MUNICIPAL DRINKING WATER SUPPLIES

ANNUAL REPORT

NOTE : ANNUAL REPORT MUST BE SUBMITTED ON OR BEFORE APRIL 1.

YEAR_2020_____

MUNICIPALITY OF Annapolis

WATER UTILITY NAME Annapolis County Water

FACILITY NAME : Cornwallis

APPROVAL TO OPERATE NO. 2009-065804-02

WATER WITHDRAWAL APPROVAL NO: 2014-090991

I certify that information provided in this report is a complete and accurate representation of Water System operation.

Offences under the Environment Act:

158 A person who

(a) knowingly provides false or misleading information pursuant to a requirement under this Act to provide information;
(b) provides false or misleading information pursuant to a requirement under this Act to provide information;
(c) does not provide information as required pursuant to this Act;
(d) hinders or obstructs an inspector or administrator who is exercising powers or carrying out duties, or attempting to do so, pursuant to this Act;
(e) knowingly contravenes a term or condition of an approval, an environmental assessment approval, a temporary approval, a certificate of variance or a certificate of qualification;

Name of the person in overall direct responsible charge

[Print Name] JAMES JENNER.....

Signature .....

Manager responsible for water system [Print Name

Signature .....

PART 1 - STANDARD SUBMISSIONS.

Has the Utility submitted following updates for the next year:

Required Submission	**Yes**	**No**	**N/A** **Last year submission remains unchanged**
Contingency Plan			X
Notification Procedure			X
Monitoring Program (including sampling points location)			X
QA/QC			X
Source Water Protection Plan			X
Source Water Implementation Schedule			X
Lab Information			X
Operations Manual			X
Staff List and certification			X

PART 2 - WATER TREATMENT PLANT MONITORING

A. WATER TREATMENT

Table 1- Raw water flow

Month	Raw water flow (m^3) Source..... Lake Cady	
	Total Monthly Volume (m^3)	**Max Daily Volume (m^3/d)**
January	13830	654
February	13352	631
March	13747	644
April	14108	719
May	8614	558
Jun	14333	738
July	15222	971
August	14830	691
September	12747	634
October	14171	706
November	14481	733
December	11764	704
Total for the year.....	161199 m3	
Maximum month	July	
Average	13433.25 m3	
Water withdraw Approval No.. 2014-090991	Withdraw limit: ....1125.m3/day.....	
Approval to Operate No:.... 2009-065804-02	Rated design capacity:..4000.cu3/day...	

Table 2 - Filtered water turbidity

Month	Filter 1			Filter 2			Filter #3	
	Turbidity		Filter to waste	Turbidity		Filter to waste		
	How many times exceed Approval	**max NTU**	max (upon return to production)	**How many times exceed Approval**	**max NTU**	max	**How many times exceed Approval**	max
January	0	.166		0	.193		0	.184
February	0	.160		0	.182		0	.168
March	0	.135		0	.117		0	.117
April	0	.124		0	.189		0	.123
May	0	.063		0	.130		0	.078
Jun	0	.041		0	.134		0	.073
July	0	.078		0	.176		0	.172
August	0	.052		0	.162		0	.075
September	0	.045		0	.172		0	.053
October	0	.053		0	.160		0	.131
November	0	.189		0	.195		0	.116
December	0	.081		0	.185		0	.108
If Approval Limits for Filtration were exceeded provide date when Department was notified:								
Action taken:								

Table 2 - Well water turbidity

Month	Well 1		Well 2		Comments
	Turbidity		Turbidity		
	How many times exceed Approval	**maximum NTU**	**How many times exceed Approval**	**maximum NTU**	
January	0		0		
February	0		0		
March	0		0		
April	0		0		
May	0		0		
Jun	0		0		
July	0		0		
August	0		0		
September	0		0		
October	0		0		
November	0		0		
December	0		0		
If exceeded provide dates of occurrence and date when Department was notified.					
Action taken:					

Table 3 - Disinfection (leaving treatment plant or well)

Month	Disinfectant residual (mg/l)			CT value
	Minimum this month	**How many times below Approval limit**	**Maximum this month**	**How many times $CT_{achieved}$ was less than $CT_{required}$**
January	1.61	0	2.10	0
February	1.38	0	2.20	0
March	1.70	0	2.09	0
April	1.56	0	2.12	0
May	1.35	0	2.58	0
Jun	1.47	0	2.57	0
July	1.44	0	2.55	0
August	1.17	0	2.12	0
September	1.22	0	2.41	0
October	1.46	0	2.52	0
November	1.37	0	2.91	0
December	1.33	0	3.87	0

If Approval Limits were exceeded provide date of occurrence and date when Department was notified:

If CT requirements were not met provide date of occurrence and date when Department was notified:

Action Taken:

NOTE: CT values must be calculated daily, or minimum operational conditions must be monitored daily and records kept by Approval Holder

MINIMUM OPERATIONAL PARAMETERS TO PROVIDE REQUIRED CT
(CT calculations for "worst case scenario" must be provided to Department) See attached

Peak Daily Flow	971 m3
Temperature at CT control Point	10c
Minimum residual at CT control Point	1.17
pH at CT control Point	8.0
Water level in the tank during peak hourly flow	75%

Total chlorine use this year:...kg	**Target organism: Giardia..... Or Viruses.....**

Table 4 - Bacteriological quality (leaving treatment plant or GUDI well)

Month	Total number of samples taken	*E.coli*	Total Coliform	Giardia		Cryptosporidium	
				if tested N/A		if tested N/A	
		No. of Present this month	No. of Present this month	No. of Present this month	Total	No. of Present this month	Total
January	4	0	0	0	0	0	0
February	4	0	0	0	0	0	0
March	5	0	0	0	0	0	0
April	4	0	0	0	0	0	0
May	4	0	0	0	0	0	0
Jun	5	0	0	0	0	0	0
July	4	0	0	0	0	0	0
August	5	0	0	0	0	0	0
September	3	0	0	0	0	0	0
October	4	0	0	0	0	0	0
November	4	0	0	0	0	0	0
December	4	0	0	0	0	0	0

If *E.coli* Present provide date of occurrence and date when Department was notified:

If Total Coliforms Present provide date of occurrence and date when Department was notified

Action taken:

Certified Lab: Yarmouth Regional Hospital

Table 5 - Fluoride (if fluoridating)

Month	**Min this month (mg/l)**	**Max this month (mg/l)**
January	N/A	
February		
March		
April		
May		
Jun		
July		
August		
September		
October		
November		
December		
If exceeded Approval limits provide date of occurrence and date when Department was notified:		
Action taken:		

Table 6 - Aluminum (for facilities using aluminum-based coagulants)

	At Treatment Facility		Distribution System*	
Month	**Min this month (mg/l)**	**Max this month (mg/l)**	**Min this month (mg/l)**	**Max this month (mg/l)**
January	.175	.211	.161	.207
February	.029	.137	.037	.259
March	.027	.148	.020	.111
April	.042	.072	.071	.092
May	.037	.072	.057	.079
Jun	.029	.039	.036	.063
July	.030	.060	.031	.081
August	.029	.057	.036	.081
September	.021	.062	.036	.071
October	.041	.061	.049	.073
November	.026	.071	.016	.057
December	.040	.072	.038	.062
If Aluminum exceeded Approval limits provide date of occurrence and date when Department was notified				
Action taken:				

Table 7- pH

Month	Raw water inlet		CT Control Point	
	Minimum this month	**Maximum this month**	**Minimum this month**	**Maximum this month**
January	5.89	6.87	6.78	8.07
February	5.83	6.51	6.83	8.39
March	6.20	6.72	6.60	8.43
April	6.07	6.89	6.98	8.29
May	6.37	6.82	7.55	8.34
Jun	5.73	6.60	6.47	8.37
July	5.96	6.36	7.10	8.37
August	6.02	6.98	7.69	8.40
September	6.27	6.91	7.17	7.82
October	6.27	6.51	7.10	7.82
November	6.27	6.60	7.03	8.09
December	6.25	6.69	6.98	8.14

Comments:

Table 8 - Guidelines for Monitoring Public Drinking Water Supplies (Section 33 of Regulations)

Parameter	**Health based guideline (mg/l)**	**AO [or OG] (mg/l)**	**Raw mg/l** (maximum this year)	**Treated mg/l** (maximum this year)	**Date**	**Location**
Alkalinity	-	-	7	50	July 29	cornwallis
Aluminum	0.1/0.2		.225	.096		
Ammonia	-	-	<.03	<.03		
Antimony	0.006	-	<.002	<.002		
Arsenic	0.010	-	<.002	<.002		
Barium	1	-	.007	<.005		
Boron	5	-	.007	.007		
Cadmium	0.005	-	<.000017	<.000017		
Calcium	-	-	2.1	1.7		
Chloride	-	≤250	6	9		
Chromium	0.05	-	<.001	<.001		
Colour	-	≤15	100	5		
Conductivity	-	-	42	235		
Copper	-	≤1.0	.007	<.001		
Fluoride	1.5	-	<.12	<.12		
Hardness	-	-	6.1	6.7		
Iron	-	≤0.3	1.110	.107		
Lead	0.010	-	.001	<.00005		
Magnesium	-	-	.7	.6		
Manganese	-	≤0.05	.148	.021		
Nitrate - nitrogen	10	-	<.05	<.05		
pH	-	6.5-8.5	6.49	8.40		
Potassium	-	-	.5	.4		
Selenium	0.01	-	<.001	<.001		

Parameter	**Health based guideline (mg/l)**	**AO [or OG] (mg/l)**	**Raw mg/l** (maximum this year)	**Treated mg/l** (maximum this year)	**Date**	**Location**
Sodium	-	≤200	4.6	46.6	July 29	
Sulphate	-	≤500	<2	36		
Total Dissolved Solids	-	≤500	20	127		
Total Organic Carbon	-	-	6.9	1.5		
Turbidity	**See Approval**	-	3.2	<.5		
Uranium	0.02	-	<.0001	<.0001		
Zinc	-	≤5.0	.009	.067		
OTHER PARAMETERS SAMPLED						

Has any of the parameter exceeded Guidelines Yes..... No...X.

If Yes provide date of occurrence and date when Department was notified:

Action taken:

Certified Lab:AGAT

Table 9 - Raw Water turbidity

Month	Minimum NTU	Maximum NTU
January	.448	1.62
February	.652	1.74
March	.553	.921
April	.372	.881
May	.507	1.81
Jun	.412	1.59
July	.978	3.64
August	.996	2.3
September	.574	1.84
October	.836	1.58
November	.540	1.96
December	.672	.744

B. WASTE TREATMENT

Table 10 - Waste water discharge

Month	Suspended Solids Limit:.....		Aluminum Limit:.....		Chlorine Limit:.....		pH Limit:		Fish toxicity	
	average mg/l	Max mg/l	average mg/l	Max mg/l	average mg/l	Max mg/l	average mg/l	Max mg/l		
January										
February										
March										
April										
May										
Jun										
July										
August										
September										
October										
November										
December										

Has any of the parameter exceeded Limits Yes..... No.....

If Yes provide date of occurrence and date when Department was notified:

PART 3 - WATER DISTRIBUTION SYSTEM MONITORING

Table 11 - Distribution System Bacteriology and Disinfection Residual

Site : A	**Location: Cornwallis Mall**										
Month	***E.coli***				**Total Coliforms**				**Free chlorine residual**		
	Present	Absent	Total number of samples	% Absent	Present	Absent	Total number of samples	% Absent	Min mg/l	Max mg/l	No. below Approval Limits
January	0	4	4	100	0	4	4	100	1.23	1.65	0
February	0	4	4	100	0	4	4	100	1.08	1.88	0
March	0	5	5	100	0	5	5	100	1.01	1.80	0
April	0	4	4	100	0	4	4	100	1.30	1.92	0
May	0	4	4	100	0	4	4	100	1.26	1.65	0
Jun	0	5	5	100	0	5	5	100	.92	1.57	0
July	0	4	4	100	0	4	4	100	1.06	1.42	00
August	0	5	5	100	0	5	5	100	1.23	1.41	0
September	0	3	3	100	0	3	3	100	1.07	1.51	0
October	0	4	4	100	0	4	4	100	1.33	1.84	0
November	0	4	4	100	0	4	4	100	1.11	1.96	0
December	0	4	4	100	0	4	4	100	.87	1.75	0
If Approval limits exceeded, provide date of occurrence and date when Department was notified:											
Action taken:											

Table 11 - Distribution System Bacteriology and Disinfection Residual (continued)

Site : B	**Location: CWWTP**										
Month	***E.coli***				**Total Coliforms**				**Free chlorine residual**		
	Present	Absent	Total number of samples	% Absent	Present	Absent	Total number of samples	% Absent	Min mg/l	Max mg/l	No. below 0.2 mg/l
January	0	4	4	100	0	4	4	100	.75	1.24	0
February	0	4	4	100	0	4	4	100	.76	1.60	0
March	0	5	5	100	0	5	5	100	.45	1.24	0
April	0	4	4	100	0	4	4	100	.64	1.33	0
May	0	4	4	100	0	4	4	100	.63	1.38	0
Jun	0	5	5	100	0	5	5	100	.39	.96	0
July	0	4	4	100	0	4	4	100	.32	1.38	0
August	0	5	5	100	0	5	5	100	.34	.98	0
September	0	3	3	100	0	3	3	100	.26	1.17	0
October	0	4	4	100	0	4	4	100	.28	1.85	0
November	0	4	4	100	0	4	4	100	.26	2.73	0
December	0	4	4	100	0	4	4	100	.62	2.26	0

Was E.Coli or Total Coliform present in any sample this year **Yes..... No.....**

If Yes provide date of occurrence and date when Department was notified:

Action taken:

Table 12a - Distribution System THM's

Month	Site A Location: Mall	Site B Location CWWTP	Site C Location: CWTP
	THM total ug/l	THM total ug/l	THM total ug/l
January			
February	48	48	44
March **1st Qt**			
April			
May	67	68	57
Jun **2nd Qt**			
July	107	113	104
August			
September **3rd Qt**			
October			
November	182		
December **4th Qt**		151	94
Annual Average	101	95	74.7
Limits	0.100 mg/l THM's - Locational running annual average based on a minimum of four quarterly samples.		
Action taken:			

Table 12b - Distribution System HAA's

Month	Site A Location: Mall	Site B Location: CWWTP	Site C Location: CWTP
	HAA (5) ug/l	HAA (5) ug/l	HAA (5) ug/l
January			
February	31	29	30
March **1st Qt**			
April			
May	34.6	30.9	28.3
Jun **2nd Qt**			
July	43	26	44.6
August			
September **3rd Qt**			
October			
November	156	137	144
December **4th Qt**			
Annual Average	66.1	55.7	61.7
Limits	0.080 mg/l HAA's - Locational running annual average based on a minimum of four quarterly samples.		
Action taken:			

Table 13 - Distribution System Turbidity

Month	Site A Location: Mall		Site B Location:		Site C Location:	
	min NTU	max NTU	min NTU	max NTU	min NTU	max NTU
January	.183	.467				
February	.189	.246				
March	.331	.453				
April	.130	.291				
May	.326	.637				
Jun	.197	.325				
July	.185	.435				
August	.235	.697				
September	.152	.315				
October	.261	.426				
November	.267	.466				
December	.380	.620				

If Approval limits were exceeded provide date of occurrence and date when Department was notified:

Action taken:

Table 14 - Distribution System Lead

Month* (specify date sampled)	Site A Location: 501 Harbourview		Site B Location: 415 Dingle		Site C Location: 508 Harbourview	
	min mg/l	max mg/l	min mg/l	max mg/l	min mg/l	max mg/l
May						
Jun						
July						
August	<.5	<.5	<.5	<.5	<.5	<.5
September						
October						

If Approval limits were exceeded provide date of occurrence and date when Department was notified:

* To be sampled during warmest months

Table 15 - Distribution System Corrosion Control Program

Month	Site A Location: 501 Harbourview		Site B Location: 415 Dingle		Site C Location: 508 Harbourview	
	Parameter 1 .....Iron..	**Parameter 2** ....Langelier index...	**Parameter 1** .....Iron.....	**Parameter 2** ... Langelier index....	**Parameter 1** .....Iron.....	**Parameter 2** . Langelier index....
January						
February						
March						
April						
May						
Jun						
July						
August	55 ug	-1.41	54 ug	-1.40	<50 ug	-1.55
September						
October						
November						
December						
Comments:						

Table 16 - Storage tank chlorine residual

Month	Storage Tank Location: 490 South Broadway			Storage Tank Location.....			
	Min mg/l	**Max mg/l**	**Number of times residual was less than 0.2 mg/l**	**Min mg/l**	**Max mg/l**	**Number of times residual was less than 0.2 mg/l**	
January	1.61	2.10	0	na			
February	1.38	2.2	0				
March	1.70	2.09	0				
April	1.56	2.12	0				
May	1.35	2.58	0				
Jun	1.47	2.57	0				
July	1.44	2.55	0				
August	1.17	2.12	0				
September	1.22	2.41	0				
October	1.46	2.52	0				
November	1.37	2.91	0				
December	1.33	3.87	0				
Action taken:							
Certified Lab:							

SOURCE WATER PROTECTION PLAN ANNUAL UPDATE CHECKLIST

Yearly review of the source water protection (SWP) plan is required. The review should consider questions including, but not limited, those listed below. Every five years, or whenever significant changes to the municipal water system or risks to its source occur, the municipal unit should consider revising the plan. Otherwise, updates may be added to the original source water protection plans in an appropriately identified appendix.

QUESTIONS TO CONSIDER IN ANNUAL UPDATE
How many source water committee meetings have been held in the past year? Have there been any changes to committee membership? N/A
Have there been any changes made to the committee terms of reference? No
Have changes to the system infrastructure been made (e.g. wells constructed or decommissioned)NO
Have any new risks to the watershed or aquifer area been identified? For example: · have new land uses which could impact the source water commenced (or existing uses changed or ceased) within the watershed or aquifer area? · have recreational uses of concern continued, declined or increased with the past year within the watershed or aquifer area? NONE
If new risks have been identified, what risk reduction strategies will be employed? N/A
Have any accidents/emergencies not considered in the contingency plan occurred within the watershed or aquifer area within the past year? NO
Has source water monitoring (differs from regulatory compliance monitoring) been undertaken? Please describe the results. NONE
Has your contingency plan been reviewed and contact information updated? YES
Have any accidents/emergencies not considered in the contingency plan occurred within the watershed or aquifer area within the past year? NO
Provide an updated schedule for the implementation of the SWP plan, including items completed within the last year, items ongoing, or items yet to be completed. Based on consideration of all the above questions, identify if any items need to be added to the implementation plan.

DESCRIPTION OF ANY EMERGENCY AND UPSET CONDITIONS AND CORRECTIVE ACTION

Water main break but didn’t affect any people.

MODIFICATION TO CONTINGENCY PLAN, EMERGENCY NOTIFICATION OR PROCEDURE OR LABORATORY CHANGE:

Removed Lucas Roch from call out list.

Added John Webber and Amy Brown to call out list

RECORD OF ANY VIOLATIONS OF APPROVAL AND CORRECTIVE ACTIONS TAKEN:

None

SUMMARY OF COMPLAINTS RECEIVED AND CORRECTIVE ACTIONS:

.

None

REVIEW OF QA/QC PROGRAM TO VALIDATE PLANT INSTRUMENT AND FACILITY LAB:

Here at the county we use all the same on line monitors.

For on line chlorine we use models CL 17. These units are cleaned once a month to insure true readings. We double check all readings 4 – 5 times week depending on holidays. We check the readings using DR2000 spectrophotometers or DR 2800 spectrophotometers.

Turbidity we use Hach 1720c and 1720e model on line turbidity meters. The units are cleaned once a month. All units are double checked at least 4-5 times a week depending on holidays. The units we use to double check the readings are bench model 2100n turbidity meters. All sites have calibration tubes to calibrate the 2100n.

Ph probes are used.

Operators are required to submit their chlorine counts to the ODRC at least once a week to insure no low chlorine residuals are found.

All month end reports are sent to the ODRC.

Month end reports are then sent to the Municipal operations supervisor.

APPENDIX A: Health-related Guidelines for Canadian Drinking Water Quality (Section 35 of Regulations)

Parameter	**Health based guideline (mg/l)**	**Raw mg/l** (maximum this year)	**Treated mg/l** (maximum this year)	**Date**	**Location**
aldicarb	0.009				
aldrin + dieldrin	0.0007				
aluminum	0.1 or 0.2				
antimony	0.006				
arsenic	0.010				
atrazine + metabolites	0.005				
azinphos-methyl	0.02				
barium	1				
bendiocarb	0.04				
benzene	0.005				
benzo[a]pyrene	0.00001				
boron	5				
bromate	0.01				
bromoxynil	0.005				
cadmium	0.005				
carbaryl	0.09				
carbofuran	0.09				
carbon tetrachloride	0.005				
chloramines (total)	3.0				
chlorate	1.0				
chlorite	1.0				
chlorpyrifos	0.09				
chromium	0.05				
cyanazine	0.01				
cyanide	0.2				
cyanobacterial toxins (as microcystin-LR) - surface water only	0.0015				

Parameter	Health based guideline (mg/l)	Raw mg/l (maximum this year)	Treated mg/l (maximum this year)	Date	Location
diazinon	0.02				
dicamba	0.12				
1,2-dichlorobenzene	0.2				
1,4-dichlorobenzene	0.005				
1,2-dichloroethane	0.005				
1,1-dichloroethylene	0.014				
dichloromethane	0.05				
2,4-dichlorophenol	0.9				
dichlorophenoxyacetic acid,(2,4-D)	0.1				
diclofop-methyl	0.009				
dimethoate	0.02				
dinoseb	0.01				
diquat	0.07				
diuron	0.15				
fluoride	1.5				
glyphosate	0.28				
Haloacetic Acids (HAAs)	0.080				
lead	0.01				
malathion	0.19				
mercury	0.001				
methoxychlor	0.9				
metolachlor	0.05				
metribuzin	0.08				
monochlorobenzene	0.08				
nitrate - nitrogen	10				
nitrilotriacetic acid (NTA)	0.4				
paraquat (as dichloride)	0.01				
parathion	0.05				
pentachlorophenol	0.06				

Parameter	Health based guideline (mg/l)	Raw mg/l (maximum this year)	Treated mg/l (maximum this year)	Date	Location
phorate	0.002				
picloram	0.19				
selenium	0.01				
simazine	0.01				
terbufos	0.001				
tetrachloroethylene	0.03				
2,3,4,6-tetrachlorophenol	0.1				
trichloroethylene	0.005				
2,4,6-trichlorophenol	0.005				
trifluralin	0.045				
trihalomethanes (THM's)	0.100				
turbidity	See Approval				
uranium	0.02				
vinyl chloride	0.002				
Gross alpha	0.5 Bq/L				
Gross beta	1 Bq/L				
Lead 210	0.2 Bq/L				

Has any of the parameter exceeded Guidelines Yes..... No.....

If Yes provide date of occurrence and date when Department was notified:

Action taken:

Certified Lab: AGAT