

Village of Clive | Highway 12/21 Water

FREQUENTLY ASKED QUESTIONS

1. What changes should I plan/expect for my home water filtration systems?

There should be no noticeable performance impacts on point-of-use (POU) filtration systems, as surface water sources are not as rich in minerals as ground-water sources. Therefore, filters should not need replacement as frequently. However, homeowners may observe increased particulate capture over the first couple of months, decreasing with time. These particles are most likely the result of the change in water chemistry in the system depending on the type and age of pipes used.

If short-term discoloration events occur, they should be followed up with flushing the homeowner's plumbing until the water becomes clear. If discoloration events persist or are ongoing, please contact your water utility provider.

2. What is the chemical composition of the Hwy 12/21 water?

The chemical composition of the drinking water provided by Hwy 12/21 meets Health Canada's [Guidelines for Canadian Drinking Water Quality](#) and the system's EPEA [Registration 230197](#) requirements through Alberta Environment and Parks. The water is similar to the water quality provided by the Village of Clive, which has the same hardness but with fewer minerals, such as iron and manganese. Hwy 12/21's water is fluoridated at the Stettler water treatment plant, but concentrations are similar to the Village of Clive's water due to the naturally occurring fluoride in the groundwater.

The public can view the Town of Stettler's most recent treated water chemical analysis at <https://www.stettler.net/the-town/departments/water>.

Please be advised that special water usage considerations are needed for dialysis patients and/or fish/aquatic pet owners to minimize their impacts. Chlorine residuals (either free chlorine or total chlorine residual) should be removed/ de-chlorinated prior to these usages. Please see the Town of Stettler's chloramine factsheet for more information at <https://www.stettler.net/public/download/files/170322>.

3. What is the difference between the Hwy 12/21 water and the Village's well water?

The drinking water provided by both utilities meets the health-based limits in Health Canada's [Guide-](#)

[lines for Canadian Drinking Water Quality](#) (GC-DWQ). The slight differences in water quality results from their source water and water treatment processes. These differences can be viewed in more

detail in Table 1 below.

The key differences in the drinking water quality provided by Hwy 12/21 and the Village of Clive are:

Table 1 – Difference in Hwy 12/21 & Village of Clive's Drinking Water by Reviewing Key Water Quality Parameters					
Parameter	Stettler Red Deer River		Clive Well 2	Clive Well 3	Summary – based on Health Canada's Guidelines for Canadian Drinking Water Quality (GCDWQ) limits: (1) maximum acceptable concentrations (MAC) based on health-based limits (2) aesthetic objectives (AO) based on aesthetic concentrations (3) operational guideline (OG) value based on operational considerations
	21-Jan	21-Jul	Feb-17	May-17	
Fluoride, mg/L	0.67	0.62	0.66	0.27	<ul style="list-style-type: none"> MAC is 1.5 mg/L Clive's water has naturally occurring fluoride in the groundwater Stettler WTP adds fluoride to the water within their EPEA Approval 1187 daily limits of 0.5-0.9 mg/L
Total Alkalinity (as CaCO ₃), mg/L	215	153	454.5	417.7	<ul style="list-style-type: none"> No GCDWQ limit established Clive water maybe slightly more aggressive towards copper materials due to its higher concentrations
Total Hardness (as CaCO ₃), mg/L	274	193	66	247.8	<ul style="list-style-type: none"> maximum acceptable level for hardness was not specified by Health Canada degree of hardness classified in calcium carbonate concentration: <ul style="list-style-type: none"> soft, 0 to <60 mg/L; medium hard, 60 to <120 mg/L; hard, 120 to <180 mg/L; very hard, >180 mg/L 80-100 mg/L provides an acceptable balance between corrosion and incrustation >200 mg/L is considered poor but tolerated by consumers >500 mg/L is unacceptable for most domestic purposes
Total Dissolved Solids, mg/L	330	257	774	624	<ul style="list-style-type: none"> AO is ≤500mg/L < 600 mg/L is generally considered to be good and > 1200 mg/L is unpalatable to most consumers > 500 mg/L result in excessive scaling in water pipes, water heaters, boilers and household appliances
pH	7.67	7.57	8.2	8	<ul style="list-style-type: none"> OG is 7-10.5 pH operational guidance (OG) in finished drinking water pH range provides utilities the flexibility to achieve water quality objectives, control contaminant concentrations, and corrosion by combined treatment approaches that are appropriate to materials in the distribution system and premise plumbing.
Turbidity, NTU	<0.10	0.63	0.81	0.55	<ul style="list-style-type: none"> good practice to ensure water entering the distribution system has turbidity levels < 1.0 NTU
Total Manganese, mg/L	0.0019	0.016	0.0331	0.105	<ul style="list-style-type: none"> MAC is 0.12 mg/L was established at a level to be protective of neurological effects in infants, the most sensitive population AO is 0.02 mg/L was established at a level to reduce consumer complaints regarding discoloured water and staining of laundry
Total Iron, mg/L	<0.01	<0.01	0.099	0.16	

- Hwy 12/21 doesn't treat the water. They only deliver the treated water from the Stettler water treatment plant to regional customers. The Village of Clive treats and distributes the water.
- Hwy 12/21 and Clive's water hardness are both considered hard to very hard; however, many of the minerals that can cause aesthetic issues or affect the palatability of drinking water are lower in the Hwy 12/21's drinking water.
- Hwy 12/21 and Clive both have fluoride in their drinking water. Fluoride is added to Hwy 12/21's water at the Stettler water treatment plant before the distribution system, while the Village of Clive's fluoride concentrations results from naturally occurring in the area's groundwater.
- Hwy 12/21 and Clive have different secondary disinfectant residuals. Hwy 12/21 uses total chlorine/ chloramine which is the residual provided by the Stetter water treatment plant so they can:
 - o provide a longer lasting residual (slower chlorine decay) to prevent biofilm growth in the regional lines;
 - o prevent the formation of certain disinfections due to water age in the long regional waterlines;
 - o cause less taste and odour problems to downstream regional customers; and
 - o maintain constant chlorine residual for downstream regional customers to meet regulatory limits under their EPEA Registrations.

On the other hand, the Village of Clive uses free chlorine residual to achieve their treatment targets as per their EPEA Registration.

4. How is 21/21 water treated differently from the Clive well water?

The goal of treatment is to provide drinking water that is potable and meets Health Canada's [Guidelines for Canadian Drinking Water Quality](#), regardless of the utility providing the water.

Hwy 12/21 receives drinking water from the Town of Stettler, which treats water from the Red Deer River. Stettler's primary treatment process is comprised of clarification, flocculation, membrane filtration, and chlorination to achieve 4-Log virus and 4-Log cryptosporidium inactivation and secondary treatment using total chlorine/chloramine residual to prevent biofilm development in the distribution system. Surface water is more difficult to treat and therefore undergoes a more comprehensive treatment process to target bacteria, viruses, and protozoa removal. For more information, please see Stettler's [EPEA Approval 1187](#), and Hwy 12/21's EPEA [Registration 230197](#) requirements, which operate under the [Code of Practice for Waterworks System Consisting Solely of a Distribution System](#).

In comparison, the Village of Clive's treats water from two groundwater wells and the treatment process is more basic involving disinfection only treatment to remove bacteria and potential viruses found in the groundwater. Clive's primary treatment process consists of chlorination to meet 4-Log virus inactivation and secondary treatment using free

chlorine residual to prevent biofilm development in the distribution system. For more information, please see Clive's EPEA Registration 528 requirements which operates under the [Code of Practice for a Waterworks System using High Quality Groundwater](#).

5. What is the capacity of the Hwy 12/21 to deliver water to the Village of Clive. (Clive's average water consumption is 150m3/day)

Planning for this system started back in 2006. Clive was an original member and has always been included in the overall design of this system. The designs have been very conservative, using an average per capita per day for water consumption of 455 litres/person/day. This forecasted that by 2033 the Village of Clive would use about 440 cubic metres per day. The system is designed to supply this presently, and can be upgraded by adding larger booster pumps in future should needs warrant this. The design capacity is currently three times larger than the Villages current consumption.

6. Does the Hwy 12/21 system have enough capacity to sustain the Village of Clive?

As indicated in the previous question, the capacity to deliver water is three times the current use in the Village. The Commission in 2022 will deliver about 310,000 cubic meters of water to Members. The Commission currently holds a Water License that allows a diversion of 395,862 cubic meters per year. This represents only a fraction of the 2.1 million cubic meters we have allocated for our water commission by the Province of Alberta. The system has reliably delivered water to customers since 2006, without any interruptions to service.

7. What happens if the Stettler water plant has an unscheduled outage?

The Stettler Water Treatment Plant is uniquely equipped with storage reservoirs and the ability to draw directly from its intake in the Red Deer River. All members receiving water have agreed to a water rationing system should it ever need to be implemented. It guarantees that everyone will share in the available water based on their previous consumption.

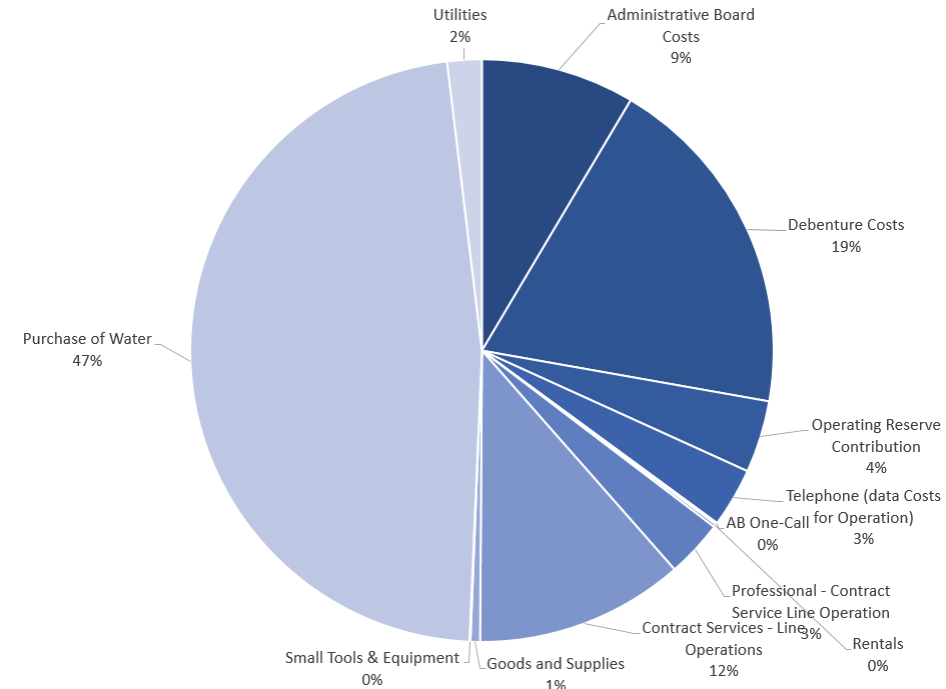
The system is designed with an equalization chamber near the start of the system. This 1,000 cubic metre storage tank is storage in addition to the storage that is found in your local community. The Clive reservoir is sized to 620 cubic metres, therefore the Village has about four days storage here and another 1-2 days in the equalization chamber.

8. What are the capital costs of connecting Clive to the Hwy 12/21 water commission and how is the project funded?

The total cost of the Clive extension is \$ 6,861,730.00. Grants fund the majority of this cost through the Provincial Water for Life and federally by the Investing in Canada Infrastructure Projects grant programs. These programs will provide \$ 5,369,364.00 to the project leaving the balance to be funded by the Commission. These costs are recaptured in the Cubic Meter Water rate that is charged to customers.

9. How are the on-going operating costs funded?

All of the operating costs that the Commission incurs are passed on to the Member customers in the form of a Water Rate. The Water Rate is equal to the costs of the Commission divided by the number of cubic meters of water sold. The following graph indicates the components of the rate for the Commission:



Sources:

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