



NORTH VANCOUVER
DISTRICT

DRINKING WATER QUALITY ANNUAL REPORT 2016

May 15, 2017. District of North Vancouver Utilities Department

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EXECUTIVE SUMMARY

This report is the sixteenth Drinking Water Quality Annual Report prepared by the DNV and provides DNV water consumers with information about the quality of their potable water and the programs that supported the drinking water system. Submission of this report to the Office of the Medical Health Officer for North Shore Vancouver Coastal Health fulfills a regulatory obligation under the Drinking Water Protection Regulation and supports our application to the Medical Health Officer for our annual Drinking Water System Permit to operate a potable water system. It adheres to Metro's "Water Quality Monitoring And Reporting Plan For The GVRD and Member Municipalities – 2006" , a template for all municipalities within Metro Vancouver to report annually on water quality results and issues.

Metro and the DNV employ a multi-barrier science based approach that encompasses water from the source to the point of delivery to consistently deliver a reliable supply of safe drinking water. All potable water supplied to DNV was treated through Metro's Seymour Capilano Filtration Plant. In 2016, 99.98% of the District of North Vancouver (DNV) water samples met or exceeded regulatory requirements. The combined efforts of the Greater Vancouver Water District (GVWD or Metro) and the DNV once again resulted in an excellent year for water quality for our customers.

1 SOURCE WATER

Metro supplies the DNV with 100% of its potable water from their Capilano and Seymour surface water reservoir sources. Metro uses multiple barriers to protect safe drinking water including watershed protection, water treatment, sampling and testing and ongoing operation of the water transmission system.

Prior to 2009, Metro's only form of treatment for both the Capilano and Seymour sources was primary disinfection using chlorine. In 2010 all Seymour water was treated at the Seymour Capilano Filtration Plant (SCFP). In 2015 the twin tunnel delivery system was brought into full operation linking the Capilano water source to the SCFP. This milestone significantly reduced historic water quality issues and concerns.

Metro analyses source water for bacteriological, chemical and physical parameters according to the "BC Safe Drinking Water Regulation" (the regulation) and the "Water Quality Monitoring And Reporting Plan For The GVRD and Member Municipalities – 2006" (the plan). The "2016 - GVWD Quality Control Annual Report" summarises water quality for all of the Metro Vancouver service area and is made available on their website www.metrovancouver.org. The report demonstrates that drinking water supplied by Metro to DNV met or exceeded all water quality standards and guidelines in 2016.

2 DNV DISTRIBUTION SYSTEM & QUALITY TESTING

2.1 General

The DNV water distribution system delivers potable water to its customers via a waterworks system incorporating approximately 364 km of water mains, 7 water pumping stations, 11 water storage reservoirs, and 36 pressure reducing stations. A population of approximately 88,000 is served through approximately 21,000 service connections.

In 2016, Metro delivered 19.2 million cubic metres of water to the DNV distribution system through nineteen different connections. A map of the overall water system, showing pressure zones is included in Appendix A.

2.2 Sampling and Testing

Sampling is performed in three scheduled categories according to the requirement of the Drinking Water Protection Regulation (the Regulation),

1. **Weekly:** Bacteriological, Chemical and Physical Parameters.
2. **Quarterly:** Disinfection by-products
3. **Semi Annually:** Metals.

Health Canada's Guideline for Drinking Water Quality (the Guideline) set the maximum acceptable concentrations for sample quality parameters.

All samples are collected by DNV staff and transported to the certified Metro lab for analysis and reporting with the exception of temperature and free chlorine residual, which are analysed and recorded by DNV staff at the time of sampling. Appendix A includes a map of the overall water system with sampling site labeled, a list of the sample site locations and the annual sampling schedule.

Weekly Samples

In 2016 DNV staff collected a total of 1330 regular scheduled samples from 39 sample sites or an average of 111 samples per month. This exceeds the Regulations population based sample requirement for DNV of 34 sites and 86 samples per month. Sample collection is scheduled weekly on a rotating basis using strategic grouping of sample sites distributed across the district. Typically 13 samples are collected twice each week for a total of 26 samples per week.

Locations of weekly sample points are distributed according to the regulation recommendations as follows;

- 10% of sampling points at “source” (supply points off Metro transmission mains)
- 40% of sampling points at locations with medium flow
- 40% of sampling points at locations with low flow
- 10% of sampling points at system dead-ends (very low flow)

Weekly Samples are analysed in three categories bacteriological, chemical and physical parameters.

- Bacteriological parameters tested include Escherichia coli (E coli), total coliform and heterotrophic plate count (HPC).
- Chemical parameter is free chlorine residual.
- Physical parameters tested are turbidity and temperature.

Figure 1 below shows the number of sample collection on a monthly basis.

DISTRICT OF NORTH VANCOUVER - 2016

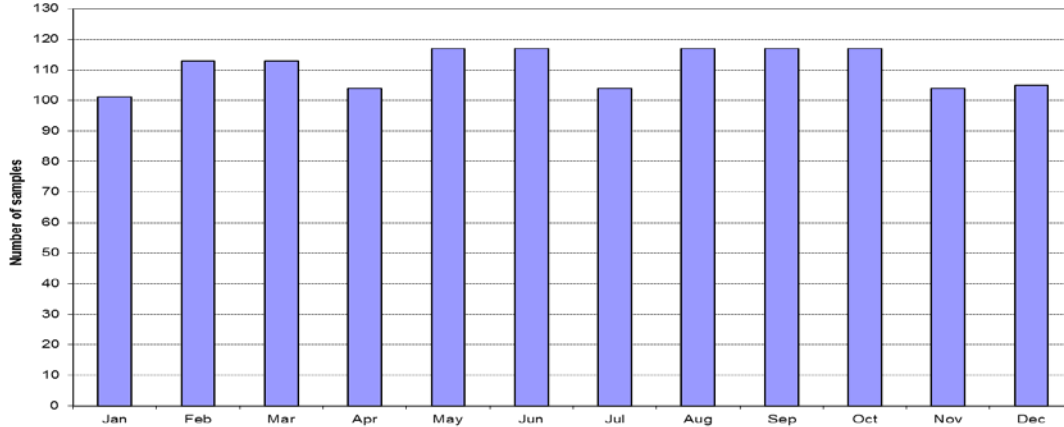


Figure 1. Number of Scheduled Weekly Samples Collected

Disinfection By-Products

Haloacetic acids (HAA) and Trihalomethanes (THM) are by-products of the water treatment with chlorine. The Guideline maximum allowable concentrations for the running quarterly averages are 0.08 for HAA and 0.1 mg/L for THM.

DNV staff collected 16 samples for disinfection by-product testing of in conformance with the regulation.

A measurement of pH in the distribution system is made at the same time as the disinfection by-products at one of the four locations on a quarterly basis. The Guideline does not provide a required value but sets a target range of 7.0-10.5 and is primarily for corrosion control.

Semi-Annual Metal Samples

In 2016 DNV staff collected eight samples for analysis at 4 locations for metal testing in conformance with regulatory requirements.

Special Samples

In addition to the scheduled weekly, quarterly and semi-annual samples special samples are collected and analysed when warranted for water quality complaint, operational concern or maintenance activity. The majority of complaints in the DNV are for discolored water. All water quality complaints are investigated with the vast majority ultimately determined to be a direct and unintentional consequence of DNV activities such as water main flushing or hydrant flow testing. In 2016 a total of 85 special samples were collected and analysed.

3 RESULTS

The DNV water sampling program meets the regulatory requirements for sample location, testing frequency and sample quantity. Samples results are provided by Metro to DNV on a weekly basis and reviewed internally upon receipt. The weekly sample results (free chlorine residual, total Coliform, E-coli, HPC, turbidity and temperature) for each sample site are presented Appendix B. A summary of the results on a parameter by parameter basis is provided below.

3.1 Weekly Bacteriological Parameters

Bacteriological standards for water distribution systems are dictated by the requirements of the regulation and the Health Canada’s [Guidelines for Canadian Drinking Water Quality](#) which provide the following criteria:

- **E. coli:** Zero detectable E. coli per 100 mL sample.
- **Total Coliform:** 10 or less total coliform per 100 mL sample and 90% or more of the samples for a given month must have zero detectable total coliform per 100 mL sample.
- **HPC:** No maximum acceptable concentration limit provided. Increases in HPC concentrations above baseline level of 500 CFU/mL s are undesirable.

All samples collected in 2016 met the guidelines for safe drinking water. There were zero occurrences of detectable E-coli or Total Coliform. All samples collected in 2016 were below the recommended maximum HPC. The annual DNV average HPC for the last five years is presented below.

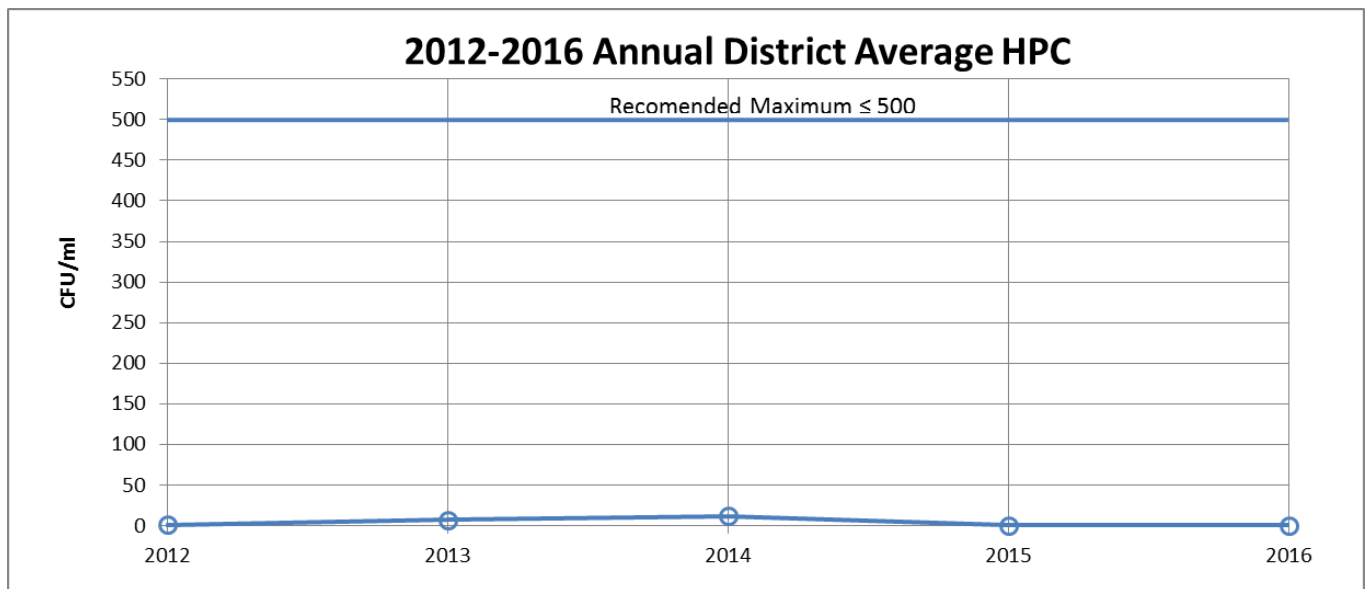


Figure 2. HPC Five Year Annual Averages

3.2 Weekly Chemical Parameter

In 2016 there were zero samples that had less free chorine than the recommended minimum of 0.20 mg/L. The 2016 average chlorine residual was 0.69 mg/L. The annual DNV average free chlorine for the past 5 years is presented below.

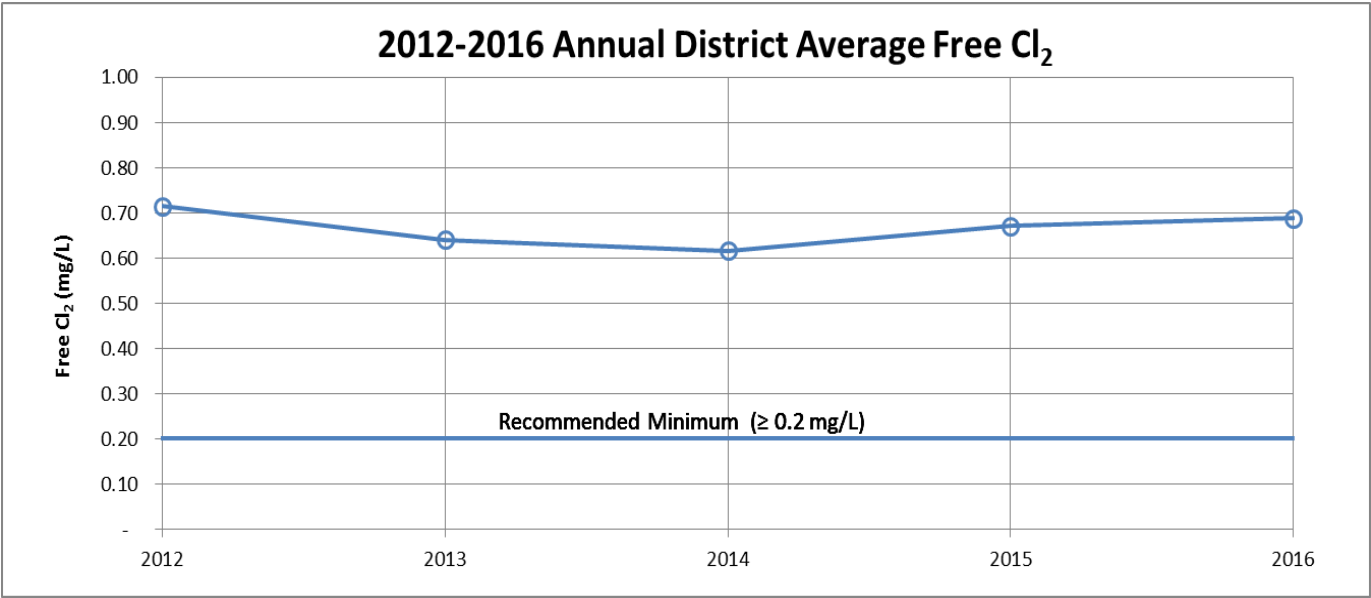


Figure 3. Free Cl₂ Five Year Annual Averages.

3.3 Weekly Physical Parameters

Turbidity.

The Nephelometric Turbidity Unit (NTU) is used to test and record the turbidity in water. The target NTU is < 1 or “best possible” and should not exceed 5.0 in distribution systems according to the guideline. The average annual turbidity for 2016 was 0.2 NTU. In 2016 six samples, or 0.5%, from six different locations tested above 1 NTU, two samples tested above 5.0 NTU. All other parameters were within acceptable ranges for all six samples. The next sample for all six locations tested below the target NTU.

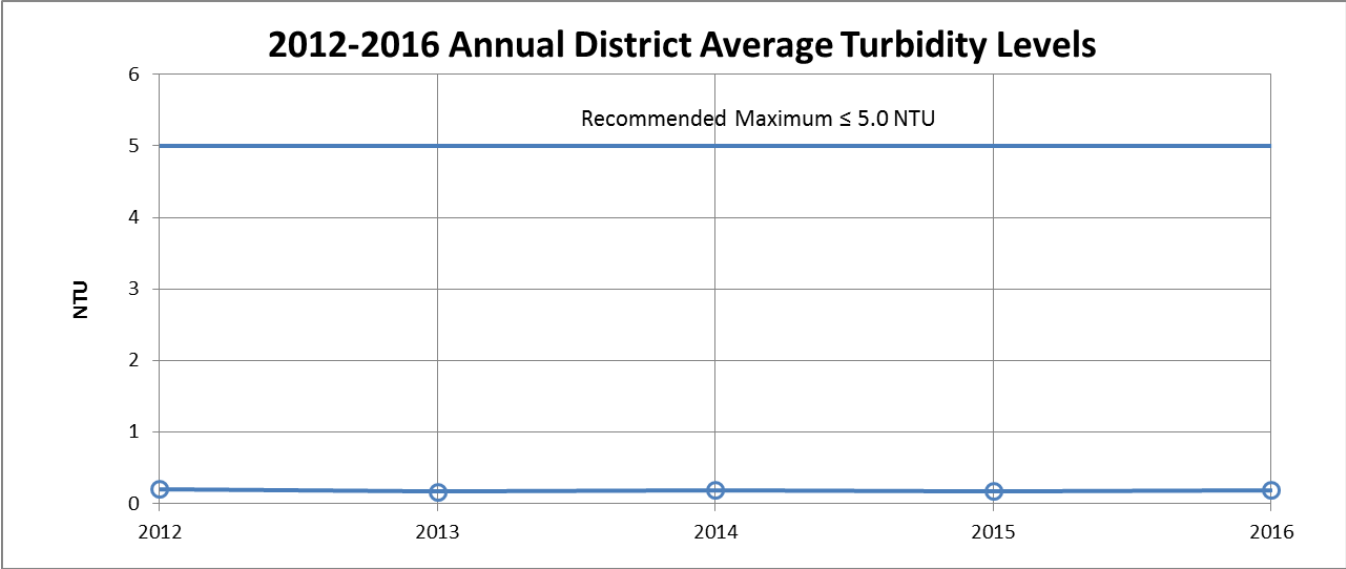


Figure 4. Turbidity Five Year Annual Averages.

Temperature

The guidelines provide an aesthetic objective for water temperature at less than or equal to 15°C. In 2016, 114 samples or 8.6 % of the samples were above 15°C and occurred during the months of August and September only.

3.4 Quarterly Disinfection By-products

Quarterly disinfection by-products tested were well below guideline limits and are presented below in Table 1. The average pH for our system in 2016 was 7.3.

Sample	Date Sampled	THM (ppb)		HAA (ppb)	
		Total Trihalomethanes	Total THM Quarterly Average (Guileline Limit 100 ppb)	Total Haloacetic Acid	Total HAA Quarterly Average (Guileline Limit 80 ppb)
DNV-727	3/1/2016	20.7	21	19.1	19
DNV-727	5/31/2016	16.1	18	15.1	17
DNV-727	9/1/2016	26	21	17.2	17
DNV-727	10/18/2016	25	22	23.9	19
DNV-733	3/1/2016	25.3	25	24.9	25
DNV-733	5/31/2016	24.2	25	21.8	23
DNV-733	9/1/2016	32	27	20.5	22
DNV-733	10/18/2016	22	26	23.1	23
DNV-734	3/1/2016	21.6	22	21.1	21
DNV-734	5/31/2016	16.8	19	19	20
DNV-734	9/1/2016	24	21	16.4	19
DNV-734	10/18/2016	25	22	25.3	20
DNV-736	3/1/2016	21.7	22	24.9	25
DNV-736	5/31/2016	19.5	21	23.2	24
DNV-736	9/1/2016	27	23	18.1	22
DNV-736	10/18/2016	15	21	23.9	23

Table 1. Quarterly Disinfection By-products 2016 Results

3.5 Semi-Annual Metals.

A total of eight samples for metals, including copper, lead and zinc, were collected from four locations in 2016. Sample locations, results, and maximum concentrations are given in Table 2 below. All samples tested for metals were below the maximum acceptable concentration guidelines for Canadian Drinking Water Quality. Where no guideline value is provided it is because Health Canada has determined that there is currently no scientific evidence of detrimental health effects at the levels typically found in drinking water.

	Site ID	DNV-721		DNV-730		DNV-734		DNV-747	
Parameter : Guideline Limit (µg/L)	Site Description	2838 Panorama Dr.		Braemar Reservoir		1181 West 22nd		1231 Lennox St. PRV	
	Sample Date	5/17/2016 7:45	10/27/2016 8:50	5/17/2016 8:45	10/27/2016 11:35	5/17/2016 9:10	10/27/2016 11:55	5/17/2016 8:05	10/27/2016 10:35
	Sample Type	REG - GRAB	REG - GRAB	REG - GRAB	REG - GRAB	REG - GRAB	REG - GRAB	REG - GRAB	REG - GRAB
Aluminum Total	200 µg/L *	24	40	22	39	22	34	23	43
Antimony Total	6 µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic Total	10 µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium Total	1000 µg/L	3.1	3.5	2.5	3.2	2.6	3.3	2.5	3.3
Boron Total	5000 µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium Total	5 µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Calcium Total	none	3370	3440	3060	2950	3010	2860	3040	2880
Chromium Total	50 µg/L	0.25	0.26	0.23	0.25	0.21	0.21	0.23	0.21
Cobalt Total	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper Total	1000 µg/L	2.3	1.2	0.7	0.6	6.8	8.2	<0.5	<0.5
Iron Total	≤300 µg/L	10	22	5	9	6	14	<5	<5
Lead Total	10 µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Magnesium Total	none	140	141	151	150	152	152	155	155
Manganese Total	≤50 µg/L	1.2	1.8	1.9	4.6	4.2	3.5	2.6	4.3
Mercury Total	1.0 µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Molybdenum Total	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel Total	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Potassium Total	none	146	185	144	189	146	187	143	181
Selenium Total	50 µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silver Total	none	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium Total	≤200,000 µg/L	1350	1540	1340	1640	1360	1610	1330	1600
Zinc Total	≤5000 µg/L	<3	<3.0	<3	<3.0	<3	<3.0	<3	<3.0

*No health-based guideline for aluminium has been established in Canada, however where aluminium based coagulants are used in water treatment this operating guideline has been set.

Table 2. Semi Annual Metal 2016 Results

3.6 Special Samples

In 2016 eighty five (85) special samples were collected. Twenty six (26) were in response to customer or staff requests and fifty nine (59) were for operational incidents or capital construction such as water main breaks or water main construction. None of samples tested positive for E.coli or Total Coliform.

OPERATIONS, MAINTENANCE & CAPITAL PROGRAMS

3.7 Water System Scheduled Maintenance

Scheduled annual system maintenance that supports water quality includes water main flushing, reservoir cleaning programs and water facility inspections. We follow the AWWA flushing program standards and performed unidirectional flushing of 32,300 m of main (9% of the system) in the east side of P2 pressure zone. The west side of the P2 zone is scheduled for 2017.

The DNV uses permanent flushing stations or regularly scheduled flushing to maintain water quality in areas with chronic aesthetic issues related to cast iron pipe material. We are eliminating the stations by upgrading cast iron with our standard ductile iron through our water main replacement program. In 2016 we eliminated two permanent flushing stations leaving three left in our system.

The DNV uses the SCADA system to optimise reservoir filling and retention time to support water turnover and quality.

3.8 Capital Upgrades

The DNV has a fully funded water main replacement program that uses a risk based protocol with seventeen weighted hazard criteria. The DNV's water main replacement program takes into consideration multiple parameters to prioritise the annual replacement schedule. The DNV standard replacement water main is ANSI/AWWA C151 & C140 special class 50 cement lined ductile iron pipe and specified in our Design Guidelines of our Development Servicing Bylaw.

Our prioritization protocol weighs the potential of failure, consequence of failure, and water quality heavily. The 2016 DNV construction crews completed the replacement of 6,334 metres of pipe. In addition Metro Vancouver contractors replaced 2,480 m of DNV water main as part of a larger Metro Main #4 main replacement project.

The following two tables list the water main replaced in 2016 and the replacement plan for 2017 respectively.

Street	From	To	Length (m)
W 15 th Street	McGuire Avenue	Pemberton Avenue	846
McGuire Avenue	W 15 th Street	Marine Drive	173
Fernwood Crescent	Sowden Street	Sowden Street	238
Cortell Street	W 21 st Street	W 22 nd Street	126
W 22 nd Street	Cortell Street	DNV/CNV Boundary	69
W 23 rd Street	Philip Avenue	Bridgeman Avenue	188
Quinton Place	Carolyn Drive	Quinton Place	112
Verona Place	Delbrook Avenue	End of Cul-de-sac	128
W Queens Road	Delbrook Avenue	Mahon Avenue	675
St Albans Avenue	E Rockland Road	North end of Cul-de-sac	223
St Pauls Avenue	St Albans Avenue	St Pauls Avenue	54
E Braemar Rd	189 E Braemar Rd	191 E Braemar Rd	32
St Andrews Avenue	E Kings Road	E St James Road	209
Shakespeare Avenue	Dryden Way	Tennyson Crescent	117
Sunnyhurst Road	Ross Road	3030 Sunnyhurst Road	32
Dempsey Road	Lynn Valley Road	Underwood Avenue	148
Burrill Avenue	Phyllis Road	End of Cul-de-sac	120
Adderley Street	Gladstone Avenue	Brooksbank Avenue	258
Swinburne Avenue	Berkley Road	End of Cul-de-sac	155
Golf Drive	Fairway Drive	End of Cul-de-sac	257
Loach Place	Golf Drive	End of Cul-de-sac	88
Fairway Drive	Golf Drive	Cummins Place	138
Mountain Highway	Lynn Valley Road	3275 Mountain Highway	134
Capilano Road	Prospect Avenue	Edgemont Boulevard	2301
Teviot Place	Capilano Road	End of Cul-de Sac	91
Riviere Place	Edgemont Boulevard	End of Cul-de Sac	203

Table 3. Water Main Replaced in 2016 by DNV

Street	From	To	Length (m)
Oakwood Crescent	Tatlow Avenue	Tatlow Avenue	502
W 20 th Street	Bridgman Avenue	Pemberton Avenue	198
Sunnyside Drive	Gladwin Drive	1381 Sunnyside Drive	124
Ranger Avenue	Sarita Avenue	5436 Ranger Avenue	193
Clements /Cliffridge Ave	Prospect Avenue	End of Clements CDS	215
Arundel/Cheviot Rd	Lions Avenue	End of Arundel CDS	353
Tudor Avenue	Chelsea Crescent	Canterbury Crescent	133
Sunnycrest Drive	Glenview Crescent	Highlands Boulevard	224
Starlight/Newdale	4355 Starlight Way	Beaver Road	587
Croydon Place	Delbrook Road	End of Cul-de-sac	42
W Windsor Road	Stanley Avenue	Mahon Avenue	395
Wellington Drive	St Andrews	End of Cul-de-sac	78
E Kensington Road	St Andrews	End of Cul-de-sac	91
Selby Road	Kilmer Road	End of Cu-de-sac	140
Macginnis Avene	Frederick Road	Wellington Drive	205
Dovercourt Road	Mountain Highway	Macginnis Avenue	236
Wellington Drive	Mountain Highway	Macginnis Avenue	240
		3275 Mountain	
Mountain Highway	Frederick Road	Highway	314
Fromme Road	E 27 th Street	End of Cul-de-sac	173
Phyllis Road	Lynn Valley Road	Burrill Avenue	468
Hoskins Road	Arborlynn Drive	Torquay Avenue	733
Appin Road	E 14 th Street	Alderlynn Drive	234
Lytton Street	Violet Street	Lytton Place	55
Belloc Street	Berkley Road	2592 Belloc Street	273
Keats Road	Berkley Road	End of Cul-de-sac	128

Table 4. Proposed Water Main Replacement 2017

3.9 Operator Training & Qualification

The DNV's distribution system is EOCP classified as a Level 3 system. The DNV currently has distribution system operators with Level 3 operator's certification from the EOCP, keeping the DNV in full compliance with the Regulation.

4 ISSUES, INCIDENTS & RESPONSE PLANS

Issues

There were no significant water quality events in 2016.

We responded to 21 emergency water main breaks in 2016. Water main break response protocol includes maintain positive pressure to protect the water system from potential contamination.

Challenges facing the DNV in 2016 for maintaining good water quality in the distribution system were ensuring that water system maintenance and replacement programs have the greatest possible positive effect on maintaining good water quality, while at the same time achieving target levels for infrastructure repair and replacement. The capital, operating and maintenance budgets along with the staffing and management of related programs continue to be a high priority for the DNV.

Security

There were no security threats to the DNV system in 2016.

DNV water storage reservoirs and pumping facilities have secured access, intrusion detection linked to the automated SCADA alarm system and designed fail safe valve operation to inhibit or reduce the impact of security threats. Assessments of new technology and improved systems to protect DNV water supply facilities are ongoing.

Notification & Emergency Response

The table below outlines the notification process for unusual situations that could potentially affect water quality

NOTIFICATION FOR UNUSUAL SITUATIONS POTENTIALLY AFFECTING WATER QUALITY			
Situation	Notifying Agency	Agency Notified	Time Frame For Notification
<i>E. coli</i> -positive sample	M.V. Laboratory or BC Centre for Disease Control	DNV and Vancouver Coastal Health (North Shore)	Immediate
Total coliform over 10 mg/L and no free chlorine residual	DNV	Vancouver Coastal Health (North Shore)	Immediately upon receipt of sample test results
Chemical Contamination	DNV	Vancouver Coastal Health (North Shore)	Immediate
Turbidity > 5 NTU	M.V. Laboratory or GVWD Operations	DNV and Vancouver Coastal Health (North Shore)	Immediate
GVRD Disinfection failure	GVWD Operations	DNV and Vancouver Coastal Health (North Shore)	Immediate in any situation in which the BCSDWR or the GCDWQ may not be met
Loss of pressure due to high demand	DNV	GVWD Operations and Vancouver Coastal Health (North Shore)	Immediate
Watermain break where contamination is suspected	DNV	Vancouver Coastal Health (North Shore)	Immediate

Table 5. Water Quality Notification

Response Plans

The flow diagram below illustrates the process that has been put in place for response to incidents that could potentially affect water quality during a loss of system integrity. Additional or cascading response protocols are outlined after the chart.

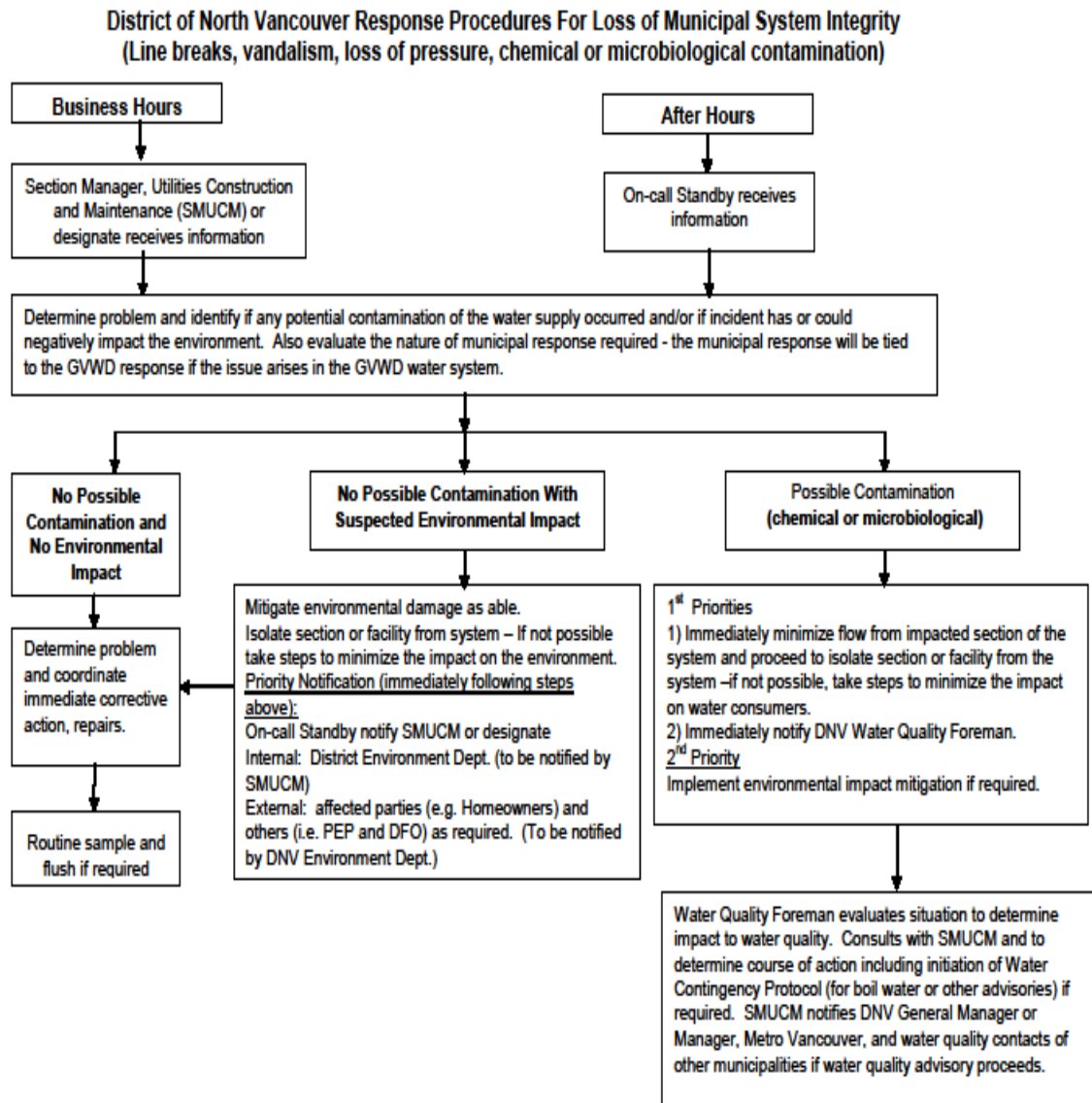


Figure 5. Loss of System Integrity Response

- ***Watermain Breaks***

Water main breaks pose an increased risk for potential contamination. Reposes procedure and repair practices are in place to reduce the risk of contamination. In instances where chemical or microbiological contamination of the system is suspected, DNV Utilities crews will make adjustments to isolate the section or facility from the system. The DNV will immediately consult with Vancouver Coastal Health (North Shore) regarding further actions, and all water quality complaints from the public will be immediately and thoroughly investigated for potential contamination.

For all watermain breaks, water samples will be taken from the vicinity of the break and tested for bacteriological, chemical and physical parameters.

- ***Turbidity Events***

Turbidity in the DNV water distribution system is monitored on a regular basis through the water sampling program. Water sampling results yielding readings greater than 1 NTU are scrutinized, along with corresponding free chlorine. Any areas from which high turbidity results originate will be flushed and re-sampled for free chlorine and turbidity.

- ***Loss of Pressure Due to High Demand***

In the event of adverse pressure loss due to high demand, DNV Utilities crews will make adjustments to the system to isolate the section or facility from the system and then take measures to supplement pressure in the affected area. The DNV will immediately consult with GVWD and Vancouver Coastal Health (North Shore) regarding further actions, and all water quality complaints from the public will be immediately and thoroughly investigated for potential contamination.

- ***Positive E-coli Results***

If a sample submitted from DNV and analysed by the Metro Vancouver laboratory or the BC Centre for Disease Control tests positive for E. coli, the following response plan will be put into action.

- i) Results of interim samples, if any, from the site will be examined by the lab. Interim samples are any samples that may have been taken from the site in the period between when the E. coli -positive sample was taken and when it was determined to be positive.
- ii) The chlorine residual noted on the sampler's field sheet will be reviewed by the lab and compared to previous readings to determine if there had been a localized loss of disinfectant residual.
- iii) The DNV Section Manager of Utilities Construction and Maintenance (SMUCM) or designate and Vancouver Coastal Health (North Shore) will be notified immediately by the laboratory.

- iv) Arrangements will be made for the immediate collection of a repeat sample (including, where possible, samples from upstream and downstream of the positive sample location).
- v) Vancouver Coastal Health (North Shore) will be contacted and the need for a “boil water” advisory will be evaluated.
- vi) If a “boil water” advisory is warranted, the public notification process as outlined in the Water Quality Monitoring And Reporting Plan For The GVRD and Member Municipalities will be followed.
- vii) The lab will contact the DNV with repeat sample results and the results of the species identification tests. The DNV will contact Vancouver Coastal Health (North Shore) to evaluate these results and to determine whether or not the advisory can be lifted.

- ***Chemical Contamination***

In the event of chemical contamination in the DNV water distribution system, Vancouver Coastal Health (North Shore) will be immediately notified. Immediate steps will be taken to isolate the contaminated area and the level of contamination will be determined through water sampling and testing. The chemical will be identified and any public health risk factors associated with the chemical presence will be determined. Through consultation with Vancouver Coastal Health (North Shore), a public advisory will be carried out.

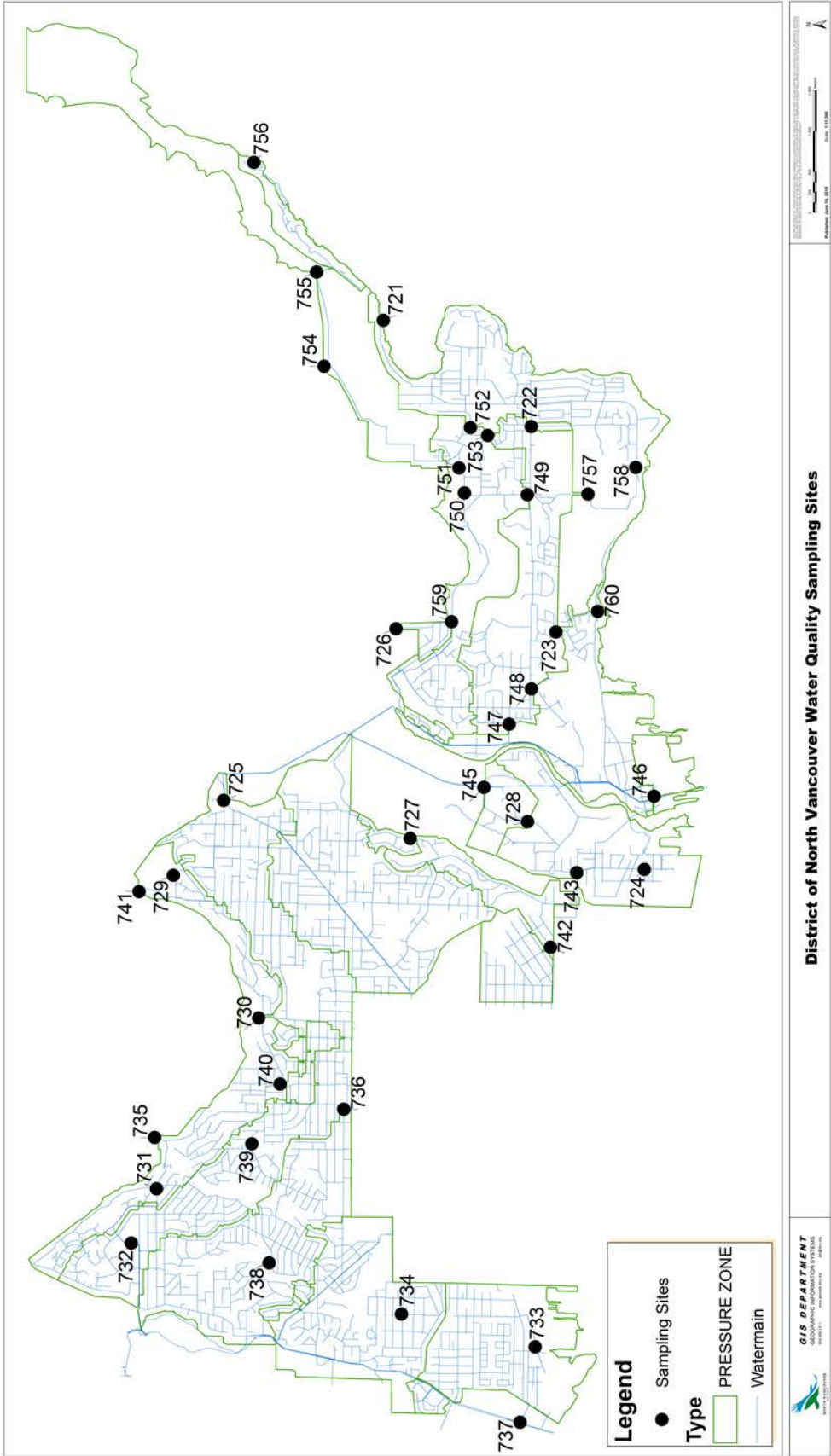
- ***Source Water Event***

In 2007 a task force comprised of Metro Vancouver, Vancouver Coastal Health, Fraser Health and member municipalities developed a communications template for source water major turbidity events. The template outlines the responsibilities of Metro Vancouver, the Health Authorities, and municipalities for notification and communications to each other and the public.

- ***GVRD Disinfection Failure***

Upon notification by GVWD Operations that an interruption in disinfection has occurred, DNV Water Quality personnel will immediately commence monitoring free chlorine residual levels at strategic locations and will contact the Vancouver Coastal Health (North Shore) if continued loss of residual is observed.

APPENDIX A: Water System, Sample Sites and Sample Schedule.



Site I.D.	Lab No.	Sample Site Location	Flow Rate
1	721	2838 Panorama Dr.	Low
2	722	Fairway & Mt Seymour Pkwy.	Medium
3	723	Plymouth Dr & Fairfield Dr.	Low
4	724	LS #13 Dominion & Mountain Hwy.	Low
5	725	Marion Pump Station	Source
6	726	Hyannis Reservoir	Low
7	727	Hoskins Rd & Kilmarnock Cres.	Medium
8	728	Lillooet Road	Low
9	729	Ramsay Pump Station	Medium
10	730	Braemar Reservoir	Low
11	731	Skyline Pump Station	Medium
12	732	Sarita Pump Station	Source
13	733	McKeen Ave & Phillip Ave.	Medium
14	734	Pemberton Heights	Low
15	735	Prospect Reservoir	Medium
16	736	PRV #4 (W Queens Rd. & Lonsdale Ave.)	Dead End
17	737	N. of BC Rail Tracks just East of Lower Cap. Rd.	Source
18	738	3906 Sunnycrest Dr.	Medium
19	739	376 Cartelier Rd.	Medium
20	740	PRV #5 (190 E. Braemar Rd.)	Medium
21	741	Mountain Hwy Reservoir (North up access Rd., N. of Mountain Hwy.)	Low
22	742	PRV # 11 (Across from 1086 Cloverly St.)	Source
23	743	PRV #7 (N across from 481 Mountain Highway)	Dead End
24	744	Not in use	
25	745	PRV # 13 (N. of 1388 Monashee Drive (Capilano College))	Source
26	746	PRV #17 (60 Riverside Dr.)	Medium
27	747	PRV # 19 (1231 Lennox St.)	Dead End
28	748	PRV # 16 (2592 Bendale Rd.)	Dead End
29	749	PRV # 18 (3728 Mt. Seymour Parkway)	Low
30	750	up path behind 1610 Mt. Seymour Rd.	Medium
31	751	Access Rd, N. end of Cascade Ct.	Low
32	752	PRV # 25 (4068 Deane Pl.)	Medium
33	753	PRV # 20 (1501 Theta Ct.)	Low
34	754	Woodlands reservoir (2.1 km N. of Hixon Rd. on Indian River Dr.)	Low
35	755	PRV # 26 3.7 km NE of Hixon Rd. on Indian River Dr.	Low
36	756	End of Fire Lane # 7 (Firelane #7 is 3.6 km from Hixon Rd.)	Dead End
37	757	PRV 200 m south of 879 Roche Point Dr.	Medium
38	758	3860 Dollarton Hwy.	Medium
39	759	Hyannis Pump Station (1919 Hyannis drive)	Low
40	760	3000 Block Dollarton Hwy.	Low

**DISTRICT OF NORTH VANCOUVER
WATER QUALITY SAMPLING AND REPORTING
CALENDAR - 2016**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<u>DISTRIBUTION SYSTEM SAMPLING</u>												
bacteria, turbidity, chlorine, temperature (twice weekly)	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
HAA's, THM's, pH (quarterly)			X		X			X		X		
metals - copper, lead, zinc (semi-annually)					X					X		
<u>NOTIFICATION</u>												
Annual Report:												
Annual report sent to MHO				X								
MHO sends Council his response					x							
Staff report to Council							x					
Posted on Web							x					

APPENDIX B: Analysis Results by Sample Site 2012 - 2016

