

# Memorandum

**To:** Mayor & Council  
**From:** Larry Plourde, Administrator  
**Date:** November 24, 2017  
**Re:** Proposed Permit Conditions for the Village Water System

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Attached please find correspondence from VIHA regarding our Water System. As stated "The intention of the conditions is to provide specific direction related to your water system and to help clarify the expectations and responsibilities associated with being a water supplier". The list of conditions is significant and increases the administrative and technical expertise required in order to be compliant with these conditions as they are implemented over the next few years.

In order to address these requirements the Village will need to ensure budgeted funds are available and that we secure the level of expertise (internal staffing/external consultants) to undertake the required studies/reports and administer our Water Supply ongoing consistent with the requirements.

Mike Lott has provided a summary of conditions that we are already conducting or complying with and provides limited comments regarding conditions we will need to address. All of the conditions will require a higher standard of ongoing adherence and administration for data collection, documentation and reporting.

Some of the conditions require studies or reports that we do not have or will have to update. We will need to secure the services of consultants with specialized expertise to update the completed Wellhead Protection Plan and provide a report on the implementation of a full disinfection system for our water service. We may be able to complete some of the conditions outlined internally with Staff (develop O & M procedure, develop cross-connection program) but as has been identified our Staffing has had capacity issues and may not have the expertise to undertake these additional special projects. Staffing options will need to be a consideration to address these requirements and the ongoing increased permit conditions. Regardless of Staffing there will need to be Consultants budgeted for to provide the expertise necessary to develop these procedures and programs.

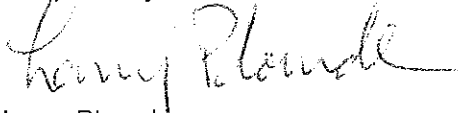
Of great significance is the comments related to disinfection of our water supply. VIHA advises the scrutiny and assessment of GUDI (ground under direct influence) Wells such as ours will be under more stringent assessment in the future.

November 24, 2017

Due to our very positive testing in the past with never a negative sample from our wells VIHA has utilized "discretion" as to requiring residual disinfection (chlorination) but advises the requirements outlined in the Provincial Guidelines are going to become more prevalent. VIHA advises "it would be prudent for the VoGR to look at the feasibility and costs associated with implementing a full disinfection system for our water system". This could go beyond chlorination to include Ultra Violet Treatment. Chlorination will also impact the outflow of the Splash Park that is discharged to our Storm Sewer. If chlorination is required this discharge will need to be redirected to the Sanitary Sewer. The chlorination of our water would also have an impact on our microbes that digest the sewage sludge potentially killing them to where our treatment plant is not effective in processing the sludge. There are systems to dechlorinate the waste water entering the Treatment Plant which will add costs to the Sewer System in addition to the added disinfection costs for the Water System.

Previously we undertook a Wellhead Protection Study and a Report on Disinfection/Water Treatment (Capital Cost estimated at \$549,000 – 2008 estimate) so we do have some information but will need to budget to have these updated. I will request Mike to prepare a budget for the requirements outlined in the VIHA correspondence. We will also need to address how we meet the Staff capacity shortfall to address these requirements and also future ongoing requirements to administer and manage our water system. The capacity deficit has been identified in several reports and the increasing legislative requirements for sewer and water continue to increase the capacity gap.

Respectfully submitted,



Larry Plourde  
Administrator

**From:** pool@conumacable.com [mailto:pool@conumacable.com]  
**Sent:** November-17-17 3:06 PM  
**To:** Larry Plourde  
**Cc:** Grant Loyer; Parks & Rec  
**Subject:** Fwd: Update requested

Larry,

**Notice of Proposed Terms and Conditions of Operating Permit, for the VOGR System. Registered letter November 8, 2017**

In reviewing the Terms and Conditions that Joseph Baratta, Drinking Water Officer, VIHA is proposing to attach to the VOGR operating permit, my comment is that the conditions seem quite reasonable for a governing agency to require of a licensed municipal purvey of potable water. I believe that the requirement to respond in writing within 60 days of receiving this notice should reflect this comment.

I spoke with Joseph today and we agreed that the VOGR is already conducting or complying with 5 of the listed conditions, #2,5,6,7,8. Condition #1 Develop and maintain a well head protection plan, has a lot of the work completed already, in the 2001 Piteau Associates report included in the KOERS 2002 Water Supply and Distribution System Review report and the 2003 EBA Engineering Consultants Ltd. report titled Wellhead Protection Study VOGR, BC. Joseph is familiar with both reports and indicated that these reports address most of the requirements in condition #1, however, updating and the development of a approved Working Protection Plan would still need to be undertaken with a licensed geotechnical company in cooperation with the VOGR/VIHA/MOE. This would be required over a two year plus period with ongoing consultation from VIHA following the guidelines listed in the three mentioned Province of BC guidance documents.

This work will require a contracted geotechnical company and extensive staff time from the VOGR.

\* Joseph also advised me that the scrutiny and assessments of GUDI wells was going to become more stringent and that the requirement to treat GUDI potable drinking water with a residual disinfectant (chlorination) was going to become more prevalent with the requirements outlined in the Province of BC guidance documents. The initial focus will be on large water providers so this may take some time, however, Joseph felt that it would be prudent for the VOGR to look at the feasibility and costs associated with implementing a full disinfection system for our water system.

This work will require a contracted engineering company and considerable staff time from the VOGR.

Conditions #3 Develop O&M procedures and #4 Develop a cross-connection protection program can be done with qualified in house staff with assistance from a contracted engineering company. \*

This work will require significant staff time from the VOGR.

Planning grants may be available for some of the aforementioned work.

Michael

Excellent health and care, for everyone,  
everywhere, every time.



November 8, 2017

**REGISTERED**

Village of Gold River  
Chief Administrative Officer Larry Plourde  
P.O. Box 610  
499 Muchalat Drive  
Gold River, B.C.  
V0P 1G0

Dear Mr. Plourde:

Re: Cover Letter: Village of Gold River System at 499 Muchalat Drive, Gold River, BC.

Pursuant to the most recent water system site inspection on August 30, 2017, included with this letter is a notice of proposed permit conditions for the Village of Gold River Water System. The intention of the conditions is to provide specific direction related to your water system and to help clarify the expectations and responsibilities associated with being a water supplier.

The most notable condition proposed is the development of a well head protection plan adapting the B.C. Ministry of Environment Well Head Protection Toolkit. Please note it is recommended that a Hydrologist with expertise in delineation of well recharge zones and conducting GARP assessments (Ground Water at Risk of Containing Pathogens) be hired to determine the extent of your wells recharge zones.

In addition to the proposed permit conditions, in 2015 and 2016, the Province of British Columbia provided additional guidance by developing three documents titled: Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies (GWTO), Guidance Document for Determining Ground Water at Risk of Containing Pathogens (GARP) and Guidelines (Microbiological) on Maintaining Water Quality in Distribution Systems. Island Health will be implementing these documents as best management practices and ensuring ground water supply systems meet the direction of these guidance documents. This process will likely begin with new and large water systems through time bound implementation strategies where needed.

Please note that when this process is started our office will be in contact to set up a meeting to discuss these objectives, how you as a water supplier can meet them, provide information, and answer questions.

If you have any questions please feel free to contact me at 250.850.2106.

Sincerely,

Joseph Baratta  
Drinking Water Officer

c.c.: Charlene MacKinnon, Sr. Environmental Health Officer, HPES, Island Health, Campbell River

JB/th



Excellent health and care, for everyone,  
everywhere, every time.

November 8, 2017

**REGISTERED**

Village of Gold River  
Chief Administrative Officer Larry Plourde  
P.O. Box 610  
499 Muchalat Drive  
Gold River, B.C.  
V0P 1G0

full report

Dear Mr. Plourde,

**Re: Notice of Proposed Terms and Conditions of Operating Permit, for the Village of Gold River System at 499 Muchalat Drive, Gold River, B.C.**

The *Drinking Water Protection Act* requires Drinking Water Officers (DWO) to exercise discretion in their oversight of drinking water systems. Specific requirements may be made of a water supplier to ensure that the system is operated in a manner that protects the health of water users. Operating Permit Terms and Conditions can often help to clarify the expectations and responsibilities associated with being a water supplier.

Section 8(4) of the *Drinking Water Protection Act* states:

The drinking water officer or an issuing official may change the terms and conditions of an operating permit if the officer or issuing official considers this advisable, but must first consult with the water supplier respecting the proposed changes and must consider any comments of the water supplier in response.

As an issuing official, I propose to attach the following Terms and Conditions to your operating permit:

*The permit holder is advised that the following Terms and Conditions are in addition to other legislated responsibilities and obligations. Ensure familiarity with The Drinking Water Protection Act, ([SBC 2001] Chapter 9) The Drinking Water Protection Regulation (B.C. Reg. 200/2003 O.C. 508/2003)*

1) Develop and maintain a well head protection plan adapting the principles of the 'BC Ministry of Environment Well Protection Toolkit' Completed by January 31, 2020.

The protection plan is to include, but not be limited to the following:

- Characterizing the aquifer(s) to include subsurface travel times and recharge areas
- Identification of possible risks within 6+ months of travel time to the wells
- Rank risks according to low, moderate and high ratings
- Identify mitigation measures for all moderate and high risks
- Monitoring and maintaining the back-up generator and fuel storage
- Securing and protecting the wells from vandalism and contamination

- 
- Develop a written set of procedures for conducting sanitary surveys within and around the well head protection zone
- 2) Adhere to a Monitoring and Sampling Program according to professional best practices, or as approved by the Drinking Water Officer, and maintain detailed and accurate records of all monitoring performed. Including but not limited to:
    - Bacteriological testing.
    - Routine monitoring of TDS and/or conductivity at wells.
    - General chemical testing of wells water quality at a minimum of every 5 years that addresses the direction provided in the 'VIHA Guidelines for the approval of water supply systems'.
  - 3) Develop Maintenance and Operating Procedures consistent with BCWWA, AWWA standards or equivalent. Maintenance and Operating Procedures shall include:
    - Well head protection
    - Storage of chemicals, and fuel
    - Location/availability of spare equipment and parts
    - Distribution system lines, including routine flushing program
    - Reservoir
  - 4) Develop a cross-connection protection program. The plan is to include:
    - Protection from potential sources within the distribution system
  - 5) Provide an operator certified by the Environmental Operators Certification Program to the level of classification, of the system as classified by the Environmental Operators Certification. Or provide the DWO with written semi-annual reports outlining the effort that has been made to meet this requirement.
  - 6) Annually review and as required update the water system 'Emergency Response Plan'. Provide Drinking Water Officer a notice of review and updated copy.
  - 7) Document all customer complaints and deviations from standard operating procedures.
  - 8) Prepare an annual report each year to water users. A copy must be provided to the DWO, with additions made upon DWO request.

Please note:

- Your current bacteriological sampling frequency is:
  - o Monthly from well #1 (June through September)
  - o Monthly from well # 2 and #3
  - o Semi-monthly from Aquatic Centre and Fire Hall

Chief Administrative Officer Larry Plourde  
November 8, 2017

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Please respond in writing within 60 days of receiving this notice if you wish to comment on the proposed changes to your permit. Your comments will be considered before a final decision is made.

Be advised that, short of judicial review, this is your only opportunity to influence the outcome of this process. Changes to the terms and conditions of an operating permit are not subject to reconsideration or review under Section 39.1 of the *Drinking Water Protection Act*.

Please contact the undersigned for further information. 250.850.2106.

Yours truly,



Joseph Baratta  
Drinking Water Officer

c.c.: Charlene MacKinnon, Sr. Environmental Health Officer, HPES, Island Health, Campbell River

JB/th



## VILLAGE OF GOLD RIVER WATER TREATMENT OPTIONS STUDY

### 13.0 COST ESTIMATES

Cost estimates have been prepared for UV treatment with chlorination (continuous or during emergencies only). The scope of work and associated costs can be refined further once the status of the water source (GUDI or non-GUDI) and the disinfection requirements from VIHA are known.

Calcium hypochlorite would be preferred to avoid the installation of a tempered emergency shower, normally required by WCB for sodium hypochlorite systems. However, capital costs for each system would still need to be reviewed, as the cost for the calcium hypochlorite system can be considerably higher than the cost for the sodium hypochlorite equipment. The estimated costs for each chlorination system are presented in Table 13-1. O&M costs would be similar for both options.

We contacted selected suppliers of treatment equipment to provide preliminary quotes for the UV and chlorination systems. The costs below assume a skid-mounted emergency shower package would be supplied with the sodium hypochlorite system and installed inside the chlorination room. The package includes the shower, eyewash and hot water tank constructed to supply 20 GPM for 15 minutes. The system is mounted on a 1.2 m x 2.4 m skid.



**TABLE 13-1  
CAPITAL COST ESTIMATE FOR CHLORINATION SYSTEMS**

Item	Description	Quantity	Unit	Unit Rate	Total
<b>1</b>	<b>Sodium Hypochlorite</b>				
1.2	Chemical pumps (2) with piping	2	each	\$2,500	\$5,000
1.3	Spill containment decks	2	each	\$2,000	\$4,000
1.4	Injection system	1	L.Sum		\$2,000
1.5	Emergency shower package	1	L.Sum		\$10,000
	<b>Total</b>				<b>\$22,000</b>
<b>2</b>	<b>Calcium Hypochlorite</b>				
2.1	Complete system with pumps and injection	1	L.Sum		\$30,000
	<b>Total (taxes excluded)</b>				<b>\$30,000</b>

For the purpose of this study, the higher amount of \$30,000 has been used to estimate the costs of the entire disinfection facility, as detailed in the following Table 13-2.

### 13.1 UV and Chlorination

This option consists of a two-room building constructed adjacent to Well No. 2 to house one UV unit and controls, as well as the chlorination system. UV treatment and chlorination would be provided to all three wells. Having a separate room for the chlorination equipment is recommended as shown on Figure 1, Appendix C.

Capital costs for this option are detailed in the following Table 13-2. The cost for the UV unit would depend on the size of the unit, which is determined based on its validation range (UVT) at a pre-determined design flow to ensure the required 40 mJ/cm<sup>2</sup> dose. Due to the limited information available on UVT values, we have assumed that the well water can maintain a minimum UVT of 90% at all times. In this case, the UV equipment quoted by Trojan Inc. would be suitable for this application under current water quality conditions.

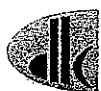
Engineering services would be required for the design of the proposed improvements; during the construction phase of the project to verify compliance with the plans and specifications; and for project completion (preparation of the completion documents, record drawings, etc.). Contingencies represent allowances for unforeseen conditions that may arise during construction of the proposed works.

Because of the nature of the proposed works and the continuous increase in construction costs, it is recommended that these costs be refined further during design of the proposed improvements.

**TABLE 13-2**  
**CAPITAL COST ESTIMATE FOR UV & CHLORINATION**

Item	Description	Quantity	Unit	Unit Rate	Total
1	Mobilization and demobilization	1	L.Sum		\$15,000
2	Earthwork	1	L.Sum		\$20,000
3	Concrete block building (6m x 4m)	24	sq.m.	\$3,500	\$84,000
4	Mechanical (HVAC, plumbing)	1	L.Sum		\$35,000
5	Electrical (lighting, heating, power)	1	L.Sum		\$35,000
6	Outside piping for Wells No.2 and 3	1	L.Sum		\$40,000
7	Watermain for Well No.1 with valves	240	m	\$292	\$70,000
8	Fence	44	m	\$90	\$4,000
9	UV unit (to treat 42 L/s to 126 L/s) Trojan Swift SCD12 (12 lamps)	1	L.Sum		\$85,000
10	Calcium hypochlorite system	1	L.Sum		\$30,000
11	Startup, Commissioning and Training	3	days	\$2,000	\$6,000
	<b>Sub-total</b>				<b>\$424,000</b>
12	Engineering & Contingencies @ $\pm 30\%$				\$125,000
	<b>Total (taxes excluded)</b>				<b>\$549,000</b>

The estimated O&M costs for this option are presented in the following Table 13-2. The O&M costs for the chlorination equipment would depend on how often the system would be used. If chlorination is used on a regular basis, O&M costs would include power and chemical consumption, as well as general maintenance such as repairs and parts



replacement. If the system is to be used during emergencies only, chemical and power consumption would be negligible. Parts such as pump diaphragms would still need to be replaced regularly.

The costs below assume the UV lamps would be replaced every year. The current cost of each lamp is estimated at \$300, for a total replacement cost of about \$4,000 per year. Labour costs are excluded, as we assume the work would be carried out by the existing staff.

**TABLE 13-3  
YEARLY O&M COST**

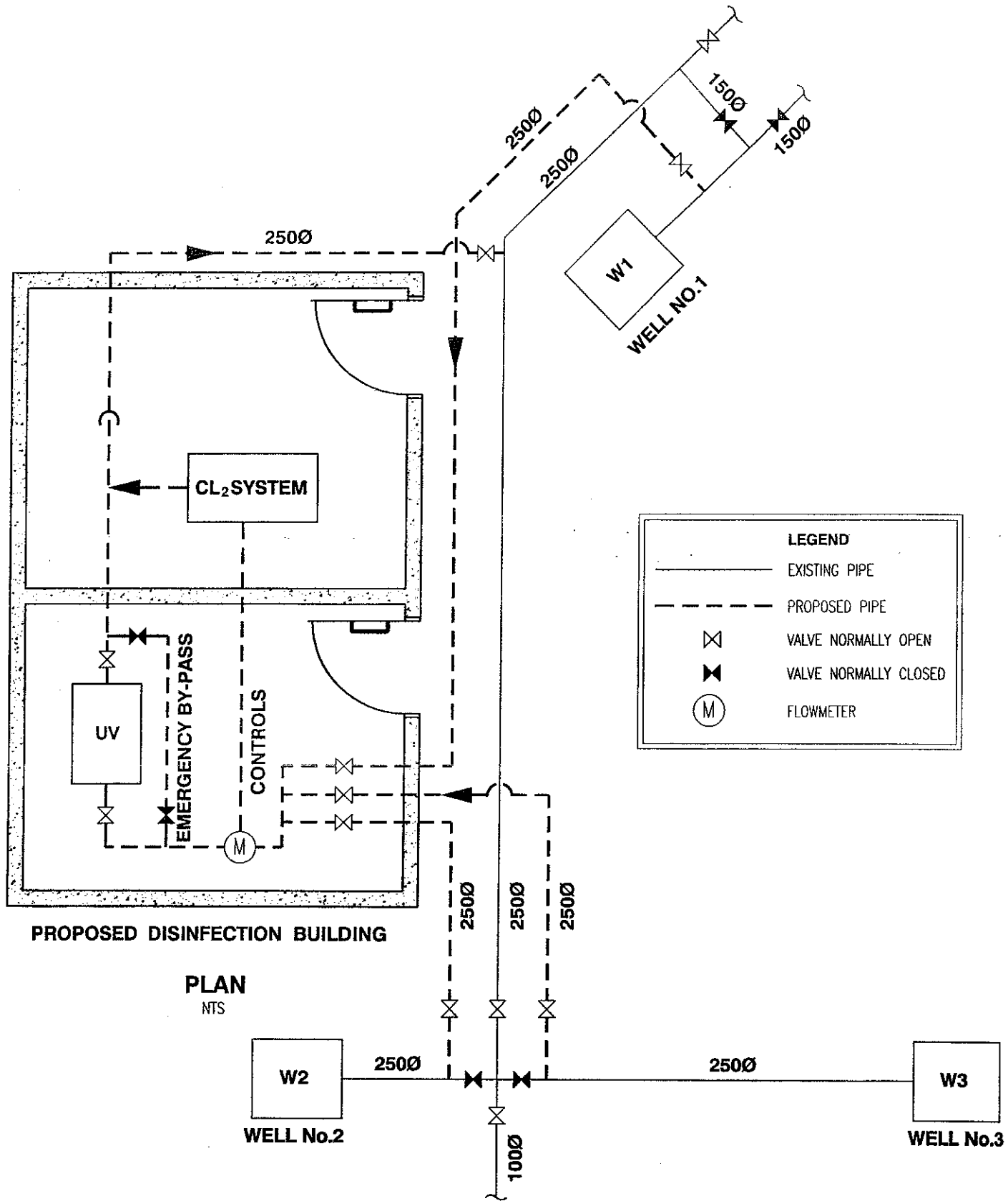
Item	Description	Quantity	Unit	Total
1	Power	1	L.Sum	\$200
2	Lamp replacement	1	L.Sum	\$4,000
3	Chemicals (continuous operation)	1	L.Sum	\$2,500
4	Services and Parts	1	L.Sum	\$1,000
5	General building maintenance	1	L.Sum	\$1,000
	<b>Total</b>			<b>\$8,700</b>

The 20-year life cycle cost is summarized in the following Table 13-4, based on an estimated O&M cost of \$8,700 per year. The life cycle cost is based on a 6% discount rate (nominal interest rate of 8% less 2% inflation rate) over a period of 20 years.

**TABLE 13-4  
LIFE-CYCLE COST**

Treatment Option	Capital Cost	20 Year Life Cycle Cost <sup>a</sup>
1. UV and chlorination	\$549,000	\$649,000

<sup>a</sup> Capital Recovery Factor = 0.0872



PLAN  
NTS

VILLAGE OF GOLD RIVER  
WATER TREATMENT OPTIONS STUDY  
PROPOSED SCHEMATIC

FIGURE 1

FILE: P:\PRODWG5\GOLF\268.6\268.6.FIGURE 1.dwg, 08-07-31

**Dayton & Knight Ltd.**  
CONSULTING ENGINEERS  
DRAWN BY: CHW  
DWG. No. 268.6