

# To Chlorinate or Not to Chlorinate

Secondary Disinfection Decisions

City of Chilliwack  
Mayor Sharon Gaetz



CITY OF  
**CHILLIWACK**

# Presentation Content

- **Background**
- **Fraser Health – Notification to Chlorinate**
- **Legal Opinion**
- **Drinking Water Protection Act**
- **Public Consultation Issues**
- **Permanent Chlorination Order**



# Chilliwack's Water Supply

- **1905**
  - Elk Creek Waterworks began supplying drinking water
- **1950**
  - Chlorination of water supply began
- **1998**
  - Surface water supplies shut down due to deteriorating drinking water quality
- **Since 1998**
  - All of the Chilliwack's water has come from the Sardis/Vedder aquifer
  - Water supply has remained non chlorinated
- **March 7, 2013 - FHA order for full time chlorination**

# Water Quality Awards

**1997 and 1999 - Best Drinking Water in Canada**

**2005 - 5<sup>th</sup> Best in the World (Berkley Springs)**



# Groundwater Source

Well 1 & 2



Well 3



Well 6 & 7



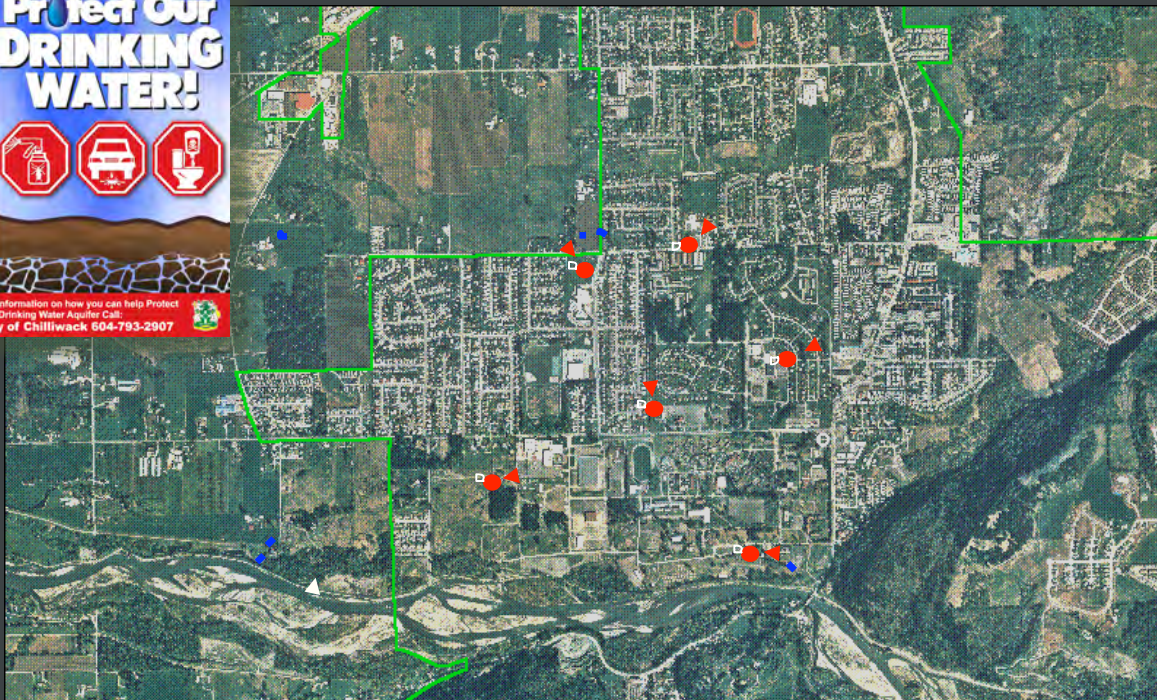
Well 9



Well 8



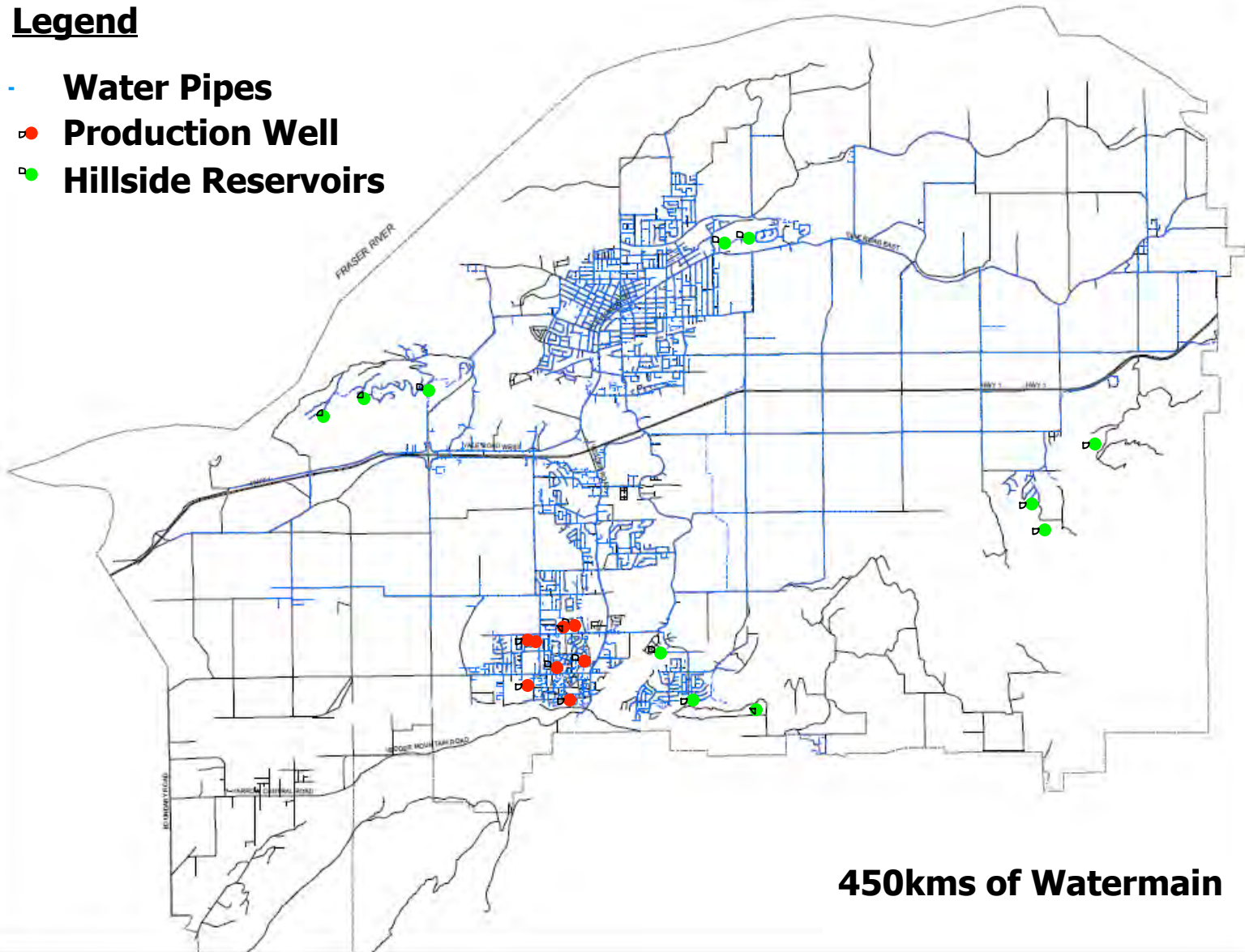
Well 10



Ground Water Protection Zone

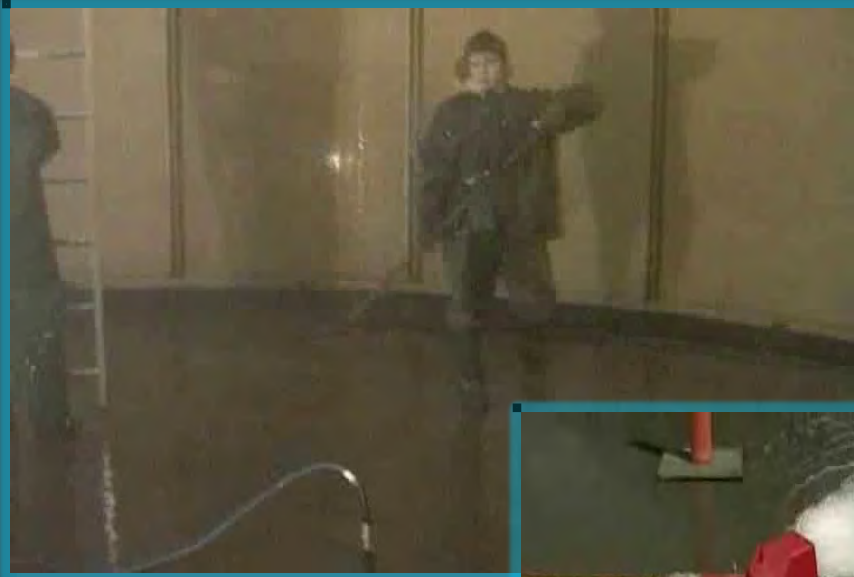
## Legend

- Water Pipes
- Production Well
- Hillside Reservoirs



**450kms of Watermain**

# System Maintenance - \$3M Yearly



# Hillside Reservoirs



**14 Reservoirs  
E.coli incidents in 2001,  
2009, 2011, 2012**



**Hillside reservoirs provide  
Water to 5% of Chilliwack's  
water users**



# FHA Initial Notification

**In December 2012, FHA issued initial notice;**

**Pursuant to *Section 8(3)* of the *Drinking Water Protection Act* FHA has notified the City that they intend to add the following conditions to the City's permit to operate a drinking water system:**

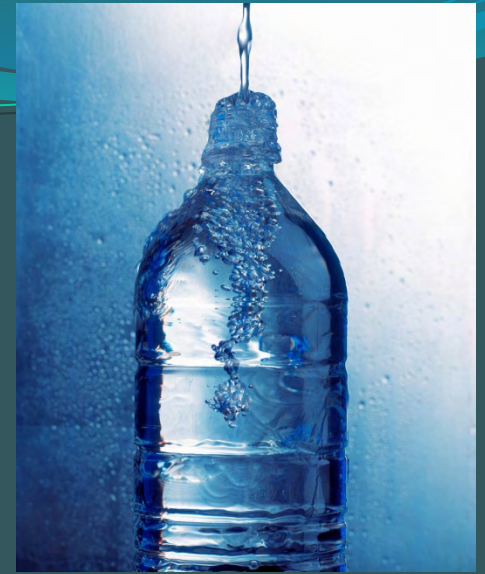
- Provide secondary disinfection in order to maintain a disinfectant residual in the distribution system**
- Continuous monitoring of disinfectant residual levels in the distribution system**



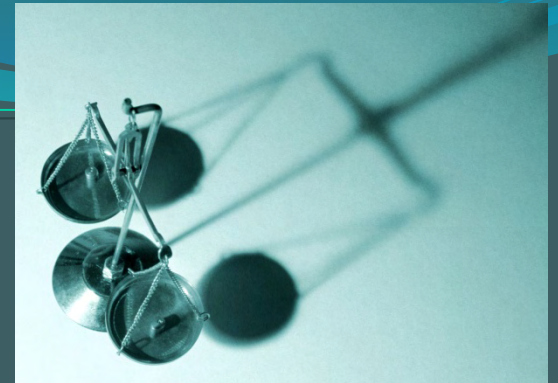
# Fraser Health's Position

**FHA stated that:**

- **Chilliwack's source water is excellent**
- **System compromised in 2009, 2011 & 2012**
- **Integrity of the distribution system is FHA's primary concern**
- **Illegal connections and cross connections exist**
- **With no disinfection residual, consumers exposed to risk of illness**
- **Water sampling and testing does not eliminate risk**
- **The size and complexity of the system warrants disinfection**



# Legal Opinion



- **FHA has legislated responsibility under DWPA to identify and abate risk**
- **City has no immunity from requirements of DWPA**
- **In the event of loss or injury arising from a failure to act, the City would be found liable in negligence**
- **Operating a water system contrary to conditions of permit is an offence under the Act**

# Chilliwack's Response to Fraser Health

## Section 8 of the *DWPA* - Considerations

- Clarification of data used
- Consideration of alternative options to chlorination
- Chlorination of hillsides only
- Public consultation process needed



# Public Consultation Needs



# Public Consultation - How it Went

**INSIDE: It may be legal, but where should medical pot be grown? Pg. 3**

## Chilliwack times

NEWS, SPORTS, WEATHER & ENTERTAINMENT

THURSDAY  
February 28, 2013

10 Sardis Strongman event a powerful motivator for some

chilliwacktimes.com



### Time to act on report

Parents want to implement special ed improvements without delay

By Carmen Hamon  
cgray@chilliwacktimes.com

Local parents want school officials to move quickly on 15 recommendations to improve special education in the Chilliwack school district. The recommendations were made by consultant David Carter, who started reviewing the district's special education services in August. He presented his 36-page report at a packed school board meeting Tuesday.

Parents there said the report addresses many of the problems they have voiced for a year, but some were frustrated it's taken the district so long to bring the report to the board.

"The document is dated Dec. 6, but the district delayed bringing it to the board until Tuesday because Carter was unavailable for the presentation."

"There's been an awful lot of time that has passed since this process first got started," said parent Don Davis. "I don't think about it."

She was hopeful, however, that alternatives could still be found to chlorination of the main system. Dr. Paul Van Buijnder addressed the approximately 200 people at the meeting Tuesday to discuss the

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## Ironic twist in water war

E. coli detected in Chilliwack water a day after Fraser Health heard defiance from residents about chlorination

By Paul A. Thompson  
paul@chilliwacktimes.com

The irony is almost too much to swallow. Less than 24 hours after hundreds of residents piled into Chilliwack Alliance Church to give Fraser Health Authority (FHA) business a piece of their mind about a chlorination edict, E. coli was detected in the main water system.

City officials issued a water quality advisory Wednesday for 350 homes in Greendale after water sampling confirmed a low level of E. coli bacteria at a test site at South Sumas and



SCAN TO SEE PHOTOS

Sumas Prairie roads. The city immediately flushed the pipes and activated its standby chlorination system.

Mayor Sharon Gaetz held a press conference Wednesday afternoon at which she said the testing was set to be confirmed and that she hoped the risk was negligible. Results from resampling were

the Times asked Gaetz if her mind was changed.

"I think any thoughtful commu-



## Hostile crowd greets FHA over chlorination

Jennifer Reiberg  
The Progress

They pleaded. They heckled. They tried to negotiate. The official who hosted Fraser Health's information meeting Tuesday night on the prospect of continuous chlorination of Chilliwack's pristine water.

Despite two and half hours of heated exchange, with all speakers saying that they don't want chlorination, there was no evident shift in the official position that chlorination is the best option for Chilliwack.

Dr. Van Buijnder acknowledged the quality of Chilliwack's award-winning drinking water, and the efforts by staff to maintain the 450 kilometers of the water distribution systems serving a growing population of more than 50,000.

"You have a really good water source, there's just no guarantee you can protect the system against incursions," he said.

Dr. Van Buijnder's bottom line was that the risk in Chilliwack posed by drinking untreated water superseded any risks of adding the groundwater source, and high secondary system, "without using a secondary disinfectant like chlorine."

With a system the size and complexity of Chilliwack, there could be an estimated 70 to 100 breaks, or "incursions" in the water system in a given year, caused by anything from illegal connections to a break in a pipe.

Chilliwack's three incidents of "minimal" E. coli detection, in 2009, 2011 and 2012, were isolated and confined to hillside reservoirs, which operate separately from the main water distribution system.

But even with water testing done twice as often as required, residents could still "be drinking it for four days," before something gets detected at the lab, if some form of bacteria should contaminate the water.

"You've got high-quality water in the groundwater source, and high quality city staff, but you can't have a backup system," without using a secondary disinfectant like chlorine.

He's most worried about a nasty strain of E. coli, like the one that hit Walkerton, Ont. The steps taken in the wake of that disaster changed the outlook on drinking water protection for the entire world.

He dismissed the health concerns of chlorination, mentioned by numerous speakers, because he said the by-products that lead to health issues aren't present in the water system due to a lack of organic

matter in the water from the under-ground aquifer.

Chlorine, filtration and UV methods don't work either for adequately

Greendale under water advisory

Just as the topic of water chlorination is reaching a fever pitch in Chilliwack, a positive E. coli test result came through Wednesday for the City of Greendale.

Water Quality Advisory for residents in Greendale on the levels of a "contaminated level in the scale."

The City has activated its standby chlorination system and is flushing the pipes in the area, said Mayor Sharon Gaetz.

The chlorine will take about 12 hours to reach the westernmost edge of Chilliwack.

"Once the chlorine is present, residents are advised to run the water in their pipes to flush the chlorinated water through the system."

City and Fraser Health officials are resampling to confirm results, which should be in by Thursday, February 28. A Boil Water Advisory is going on, but if the tests come back clear it will be recalled immediately, said officials.

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Dr. Paul Van Buijnder, Fraser Health's Chief Medical Health officer, faces a tough audience during an information meeting in Chilliwack Tuesday.

PHOTO: JENNIFER REIBERG/PROGRESS

# Capital Costs



**Disinfection system capital costs range from \$900k to \$2.17M**

<b>System</b>	<b>\$ Capital</b>	<b>Plus Residual Monitoring Equipment \$</b>	<b>Total</b>
Chlorine Gas	840,000	300,000	<b>1,140,000</b>
Chloramines	1,275,000	300,000	<b>1,575,000</b>
Sodium Hypochlorite	1,275,000	300,000	<b>1,575,000</b>
On Site Generation	1,575,000	300,000	<b>1,875,000</b>
Chlorine Dioxide	1,575,000	300,000	<b>1,875,000</b>
MIOX	1,875,000	300,000	<b>2,175,000</b>
Calcium Hypochlorite	600,000	300,000	<b>900,000</b>

- **Some limited federal grant funding opportunities may exist**
- **No provincial funding available**

# Annual O&M Costs

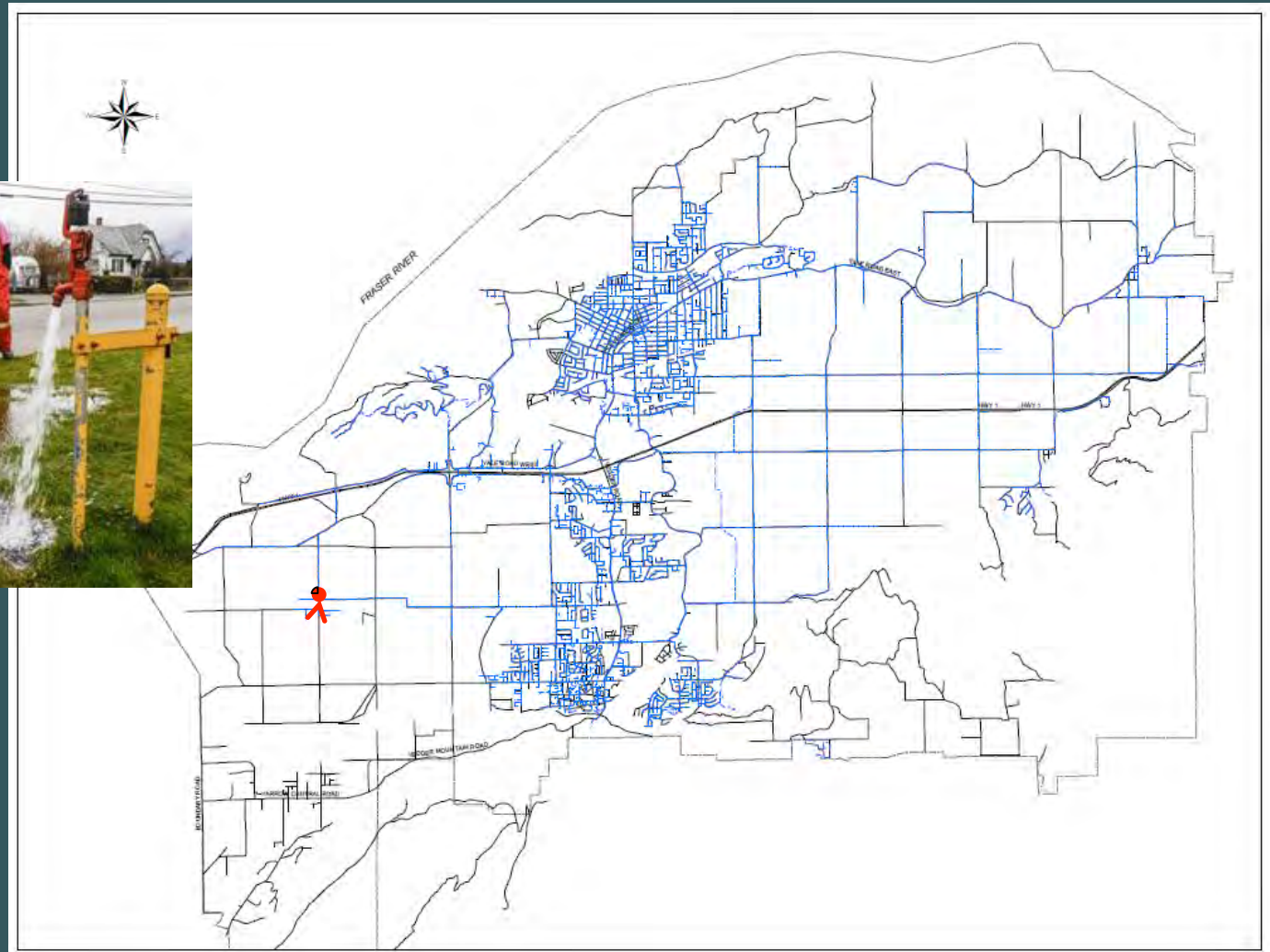
**Disinfection system O&M costs range from \$150k to \$300k per year.**

**O&M costs passed onto system users – 3% water rate increase**





# E.Coli Presence – Post Public Meeting



- 6550 Sumas Prairie Road (at South Sumas Road)

**6550 Sumas Prairie Road  
Sample Collection Stand Pipe**

# Water System Response Plan Initiated

- **Water immediately resampled**
- **Chlorination system activated**
- **Water mains flushed**
- **Boil water order issued (to affected area)**
- **Follow up samples all negative**
- **Post incident investigation undertaken**



# Areas of Investigation



# Preliminary Conclusions

- **Sample tap could draw in ground water (worn plunger)**
- **28 properties without check valves still to be assessed for possible cross connections with private wells**
- **Raining Heavily during sample collection**



# Fraser Health – Post Incident Actions

- Order issued pursuant to *Section 8 (4)* of the *DWPA*
- “Provide secondary disinfection in order to maintain a disinfection residual in the distribution system. The city is currently chlorinated as part of the emergency response. Fraser Health requires this to continue on an ongoing basis with a target residual disinfection at the tap of 0.2 mg/L of free chlorine.”



fraserhealth

HEALTH  
PROTECTION

# PERMIT TO OPERATE

A Drinking Water System with  
10001-20000 Connections

Water Supplier: City of Chilliwack  
Facility Name: City of Chilliwack Water System

## Conditions of Permit

City of Chilliwack will provide secondary disinfection in order to maintain a disinfection residual in the distribution system. The city is currently chlorinated as part of the emergency response. Fraser Health requires this to continue on an ongoing basis with a target residual disinfection at the tap of 0.2 mg/L of free chlorine.

7-Mar-2013  
Effective Date

  
Environmental Health Officer

*This permit must be displayed  
in a conspicuous place and is nontransferable*



# Thank You



*City of Chilliwack*

Office of the Mayor