

GUIDELINES FOR THE APPROVAL OF WATER SUPPLY SYSTEMS

Vancouver Island Health Authority

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Vancouver Island Health Authority

1. INTRODUCTION

To improve public health protection in British Columbia, the Ministry of Health Service's **Drinking Water Protection Act**, Section 7 and Section 6 of the *Drinking Water Protection Regulation*, requires that a **Construction Permit** is obtained from a Drinking Water Officer before construction, installation, alteration or extension of a water supply system is commenced. New sources of water require both a **Construction Permit** before construction of works and an **Operating Permit** before the source can be used. The Construction Permit is issued by the Public Health Engineer (or the Drinking Water Officer) and the Operating Permit is issued by the local Environmental Health Officer (or the Drinking Water Officer).

Applications may be made by water system staff, consultants or owner, should be of professional quality, and must be prepared by a professional engineer registered to practice in British Columbia.

Applications for a Construction Permit should be made in writing at least 60 working days before approval is needed. For water systems on Vancouver Island, the Gulf Islands and the mainland coast (Brettell Point to Cape Caution), submit applications to:

Vancouver Island Health Authority
Public Health Engineering,
3rd Floor 6475 Metral Drive, Nanaimo, BC V9T 2L9

Telephone: (250) 755-6299
Fax: (250) 755-3372

Include a completed "Application for Water Supply Systems Construction Permit" (see attached), plus other information as applicable (see section 2. "SUBMISSION REQUIREMENTS"). If the proposed water system involves more extensive works, include an explanatory letter which provides the name of the water system that the proposed works is part of, the name and current address of the water purveyor (owner/representative) that the Construction Permit is to be sent to, and other information as noted in the applicable portions of the following sections.

The overall objective is water quality that consistently meets the **Drinking Water Protection Act**, the *Drinking Water Protection Regulation* and the Guidelines for Canadian Drinking Water Quality, Health Canada and adequate quantity to meet reasonable peak demands without development of low pressures, which could result in health hazards.

2. SUBMISSION REQUIREMENTS

2.1 General

Submit ONE complete set of plans for watermain extensions or replacements. Submit THREE complete sets of construction plans (and specifications where needed) for new sources. All plans submitted by a professional engineer must be signed and sealed.

Include a key plan/map to show where the water system is located. Include all supply, transmission, storage, pumping, treatment and distribution works. Include a plan and profile to show high and low spots in the water system and any sanitary and storm sewers that are crossed or are nearby.

Where watermains are nearer than 3 m horizontally or have less than 45 cm clearance vertically (with watermain above, where possible) from any sanitary or storm sewer, detail safeguards that are proposed to protect the watermain.

For new groundwater sources, submit to the Public Health Engineer, with a copy to the local Environmental Health Officer, data on chemical and bacteriological water quality (see attached parameters list) and, as applicable: well log, pump test, hydrogeologist's report, mechanical and instrumentation/control facilities at wellhead, or pumphouse, proposed treatment and confirmation that the water will have acceptable taste (caution: do not taste undisinfected water), colour and odour. The hydrogeological report should include an assessment and recommendations on: water quality protection including a description of any risks, confining/protective layers, time of travel radius for existing/suspected point sources of potential well contamination, non-point sources, maximum discharge rates, wellhead protection, and quality and quantity monitoring including parameters and frequency, etc. The report should include information on historical use of groundwater in the area and area recharge.

For new surface water sources, submit to the Public Health Engineer, with a copy to the local Environmental Health Officer, data on chemical and bacteriological water quality (see attached parameters list) and as applicable: water license, mechanical and instrumentation/control facilities at the intake or pumphouse, method of disinfection, proposed treatment and confirmation that the water will have acceptable taste (caution: do not taste undisinfected water), colour and odour, description of the watershed, noting any existing or potential sources of contamination, which may affect water quality, flood level, safe yield, hydrological data, etc. The level of treatment and disinfection for surface supplies should ensure a minimum level of inactivation of 99.99% for viruses and bacteria, 99.9% for *Giardia lamblia* cysts and 99% for cryptosporidium oocysts. Higher levels of treatment and disinfection may be required based on pollution sources in the watershed or poor water quality.

Additional testing or pilot scale studies of treatment processes may be required. Disinfection must not create unacceptable levels of disinfection by-products (trihalomethanes, haloacetic acids, chlorite or bromate).

Where the proposed water system involves new lots or strata with on-site sewage disposal systems under the *Sewerage System Regulation*, state clearly the number of lots/units that are to be served by the new water system.

Where new servicing and an existing water system are involved, confirm that both water quality and capacity of the existing or proposed expanded or improved waterworks, as applicable, are, or will be, adequate to accommodate existing, already committed and proposed new servicing.

Where applicable provide an equipment maintenance manual, operating guidelines and a written Emergency Response Plan (per **Drinking Water Protection Act**, Section 10; **Drinking Water Protection Regulation**, Section 13) to the local Environmental Health Officer. The submission may be in draft form for review and comment before finalizing.

Where applicable, provide a description of the planned physical, chemical and bacteriological water quality monitoring program including parameters, frequency and duration, and provide a commitment to carry out the program.

2.2 **Other Agencies**

Where applicable, confirm that the water system meets all local government bylaws.

Where a water utility is involved, confirm that the design incorporates the wishes of the Comptroller of Water Rights, via the Utility Regulation Section, Land and Water Management Division, Land and Water British Columbia, Inc., in Victoria.

Where water systems are to be installed on road easements under the jurisdiction of the Ministry of Transportation, confirm that an approval has been received for the specific proposal and state any conditions specified.

2.3 **Construction**

Specify who will be responsible for construction inspections and post construction certification of the waterworks to ensure that materials and construction standards meet current engineering standards such as American Water Works Association (AWWA).

3. SMALL SYSTEMS AND RURAL RESIDENTIAL COMMUNITY SYSTEMS

In cases where an application for approval is made for a Construction Permit for a small water system serving less than 50 people (or the equivalent 15 service connections), and is needed to resolve existing water problems, to minimize approval costs the procedures outlined above will generally apply, but the submission may be modified, at the discretion of the Drinking Water Officer or Public Health Engineer, as follows:

- a) It should be of reasonable quality, with an explanatory letter and plans preferably prepared by a Professional Engineer.
- b) It should include the name and address of the water supplier or person responsible for the water system operation and include documentation outlining the legal basis for operation - Municipality, Regional District, Improvement District, Water Utility under the Water Utility Act, Water Users Community under the Water Act, Strata Corporation, Privately Owned (mobile home parks, campsites), etc.
- c) It should contain sufficient general information to assess the proposal.
- d) It should include recent bacteriological and chemical analysis of the proposed source and, if warranted, contamination protection plans.
- e) It should include, where applicable, in recognition of the nature and often remote location of these small/rural systems, written operating and maintenance instructions, a written Emergency Response Plan and a written sampling/water quality-monitoring plan. A draft copy may be submitted to the local Environmental Health Officer before finalizing.

NOTE: An **Operating Permit** must be obtained from the local Environmental Health Officer before a new source is used.

The publication Design Guidelines for Rural Residential Community Water Systems is available from the Utility Regulation Section, Land and water Management Division, Land and Water British Columbia, Inc., in Victoria, and can be used as a reference document.

4. WATER QUALITY

Water supplies for drinking, culinary, and other domestic uses must be free of pathogenic organisms and their indicators and deleterious chemical substances including radioactive materials. In addition, the water should have acceptable colour, odour and taste.

The **Drinking Water Protection Act**, the **Drinking Water Protection Regulation** and the current edition of Guidelines for Canadian Drinking Water Quality should be used as a guideline for evaluation of water sources.

The raw water must be sampled and analyzed for the parameters shown on the attached lists. Initial samples from groundwater sources should be taken near the conclusion of the pump test, when the water is visually clear of sediment.

5. SOURCE AND PROTECTION

The water supply should be obtained from a source that is most likely to produce drinking water of a quality meeting the **Drinking Water Protection Act**, the **Drinking Water Protection Regulation** and the Guidelines for Canadian Drinking Water Quality. The source chosen should be one, which is least subject to municipal and industrial contamination, or other types of contamination, resulting from human, or animal activities within the watershed or within the aquifer recharge zone. Every effort should be made to prevent contamination of the source. The water source should be protected against access by unauthorized persons.

The water supplier shall conduct routine quality monitoring of the water source. The monitoring program should attempt to recognize all potential sources of contamination and assess their present and future importance. The monitoring program and any remedial action should be determined in consultation with the local Environmental Health Officer.

6. DISINFECTION AND TREATMENT REQUIREMENTS

Some natural purification occurs in surface waters because of dilution, storage, sunlight and associated physical and biological processes. With groundwater, natural purification may occur by filtration of the water through soil. However, effective treatment should be provided whenever necessary to ensure safety and consistency in the quality of all finished waters.

Water sources for new water systems or new sources for existing systems using surface water or shallow groundwater must be disinfected. If necessary, treatment such as coagulation-flocculation, adsorption, sedimentation and filtration may be needed. Deep well sources must be disinfected if deemed necessary by the Medical Health Officer for reasons of either bacteriological quality or nuisance biological growths and may require other treatment to meet the quality guidelines.

The applicant must demonstrate that the source is adequately protected from contamination and that the bacteriological and/or physical and chemical water quality of the source consistently meets the **Drinking Water Protection Act**, the **Drinking Water Protection Regulation** and the Guidelines for Canadian Drinking Water Quality. Provisions should be made for the installation and operation of disinfection and/or other treatment facilities should they be required at a later date.

7. HEALTH RELATED DESIGN CONSIDERATIONS

7.1 Quantities

Water supplied must be of sufficient quantity for sanitary purposes and 225 L (50 Imperial gallons) per person per day (680 L or 150 Imperial gallons per household based on triple occupancy) may be adequate. Water for fire fighting, irrigation, or other purposes, is additional to that required for sanitary purposes. The supply must be adequate to meet reasonable peak demands without development of low pressures that could result in health hazards. For details regarding fire protection requirements, the designer should refer to the most current Fire Underwriters Survey publication entitled Water Supply for Public Fire Protection available from the Insurance Advisory Organization (604) 681-3113.

7.2 Wells

Wells must be located to conform to the requirements of the **Sanitary Regulations** (30.5 m from any probable source of contamination, 6 m from any dwelling house and 122 m from a cemetery) pursuant to the **Health Act**. Wells should, in general, follow the "AWWA Standard for Water Wells" (A100-97) and the publication "Guidelines for Minimum Standards in Water Well Construction" available from the Groundwater Section, Water Protection Branch, Ministry of Environment and the **Groundwater Protection Regulation** pursuant to the Water Act to ensure contamination does not enter the well.

7.3 **Pumping Stations**

Pumping facilities must be designed to maintain the sanitary quality of the pumped water. Subsurface pits or pump rooms and inaccessible installations should be avoided. No pumping station should be subject to flooding. A standby pump should normally be provided. Standby power should be provided in situations where a power failure could produce complete pressure loss in high areas of the distribution system.

7.4 **Impounding Reservoirs**

Any earth storage facility for raw water should be designed to minimize contact between the water and organic materials such as grass, peat, trees, etc.

7.5 **Finished Water Storage**

Finished water storage must be adequately protected from contamination. Storage structures must have a cover that is watertight, opaque and vermin proof. No drains or overflows shall be directly connected to a sewer or storm drain. Venting of these structures must not be by open construction between the sidewall and the roof, but by special vent structures, which will exclude birds, vermin, and dust. Manholes to these structures must be framed at least 10 cm (4 inches) above the surface of the roof at the opening and the cover must be watertight and extend down around the frame at least 5 cm (2 inches).

It is recommended that 455 L (100 gallons)/dwelling unit be provided for emergency standby storage. Additional storage may be required for pressure regulation and for fire protection.

Steel storage tanks, and paintings and coatings for steel storage tanks, shall comply with the AWWA standards for steel tanks (D100, D102, D103 or D104). Hydropneumatic tanks should be constructed to comply with the B. C. Boiler and Pressure Vessels Code.

7.6 **Transmission and Distribution**

It is recommended that watermains normally be 15 cm (6 inches) in diameter or greater and be looped wherever economically feasible to minimize contamination risks and service disruption during repair of breaks or watermain flushing.

Flushouts or hydrants should be provided for flushing purposes on dead-ends and low points. Air relief valves should be provided at high points.

Wherever possible, watermains should be laid at least 3 meters (10 feet) horizontally from any manhole, oil-water separator, vertical seepage pit etc, or sanitary or storm sewer. Where this horizontal separation is not possible, (where watermains and sewers must cross or share the same trench) the watermain should be at least 0.45 m (1.5 feet) above the sewer (measured between the bottom of the watermain and top of the sewer) and sufficiently to one side of the sewer to allow for sewer repairs without disturbing the watermain.

If neither the horizontal or vertical separation are possible then the sewers should be of the same service capability as the watermain, and should be designed to withstand high groundwater table conditions without damage to joint seals. (This also applies to watermains when depressurized). The bottom portion of manholes, manhole connections to sewers, service connections to sewers and joints in service connections should all be designed to not leak where the normal separation distances are not possible. At crossings, the watermain joints should be as far as possible from the sewers.

Where new and existing works are involved, these construction practices should be applied to the new works and, with possible exceptions, the existing works may remain as is.

Where watermain must cross under sewers, at least 0.45 m clear vertical separation should be provided. Protection should be detailed wherever crossings have inadequate structural separation. Wherever possible these separation practices should also be applied to water service connections.

Watermain valves should be provided to isolate reasonably sized sections of the system for repair or maintenance. It is recommended that they be placed on property line projections if possible, to make them easier to locate.

Cross connections with any sanitary or storm sewer or other source of non-potable water is prohibited. Measures should be taken to prevent freezing of watermain and services. The system should be pressure tested before use.

7.7 **Disinfection**

The water purveyor is responsible to ensure that all new and repaired tanks, watermain, wells, etc. are disinfected before use according to the AWWA Standards or an equivalent provided for such disinfection.

Disinfecting agents commonly used in water treatment are chlorine, chlorine compounds, ultraviolet light and ozone. Other methods of disinfection will be considered if an application provides sufficient evidence to support their use.

Free residual chlorination is the method of disinfection most commonly practised. A minimum contact time (T) and minimum level of free chlorine residual (C) is required to produce a CT (product of C and T) of 12 min•mg/L. This level of CT will ensure adequate destruction of viruses and bacteria. If inactivation of *Giardia lamblia* cysts are required, higher levels of CT are required. Consideration must be given to pH, ammonia, taste producing substances, temperature, bacteriological quality and other pertinent factors when determining CT. At pH levels above 9, CT has to be increased substantially and this office should be contacted for appropriate levels. Where other methods of disinfection are employed, contact time and residual concentrations must be sufficient to provide adequate disinfection.

The water quality following any treatment and disinfection should normally produce a minimum chlorine residual of 0.2 mg/L or a chloramine residual of 1 mg/L (maximum 3.0 mg/L) throughout the distribution system.

The capacity of chlorination equipment must be such that an adequate residual can be maintained when maximum flow rates coincide with anticipated maximum chlorine demands. The equipment must be of such design that it will operate accurately over the entire anticipated flow, including low chlorine demand and low flows.

If gas chlorine is used, a separate room and operator protection must be provided including fan ventilation from floor level to an approved area, viewing window, exterior light and fan switches, chain storage for cylinders, chlorine container repair kit, breathing apparatus, emergency eye wash facilities, chlorine leak monitoring and alarm equipment. Additional guidelines for gas chlorine are available from this office and the Workers' Compensation Board.

If powdered chlorine is used, storage facilities should preclude contact with moisture or organic materials and should be mechanically vented to an approved area.

If needed, to ensure reliable, effective and continuous disinfection, additional facilities such as standby equipment, flow pacing, residual monitoring, automated recording and controlling equipment and alarms should be provided.

A chlorine test kit (DPD) suitable for measuring both free and total chlorine residual over a range of 0 to 2.0 mg/L, should be provided when chlorine is used. Test kits with either a scale or digital readout are far better than those, which rely on visual colour comparison, particularly for measurements below 0.5 mg/L, and should be provided.

7.8 **Fluoridation**

If water is to be fluoridated as a means of reducing tooth decay, the control objective is 1.0 mg/L. Where flow is variable, automatic proportioning equipment must be used.

If fluoride is used in acid form, facilities for operator safety must be provided including pumps for transferring acid, suitable acid storage, fan ventilation to an approved area, protective clothing and emergency eye wash units. Facilities for spill containment must also be provided. If powdered fluoride is used, storage facilities should be mechanically vented to an approved area and should preclude contact with moisture or other foreign materials. A suitably accurate fluoride test kit should be provided. In larger installations, fluoride monitoring, automated recording and controlling equipment and alarms should be provided.

8. OPERATING PERMIT

New sources of water require an **Operating Permit** from the local Environmental Health Officer, to confirm that the quality is satisfactory before the source is used. The Environmental Health Officer may require additional pumping and analysis before issuing the Operating Permit.

9. COMMENTS AND QUESTIONS

Suggestions for improving public health protection of water systems and for improving these guidelines and any questions concerning these guidelines would be welcomed.

Provincial legislation is available from the Queen's Printer, 563 Superior Street, P.O. Box 9452, Stn. Prov. Govt., Victoria, B. C., V8W 9V7, tel. (250)-387-6409. The **Drinking Water Protection Act**, the **Drinking Water Protection Regulation** can be viewed at the www.qp.gov.bc.ca. The Guidelines for Canadian Drinking Water Quality are available from Health Canada and can be viewed at www.hc-sc.gc.ca/ehp/ehd/catalogue/general/iyh/dwguide.htm.

WATER SOURCE MONITORING – APPROVAL OF NEW SOURCES

MINIMUM UNTREATED WATER SOURCE QUALITY PARAMETERS TO BE ANALYZED

SOURCE TYPE: SURFACE WATER

MICROBIOLOGICAL(1)

Total Coliform	<i>Escherichia coli</i>
Non-coliform (background) bacteria	Heterotrophic Plate Count

PHYSICAL/CHEMICAL

Alkalinity	Nitrate
Ammonia	Nitrite
Arsenic	Organic Nitrogen
Chloride	pH
Colour	Selenium
Conductivity (2)	Sulphate
Corrosiveness (3)	Total Dissolved Solids
Fluoride	Total Organic Carbon (5) (6)
Hardness	Turbidity
Metals Scan (4)	

Notes:

- (1) Bacterial analysis must be conducted at an approved laboratory (see attached list).
 - (2) Conductance/Specific Conductance.
 - (3) Calcium Carbonate saturation/Langelier's index.
 - (4) At least: aluminum, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorous, potassium, silver, sodium, zinc (expand if mineralized to include mercury).
 - (5) If Turbidity less than 1.0 mg/L Dissolved Organic Carbon may be used as an alternative to Total Organic Carbon.
 - (6) If Total Organic Carbon greater than 2.5 mg/L analyze for Tannins and Lignin and perform a trihalomethane formation potential test (if chlorine is being used as the method of disinfection).
1. Analysis of additional parameters may be required based on the results of initial analysis and on potential impact by nearby sources of contamination or polluting sources. If industrial, agricultural or pesticide pollution is suspected, identify what chemicals may have been used and analyse for most likely indicator parameters. If petroleum pollution is suspected (underground fuel storage) analyse for alkyl benzene compounds. If parasitic pollution suspected, *Giardia lamblia* and/or *cryptosporidium* analysis may be required.
 2. Analyses must be sufficiently accurate so that the minimum detectable concentration is less than 10% of **Drinking Water Protection Act**, the **Drinking Water Protection Regulation** or the Guidelines for Canadian Drinking Water Quality where applicable. Other analysis must provide sufficient information to reasonably assess the water suitability for drinking purposes and to determine what, if any, treatment might be needed. Analyses must be conducted in accordance with methods prescribed in "Standard Methods for the Examination of Water and Wastewater" (latest edition) or other acceptable procedures.

WATER SOURCE MONITORING – APPROVAL OF NEW SOURCES

MINIMUM UNTREATED WATER SOURCE QUALITY PARAMETERS TO BE ANALYZED

SOURCE TYPE: SHALLOW WELLS, DEEP WELLS, and SPRINGS

MICROBIOLOGICAL(1)

Total Coliform	<i>Escherichia coli</i>
Non-coliform bacteria	Iron and Sulphur Bacteria (deep wells)
Heterotrophic Plate Counts	

PHYSICAL/CHEMICAL

Alkalinity	Nitrate
Ammonia	Nitrite
Arsenic	Organic Nitrogen
Chloride	pH
Colour	Selenium
Conductivity (2)	Sulphate
Corrosiveness (3)	Sulphide (as hydrogen sulphide) (5)
Fluoride	Total Dissolved Solids
Hardness	Total Organic Carbon (6) (7)
Metals Scan (4)	Turbidity

Notes:

1. Bacterial analysis must be conducted at an approved laboratory (see attached list).
 2. Conductance/Specific Conductance.
 3. Calcium Carbonate saturation/Langelier's index.
 4. At least: aluminum, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorous, potassium, silver, sodium, zinc (expand if mineralized to include mercury).
 5. For deep wells: On site or preserve sample, or use alternative method of confirming that water has satisfactory odour.
 6. If Turbidity less than 1.0 mg/L Dissolved Organic Carbon may be used as an alternative to Total Organic Carbon.
 7. If Total Organic Carbon greater than 2.5 mg/L analyze for Tannins and Lignin and perform a trihalomethane formation potential test (if chlorine is being used as the method of disinfection).
1. Analysis of additional parameters may be required based on the results of initial analysis and on potential impact by nearby sources of contamination or polluting sources. If industrial, agricultural or pesticide pollution is suspected, identify what chemicals may have been used and analyse for most likely indicator parameters. If petroleum pollution is suspected (underground fuel storage) analyse for alkyl benzene compounds. If parasitic pollution suspected, *Giardia lamblia* and/or *cryptosporidium* analysis may be required.
 2. Analyses must be sufficiently accurate so that the minimum detectable concentration is less than 10% of Guidelines for Canadian Drinking Water Quality, the **Drinking Water Protection Act** or the **Drinking Water Protection Regulation** where applicable. Other analysis must provide sufficient information to reasonably assess the water suitability for drinking purposes and to determine what, if any, treatment might be needed. Analyses must be conducted in accordance with methods prescribed in "Standard Methods for the Examination of Water and Wastewater" (latest edition) or other acceptable procedure.

**LABORATORIES APPROVED BY THE PROVINCIAL HEALTH OFFICER
FOR WATER MICROBIOLOGY TESTING**

(For updates to the approved laboratories check: http://www.pathology.ubc.ca/education/Certificate_Programs/Enhanced_Water_Quality_Assurance/PHO_-_Approved_Laboratory_List.htm)

AT April 6, 2006

NAME	ADDRESS	PHONE	FAX	APPROVED FOR	Approval Period
ALS ENVIRONMENTAL - CALGARY, ALBERTA	#2-21 HIGHFIELD CIRCLE SE, CALGARY, AB CANADA T2G 5N6	403-214-5431	403-214-5430	TOTAL COLIFORM AND <i>E. coli</i> .	To May 31, 2007
ALS ENVIRONMENTAL - FORT St. JOHN, BRITISH COLUMBIA	#2-8820 100TH STREET, FORT St. JOHN, BC V1J 3W9	250-785-8281	250-785-8286	TOTAL COLIFORM AND <i>E. coli</i> .	To June 16, 2007
ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA	1988 TRIUMPH STREET, VANCOUVER BC V5L 1K5	(604) 253-4188	(604) 253-6700	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To June 8, 2006
BCCDC ENVIRONMENTAL MICROBIOLOGY LABORATORY 2007	655 WEST 12TH AVENUE, VANCOUVER BC V5Z 4R4	(604) 660-1753	(604) 660-6073	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 31,
CANTEST LTD - BURNABY, BRITISH COLUMBIA 2007	4606 CANADA WAY, BURNABY BC V5G 1K5 (604) 734-7276	(604) 731-2386	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To November 25,
CANTEST LTD - VICTORIA, BRITISH COLUMBIA	1104 – 4464 MARKHAM STREET, VICTORIA BC V8Z 7X8	(250) 385-6112	(250) 382-6364	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To September 15, 2007
CARO ENVIRONMENTAL SERVICES	102 – 3677 HIGHWAY 97N, KELOWNA BC V1X 5C3	(250) 765-9646	(250) 765-3893	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 31, 2007
C R D WATER SERVICES LABORATORY*	479 ISLAND HIGHWAY, VICTORIA BC V9B 1H7	(250) 474-9680	(250) 474-9691	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 31, 2007
ECO TECH LABORATORY LTD.	10041 DALLAS DRIVE, KAMLOOPS BC V2C 6T4	(250) 573-5700	(250) 573-4557	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To February 28, 2007
G V R D WATER LABORATORY	4330 KINGSWAY, VANCOUVER BC V5G 4G8	(604) 451-6001	(604) 451-6019	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 31, 2007
IG MICROMED ENVIRONMENTAL INC	190 - 12860 CLARKE PLACE, RICHMOND BC V6V 2H1	(604) 279-0666	(604) 279-0663	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To June 6, 2006
MB LABORATORIES LTD	2062 HENRY AVENUE WEST, SIDNEY BC V8L 5Y1	(250) 656-1334	(250) 656-0443	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To January 14, 2008
NORTH ISLAND LABORATORIES Nanaimo - Drop Off	2755 B MORAY AVE, COURTENAY BC V9N 8M9 532 – B COMOX ROAD, NANAIMO BC V9R 3J1	(250) 338-7786 (250) 716-8731	(250) 338-7553	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 9, 2007
NORTHERN LABORATORIES LTD	251 KAIEN ROAD, PRINCE RUPERT BC V8J 4B7	(250) 627-1906	(250) 627-8214	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To December 31, 2007
NORWEST LABS	104 - 19575 - 55A AVENUE, SURREY BC V3S 8P8	(604) 514-3322	(604) 514-3323	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To June 15, 2006
MAXXAM ANALYTICS INC.	8577 COMMERCE COURT, BURNABY BC V5A 4N5	(604) 444-4808	(604) 444-4511	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To August 24, 2006
PROVINCIAL LABORATORY FOR PUBLIC HEALTH - CALGARY (MICROBIOLOGY)	3030 HOSPITAL DRIVE NW, CALGARY, AB T2N 4W4	(403) 944-4563	(403) 270-2216	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To June 1, 2006
PROVINCIAL LABORATORY FOR PUBLIC HEALTH - EDMONTON (MICROBIOLOGY)	8440 – 112 STREET, EDMONTON, AB T6G 2J2	(780) 407-2699	(780) 407-8984	TOTAL COLIFORM, FECAL COLIFORM AND <i>E. coli</i> .	To June 1, 2006

*CRD Water Services Laboratory does not accept any external water samples for testing

APPLICATION FOR WATERWORKS CONSTRUCTION PERMIT
Vancouver Island Health Authority

Water System Name: _____

Date: _____

Owner/Representative: _____

Address: _____
 (if new) _____

Telephone: _____

Postal Code: _____

DESCRIPTION OF PROPOSED WATERMAIN EXTENSION/REPLACEMENT:
 (e.g. 200m of 150mm Class 150 PVC)

LENGTH (m)	SIZE (mm)	PRESSURE RATING (Class)	TYPE

Description of related works - source, treatment, reservoir, etc.

Does the submission include a new source(s)? _____

Does the water quality of the existing waterworks and/or new source(s) meet the *Drinking Water Protection Regulation* and the *Guidelines for Canadian Drinking Water Quality*? _____

Will all watermains have 3 meters clear horizontal separation from sanitary and storm sewers? _____

At all crossings and wherever the normal horizontal separation is not possible are the watermains at least 45 cm (18 inches) above and clear of the sanitary or storm sewer? _____

Do all service connections meet the above separation guidelines? _____

Have blow-offs or hydrants been provided for flushing purposes on all dead-ends and low points? _____

Have air relief valves, hydrants or services designed to provide air relief been provided at all high points? _____

Will watermains/reservoirs be disinfected per current AWWA standards? _____

Are all works on public right-of-ways or registered easements? _____

Are all plans, reports, specifications, etc., sealed and signed by a Professional Engineer? _____

How many new lots/connections will be serviced? _____

Is the capacity of the existing waterworks adequate (including existing and committed servicing)? _____

Are the lots serviced by septic tank _____ or sewer _____ systems?

Submitted by: _____
 Signature: _____

Send to: **Public Health Engineering**
Vancouver Island Health Authority
3RD Floor 6475 Metral Drive, Nanaimo BC V9T 2L9