakeholders and their businesses. Many of these businesses and the families operating them have been involved with the scheme since its commencement.

The Directors are fortunate to have local resources for professional legal and accounting advice with clear understanding of the commercial and practical issues of the operation of both businesses and the importance of a rural water scheme to the stakeholders and the region and for the trading entity to be properly managed and governed.

4. Reserves

It is proposed that bank arrangements will be established to provide reserves to repair any major problems that may occur on the scheme. At the present time it is expected the current reserves held by the Council on behalf of the scheme will be transferred to the control of the Company during the transfer. Such reserves will provide funding if unforeseen problems eventuate.

Additionally, the Company will have the ability to borrow against annual income to meet initial unforeseen major events which can then be charged back to the consumer retrospectively to recover any costs, as and when necessary.

The 30 Year Financial Forecast prepared by Erin Howes of contains an assessment of the costs to be incurred in the event of a serious blow out in expenditure.

5. Operational/Repair & Maintenance

The Scheme is now around 50 years old and is well established and maintained.

It is proposed that the reticulation of the scheme shall be contracted to a private company – Downers, who also undertakes work on other water schemes in the region. Downers staff have a deep depth of knowledge of the operations of such schemes. In addition, many of the stakeholders have valuable local knowledge and understanding of the scheme's idiosyncrasies in their areas.

6. Directors Responsibilities

Our Directors have specific areas of expertise, which allows for a spread of responsibility. Many these Directors have been involved with the scheme for many years, some more than thirty, in various capacities either as a committee member or in other voluntarily capacities.

It is proposed that with the new company that Directors are elected for three years, with two retiring each year, who if still available are to be nominated for re-election.

7. Management of Property

It is noted that the Act requires the Company address the ability and commitment of the Company in relation to any property within the scheme distribution area if it is sold or leased to another person. The Otama water scheme traverses a large number of properties in the scheme distribution area, both rural and urban. As the scheme will now operate on a different footing it is proposed that any users shall become shareholders of the Company to recognise, and record, their entitlements to water and the obligations of both the user and the Company with regards the supply of water. Accordingly, to formalise this relationship the parties will be required to enter to:

1. A user supply agreement, detailing the terms and conditions of the supply of water and the requirement to meet the costs for water charges. This agreement will also provide an agreement for access, to access the pipes which transverse the user's property, and the user's agreement to grant an easement if ever called upon in favour of the Company for the water pipes crossing the user's land.
2. Share transfer instrument, recording the transfer of share(s) in the Company.
3. Incumbrance instrument, registering against the title to the user's land, formal notification of the user's participation and receipt of water from the Otama rural water scheme. Such incumbrance will note the interest of the user and the Company in the scheme and provide notice to any ongoing purchaser, or lessee, of the water scheme's existence.

The documents will provide the provisions for both the operation of the scheme, a user's participation and involvement in the scheme, and the basis on which the scheme will be operated and the requirement that on the sale or transfer of land that the new landowner will similarly be required to enter into a user supply agreement with the Company. As a result, there shall be a clear obligation upon a landowner, who is a member of the scheme, to meet the payment and operation requirements of the scheme and to satisfy the transfer requirements for the Company share(s) on sale to a new property owner.

In the event a property owner was to lease their land to another user, the property owner would remain liable for the water charges incurred on the property and it would be inherent on that user to either meet the costs of water and the going obligations, or to pass the costs of such water onto their lessee if they so elect. The obligation of the supply of water being linked to the land, contractually controlled by the above documents.

6. Water Safety Management

See attached.

Water Safety Plan

Version No	Description	Author	Reviewed	Revision Date
V1.0	Opus International Consultants – Reviewed and approved by the DWA	Chris Bergin	Jim Graham	March 2018
V2.0	Update following DWA adequacy review	Matthew Bayliss	Ramesh Sharma	October 2018
V2.1	2019 Annual Update	Alex Mckenzie	Matt Bayliss	October 2019
V3.0	Next Full Revision Due June 2023			

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1 Revision Details

Following approval of this plan it will be revised and submitted for re-approval following any major system reconfigurations or, alternatively, before 1 June 2023.

Assessment of the performance of the plan

Assessment of the performance of the plan will be undertaken annually. The assessment will consider any events, non-compliances, near misses and unexpected situations that have occurred, progress against the improvement schedule and any changes to any of the supply elements. Any matters requiring attention will be included into the Annual Plan, the Asset Management Plan for Water Supplies and if requiring significant capital funding, the Council Long Term Plan.

Reporting of the plan

A brief report on the performance of the plan, including information from the assessment of the plan will be provided by the Technical Administrator annually on the anniversary of finalisation of the plan. The report will cover the items listed above in the assessment of the performance of the plan. The 3 Waters Asset Manager will be responsible for ensuring that any matters requiring attention will be appropriately included into the Annual Plan or the Asset Management Plan for Water Supplies. If significant capital funding is required the 3 Waters Asset Manager will include the matter into the Council approval process and the Council Long Term Plan.

Links to other quality systems

This Water Safety Plan (WSP) will be linked to the Annual Plan, the Asset Management Plan for Water Supplies and the Council Long Term Plan.

2 Introduction

This WSP has been prepared for the Otama Rural Water Scheme to identify potential events that present public health risks to the consumers of the drinking water supply. Gore District Council is committed to the WSP and to the future improvements to the supply that have been identified in this WSP.

Historically the scheme was developed as a stockwater scheme however over the years due to the reliability and quality of the water the majority of consumers on the scheme have connected the supply up to their households. It has been suggested that the Otama Rural Water Scheme meets the rural agricultural Drinking-water supply criteria set out in the Health (Drinking Water) Amendment Act 2007 and that drinking water standards compliance could be demonstrated against this criteria.

The Health (Drinking Water) Amendment Act 2007 introduced this new category of Drinking-water supply which is defined as:

- a. a large, medium, minor, small, or neighbourhood Drinking-water supply from which 75% or more of the water supplied
 - i. is used for the purposes of commercial agriculture; and
 - ii. does not enter a dwelling house or other building in which water is drunk by people or other domestic and food preparation use occurs; but
- b. does not include a Drinking-water supply using a single connection to provide water to:
 - iii. a town; or
 - iv. a village or other place with a permanent population of 50 people or more that is used primarily for residential purposes.

Based upon this definition it is possible that the supply could be registered as a rural agricultural Drinking-water supply providing water to a population of approximately 300 people. The status of the supply is not clear but if it is decided to use the rural agricultural Drinking-water supply provisions, the option of providing potable water by installing point of entry or point of use treatment at individual dwelling-houses becomes available.

The water is sourced from a shallow well, is stored and then delivered to the community.

The scheme is administered at the main council offices on 29 Bowler Ave, Gore and managed by the Councils 3 Waters Group. Operation of the supply, treatment and reticulation is undertaken by the Council 3 Waters Team. The management, maintenance and operation of the Otama water supply are the responsibility of:

- 3 Waters Asset Manager, Matt Bayliss
- Technical Administrator, Alex Mckenzie
- Field Supervisor, Ian Lowe
- Operators, 3 Waters Field Staff

At 30 June 2017, a referendum amongst Otama residents was undertaken to determine ownership of the Otama Water Scheme currently owned and managed by Gore District Council. Residents voted in favour of forming a new company with directors appointed by residents to own, govern and manage the scheme. In May 2019 a Local Members' Bill was passed by parliament specifying the process that the Gore District Council must follow to authorise a transfer of the scheme into the ownership of Otama Rural Water Limited. Otama

Rural water limited are current preparing the necessary documentation as outlined in the member's bills following which a referendum of the scheme consumers will be held. It is expected that the scheme ownership will be transferred to Otama Rural Water Limited at some stage during 2020. Should the change in ownership occur, a new WSP will need to be prepared reflecting the change in ownership and operation of the scheme.

3 Supply Details

Table 1. Summary of Otama water supply details

Supply Details		
Supply Name	Otama	
WINZ Community Code	OTA004	
Supply Owner	Gore District Council	
3 Waters Asset Manager	Matt Bayliss	
Technical Administrator	Alex Mckenzie	
Operators	3 Water Field Staff	
Population Served by Supply	300 (WINZ register 2017)	
Source Details		
Source Name	Pyramid Well	
Source WINZ Code	G00314	
Type of Source	Groundwater	
Depth of Well	8m	
Consent Number	G028-001	
Consent Expires	8 March 2029	
Maximum Consented water take:	2,600m³/day	
Grid Reference of Source (NZTM)	Easting:168.8128	Northing: -45.9107
Treatment Plant		
Plant Name	Pyramid Pump Station	
Plant WINZ Code	TP00480	
Location	Otama	
Treatment Processes	Non-continually monitored Chlorine Dosing	
Average Daily Volume	693m³/day	
Peak Daily Volume	1169m³/day	
Distribution		
Distribution Zone Name	Otama	
Distribution Zone WINZ Code	OTA004OT	
Distribution Zone Population	300 (WINZ register 2017)	

4 Description of the Otama Rural Water Scheme

The Otama Rural Water Scheme is a relatively simple one. Water is abstracted from an 8-metre-deepwell located approximately 50m from the Mataura River. A concrete apron has been installed around the well and it is located within a fenced compound. Water is pumped from the well to a high lift pump located in a nearby shed. In May 2018 a chlorine gas dosing system was installed at the pyramid pump station.

The water is pumped to nine 25m³ plastic tanks referred to as the Pyramid reservoirs. The tanks are arranged in a 3x3 parallel formation and provide and discharge at a single outlet point. A level sensor in tanks one, two and three control the well pump, calling for water when the tank levels are at about 80%. The tanks are arranged in parallel and water discharges from tanks number seven, eight and nine which feeds the distribution system.

A second pump is connected adjacent to the service pump in the pump shed and can be used to supply the distribution system in the event the service pump should fail or require maintenance. A pressure vessel is installed with a connection to the delivery main to attenuate the effects of water hammer.

From the Pyramid reservoirs, the distribution system splits into two main branches and consists of approximately 82 kilometres of piping, mainly PVC and PE. The system includes several booster pump stations and additional storage reservoirs are installed at locations referred to as Wendon, Blackshill, Kennedy, Nichols and along Otama Rd. In total, the storage reservoirs provide approximately 48 hours of supply. All connections to this supply are required to have storage tank(s) installed with a suitable air gap.

Pipe work inspection and a review of pipe material condition is undertaken by council on a routine basis and recorded in the Councils Asset Finda database. The pipe condition is generally in good condition and pipe type and condition is continually updated as replacement and repairs occur.

As the pipeline passes over private land holdings there is potential for damage to occur when struck by farmers particularly when ploughing paddocks. It is requested that farmers contact the Council prior to starting any works that may damage pipes so that maps can be provided and/or pipes can be located to avoid damage.

All connections are required to have a tank with two days storage and an airgap for backflow prevention. There is little industry in Otama and no hazardous industries. The Otama supply supplies water to 2 rural primary schools that have individual WSPs.

There is no on-site emergency generator that can supply electricity to run the plant if there is a power outage. In the event of power failure each connection has a minimum of 2 days of stored water.

Sampling for pH, free available chlorine and E-coli is carried out each week at the pyramid pump station and monthly in the distribution network. In 2015 and 2017 E.coli results were detected. These followed flood events and were linked to the Mataura River. On 13 October 2017, the GDC issued a permanent boil water notice to consumers on the rural water scheme due to the elevated risk of possible contamination in the source water that was identified during the catchment assessment process. This resulted in a chlorine gas dosing's system and

online turbidity meter being installed in May 2018. The permanent boil water notice was removed in August 2018 following the minimum chlorine residual of 0.2 mg/l being achieved in the network.

The supply is not automated in any way (except for pump control from the tank level sensor) or controlled by a SCADA system. Flow data is telemetered to the Council office with alarms on pump stop and low reservoir alarmed to the operators.

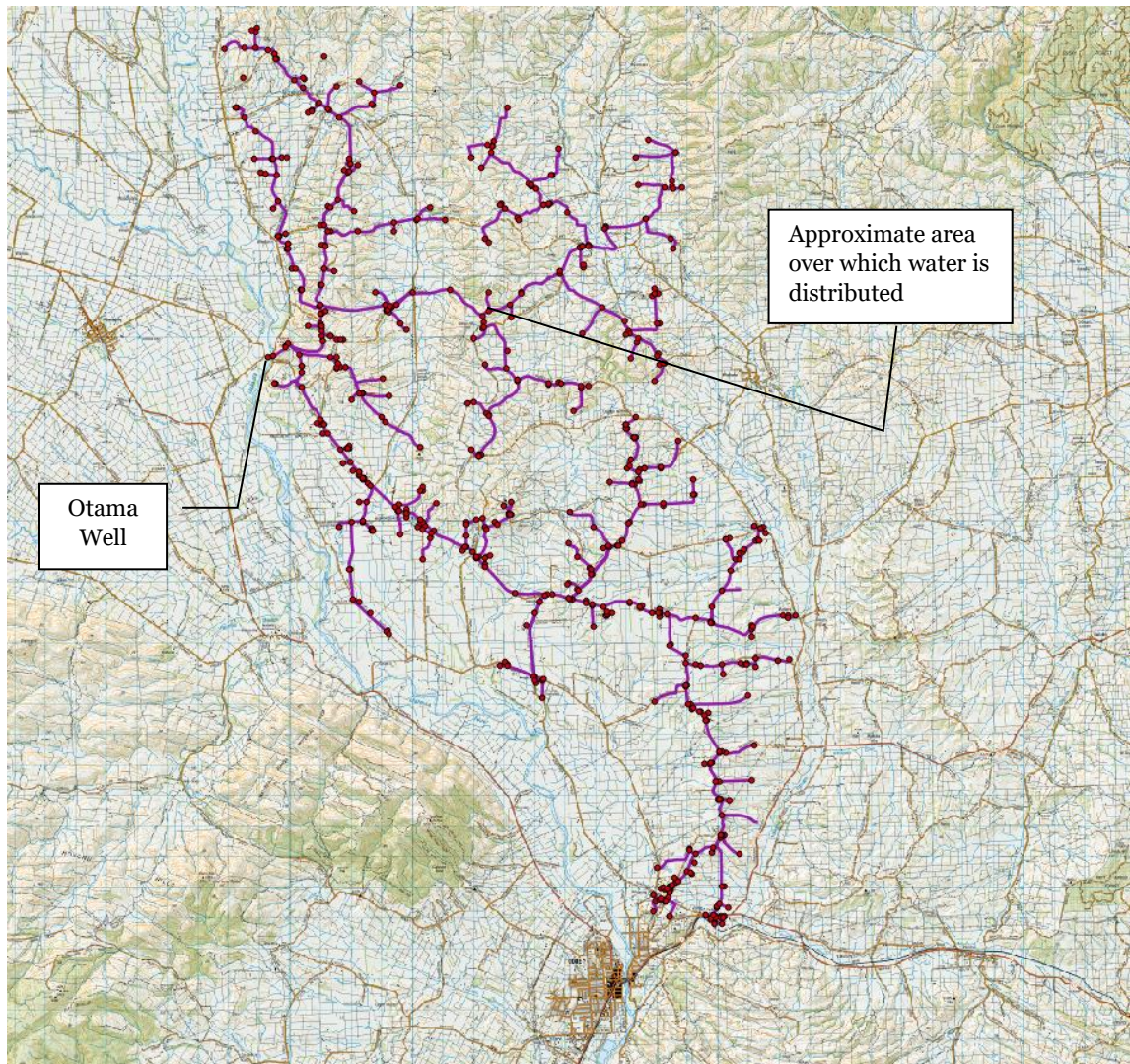
The supply pump stations and distribution systems is operated and maintained by the Council's 3 Waters Team. The 3 Waters team visit the pump shed weekly, and the reservoir bi monthly.

The Council take responsibility for the operation and management of the scheme up to the ballcock on the storage tanks at the point of supply. The storage tanks and downstream pipework is the responsibility of the property owners.

All service calls that come into the council are captured and managed on the Customer Request Management (CRM) system. This system is part of the Authority software platform that the Council uses to collect, manage and assimilate customer information. The CRM system provides details of the phone call, the resolution and the time for resolution of the issue.

This process assists Council with the management of calls and enables work to be dispatched to the operations team to restore network functionality. In addition to this the CRM system allows the Council to perform analysis and determine trends with regard to customer requests.

Figure 1. Location of the Otama well and reticulation system



5 Photographs of Otama Water Supply



Figure 2: Otama Well



Figure 3: Otama Pump Station



Figure 4. Otama well concrete apron



Figure 5. Pyramid Road Service (left) and backup pumps



Figure 6: Chlorine Dosing and Online Turbidity Meter



Figure 7: Chlorine Gas Storage



Figure 8. Pump control systems



Figure 9. Pyramid Rd tank farm (9 x 25,000L)



Figure 10. Ridge Rd Pump station**Figure 11. Ridge Rd Pumps****Figure 62. Wendon Reservoir****Figure 73. Barrds Break Tank****Figure 84: Kennedys Reservoir****Figure 95: Kennedy Pump station****Figure 106: Kennedy Booster pumps****Figure 117: Kennedy pump station**



Figure 128: Nichols Booster



Figure 139: Blackhills reservoirs



Figure 20: Otama Break tank



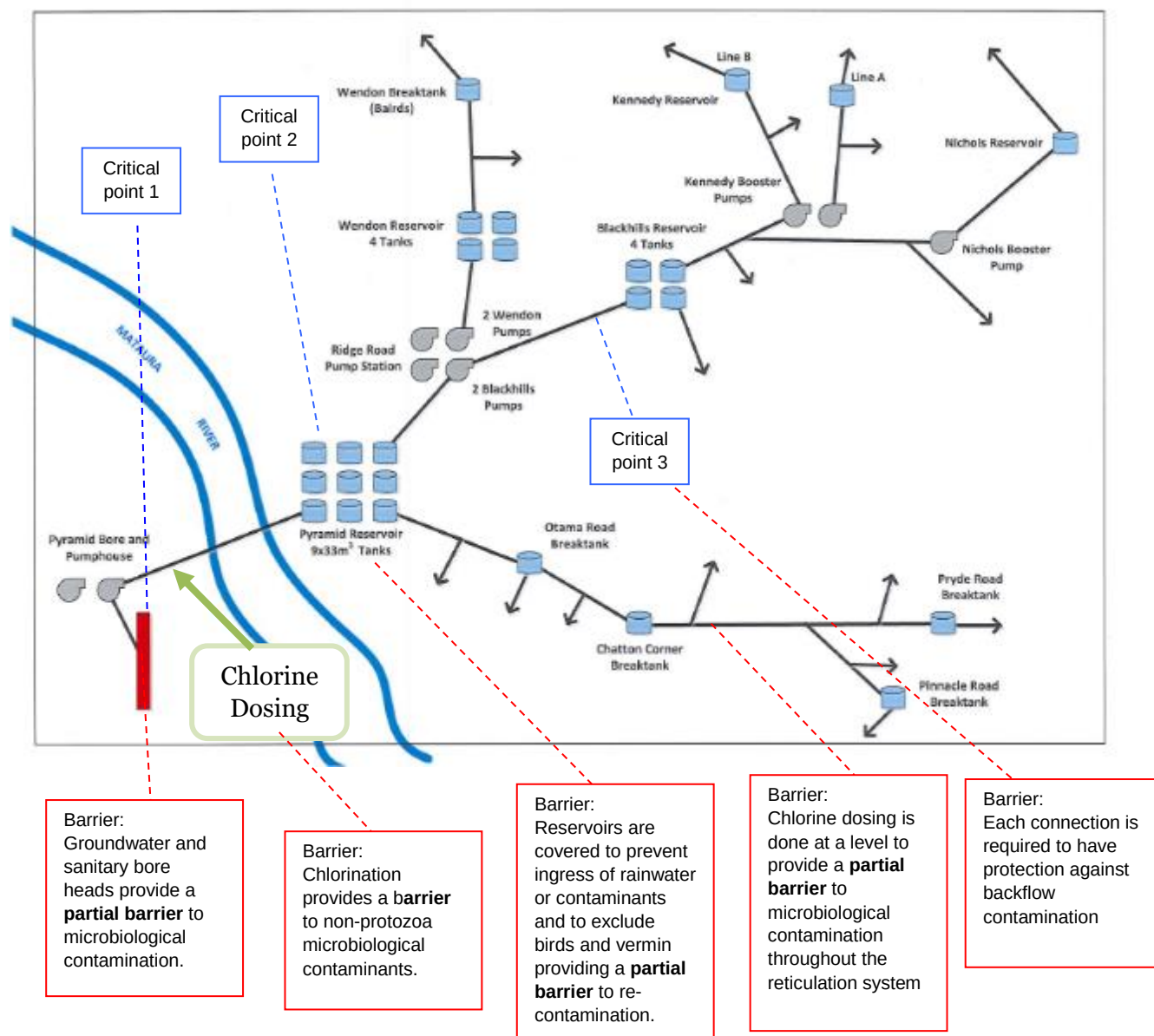
Figure 21: Chatton Corner Break tank



Figure 142: Pinnacle Rd Break tank

6 Flow Chart/Schematic of the Supply

Figure 15. Supply schematic



7 Barriers to Contamination

Table 2. Critical points

Critical points where hazards can be eliminated, minimised or isolated include:

	Critical Point	Description
1.	Groundwater source	<i>Well or well pump failure may result in a loss of source water for the supply. Infiltration of surface water into the well can compromise water quality</i>
2.	Chlorine dosing	<i>Failure will result in a lack of bacterial and viral control, overdosing may exceed the chemical MAV.</i>
2.	Water storage	<i>Possible point for microbiological contamination and water stagnation</i>
3.	Distribution system connections	<i>Possible access point for contamination due to backflow</i>

Existing barriers to contamination include:

1. Prevention of contamination of treated water in storage

The reservoirs are covered to prevent unauthorised access, ingress of rainwater or contaminants, and to exclude birds and vermin. This contributes to the provision of a **partial barrier against re-contamination** of water following abstraction. In addition to this a chlorine residual is maintained in the distribution network to provide a full barrier against bacterial and viral contamination in the network.

2. Control of bacterial and viral contamination

Use of groundwater reduces the levels of bacteria and viruses that are likely to be present in the source. In addition to this the water is chlorinated to provide a full barrier against bacterial and viral contamination.

Barriers that are not provided

Control of particulate contamination

The use of groundwater contributes to the source water having low levels of turbidity, but turbidity can become elevated when the river is dirty and/or in flood.

Inactivation or removal of protozoa contamination

Use of groundwater reduces the likelihood of protozoa being present in the source water but a barrier to protozoa contamination is not installed.

8 Critical Control Point Process Control

Critical control points

Critical Control Points outline preventative operational process controls that set firm operational target criteria and process control limits for the preventive measures, define routine and ongoing operational monitoring and response protocols that check the adequacy of controls in a timely manner. This often includes real time continuous monitoring.

One Critical Control Point has been identified and documented in the Otama Water Supply. This is included in Appendix 1.

A copy of the Critical Control Points is to be kept at the Water Treatment Plants and at the Council Yard (where the online monitoring system is monitored). These will be bi-annually reviewed and updated.

Critical and Action Limits

The critical limit is a prescribed tolerance that distinguishes acceptable from unacceptable performance at the critical control point requiring corrective actions. As shown in Appendix 1 the CCP limits for water leaving the treated water reservoirs have been set as follows:

- An alarm is received indicating chlorine is not being dosed
- The FAC measured downstream of the treated water reservoir is less than 0.3 mg/l

These limits have been set at a level which is significantly outside the expected normal operating limits but still inside the maximum acceptable values for ensuring safe drinking water. This will ensure that a response has already been initiated before the maximum acceptable limits have been reached.

9 Improvement Schedule

The improvement schedule outlines improvements that have been recommended for preventing, reducing or eliminating the identified public health risks in the Otama drinking water supply. Possible improvements to the water supply have been identified in the 'Additional Measures That Could Be Put in Place' column of the risk tables. The most suitable option to improve the management of each unmanaged risk has then been included in the improvement schedule. It should be noted that costs are estimates only. Each project is ranked according to the priority to which projects should be completed. All improvements are dependent on Council priorities, affordability and Council statutory budget approval processes.

WAM 3 Waters Asset Manager

TA Technical Administrator

FS Field Supervisor

TPO Treatment Plant Operators

Table 3. Recommended Improvements

WAM- 3 Waters Asset Manager

TA - Technical Officer

FS – Field Supervisor

TPO - Treatment Plant Operators

Priority	Risk level	Water Supply area	Reference to risk table	Proposed works	Person responsible	Expected cost	Intended completion date	2019 Progress Update
1	Very high	Catchment	1.1, 1.2, 6.7	Investigate options to provide treatment for the supply so that a barrier to protozoa, bacteria and viruses can be installed	WAM	Investigate \$20000 Install \$500,000	Investigation to be completed by the end of 2018, construction works will depend on budgets	Investigation has been completed, increased monitoring programme underway to collect necessary information to determine preferred option. Preferred option to be selected by early 2021
2	Very High	Other	6.3	Develop an operations and maintenance manual for the supply	TA TPO	Staff time	Mid 2020	Regular inspections and maintenance being implemented as part of the Councils new Inspection and Test plan.
3	Very High	Catchment	1.1 – 1.3 and 1.5	Engage with the Regional Council and property owners located in the catchment area immediately surrounding the well area to improve communication paths and ensure they are aware of this risks in the area.	WAM	Staff Time	Ongoing	The Council is participating in a joint working group to help facilitate this process.

4	Moderate	Chlorination	3.2 – 3.9	Develop a standard operating procedure for the operation and maintenance of the chlorination process.	WAM/ FS/ TPO	Staff Time	End of 2019	Has been drafted and is expected to be finalised by the End of 2019.
5	Moderate	Reticulation	5.3	Introduce a programme of auditing contractor pipe repairs to ensure appropriate procedures are followed	WAM TA	Staff time	Mid 2021	All work currently completed/ overseen by Council staff. Auditing will be required when a contractor is engaged to operate the supply when the scheme moves into private ownership.
6	Moderate	Other	6.5	Consider the need for on-line monitoring and alarms in the investigation of options for treatment systems	WAM TA	Staff time	End of 2019	Refer to the scheme's chlorine SOP for details of existing alarms. Further online monitoring and alarms will be installed as part of the upgrade proposed under improvement item 1.
7	Moderate	Other	6.5	Prepare a monitoring and inspection plan for the scheme including booster pump stations and reservoirs	WAM TA	Staff time	Mid 2019	Regular inspections and maintenance being implemented as part of the Councils new Inspection and Test plan. This will be reviewed in 12 months' time.
8	Moderate	Reticulation	5.4	Prepare and implement a council water supply backflow prevention policy which includes identification of risk premises, preparation of a	WAM TA	Staff time	Mid 2019	The Council adopted a backflow policy in March 2019. A report considering how this will

				register of all backflow protection devices and a database of annual testing				be implemented with respect to the scheme has been drafted and will be considered by the committee at their next meeting.
9	Low	Catchment	1.3, 1.4	Undertake analysis for a suite of chemical parameters every two years	TA	Staff time \$1000 sample costs	Mid 2019	Quarterly testing of water quality is underway as part of the work under improvement item 1.
10	Low	Well and pump	2.3	Run standby pump regularly to confirm it operates as expected	FS TPO	Staff time	Mid 2019	This was run on the 26 th of September 2019 with no issues reported.
11	Low	Storage reservoirs	4.6	Undertake a condition and security assessment of the concrete reservoirs	TA TPO	Staff time	Mid 2019	Completed in August 2019. One reservoir has been identified for replacement and will be discussed with the scheme committee at their next meeting.
12	Low	Booster Pump	6.9	Undertake a condition and resilience assessment of all booster pump stations	TA	Staff time	Mid 2021	New improvement item recently added
13	Low	Catchment	1.7	Complete a Cyanobacteria risk assessment of the raw water supply	3WAM	\$5000	Mid 2021	New improvement item recently added
14	Low	Reticulation	2.8	Complete a survey of all consumer tanks to determine if all consumers have a minimum of 48 hours onsite storage	TA	Staff Time	End of 2020	To be completed as part of the 2020 annual water meter readings

10 Benefits of Proposed Improvements

The proposed improvements will provide public health benefits by reducing the risk of adverse health outcomes associated with poor drinking water quality. Installation of treatment processes will ensure that the water supplied to consumers is always potable. Installation of continuous monitoring of water quality parameters and telemetering data to Council with alarms to the plant operators will ensure that plant failures are quickly identified and managed. Auditing of contractors and backflow prevention devices will insure that unnecessary risks of distribution system contamination do not occur.

11 Methodology

This WSP has been prepared consistent with the approaches recommended by the Ministry of Health. Supporting documents include the WSP Guides (2014) and *A Framework on How to Prepare and Develop Water Safety Plans for Drinking-water Supplies*, Ministry of Health (2014). A qualitative risk assessment approach has been taken following the guidance notes in Appendix 2 of the “Framework” allowing the prioritisation of improvement needs and development of the Improvement Schedule.

Risk tables have been prepared which identify the event, cause, risk without preventative measures, indicators that the event may be occurring, preventative measures that are currently in place to prevent the event, whether the risk is controlled, the residual risk, additional measures that could be put in place and the person(s) who is primarily responsible for managing that risk. The risk without preventative measures provides an indication of the risk level of the event related to that cause if nothing was in place to prevent the event. The residual risk is the remaining level of risk, taking account of the measures that are in place to prevent the event related to that cause.

Indicative cost estimates and implementation timeframes have been prepared for the required improvement measures and included in the improvement schedule where necessary. These will be carried forward to the next Asset Management Plan (AMP) and Council Long Term Plan for approval and inclusion in annual budgets following the statutory public consultation process. Implementation of the Improvement Schedule is ultimately subject to Council funding approval.

The 3 Waters Asset Manager is responsible for implementation of the Improvement Schedule within the timeframes indicated, but subject to community and council approvals, funding constraints and availability of resources. The Asset Officer is responsible for on-going review and updating of the WSP.

Contingency Plans have been prepared to provide guidance in the event that control measures fail to prevent the occurrence of a risk event that may present acute risk to public health. The 3 Waters Asset Engineer, the Asset Officer and the Treatment Plant Operators are responsible for implementation of the Contingency Plans when monitoring has identified the occurrence of a risk event.

Separate risk tables have been prepared for: catchment, well, storage reservoirs, reticulation, other.

12 Risk Ranking Procedure

Potential public health risks have been evaluated using the Likelihood and Consequence scales tabulated below to determine a risk level – low, moderate, high, very high or extreme. The assessed risk level allows prioritisation of the associated improvement measures.

Table 4. Likelihood Scale

Likelihood	Description
Almost certain	Is expected to occur in most circumstances.
Likely	Will probably occur (once in a year)
Possible	Might occur at some time (once in 5 years)
Unlikely	Could occur at some time (once in 25 years).
Rare	Only in exceptional circumstances (once in 50 years).

Table 5. Consequence Scale

Consequences	Description
Insignificant	Insignificant public health impact
Minor	Minor public health impact or inconvenience to supply users
Medium	Moderate public health impact and/or short-term loss of supply
Major	Major public health impact and/or loss of supply for a long period. Small number of water-borne illnesses
Catastrophic	Major public health impact. Significant water-borne illness

Table 6. Risk Level Allocation Table

	Consequence				
Likelihood	Insignificant	Minor	Medium	Major	Catastrophic
Almost certain	Moderate	Moderate	Very High	Extreme	Extreme
Likely	Low	Moderate	High	Very High	Extreme
Possible	Low	Moderate	Moderate	Very High	Very High
Unlikely	Low	Low	Moderate	High	Very High
Rare	Low	Low	Low	Moderate	High

13 Drinking Water Standards and Grading

At the time, this WSP was prepared, the Otama water supply does not fully comply with the Drinking Water Standards for New Zealand 2005 (R2008) (DWSNZ). Table 7 below shows a summary of the compliance with the DWSNZ to date.

The treatment plant and distribution zone at Otama are not currently graded.

Table 7. Summary of Compliance with DWSNZ

Compliance area	Comments
Bacterial compliance criteria used for water leaving the treatment plant	Criterion 1
Protozoa log removal requirement required for the supply	3-log.
Protozoa treatment process	None
Compliance criteria 6A or 6B is used for water in the distribution zone.	Criterion 6A
Bacterial compliance for water leaving the treatment plant has been achieved for the last 4 quarters.	No
Protozoa compliance for water leaving the treatment plant has been achieved for the last 4 quarters.	No
Bacteria compliance for water in the distribution zone has been achieved for the last 4 quarters.	No
P2 determinands allocated to supply	None
Chemical compliance achieved for the last 4 quarters.	Yes
Cyanobacteria identified in the supply	No
Cyanobacterial compliance has been achieved for the last 4 quarters.	N/A

14 Consultation

On 4 October 2017, a site visit to the Otama Rural Water Scheme was carried out by Christopher Bergin of Opus with the Assets Officer and Treatment Plant Operator.

An inspection of the well, pumps, storage and other parts of the supply was undertaken. Operation of the supply was discussed including the operation and performance limits, the critical points, the lack of barriers to contamination, the risks that have been identified, how these risks are managed currently and the improvements that could be put in place.

The information provided during this consultation has been used to compile the risk tables.

After this consultation, telephone discussions and email contact has been used to provide information necessary for the preparation of this WSP. The WSP was then reviewed by the Council's staff (3 Waters team) before completion.

In July 2018, Council staff updated the water safety plan following chlorination of the scheme and to include critical control points. Further updates were also made in October 2018 following the adequacy review of the Drinking Water Assessor.

15 Contingency Plan

Note: Refer also to the Emergency Response plan in Appendix 2 of this document for guidance on actions to be taken following a suspected waterborne disease outbreak.

Otama Water Supply Contingency Plan	
Type of Event	Required Contingency Action
Severe turbidity of source water and high turbidity in distribution zone. Indicators: Complaints from consumers.	Cease abstraction while source is turbid and supply from water storage. Manually chlorinate reservoirs Monitor storage level If storage is low and water with low turbidity cannot be supplied, advise DWA and issue Boil Water notice while problem is resolved. Keep customers informed and advise once regular supply is restored
<i>E. coli</i> transgression in water in distribution zone Indicators: <i>E. coli</i> transgression reported following routine monitoring.	Follow transgression response procedure in DWSNZ Issue "Boil Water" notice Advise Drinking Water Assessor (DWA) Commence daily <i>E. coli</i> testing at WTP Use an enumeration test method Sample in distribution system Investigate cause, inspect plant and source Take remedial action Continue to sample for <i>E. coli</i> until 3 consecutive samples are free of <i>E. coli</i> If <i>E. coli</i> is found in repeat samples consult with DWA, intensify remedial action, increase disinfection, consider alternative supply
Severe microbiological contamination of source water Indicators: A contamination event near to the wellhead may be observed by or reported to Gore District Council staff. May also be indicated by reported illness among consumers or positive <i>E. coli</i> monitoring results	Issue "Boil Water" notice Advise Drinking Water Assessor (DWA) Inspect wellhead and area around well to identify source of contamination and rectify problem as quickly as possible Manually chlorinate reservoirs Consider provision of emergency treatment or alternative water supply (e.g. tankers) Disinfect contaminated reservoirs and flush mains when satisfactory quality water can be supplied Keep customers informed and advise once regular supply is restored

Otama Water Supply Contingency Plan

Type of Event	Required Contingency Action
Inadequate chlorination Indicators: Low FAC measured at the outlet of the reservoir or in the network. Operational issue noted with the chlorination equipment during routine maintenance checks	Refer CCP O3 and O4 Inspect chlorination equipment to identify cause of problem and rectify as quickly as possible. Manually chlorinate reservoirs Advise DWA and issue boil water notice if appropriate, i.e. if cannot reinstate adequate chlorination Keep customers informed and advised once regular service is restored
Over chlorination – above 3 mg/l Indicators: High FAC measured at the reservoir or in the network by Council Staff. May also be indicated by reported water quality concerns from consumers (taste, odour, colour) or illness among consumers.	Advise Drinking Water Assessor (DWA) Assess situation and advise customers regarding use/treatment/disposal of contaminated water Arrange emergency water supply (tankers) if necessary Inspect chlorination equipment and rectify problem as quickly as possible Flush contaminated reservoir and mains when satisfactory quality water can be supplied Keep customers informed and advise once regular supply is restored
Chemical contamination of source water Indicators: A contamination event near to the wellhead may be observed by or reported to Gore District Council staff. May also be indicated by reported water quality concerns from consumers (taste, odour, colour) or illness among consumers.	Advise Drinking Water Assessor (DWA) Assess situation and advise customers regarding use/treatment/disposal of contaminated water Arrange emergency water supply (tankers) if necessary Inspect wellhead and area around well to identify source of contamination and rectify problem as quickly as possible Flush contaminated reservoir and mains when satisfactory quality water can be supplied Keep customers informed and advise once regular supply is restored
Loss of continuous supply – Insufficient water available for abstraction or loss of ability to take water from the Otama well Indicators: Observed or reported low abstraction levels or damage to critical pipelines of other infrastructure.	Advise the DWA within 24 hours of the event Advise customers of the situation and the requirement to conserve water Provide an alternate drinking water supply i.e. emergency water tankers if necessary Implement demand management strategies as required and if possible Arrange for the necessary repairs to be made Keep customers informed and advise once regular supply is restored.
Cyanobacterial/Cyanotoxin contamination of source water	Advise Drinking Water Assessor (DWA) Dose powdered activated carbon Monitor source water for cyanobacteria

Otama Water Supply Contingency Plan

Type of Event	Required Contingency Action
	Monitor water leaving the treatment plant for cyanotoxins If cyanotoxins in water leaving the treatment plant exceed 50% of the MAV prepare to supply drinking water from tankers to the community If cyanotoxins in water leaving the treatment plant exceed the MAV supply drinking water from tankers to the community Keep customers informed and advise once regular service is restored
Earthquake, flood or other natural disaster	Refer to Council Emergency Response Plan and other events as described above.

16 Risk Tables

WAM - 3 Waters Asset Manager

TA – Technical Administrator

FS – Field Supervisor

TPO – Treatment Plant Operators

Table 8. Risk Tables

1. Catchment									
Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Controlled	Residual Risk	Additional Measures That Could be put in Place	Resp
Microbiological Contamination	1.1	Surface runoff from catchment	Very high (likely x major)	Positive <i>E. coli</i> results at the well Turbidity in raw water. Illness in community	Well provides water with low levels of micro contamination Chlorination of the water <i>E. coli</i> monitoring of the source water	No	Very High (likely x Major)	Investigate options to provide treatment for the supply so that a barrier to protozoa, can be installed Engage with the Regional Council and property owners located in the catchment area immediately surrounding the well area to improve communication paths and ensure they are aware of this risks in the area.	WAM TA FS TPO

Microbiological contamination	1.2	Discharges from community wastewater systems, dairy effluent irrigation, farmed animals or septic tank systems.	Very high (likely x major)	Positive <i>E. coli</i> results at the well Turbidity in raw water. Illness in community	Well provides water with low levels of micro contamination Chlorination of the scheme water <i>E. coli</i> monitoring of the source water	No	Very high (likely x major)	Investigate options to provide treatment for the supply so that a barrier to protozoa can be installed. Engage with the Regional Council and property owners located in the catchment area immediately surrounding the well area to improve communication paths and ensure they are aware of this risks in the area.	WAM TA
Chemical contamination	1.3	Surface runoff containing chemical contaminants from agricultural activities. (e.g. pesticides, fertilisers etc)	Moderate (unlikely x medium)	Taste and/or odour. Complaints or information provided by public about activities in catchment.	Few activities in catchment would contribute significant chemical contamination to the ground water	No	Low (rare x medium)	Undertake analysis for a suite of chemical parameters every two years. Engage with the Regional Council and property owners located in the catchment area immediately surrounding the well area to improve communication paths and ensure they are aware of this risks in the area.	WAM TA FS TPO
Chemical Contamination	1.4	Naturally occurring chemical contaminants	Moderate (possible x medium)	Taste and/or odour Results of raw water chemical testing	Likely contaminants iron and manganese have not been identified	No	Low (unlikely x minor)	Undertake analysis for a suite of chemical parameters every two years	TA

Chemical Contamination	1.5	Chemical spill contaminates ground water in catchment	Moderate (possible x medium)	Chemical spill is reported Testing identifies unexpected contaminant Complaints of taste or odour	Transit time of groundwater to well means some delay before contaminated water is abstracted at the well	Yes	Low (unlikely x minor)	Engage with the Regional Council and property owners located in the catchment area immediately surrounding the well area to improve communication paths and ensure they are aware of this risks in the area.	WAM TA
Loss of Supply	1.6	Drought lowers water table reducing or preventing abstraction	High (unlikely x major)	Prolonged drought conditions Reduced/no flow from well	Water conservation measures (water restrictions) can be implemented during drought conditions Emergency management plan can be activated Well level is continuously monitored	Yes	Low (rare x medium)	Investigate options for an alternative water source	WAM FS
Cyanobacterial Contamination	1.7	Cyanobacterial growth in the raw water	High (possible x major)	Taste and odour complaints Algal bloom in the river	Natural filtration achieved due to groundwater abstraction.	Partially	Moderate (rare x major)	Complete a Cyanobacterial risk assesment of the raw water source	

2. Well and Pump

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
Loss of Supply	2.1	Intentional vandalism to wellhead and/or well electrical components	Very High (possible x major)	Obvious signs of damage to wellhead Reduced/no flow from well.	Well is located within a fenced area beneath a steel head casing within public view Minimum of 48 hours of stored water is available	Yes	Low (unlikely x minor)	None required	FS TPO
Loss of Supply	2.2	Damage to wellhead and electrical components from flooding	Very high (likely x major)	Obvious signs of flooding, or heavy/prolonged rainfall	If well was flooded, then whole community would be flooded and emergency declared Boil water notice would be issued if well was flooded Minimum of 48 hours of stored water is available Electrical components are located above flood level.	Yes	Moderate (unlikely x medium)	None required	FS TPO

Loss of Supply	2.3	Abstraction pump failure	Very high (possible x major)	Reduced/no flow from well.	Pump can be easily and quickly replaced Standby pumps are present in pump shed Minimum of 48 hours of stored water is available	Yes	Low (unlikely x minor)	Run standby pump regularly to confirm it operates as expected	FS TPO
Loss of Supply	2.4	Failure of well structures or damage to well from natural event like an earthquake	Very high (possible x major)	Reduced/no flow from well. High turbidity in water in reticulation	Minimum of 48 hours of stored water is available Water could be abstracted directly from the Mataura River if required A new well could be installed close to existing well within a month	Yes	Low (unlikely x minor)	None required	WAM
Contamination of supply	2.5	Well maintenance results in potential for contamination of supply	Very high (possible x major)	Positive <i>E. coli</i> results at well Visual evidence of maintenance failures	Staff are trained and aware of contamination risks Chlorination of water	Yes	Moderate (unlikely x medium)	None required	FS TPO

Loss of right to take Water	2.6	Consent to take water is not renewed or is declined	Very High (possible x major)	Expiry date of existing resource consents.	Current consent expires in 2029	Yes	Moderate (rare x major)	None required	WAM TA
Insufficient water for supply	2.7	Well unable to meet demand.	Very High (possible x major)	Low or reducing storage levels at times of high demand	Community has static population and demand will not increase An additional well could easily be installed	Yes	Low (rare x medium)	None required	WAM FS
Loss of Supply	2.8	Well pump failure due to power outage.	Very high (possible x major)		Minimum of 48 hours of stored water is available that can be supplied under gravity	Yes	Low (unlikely x minor)	None required	WAM FS
Inadequate Emergency Disinfection	2.9	Oxidant demand exceeds chlorine dose due to high raw water turbidity	High (likely x medium)	High turbidity in raw or abstracted water. FAC is less than 0.4 mg/L or E. coli detected in water in the reticulation	None	No Source water is known to become slightly turbid under some conditions	High (likely x medium)	Prepare standard operating procedure for high turbidity events	WAM TPO

3. Chlorination

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Controlled	Residual Risk	Additional Measures That Could be put in Place	Resp.
Inadequate Chlorination	3.1	Inadequate contact time during peak demand.	Moderate (possible x medium)	Lack of storage after treatment <i>E. coli</i> detected in water leaving the reservoirs.	A minimum of 4.5 hours storage based on the peak daily demand is provided in reservoirs This provides sufficient contact time (i.e greater than 30 minutes as required by the DWSNZ).	Yes	Low (rare x medium)	Installation of treatment processes which meet the bacterial and protozoal requirements of the DWSNZ. I.e. UV treatment. Provide more than 24 hours treated storage	WAM
Inadequate Chlorination	3.2	Chlorine gas supply exhausted.	Very high (possible x major)	Illness in community. FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving treatment plant.	Automatic change over between duty and Standby chlorine gas cylinders. Additional spare cylinders kept in stock Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Emergency response plan prepared including draft Boil Water notice	Yes	Moderate (unlikely x medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points. Develop a Standard operating procedure regarding the operation and maintenance of chlorine dosing and monitoring systems	3WAM FS

Inadequate Chlorination	3.3	Chlorinator failure.	Very high (possible x major)	Illness in the community. FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving treatment plant.	Chlorine dosing no flow alarm set-up in telemetry system Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Chlorine regulators serviced annually by specialist contractor Emergency response plan prepared including draft Boil Water notice	Partially	Moderate (possible x medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine residual allowing alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points. The installation of treatment processes which meet the bacterial and protozoal requirements of the DWSNZ I.e. UV treatment. Develop a Standard operating procedure regarding the operation and maintenance of chlorine dosing and monitoring systems	3WAM FS TPO
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Inadequate Chlorination	3.4	Chlorine dose level incorrectly set.	Moderate (possible x medium)	FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving the treatment plant.	Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Chlorine analyser serviced annually by specialist contractor. Emergency response plan prepared	Partially	Moderate (Possible x Medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points. The installation of treatment processes which meet the	WAM TPO
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					including draft Boil Water notice has been prepared			bacterial and protozoal requirements of the DWSNZ I.e. UV treatment. Develop a Standard operating procedure regarding the operation and maintenance of chlorine dosing and monitoring systems	
Inadequate Chlorination	3.5	High chlorine demand.	Moderate (possible x medium)	FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving the treatment plant. Need to increase chlorine dosing set point. Odour complaints	Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Operators check chlorine levels weekly and can adjust set-points if required.	Partially	Moderate (possible x medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate upgrading of the treatment system and water storage to allow selective abstraction. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points.	WAM TPO
Inadequate Chlorination	3.6	Chlorinator failure due to local power failure.	Very high (possible x major)	FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving the treatment plant.	Well abstraction pumps will not run if there is power failure. All consumers are required to have a minimum of two days onsite storage	Yes	Low (rare x insignificant)	The installation of back-up generator power supplies for abstraction pumps and chlorine dosing systems. Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels.	WAM TPO

					Chlorine dosing no flow alarm set-up in telemetry system			Investigate installing an automatic plant shut down system when FAC is outside predetermined set points.	
Inadequate Chlorination	3.7	Lack of chlorine due to dosing pipe failure or leak.	High (unlikely x major)	Illness in the community. FAC is less than 0.5 mg/L or <i>E. coli</i> detected in water leaving the treatment plant.	Chlorine dosing no flow alarm set-up in telemetry system Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Emergency response plan prepared including draft Boil Water notice. Chlorine analyser serviced annually by specialist contractor.	Yes	Moderate (Unlikely x Medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points or installation of duty stand-by chlorine dosing system	3WAM FS TPO
Over Chlorination	3.8	Chlorinator failure.	Moderate (Possible x medium)	FAC level high. Odour and taste. Complaints from consumers.	Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Chlorine analyser serviced annually by specialist contractor.	Partially	Moderate (possible x medium)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set points. Develop a Standard operating procedure regarding the	WAM FS TPO

								operation and maintenance of chlorine dosing and monitoring systems	
Over Chlorination	3.9	Chlorine dose level incorrectly set.	Moderate (Possible x medium)	FAC level high. Odour and taste. Complaints from consumers.	Residual based chlorine dosing Weekly checks of the chlorine dosing equipment and chlorine residual leaving the pump station. Staff appropriately trained in use of chlorine dosing equipment	Partially	Low (unlikely x minor)	Upgrading of the telemetry system to allow continuous monitoring of chlorine and alarms when chlorine is outside predetermined levels. Investigate installing an automatic plant shut down system when FAC is outside predetermined set-points.	WAM FS TPO

4. Rising Main									
Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
Pipeline damage / Loss of Supply	4.1	Contractors or farmers excavate along pipeline route, damaging pipe	Very high (likely x major)	Heavy machinery observed operating close to pipeline route	Farmers are generally aware that pipeline may cross their property GIS records of pipe location maintained – printed copies of maps provided to consumers on request	Yes	Moderate (unlikely x medium)	Regular reminder to farmers to be aware of where pipes are that pipe location maps are available upon request.	WAM
	4.2	Damage to, or failure of the rising main	Very high (possible x major)	Evidence of leakage from pipe Reduced/no flow to the reservoirs Increased flows at the pump station	Pipe failures are repaired as a priority. Spare pipe and fittings are held in stock allowing a quick response. All consumers are required to have a minimum of two days storage kept onsite	Yes	Moderate (possible x medium)	Investigate alternative or back up water sources (refer comments in item 4.3). Consider resilience of critical water mains and improve as necessary.	WAM

Damage to Temporary River Crossing Pipeline	8.0	Flooding or wind damage to the temporary pipeline across the river. Note there was installed as a result of the Pyramid Bridge failing in February 2018. A contractor has been engaged to replace the bridge with construction of the new bridge expected to start in late 2019.	Very high (possible x major)	Evidence of leakage from pipe Reduced/no flow to the reservoirs Increased flows at the pump station Intense sustained weather Earthquake land slide, flooding Warnings from Govt agencies incl Met Office, Niwa, Civil Defence, Regional Council or Police	Spare pipe and fittings are held inn stock allowing a quick response. All consumers are required to have a minimum of two days storage kept onsite	Yes	Moderate (rare x major)	As a result of the Pyramid Bridge failure investigations into alternative water sources and alternative river crossing arrangements has been completed. Following this work it however has been determined that the existing well and a pipeline across the new Pyramid Bridge is the best long term sustainable solution for the scheme. Constrcution of a new bridge and pipeline across the river is planned to start in October 2019 and be completed by Mid 2020. The contractor is in the process of developing a contingency plan in the event that the pipe is damaged during construction. While this has not yet been finalised the contractor will have a large crane onsite through out the construction works allowing a quick replacement of the pipe. The Council has also purchased replacement pipe in the event of the pipe failing.	WAM

5. Storage Reservoirs (Pyramid and All other Minor Reservoirs)

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Controlled	Residual Risk	Additional Measures That Could be put in Place	Resp
Microbiological contamination	5.1	Leakage through reservoir roofs or other parts of structure or access by birds or vermin.	Very high (possible x major)	<i>E. coli</i> detected in distribution system Visual inspection identifies problems	Reservoirs are covered and all entry hatches are secure against ingress Reservoirs are inspected when operators are in reticulation weekly Chlorine residual maintained in network	Yes	Moderate (unlikely x medium)	None required	TA TPO
Microbiological contamination	5.2	Vandalism to reservoirs.	Moderate (possible x medium)	<i>E. coli</i> detected in distribution system Evidence of perimeter fence damage or reservoir damage Reports from the public	Most reservoirs are secured behind fences or located on private farm land with restricted access	Yes	Moderate (unlikely x medium)	None required	FS TPO

Microbiological contamination	5.3	Sediment accumulation within reservoir	Moderate (possible x medium)	Visible suspended matter in water in distribution system Water quality complaints	Use of well water ensures water entering reservoir has very low particulate load Reservoirs are checked and can be cleaned	Yes	Low (unlikely x minor)	None required	FS TPO
Microbiological Contamination	5.4	Contamination through insanitary maintenance or sampling procedures.	Moderate (possible x medium)	<i>E. coli</i> in water in distribution system	Access to reservoirs is restricted to trained staff. Chlorine residual is maintained in network Hygiene procedures are in place.	Yes	Low (unlikely x minor)	None required	FS TPO
Loss of supply	5.5	Insufficient storage for peak demand	Very high (likely x major)	Loss of water or pressure in reticulation Frequent low reservoir levels	Minimum of 48 hours of stored water is available Current demand easily met and not expected to increase	Yes	Low (unlikely x minor)	None required	WAM

6. Reticulation

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Controlled	Residual Risk	Additional Measures That Could be put in Place	Resp
Loss of Supply	6.1	Pipe failure.	High (likely x medium)	Complaints from consumers about loss of supply. Change in flow or pressure in reticulation.	Pipe failures are repaired as a priority Reticulation system is relatively small	Yes	Moderate (likely x minor)	None required	FS TPO
Loss of Supply	6.2	Excessive demand, excessive capacity, water stagnation, inadequate or excessive pressures in network	High (likely x medium)	Complaints from consumers about low pressure or loss of supply Unexpected pipe breakages Taste and odour complaints	Reticulation system is small and demand is minimal	Yes	Moderate (unlikely x medium)	None required	WAM FS

Microbiological Contamination	6.3	Inadequate controls on maintenance and construction work.	Moderate (possible x medium)	Complaints from consumers about taste or odour <i>E. coli</i> present in reticulation system	Maintenance and replacement work is undertaken by qualified and experienced staff with written procedures Chlorine residual is maintained in network	Partially	Moderate (unlikely x medium)	Introduce a programme of auditing contractor pipe repairs to ensure appropriate procedures are followed	WAM FS
Chemical or Microbiological Contamination	6.4	Backflow from consumer connections.	Very high (likely x major)	Contaminants identified in the reticulation system. Taste or odour complaints from consumers	All connections required to have an air gap on tanks Chlorine residual maintained in network	Partially	Moderate (unlikely x medium)	Audit implementation of council water supply backflow prevention policy which includes identification of risk premises, preparation of a register of all backflow protection devices and a database of annual testing	FS TPO
Chemical or Microbiological Contamination	6.5	Corrosion of plumbing fittings due to plumbosolvency of water	Moderate (likely x minor)	Taste complaints by consumers Staining of tubs or basins	Plumbosolvency notices are issued to consumers twice yearly as per section 8.2.1.4 of the DWSNZ05/08	Partially	Moderate (likely x minor)	None required	TA
Supply of Turbid Water	6.6	Silt or biofilm build up within reticulation pipes.	Moderate (possible x minor)	Reduced flows in reticulation. Complaints from consumer about quality of water	Flushing undertaken as required in response to complaints	Yes	Low (unlikely x minor)	None required	TPO

Inadequate Supply of Water	6.7	Poor quality workmanship or inappropriate materials used for reticulation pipes and fittings or contractor damage to pipes	Moderate (possible x medium)	Contaminants identified in the reticulation system. Taste and odour complaints from consumers	Gore DC requires all work and materials used in reticulation to meet standard specifications Best practice approach taken to reticulation work Trained contractors undertake installations	Yes	Low (rare x medium)	None required	FS TPO
Inadequate Emergency Disinfection	6.8	Oxidant demand exceeds chlorine dose due to high raw water turbidity	High (likely x medium)	High turbidity in raw or abstracted water. FAC is less than 0.8 mg/L or E. coli detected in water in the reticulation	Raw water turbidity continually monitored Chlorine residual maintained in the network	No Source water is known to become slightly turbid under some conditions	High (likely x medium)	Prepare standard operating procedure for high turbidity events	FS TPO

Loss of Supply	6.9	Failure of Booster Pumps	High Likely x Medium	Pump telemetry alarms Complaints from consumers about loss of supply.	All consumers are required to have two days storage. Telemetry alarms in place with an operator on-call at all times Duty assist pump arrangements installed in most pump stations??? 3 monthly inspections of Booster pump stations	Partially	Moderate Possible x Minor	Complete a condition and resilience assessment of all booster pump stations.	
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7. Other

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
DWSNZ Compliance Failure	7.1	Inadequate sampling programme or sample collection error or failure to demonstrate other compliance requirements	High (likely x medium)	DWSNZ compliance failure due to sampling programme, determination of protozoa treatment requirement or other standards requirement	Sampling for <i>E. coli</i> is undertaken	Partially <i>E. coli</i> is sampled weekly. DWSNZ require sampling weekly Trained sampling staff used.	Moderate (unlikely x medium)	None required	TPO
Failure of Equipment due to Inadequate Maintenance	7.2	Supply equipment fails due to inadequate asset information and inadequate maintenance planning	Very high (almost certain x medium)	Unexpected plant or equipment failure.	Small simple plant with few assets	Yes	Moderate (unlikely x medium)	None required	WAM

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
Failure due to Inadequate Procedures	7.3	Insufficient, inadequate out of date or incorrect manual of operational procedures	Very high (almost certain x medium)	Operational manuals not used. Operational Manuals not up to date	Very simple plant Monthly checks of pump stations	No	Very high (almost certain x medium)	Develop an operations and maintenance manual for the supply	WAM TA
Operator Error or Mismanagement	7.4	Inadequate training, professional development and up-skilling of operators	Extreme (almost certain x major)	Poor operation of plant. Plant compliance failure. Loss of supply.	3 Waters Asset Engineer has engineering degree Operators hold or are studying for National Certificate in Drinking Water Treatment	Yes	Moderate (possible x medium)	None required	WAM
Failure to Provide Safe Water	7.5	Inadequate data collection, reporting and control systems	High (likely x medium)	Information about how the supply is operating is not available Manual collection and recording of data Manual operation of treatment plant	Grab sampling is used to demonstrate compliance Simplicity of plant limits the value of monitoring operational procedures	Partially	Moderate (possible x medium)	Consider the need for on-line monitoring and alarms in the investigation of options for treatment systems Prepare a monitoring and inspection plan for the supply	WAM

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
Loss of Supply	7.6	Power failure	Very high (possible x major)	General power failure evident Water supply disrupted	Backup generator could provide power for the well pump Minimum of 48 hours of stored water is available	Yes	Low (unlikely x minor)	None required	WAM FS
Compliance Failure	7.7	Supply does not have adequate infrastructure to provide water that will comply with the DWSNZ	Very high (almost certain x medium)	Failure to comply with DWSNZ Lack of treatment infrastructure	Source water is variable quality groundwater	No	Very high (almost certain x medium)	Investigate options to provide treatment for the supply so that a barrier to protozoa, bacteria and viruses can be installed	WAM

Event	No	Cause	Risk Without Preventative Measures	Indicators	Preventative Measures in Place	Risk Managed	Residual Risk	Additional Measures That Could be put in Place	Resp
Supply Failure	7.8	Catastrophic natural disaster or failure including earthquake, flooding, volcanic eruption	High (rare x catastrophic)	Major natural disaster occurs Intense sustained weather Earthquake land slide, flooding Total plant failure is evident Warnings from Govt agencies incl Met Office, Niwa, Civil Defence, Regional Council or Police	Prior warning from Govt agencies incl Met Office, Niwa, Civil Defence, Regional Council or Police Robust secure plant structures System and people backups, monitoring and alarms Business continuity plan in place and exercised Emergency response plan	Yes	Moderate (rare x major)	None required	WAM

17 Appendix 1 – Critical Control Points

Otama Water Supply – Critical Control Point

Primary Disinfection by free chlorination

Process objectives

1. Provide a primary disinfection CCP to inactivate bacterial and viral pathogens that may have entered upstream of the dosing point
2. Provide a residual disinfection quality control point to help inactivate pathogens entering downstream of the dosing point.

Note – FAC is not continually monitored for this scheme - An alarm is installed to notify the operators if the chlorine system is not operating. In addition to this FAC is manually checked on a weekly basis.

Operational day-to-day monitoring of control process	
What	Free available chlorine (FAC) concentration in mg/L
When	Weekly Manual Testing
Where	At designated treated water monitoring location downstream of the Pyramid Reservoir.
How	Automated Alarm System/ Manual monitoring of chlorine
Who	Duty Operator during work hours, On-call operator during after hours
Records	Water Outlook

Process performance criteria at the operational monitoring point:		Correction if performance criteria are not met:
Target Range	FAC: 0.5 – 0.8 mg/L	- Duty operators to monitor and adjust dosing system to achieve target range. - Minimum weekly checking of FAC at designated sampling location
Action Limits	- FAC: <0.4 mg/l >1.5 mg/l	- Duty operator to alter chlorine dose rate at the pumphouse and recheck FAC the next day. - Duty operator to notify the field supervisor - Field Supervisor to notify Asset Manager Note - if action limits have been regularly breached i.e. more than once a month, Field Supervisor to complete an investigation into this and report back to the Asset Manager

Critical Limits	• FAC: - Alarm received indicating chlorine is not being dosed - FAC at the designated monitoring location is <0.3 mg/l	• Duty operator or On-call operator to immediately notify Field Supervisor • Field Supervisor to immediately notify Asset Manager • Duty operator to attend water treatment plant and investigate potential cause of exceedance and/or potential remedial actions • Asset Manager to consider triggering contaminated Water Supply Emergency Response Plan (refer Appendix 3 of the Gore WSP)
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Note:

- the “duty” operator is the designated operator responsible for operating the water treatment plant at that time (this is rotated between the Council’s qualified treatment plant operators on a monthly basis).
- The “On-call” operator is the 3 Waters Field team member responsible for responding to all after-hours alarms at that time (this is rotated on a weekly basis between the Councils 3 Waters Field Staff deemed capable of being on-call)
- If an alarm is received outside of normal working hours the on-call operator is to contact a trained operator as soon possible so that they can attend site. If one of the trained operators cannot be contacted the issue is to be escalated to the Field Supervisor or Asset Manager.

Supporting programmes

1. Minimum weekly testing of Free Available Chlorine downstream of the main reservoir.
2. Monthly operator check of alarms
3. All duty operators to hold an NZ certificate in drinking water treatment
4. Use of only potable water grade chlorine stock solution from an approved supplier.
5. Laboratory verification checks for E.coli and total coliforms weekly, with transgression reporting to operator and district health board if results are outside the DWSNZ.

18 Appendix 2 – Contaminated Water Supply Emergency Response Plan

Potential Scenarios when is this response plan to be used

This plan should be used in any scenario when there is evidence to suggest the safety of the Council's water supply has been compromised, this may include:

- One of the Critical Control Point (CCP) critical limits has been exceeded
- Following a significant failure of equipment at the water treatment plant i.e. chlorine dosing equipment fails
- Increase in reported waterborne disease related incidents, this information is likely to come from the Ministry of Health or Southern District Health Board
- Following a significant Natural Disaster (i.e. an earthquake) that is suspected to have caused wide spread damage to the network

Initial Investigation

If it is suspected that the safety of the Council's water supply has been compromised and there is potential for an outbreak of a Waterborne disease the following actions should immediately be taken:

- Inform the On-call Health Protection Officer (available 24/7) at the Dunedin Hospital (03) 474-0999, oncallhpo@sotherndhb.govt.nz.
- Inform relevant staff within the Council of the developing situation (i.e. Chief Executive, District Assets Manager, Communications Manager, appropriate staff from 3 Waters Department)
- Duty Operator and Field Supervisor to check treatment plants, water sources and network to determine potential cause of contamination issue – this will include review of Scada records for any anomalies that may have been missed and checking relevant online monitoring equipment to ensure it is working (including alarms).
- Has there been any events in the catchment or network that have potential to contaminate the water supply? Discuss this with 3 Waters Field Staff.
- If relevant ask the Southern District Health Board (SDHB) to provide any additional information i.e. number of people that are believed to be sick, when did this begin, what parts of the community have been effected (age, location, etc) is it believed to a bacterial or protozoa outbreak.
- Review Figure 4.1 (Response to a transgression in drinking-water leaving the treatment plant) and Figure 4.2 (Response to a transgression in a drinking-water supply distribution zone) and respond accordingly. If additional E-coli sampling is required take as many samples as practicable to ensure a good understanding of the problem is gained.
- Determine which area(s) are effected i.e. is it confined to one water scheme – considered ringing schools, rest homes, childcare centres, medical centres and doctors to check attendances and/or if any issues have been noted. Consider ringing schools/ resthomes outside the suspected area as a control
- Consider any other major events (concerts, sporting events etc, that could potentially be linked to the outbreak – possibly using an alternative water source)
- Review recent E-coli and total coliform sampling results to check there isn't anything of concern? Consider taking additional E-coli, FAC and/or Protozoa testing, refer to bacteriological sampling SOP for further details.

Once this information has been gathered, call a meeting with internal staff (Chief Executive, District Assets Manager, Communications Advisor, and Appropriate Staff from 3 waters department).

Items to be discussed at meeting

- Summary of information gathered so far, likely cause of contamination
- What other work can/ is being done within the network i.e. sampling and investigation work
- Should a boil water notice be sent out, if so when? Refer to Boil Water Notice Implementation section below
- Should a tankered water supply be provided or water suppliers be put on high alert, refer alternative water source action section attached
- Develop a communications plan for the next 12, 24 and 72 hours – this should consider how quickly any messages need to get out and the target audience, refer to the Boil Water Notice implementation plan below for potential communication streams
- Develop an action plan for the next 12, 24 and 72 hours

Discuss with the On-call Health Protection Officer the findings of the initial investigation and any proposed measures to be taken in the interim

Implement measures as required providing regular updates to Council management staff and the Health Protection Officer/ Drinking Water Assessor.

Once sufficient measures have been put in place to ensure any risk has been appropriately managed complete a full investigation into what caused the potential risk and identify potential measures that can be taken to prevent this from occurring in the future.

Boil Water Notice - Implementation Plan

Refer to the Example Boil Water Notice and Boil Water Notice Fact Sheet attached (this is also saved in in Trim under folder SC 0633)

Distribution Method of Boil Water Notice

- Individually contact schools, and marie
- Post on Gore District Council Facebook, Anteno and Internet Pages
- Radio Broadcast, Note the communications manager has contact details of all radio broadcaster contact details
- Contact television networks (if this is deemed appropriate)
- If it is related to the Otama Rural Water Scheme, use the text and email alert system.
- Hand Distribution – No of staff to be used to cover off entire scheme appropriate time frame - approx. 250 copies required for the Otama scheme,

Tanker Water Supply Implementation Plan

- Approved contractors to supply this water, this information can be found on ESR Register of Drinking Water Carriers - <http://www.drinkingwater.esr.cri.nz/carriers/carriersforregion.asp?NZRegion=NZNZ01>
- Consider the number of tankers required – Note based on 20 L per household per day Gore would require eight 10,000 L tankers per day, Maitua would need two 10,000 L tankers per day.
- Where best to locate the tankers for distribution, potential locations as follows:
 - Gore – outside the trout, outside East Gore School and outside St Peters College
 - Maitua – outside the community center

- Otama – outside the Otama Hall
- Distribution protocol – provide hand sanitiser at each distribution location, and set up a sign as attached to this plan
- Ensure the community is notified of the availability and location of the water

BOIL WATER NOTICE



Scheme Affected i.e. - Otama Rural Stock Water Scheme

Reason for Boil Water Notice i.e. Routine testing of the water quality at the Pyramid Pump Station has shown that there is an issue in this area. The Escherichia coli (Ecoli), a type of bacteria has been found present in this water supply. |

Who is affected i.e. This is a notice to inform properties connected to the Otama Rural Water Scheme that a boil water notice has been placed over this stock water supply.

What will happen now i.e. Further water quality testing will commence at the Pyramid Pump Station until the water testing results have returned 'absent' Ecoli results.

How long will the boil water notice remain in place i.e. The boil water notice will remain in place until the water quality has returned to a satisfactory level.

When will a further update be provided and how can this be accessed i.e. A further notice of the status of the water supply will be issued on Wednesday 1 July 2015. This will be posted on the Council website and Facebook page. This will also be advertised on the the Hokonui Radio Station (94.8 FM)

Until then, please continue to boil all water intended for cooking and drinking.

Are there any special provisions being made i.e. A drinking water tanker is being made available at the Otama School Hall, please bring your own clean water container to collect a suitable drinking water supply.

If you have any questions regarding this notice please contact the 3 Waters Team at the Gore District Council 03 209 0330.

Thank you for your co-operation.

PERMANENT BOIL WATER NOTICE FACT SHEET



What are the reasons for the Boil Water Notice?

A catchment assessment of the scheme, undertaken during the preparation of a Water Safety Plan for the scheme, has indicated a very high risk of microbiological contamination.

What do I do if I have drunk the water and think it has made me sick?

If you get diarrhoea, vomiting and/or a fever, contact your doctor. Babies, young children, the elderly and people who have compromised immune systems are more at risk of illness.

How do I use water when a boil water advisory has been issued?

The water (hot and cold) must NOT be used for drinking, making up baby formula and Juices, cooking, making ice, washing fruits and vegetables, or brushing teeth. For these purposes use either boiled water or bottled water.

Hot water from your tap is not safe to use during a boil water advisory as the temperature of your hot water cylinder is not high enough to kill germs.

How do I boil the water?

Boiling will kill all disease-causing organisms. Place the water in a clean metal pan and bring to a rolling boil for one minute.

Electric jugs with a cut-off switch can be used as long as they are full — allow the water to come to the boil and switch off. Do not hold the switch down to increase the boiling time. Boiled water should be covered and allowed to cool in the same container. The taste will improve if allowed to stand for a few hours before use.

Can I take a bath or shower?

Adults, teens and older children may shower or bathe with untreated water as long as no water is swallowed (avoid the face). Young children should be sponge-bathed instead of bathing in a tub because they are likely to swallow the bath water. If you have recent surgical wounds or a chronic illness, you may want to use bottled or boiled water for bathing.

What about teeth brushing and shaving?

Only use boiled or bottled water for brushing your teeth. You can shave using tap water.

Can I use the water for handwashing?¶

You should either:¶

- Use bottled or boiled water for handwashing.¶
- Use soap and tap water followed by an additional hand disinfection, by either:¶
¶
- Rinsing hands in disinfectant solution (add 1 teaspoon plain household bleach to 10 litres of water and allow to stand for 30 minutes before use. Change solution frequently).¶
- Using an alcohol-based hand sanitiser containing at least 60% alcohol.¶
- Wet wipes used for cleaning babies are not effective for disinfecting hands.¶

¶

How do I prepare food and drinks?¶

- Fruits and vegetables should be washed using cooled, boiled water. Use boiled water if adding to foods that will not be cooked. Tap water can only be used in foods that will be thoroughly cooked.¶
- Do not use ice, food or drinks that may have been made from contaminated tap water.¶

¶

What should I do about feeding my baby?¶

- If breastfeeding, continue as usual. If you are using baby formula, prepare using bottled or cooled, boiled water.¶
- Wash and sterilise bottles and teats by boiling or microwaving.¶

¶

Example Poster to be displayed at Waster Distribution Location

Drinking Water..

Please Sanitise Your Hands Before

Using the Tap

If you notice any issues or have any questions regarding the water tanker or water usage please contact the Gore District Council on (03) 209 0330

