Sarah Belisle
Senior Drinking Water Officer
Office of Drinking Water
Conservation and Water Stewardship
Unit B – 284 Reimer Avenue
Steinbach, MB R5G 0R5

March 1, 2022

Ms. Belisle,

Re: 2021 Grunthal Public Water System Report

Please find attached our annual Public Water System Report for the Community of Grunthal.

This report was posted on our website at **www.hanovermb.ca** on March 10, 2022 and hard copies were made available from our R.M.'s office at 28 Westland Drive in Mitchell, Manitoba. We notified residents that this report is available through our Facebook page.

If you have any questions or concerns, please contact Rob Driedger.

Sincerely,

Rob Driedger, C.E.T.
Manager of Engineering & Utilities
Phone: 204-346-7121
E-Mail: rob.driedger@hanovermb.ca

Grunthal Public Water System
Annual Report

2021

Rural Municipality of Hanover
March 1, 2022

Public Water System Annual Report
LUD of Grunthal – 2021

March 1, 2022

Name of Public Water System: Grunthal Public Water System

Name of legal owner: The Rural Municipality of Hanover

Contact: Rob Driedger, C.E.T., Manager of Engineering & Utilities
Phone: (204) 346-7121
E-Mail: rob.driedger@hanovermb.ca

Website: www.hanovermb.ca

Water Systems Emergency #: (204) 326-4488

Name of Operators: Barry Broesky, Utility Operator, Class II
Phone: (204) 371-0484
E-Mail: barry.broesky@hanovermb.ca

Rob Friesen, Utility Operator, Class II
Phone: (204) 371-8236
E-Mail: rob.friesen@hanovermb.ca

Table of Contents

Introduction

The 2021 Annual Report for the Grunthal Public Water Systems ability to produce safe potable water and to meet Provincial regulations.

1. Description of Water System

The Grunthal Water Treatment Plant provides potable drinking water to approximately 2125 residents within the community. Treated water produced at the water plant meets all health and aesthetic objectives as set forth in the Guidelines for *Canadian Drinking Water Quality*.

1.1 Water Supply Source

The Grunthal Water Treatment Plant receives groundwater from one main drilled well as a well as a back-up well. Both wells draw from a water source at roughly 80 feet to 90 feet below the ground surface. Then main well in use at the time produces water at approximately 200 imperial gallons per minute and this raw water is pumped to the water treatment plant reservoir. The raw water does contain some iron that it picks up in the rock aquifer but these metals do not pose any health concerns.

1.2 Intake Structures

Not applicable.

1.3 Water Treatment Process

As the raw water enters the water treatment plant it is immediately treated with Chlorine for disinfection along with HIB-5, which is an iron sequester which keeps any iron particles from settling out of the water causing staining in the piping. Once treated, the water is then stored in a 65,000 imperial gallon reservoir and a 263,000 imperial gallon reservoir from where it can then be distributed throughout the watermain system.

1.4 Distribution System

Treated water from the reservoir is pumped through the mains into the distribution system via three 20hp variable drive duty pumps. The duty pumps distribute the water at pressures of around 60psi through 150mm and 200mm watermains throughout the community. The watermains currently consists of either an AC or poly high density pipe construction.

1.5 Storage Reservoirs

As indicated above the storage reservoirs include a 65,000 imperial gallon reservoir and 263,000 imperial gallon reservoir that are above ground reservoirs.

1.6 Number of Connections, Population Served and Types of Water Users

There are approximately 607 water connections with the Grunthal Menno Home and Carleton Hatcheries being the largest users to date. Estimated population use is about 2125 people.

1.7 Classification and Certification

The Grunthal Water Treatment Plant is classified as a Class 1 Water Treatment Facility and is currently operated by two utility operators with certification under the Environmental Act's Water and Wasterwater Facility Operators Regulation. *(See Appendix A – Operator Certification)*
In addition the plant is regulated under license number PWS-09-325-02 and complies with The Drinking Water Safety Act.

2. Disinfection System in Use

2.1 Type of Disinfection System Used

The Grunthal Water Treatment Plant disinfects by adding 12% sodium hypochlorite solution to the water via a chlorinator pump.

2.2 Equipment Redundancy and Monitoring Requirements

As required by the *Drinking Water Safety Act*, the Grunthal Public Water System ensures continuous disinfection as maintained at the plant by keeping stock of all spare parts required for the chlorinator. In addition, a complete spare chlorinator is kept at the plant.

Disinfectant residuals are monitored daily at the water treatment plant and periodically in the distribution system and recorded on the appropriate monitoring forms. Monthly chlorination report forms are sent to the regional Drinking Water Officer at the end of each month.

2.3 Disinfectant Residual Overall Performance Results

For 2021, the Grunthal Public Water System was compliant in the audited time period.

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the *Guidelines for Canadian Drinking Water Quality,* developed by Health Canada. The parameters are health-based and they express the maximum acceptable concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The 2020 results for the Grunthal Public Water System are summarized in the following table.

SOURCE	PARAMETER	STANDARD	FREQUENCY	TEST RESULTS
GROUND WATER	**TC & EC***	No TC of EC	Bi-Weekly	100%
	Disinfectant	WTP (>0.5 mg/l)	Daily	100%
		Distribution (0.1 mg/l)	Bi-Weekly	100%
	Lead	0.01 mg/l	As per instructions of the Drinking Water Officer	.000086mg/l Raw .000065mg/l Treated
	Arsenic	0.01 mg/l	One Raw and One Treated water sample once every three years	.00038mg/l Raw .00043 mg/l Treated
	Benzene	.005 mg/l		.00050 mg/l Raw
	Fluoride	1.5 mg/l		.194mg/l Raw .194 mg/l Treated
	Nitrate	As Nitrate: 45 mg/l		Passed
		As Nitrogen: 10 mg/l		.0929mg/l Raw .117mg/L Treated
	Trichloroethylene	0.005 mg/l		<0.00050
	Tetrachloroethylene	0.03 mg/l		≤0.00050
	Uranium	0.02 mg/l		0.000752 Raw 0.000750 Treated

**Bacterial Testing: We test the raw water (untreated well water, the treated water leaving the treatment facility and the water in the distribution system within the Town of Grunthal, every two weeks (bi-weekly) for the presence of Total Coliform (TC) and E. Coli (EC) bacteria. If these bacteria are present in the water, it is an indication that disease-causing organisms mays also be present.*

4. **Water System Failures and Corrective Actions in 2021**

   2021 – Failure to submit a Advisory Notification plan – Advisory Notification plan is now in place, copies can be made upon request.

5. **Additional Records Required**

   Advisory Notification plan is now in place. Copies can be made upon request.

6. **Drinking Water Safety Order on your System and Actions Taken in Response**

   None

7. **Warnings Issues or Charges Laid on the System in Accordance with the Drinking Water Safety Act**

   None

8. **Major Expenses Incurred in 2021**

   None

9. **Future System Expansion and/or Increased Population**
   In 2022, there is a possibility of a new development starting construction on the NW corner of the community

10. **Appendix**
    a. Operators Certification
    b. Compliance Audit
    c. Testing Summary
    d. Analyses
    e. Operating License for Public Water System
    f. *Disinfection Reports*

Appendix A

Operators Certification

Water and Wastewater Facility Operators Certification Program

This is to certify

Barry A. Broesky

has qualified as a

Water Treatment	*Class II*
Water Distribution	*Class II*
Wastewater Treatment	*Class II*
Wastewater Collection	*Class II*

Operator

in accordance with the Water and Wastewater Facility Operators Regulation under *The Environment Act.*

Dated at Winnipeg, Manitoba **this** 7th **day of** April 2020.

Certificate No.: 2009-312
Expires: 2025 April 7
Operator ID: 00107

S. Koilen

Director
Manitoba Conservation and Climate

Certificate is the property of Manitoba Conservation and Climate and must be surrendered upon request.

Manitoba

Water and Wastewater Facility Operators Certification Program

This is to certify

Robert J. Friesen

has qualified as a

Water Treatment	*Class II*
Water Distribution	*Class II*
Wastewater Treatment	*Class II*
Wastewater Collection	*Class II*

Operator

in accordance with the Water and Wastewater Facility Operators Regulation under *The Environment Act.*

Dated at Winnipeg, Manitoba **this** 9th **day of** December 2020.

Certificate No.: 2015-260
Expires: 2025 December 9
Operator ID: 02505

S. Koivum

Director
Manitoba Conservation and Climate

Manitoba

Appendix B

Compliance Audit

Manitoba
Conservation and Climate

January 18, 2022

2021 Annual Compliance Audit

Water System: GRUNTHAL - PWS	**Code:** 86.00
Water System Owner: Rural Municipality of Hanover	**Address:** 28 Westland Drive, Mitchell, MB R5G 2N9
Operating Licence: PWS-09-325-02	**Expiry Date:** May 31, 2023
Water System Assessment Due Date: March 1, 2025	
Public Water System Annual Report Due Date: March 31, 2022	**Advisory Notification Plan Due Date:** May 1, 2022

1) This report documents compliance of the Grunthal Public Water System for the period from January 1 to December 31, 2021.

2) This report provides specific information on the non-compliance incidents identified in the summary below.

3) Other than the information provided in this report, the water supplier has complied with The Drinking Water Safety Act, its supporting regulations, and the terms and conditions of the water system's current operating licence.

4) This report is based on information submitted by the water supplier, agents of the water supplier, and / or the Province of Manitoba.

5) Where non-compliance items are identified, the issues do not necessarily translate into increased public health risk. The Office of Drinking Water uses processes, including boil water advisories, to notify water users of a public health risk.

Non-compliance with Treatment Standards:

Water system was compliant in the audited time period.

Non-compliance Incidents:

Date	Incident	Outcome
2021	Failure to submit a Advisory Notification Plan	Non-compliant

If you have any questions, please do not hesitate to contact me at (204) 371-5065.

Sincerely,

Sarah Belisle Digitally signed by Sarah Belisle
Date: 2022.01.18 11:02:55 -06'00'

Sarah Belisle
Senior Regional Drinking Water Officer

Appendix C

Testing Summary

DWQ Officer	Community Code	TC	EC	Collection Date	Sample Identification	Sample Number
SARAH	86.00	0	0	12-Jan-21	GRUNTHAL 1 - RAW	L-2547592-1
SARAH	86.00	0	0	12-Jan-21	GRUNTHAL 2 - TREATED	L-2547592-2
SARAH	86.00	0	0	12-Jan-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2547592-3
SARAH	86.00	0	0	26-Jan-21	GRUNTHAL 1 - RAW	L-2558177-1
SARAH	86.00	0	0	26-Jan-21	GRUNTHAL 2 - TREATED	L-2558177-2
SARAH	86.00	0	0	26-Jan-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2558177-3
SARAH	86.00	0	0	09-Feb-21	GRUNTHAL 1 - RAW	L-2556241-1
SARAH	86.00	0	0	09-Feb-21	GRUNTHAL 2 - TREATED	L-2556241-2
SARAH	86.00	0	0	09-Feb-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2556241-3
SARAH	86.00	0	0	24-Feb-21	GRUNTHAL 1 - RAW	L-2560995-1
SARAH	86.00	0	0	24-Feb-21	GRUNTHAL 2 - TREATED	L-2560995-2
SARAH	86.00	0	0	24-Feb-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2560995-3
SARAH	86.00	0	0	09-Mar-21	GRUNTHAL 1 - RAW	L-2565306-1
SARAH	86.00	0	0	09-Mar-21	GRUNTHAL 2 - TREATED	L-2565306-2
SARAH	86.00	0	0	09-Mar-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2565306-3
SARAH	86.00	0	0	23-Mar-21	GRUNTHAL 1 - RAW	L-2569842-1
SARAH	86.00	0	0	23-Mar-21	GRUNTHAL 2 - TREATED	L-2569842-2
SARAH	86.00	0	0	23-Mar-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2569842-3
SARAH	86.00	0	0	06-Apr-21	GRUNTHAL 1 - RAW	L-2573735-1
SARAH	86.00	0	0	06-Apr-21	GRUNTHAL 2 - TREATED	L-2573735-2
SARAH	86.00	0	0	06-Apr-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2573735-3
SARAH	86.00	0	0	20-Apr-21	GRUNTHAL 1 - RAW	L-2578639-1
SARAH	86.00	0	0	20-Apr-21	GRUNTHAL 2 - TREATED	L-2578639-2
SARAH	86.00	0	0	20-Apr-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2578639-3
SARAH	86.00	0	0	04-May-21	GRUNTHAL 1 - RAW	L-2583720-1
SARAH	86.00	0	0	04-May-21	GRUNTHAL 2 - TREATED	L-2583720-2
SARAH	86.00	0	0	04-May-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2583720-3
SARAH	86.00	0	0	18-May-21	GRUNTHAL 1 - RAW	L-2589511-1
SARAH	86.00	0	0	18-May-21	GRUNTHAL 2 - TREATED	L-2589511-2
SARAH	86.00	0	0	18-May-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2589511-3
SARAH	86.00	0	0	01-Jun-21	GRUNTHAL 1 - RAW	L-2595330-1
SARAH	86.00	0	0	01-Jun-21	GRUNTHAL 2 - TREATED	L-2595330-2
SARAH	86.00	0	0	01-Jun-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2595330-3
SARAH	86.00	0	0	15-Jun-21	GRUNTHAL 1 - RAW	L-2601771-1
SARAH	86.00	0	0	15-Jun-21	GRUNTHAL 2 - TREATED	L-2601771-2
SARAH	86.00	0	0	15-Jun-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2601771-3
SARAH	86.00	0	0	29-Jun-21	GRUNTHAL 1 - RAW	L-2608088-1
SARAH	86.00	0	0	29-Jun-21	GRUNTHAL 2 - TREATED	L-2608088-2
SARAH	86.00	0	0	29-Jun-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2608088-3
SARAH	86.00	0	0	13-Jul-21	GRUNTHAL 1 - RAW	L-2613641-1
SARAH	86.00	0	0	13-Jul-21	GRUNTHAL 2 - TREATED	L-2613641-2
SARAH	86.00	0	0	13-Jul-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2613641-3
SARAH	86.00	0	0	27-Jul-21	GRUNTHAL 1 - RAW	L-2619471-1
SARAH	86.00	0	0	27-Jul-21	GRUNTHAL 2 - TREATED	L-2619471-2
SARAH	86.00	0	0	27-Jul-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2619471-3
SARAH	86.00	0	0	10-Aug-21	GRUNTHAL 1 - RAW	L-2625068-1
SARAH	86.00	0	0	10-Aug-21	GRUNTHAL 2 - TREATED	L-2625068-2
SARAH	86.00	0	0	10-Aug-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2625068-3
SARAH	86.00	0	0	24-Aug-21	GRUNTHAL 1 - RAW	L-2631102-1
SARAH	86.00	0	0	24-Aug-21	GRUNTHAL 2 - TREATED	L-2631102-2
SARAH	86.00	0	0	24-Aug-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2631102-3
SARAH	86.00	0	0	07-Sep-21	GRUNTHAL 1 - RAW	L-2636447-1
SARAH	86.00	0	0	07-Sep-21	GRUNTHAL 2 - TREATED	L-2636447-2
SARAH	86.00	0	0	07-Sep-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2636447-3
SARAH	86.00	0	0	21-Sep-21	GRUNTHAL 1 - RAW	L-2642279-1
SARAH	86.00	0	0	21-Sep-21	GRUNTHAL 2 - TREATED	L-2642279-2
SARAH	86.00	0	0	21-Sep-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2642279-3
SARAH	86.00	0	0	05-Oct-21	GRUNTHAL 1 - RAW	L-2647813-1
SARAH	86.00	0	0	05-Oct-21	GRUNTHAL 2 - TREATED	L-2647813-2
SARAH	86.00	0	0	05-Oct-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2647813-3
SARAH	86.00	0	0	19-Oct-21	GRUNTHAL 1 - RAW	L-2653093-1
SARAH	86.00	0	0	19-Oct-21	GRUNTHAL 2 - TREATED	L-2653093-2
SARAH	86.00	0	0	19-Oct-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2653093-3
SARAH	86.00	0	0	02-Nov-21	GRUNTHAL 1 - RAW	L-2658558-1
SARAH	86.00	0	0	02-Nov-21	GRUNTHAL 2 - TREATED	L-2658558-2
SARAH	86.00	0	0	02-Nov-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2658558-3

SARAH	86.00	0	0	16-Nov-21	GRUNTHAL 1 - RAW	L-2663637-1
SARAH	86.00	0	0	16-Nov-21	GRUNTHAL 2 - TREATED	L-2663637-2
SARAH	86.00	0	0	16-Nov-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2663637-3
SARAH	86.00	0	0	06-Dec-21	GRUNTHAL 1 - RAW	L-2669819-1
SARAH	86.00	0	0	06-Dec-21	GRUNTHAL 2 - TREATED	L-2669819-2
SARAH	86.00	0	0	06-Dec-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2669819-3
SARAH	86.00	0	0	14-Dec-21	GRUNTHAL 1 - RAW	L-2672694-1
SARAH	86.00	0	0	14-Dec-21	GRUNTHAL 2 - TREATED	L-2672694-2
SARAH	86.00	0	0	14-Dec-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2672694-3
SARAH	86.00	0	0	29-Dec-21	GRUNTHAL 1 - RAW	L-2675888-1
SARAH	86.00	0	0	29-Dec-21	GRUNTHAL 2 - TREATED	L-2675888-2
SARAH	86.00	0	0	29-Dec-21	GRUNTHAL 3 - COTTONWOOD RD.	L-2675888-3

Appendix D

Analyses

RM of Hanover - Grunthal PWS
ATTN: BARRY BROESKY
Grunthal - PWS
28 Westland Drive
Mitchell MB R5G 2N9

Date Received: 28- AUG- 20
Report Date: 04- SEP- 20 13:16 (MT)
Version: FINAL

Client Phone: 204- 371- 0484

Certificate of Analysis

Lab Work Order #: L2495655

Project P.O. #:	NOT SUBMITTED
Job Reference:	GRUNTHAL - PWS 86.00
C of C Numbers:	
Legal Site Desc:	6700

Hua Wo
Chemistry Laboratory Manager

ALS Environmental

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495655-1 27-AUG-20 11:30 GRUNTHAL 1 - RAW	L2495655-2 27-AUG-20 11:30 GRUNTHAL 2 - TREATED
Colour, True	CU	15	-		28.2	<5.0
Conductivity	umhos/cm	-	-		754	771
Hardness (as CaCO3)	mg/L	-	-		386 HTC	388 HTC
Langelier Index (4 C)	No Unit	-	-		0.79	0.82
Langelier Index (60 C)	No Unit	-	-		1.6	1.6
pH	pH units	7.00-10.5	-		8.00	8.03
Total Dissolved Solids	mg/L	500	-		431	458
Transmittance, UV (254 nm)	%T/cm	-	-		89.5	90.8
Turbidity	NTU	-	-		1.59	0.64

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495655-1 27-AUG-20 11:30 GRUNTHAL 1 - RAW	L2495655-2 27-AUG-20 11:30 GRUNTHAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-		373	369
Ammonia, Total (as N)	mg/L	-	-		0.498	<0.010
Bicarbonate (HCO3)	mg/L	-	-		455	451
Bromide (Br)	mg/L	-	-		0.037	<0.010
Carbonate (CO3)	mg/L	-	-		<0.60	<0.60
Chloride (Cl)	mg/L	250	-		22.0	29.7
Fluoride (F)	mg/L	-	1.5		0.194	0.194
Hydroxide (OH)	mg/L	-	-		<0.34	<0.34
Nitrate (as N)	mg/L	-	10		0.0929	0.117
Nitrite (as N)	mg/L	-	1		<0.0010	<0.0010
Sulfate (SO4)	mg/L	500	-		40.8	40.8

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID / Sampled Date / Sampled Time / Sample ID	L2495655-1 27-AUG-20 11:30 GRUNTHAL 1 - RAW	L2495655-2 27-AUG-20 11:30 GRUNTHAL 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-		2.09	2.04
Total Organic Carbon	mg/L	-	-		2.04	1.97

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2495655-1	L2495655-2	L2495655-3
				Sampled Date	27-AUG-20	27-AUG-20	27-AUG-20
				Sampled Time	11:30	11:30	13:00
				Sample ID	GRUNTHAL 1 - RAW	GRUNTHAL 2 - TREATED	GRUNTHAL 3 - DISTRIBUTION MID-POINT
Analyte	Unit	Guide Limit #1	Guide Limit #2				
Aluminum (Al)-Total	mg/L	0.1	-		<0.0030	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.006		<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01		0.00038	0.00043	0.00038
Barium (Ba)-Total	mg/L	-	2		0.352	0.347	0.333
Beryllium (Be)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-		<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5		0.088	0.084	0.085
Cadmium (Cd)-Total	mg/L	-	0.005		<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-		87.2	88.0	87.8
Cesium (Cs)-Total	mg/L	-	-		<0.000010	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05		<0.00010	<0.00010	0.00016
Cobalt (Co)-Total	mg/L	-	-		0.00022	0.00020	0.00014
Copper (Cu)-Total	mg/L	1	2		0.00227	0.00979	0.0106
Iron (Fe)-Total	mg/L	0.3	-		0.340	0.354	0.106
Lead (Pb)-Total	mg/L	-	0.005		0.000086	0.000065	0.000358
Lithium (Li)-Total	mg/L	-	-		0.0190	0.0192	0.0190
Magnesium (Mg)-Total	mg/L	-	-		40.8	40.8	41.3
Manganese (Mn)-Total	mg/L	0.02	0.12		0.0636	0.0565	0.0172
Molybdenum (Mo)-Total	mg/L	-	-		0.000744	0.000776	0.000780
Nickel (Ni)-Total	mg/L	-	-		<0.00050	<0.00050	0.00050
Phosphorus (P)-Total	mg/L	-	-		<0.050	0.540	0.420
Potassium (K)-Total	mg/L	-	-		4.28	4.26	4.39
Rubidium (Rb)-Total	mg/L	-	-		0.00195	0.00199	0.00191
Selenium (Se)-Total	mg/L	-	0.05		<0.000050	0.000056	0.000061
Silicon (Si)-Total	mg/L	-	-		9.43	9.45	9.42
Silver (Ag)-Total	mg/L	-	-		<0.000010	<0.000010 RRV	<0.000010
Sodium (Na)-Total	mg/L	200	-		21.6	28.2	28.2
Strontium (Sr)-Total	mg/L	-	7		0.479	0.479	0.472
Sulfur (S)-Total	mg/L	-	-				14.5
Tellurium (Te)-Total	mg/L	-	-		<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-		<0.000010	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-		<0.00010	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	L2495655-1 27-AUG-20 11:30 GRUNTHAL 1 - RAW	L2495655-2 27-AUG-20 11:30 GRUNTHAL 2 - TREATED	L2495655-3 27-AUG-20 13:00 GRUNTHAL 3 - DISTRIBUTION MID-POINT
Titanium (Ti)-Total	mg/L	-	-	<0.00030	<0.00030	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.000752	0.000750	0.000758
Vanadium (V)-Total	mg/L	-	-	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-	0.0059 RRV	0.0095 RRV	0.0067 RRV
Zirconium (Zr)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Volatile Organic Compounds (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	L2495655-1 27-AUG-20 11:30 GRUNTHAL 1 - RAW
Benzene	mg/L	-	0.005	<0.00050
1,1-dichloroethene	mg/L	-	0.014	<0.00050
Dichloromethane	mg/L	-	0.05	<0.0050
Ethylbenzene	mg/L	0.0016	0.14	<0.00050
MTBE	mg/L	0.015	-	<0.00050
Tetrachloroethene	mg/L	-	0.01	<0.00050
Toluene	mg/L	0.024	0.06	<0.00050
Trichloroethene	mg/L	-	0.005	<0.00050
o-Xylene	mg/L	-	-	<0.00050
M+P-Xylenes	mg/L	-	-	<0.00040
Xylenes (Total)	mg/L	0.02	0.09	<0.00064
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-	92.7
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-	96.8

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
RRV	Reported Result Verified By Repeat Analysis
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP

Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C

True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2-L-IC-N-WP	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WP	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E

A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaportaed to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.

TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)

Turbidity in aqueous matrices is determined by the nephelometric method.

UV-%TRANS-WP	Water	UV Transmittance (Calculated)	APHA 5910B

Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um polyethersulfone (PES) filter and its UV Absorbance is measured in a quartz cell at 254 nm. UV Transmittance is calculated from the UV Absorbance result and reported as UV Transmittance per cm. The analysis is carried out without pH adjustment.

VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A

In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.

XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

ALS Environmental

Quality Control Report

Workorder: L2495655 Report Date: 04-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
LK-TITR-WP	Water							
Batch R5205048								
WG3394834-25 DUP Alkalinity, Total (as CaCO3)		**L2495601-2** 294	294		mg/L	0.1	20	28-AUG-20
WG3394834-24 LCS Alkalinity, Total (as CaCO3)			107.9		%		85-115	28-AUG-20
WG3394834-21 MB Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	28-AUG-20
R-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Bromide (Br)		**L2495655-1** 0.037	0.039		mg/L	7.2	20	28-AUG-20
WG3393905-14 LCS Bromide (Br)			99.4		%		85-115	28-AUG-20
WG3393905-13 MB Bromide (Br)			<0.010		mg/L		0.01	28-AUG-20
WG3393905-16 MS Bromide (Br)		**L2495655-1**	99.8		%		75-125	28-AUG-20
-DOC-HTC-WP	Water							
Batch R5209771								
WG3397334-7 DUP Dissolved Organic Carbon		**L2495603-8** 1.55	1.57		mg/L	1.3	20	02-SEP-20
WG3397334-6 LCS Dissolved Organic Carbon			104.2		%		80-120	02-SEP-20
WG3397334-5 MB Dissolved Organic Carbon			<0.50		mg/L		0.5	02-SEP-20
WG3397334-8 MS Dissolved Organic Carbon		**L2495603-8**	108.0		%		70-130	02-SEP-20
-TOC-HTC-WP	Water							
Batch R5209758								
WG3397434-3 DUP Total Organic Carbon		**L2495584-1** 1.60	1.50		mg/L	6.5	20	02-SEP-20
WG3397434-2 LCS Total Organic Carbon			105.5		%		80-120	02-SEP-20
WG3397434-1 MB Total Organic Carbon			<0.50		mg/L		0.5	02-SEP-20
WG3397434-4 MS Total Organic Carbon		**L2495584-2**	108.4		%		70-130	02-SEP-20
L-L-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
L-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Chloride (Cl)		**L2495655-1** 22.0	22.0		mg/L	0.0	20	28-AUG-20
WG3393905-14 LCS Chloride (Cl)			99.6		%		90-110	28-AUG-20
WG3393905-13 MB Chloride (Cl)			<0.10		mg/L		0.1	28-AUG-20
WG3393905-16 MS Chloride (Cl)		**L2495655-1**	106.3		%		75-125	28-AUG-20
OLOUR-TRUE-WP	Water							
Batch R5204661								
WG3393567-3 DUP Colour, True		**L2495512-1** 22.6	20.9		CU	7.9	20	28-AUG-20
WG3393567-6 DUP Colour, True		**L2495655-2** <5.0	<5.0	RPD-NA	CU	N/A	20	28-AUG-20
WG3393567-2 LCS Colour, True			98.9		%		85-115	29-AUG-20
WG3393567-5 LCS Colour, True			100.3		%		85-115	28-AUG-20
WG3393567-1 MB Colour, True			<5.0		CU		5	28-AUG-20
WG3393567-4 MB Colour, True			<5.0		CU		5	29-AUG-20
C-WP	Water							
Batch R5205048								
WG3394834-25 DUP Conductivity		**L2495601-2** 3250	3240		umhos/cm	0.3	10	28-AUG-20
WG3394834-23 LCS Conductivity			99.4		%		90-110	28-AUG-20
WG3394834-21 MB Conductivity			<1.0		umhos/cm		1	28-AUG-20
-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Fluoride (F)		**L2495655-1** 0.194	0.189		mg/L	2.7	20	28-AUG-20
WG3393905-14 LCS Fluoride (F)			102.6		%		90-110	28-AUG-20
WG3393905-13 MB								

ALS Environmental

Quality Control Report

Workorder: L2495655 Report Date: 04-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IC-N-WP	Water							
Batch R5208621								
WG3393905-13 MB								
Fluoride (F)			<0.020		mg/L		0.02	28-AUG-20
WG3393905-16 MS		**L2495655-1**						
Fluoride (F)			105.6		%		75-125	28-AUG-20
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-4 DUP		**WG3394876-3**						
Aluminum (Al)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	01-SEP-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Arsenic (As)-Total		0.00277	0.00280		mg/L	1.2	20	01-SEP-20
Barium (Ba)-Total		0.145	0.144		mg/L	1.0	20	01-SEP-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-SEP-20
Boron (B)-Total		0.137	0.146		mg/L	6.2	20	01-SEP-20
Cadmium (Cd)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	01-SEP-20
Calcium (Ca)-Total		67.8	71.3		mg/L	5.0	20	01-SEP-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Chromium (Cr)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Cobalt (Co)-Total		0.00053	0.00051		mg/L	3.0	20	01-SEP-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	01-SEP-20
Iron (Fe)-Total		1.24	1.25		mg/L	0.9	20	01-SEP-20
Lead (Pb)-Total		0.000052	0.000050		mg/L	4.0	20	01-SEP-20
Lithium (Li)-Total		0.0299	0.0303		mg/L	1.3	20	01-SEP-20
Magnesium (Mg)-Total		51.0	51.9		mg/L	1.8	20	01-SEP-20
Manganese (Mn)-Total		0.0141	0.0142		mg/L	0.6	20	01-SEP-20
Molybdenum (Mo)-Total		0.000584	0.000583		mg/L	0.1	20	01-SEP-20
Nickel (Ni)-Total		0.00154	0.00153		mg/L	0.4	20	01-SEP-20
Potassium (K)-Total		5.17	5.25		mg/L	1.4	20	01-SEP-20
Phosphorus (P)-Total		<0.050	<0.030	RPD-NA	mg/L	N/A	20	01-SEP-20
Rubidium (Rb)-Total		0.00273	0.00279		mg/L	2.0	20	01-SEP-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-SEP-20
Silicon (Si)-Total		5.55	5.65		mg/L	1.8	20	01-SEP-20
Silver (Ag)-Total		0.000013	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Sodium (Na)-Total		18.6	19.1		mg/L	2.8	20	01-SEP-20

ALS Environmental

Quality Control Report

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-4 DUP		**WG3394876-3**						
Strontium (Sr)-Total		0.590	0.602		mg/L	2.1	20	01-SEP-20
Sulfur (S)-Total		2.82	2.90		mg/L	3.0	20	01-SEP-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	01-SEP-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	01-SEP-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-SEP-20
Uranium (U)-Total		0.000913	0.000923		mg/L	1.1	20	01-SEP-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	01-SEP-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	01-SEP-20
WG3394876-2 LCS								
Aluminum (Al)-Total			101.4		%		80-120	01-SEP-20
Antimony (Sb)-Total			97.5		%		80-120	01-SEP-20
Arsenic (As)-Total			98.8		%		80-120	01-SEP-20
Barium (Ba)-Total			97.8		%		80-120	01-SEP-20
Beryllium (Be)-Total			98.7		%		80-120	01-SEP-20
Bismuth (Bi)-Total			97.4		%		80-120	01-SEP-20
Boron (B)-Total			98.5		%		80-120	01-SEP-20
Cadmium (Cd)-Total			99.0		%		80-120	01-SEP-20
Calcium (Ca)-Total			99.1		%		80-120	01-SEP-20
Cesium (Cs)-Total			93.4		%		80-120	01-SEP-20
Chromium (Cr)-Total			99.6		%		80-120	01-SEP-20
Cobalt (Co)-Total			97.1		%		80-120	01-SEP-20
Copper (Cu)-Total			97.9		%		80-120	01-SEP-20
Iron (Fe)-Total			96.8		%		80-120	01-SEP-20
Lead (Pb)-Total			96.5		%		80-120	01-SEP-20
Lithium (Li)-Total			96.8		%		80-120	01-SEP-20
Magnesium (Mg)-Total			111.5		%		80-120	01-SEP-20
Manganese (Mn)-Total			100.5		%		80-120	01-SEP-20
Molybdenum (Mo)-Total			97.7		%		80-120	01-SEP-20
Nickel (Ni)-Total			100.2		%		80-120	01-SEP-20
Potassium (K)-Total			101.3		%		80-120	01-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-2 LCS								
Phosphorus (P)-Total			103.1		%		80-120	01-SEP-20
Rubidium (Rb)-Total			99.96		%		80-120	01-SEP-20
Selenium (Se)-Total			100.0		%		80-120	01-SEP-20
Silicon (Si)-Total			104.3		%		80-120	01-SEP-20
Silver (Ag)-Total			95.0		%		80-120	01-SEP-20
Sodium (Na)-Total			104.0		%		80-120	01-SEP-20
Strontium (Sr)-Total			97.2		%		80-120	01-SEP-20
Sulfur (S)-Total			102.7		%		80-120	01-SEP-20
Tellurium (Te)-Total			96.0		%		80-120	01-SEP-20
Thallium (Tl)-Total			97.2		%		80-120	01-SEP-20
Thorium (Th)-Total			91.8		%		80-120	01-SEP-20
Tin (Sn)-Total			94.9		%		80-120	01-SEP-20
Titanium (Ti)-Total			96.4		%		80-120	01-SEP-20
Tungsten (W)-Total			96.6		%		80-120	01-SEP-20
Uranium (U)-Total			98.7		%		80-120	01-SEP-20
Vanadium (V)-Total			100.5		%		80-120	01-SEP-20
Zirconium (Zr)-Total			91.3		%		80-120	01-SEP-20
WG3394876-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	01-SEP-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Boron (B)-Total			<0.010		mg/L		0.01	01-SEP-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	01-SEP-20
Calcium (Ca)-Total			0.055	B	mg/L		0.05	01-SEP-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Iron (Fe)-Total			<0.010		mg/L		0.01	01-SEP-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	01-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-1 MB								
Magnesium (Mg)-Total			0.0074	B	mg/L		0.005	01-SEP-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Potassium (K)-Total			<0.050		mg/L		0.05	01-SEP-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	01-SEP-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	01-SEP-20
Silicon (Si)-Total			<0.10		mg/L		0.1	01-SEP-20
Silver (Ag)-Total			0.000011	B	mg/L		0.00001	01-SEP-20
Sodium (Na)-Total			<0.050		mg/L		0.05	01-SEP-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Sulfur (S)-Total			<0.50		mg/L		0.5	01-SEP-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	01-SEP-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	01-SEP-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	01-SEP-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	01-SEP-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	01-SEP-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	01-SEP-20
WG3394876-5 MS		**WG3394876-3**						
Aluminum (Al)-Total			93.0		%		70-130	01-SEP-20
Antimony (Sb)-Total			87.9		%		70-130	01-SEP-20
Arsenic (As)-Total			93.6		%		70-130	01-SEP-20
Barium (Ba)-Total			N/A	MS-B	%		-	01-SEP-20
Beryllium (Be)-Total			94.0		%		70-130	01-SEP-20
Bismuth (Bi)-Total			85.2		%		70-130	01-SEP-20
Boron (B)-Total			N/A	MS-B	%		-	01-SEP-20
Cadmium (Cd)-Total			91.3		%		70-130	01-SEP-20
Calcium (Ca)-Total			N/A	MS-B	%		-	01-SEP-20
Cesium (Cs)-Total			88.5		%		70-130	01-SEP-20
Chromium (Cr)-Total			94.1		%		70-130	01-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
IET-T-CCMS-WP	Water							
Batch R5208572								
WG3394876-5 MS		**WG3394876-3**						
Cobalt (Co)-Total			90.2		%		70-130	01-SEP-20
Copper (Cu)-Total			89.0		%		70-130	01-SEP-20
Iron (Fe)-Total			92.8		%		70-130	01-SEP-20
Lead (Pb)-Total			86.0		%		70-130	01-SEP-20
Lithium (Li)-Total			90.4		%		70-130	01-SEP-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	01-SEP-20
Manganese (Mn)-Total			90.3		%		70-130	01-SEP-20
Molybdenum (Mo)-Total			94.4		%		70-130	01-SEP-20
Nickel (Ni)-Total			89.9		%		70-130	01-SEP-20
Potassium (K)-Total			N/A	MS-B	%		-	01-SEP-20
Phosphorus (P)-Total			98.8		%		70-130	01-SEP-20
Rubidium (Rb)-Total			92.9		%		70-130	01-SEP-20
Selenium (Se)-Total			94.4		%		70-130	01-SEP-20
Silicon (Si)-Total			89.4		%		70-130	01-SEP-20
Silver (Ag)-Total			88.2		%		70-130	01-SEP-20
Sodium (Na)-Total			N/A	MS-B	%		-	01-SEP-20
Strontium (Sr)-Total			N/A	MS-B	%		-	01-SEP-20
Sulfur (S)-Total			100.1		%		70-130	01-SEP-20
Tellurium (Te)-Total			84.7		%		70-130	01-SEP-20
Thallium (Tl)-Total			87.1		%		70-130	01-SEP-20
Thorium (Th)-Total			90.8		%		70-130	01-SEP-20
Tin (Sn)-Total			89.3		%		70-130	01-SEP-20
Titanium (Ti)-Total			95.2		%		70-130	01-SEP-20
Tungsten (W)-Total			92.1		%		70-130	01-SEP-20
Uranium (U)-Total			90.1		%		70-130	01-SEP-20
Vanadium (V)-Total			96.5		%		70-130	01-SEP-20
Zirconium (Zr)-Total			91.1		%		70-130	01-SEP-20
H3-COL-WP	Water							
Batch R5208683								
WG3396547-7 DUP		**L2495645-1**						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	01-SEP-20
WG3396547-6 LCS								
Ammonia, Total (as N)			99.7		%		85-115	01-SEP-20
WG3396547-5 MB								

ALS Environmental

Quality Control Report

Workorder: L2495655 Report Date: 04-SEP-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
H3-COL-WP	Water							
Batch R5208683								
WG3396547-5 MB Ammonia, Total (as N)			<0.010		mg/L		0.01	01-SEP-20
WG3396547-8 MS Ammonia, Total (as N)		**L2495645-1**	98.3		%		75-125	01-SEP-20
O2-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Nitrite (as N)		**L2495655-1** <0.0010	<0.0010	RPD-NA	mg/L	N/A	20	28-AUG-20
WG3393905-14 LCS Nitrite (as N)			99.3		%		90-110	28-AUG-20
WG3393905-13 MB Nitrite (as N)			<0.0010		mg/L		0.001	28-AUG-20
WG3393905-16 MS Nitrite (as N)		**L2495655-1**	105.6		%		75-125	28-AUG-20
O3-L-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Nitrate (as N)		**L2495655-1** 0.0929	0.0942		mg/L	1.3	20	28-AUG-20
WG3393905-14 LCS Nitrate (as N)			99.7		%		90-110	28-AUG-20
WG3393905-13 MB Nitrate (as N)			<0.0050		mg/L		0.005	28-AUG-20
WG3393905-16 MS Nitrate (as N)		**L2495655-1**	106.3		%		75-125	28-AUG-20
H-WP	Water							
Batch R5205048								
WG3394834-25 DUP pH		**L2495601-2** 7.49	7.51	J	pH units	0.02	0.2	28-AUG-20
WG3394834-22 LCS pH			7.35		pH units		7.3-7.5	28-AUG-20
O4-IC-N-WP	Water							
Batch R5208621								
WG3393905-15 DUP Sulfate (SO4)		**L2495655-1** 40.8	40.8		mg/L	0.1	20	28-AUG-20
WG3393905-14 LCS Sulfate (SO4)			100.6		%		90-110	28-AUG-20
WG3393905-13 MB								

ALS Environmental

Quality Control Report

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
O4-IC-N-WP	Water							
Batch R5208621								
WG3393905-13 MB Sulfate (SO4)			<0.30		mg/L		0.3	28-AUG-20
WG3393905-16 MS Sulfate (SO4)		**L2495655-1**	104.4		%		75-125	28-AUG-20
DS-WP	Water							
Batch R5207782								
WG3392901-6 DUP Total Dissolved Solids		**L2495130-13** 2330	2300		mg/L	1.3	20	28-AUG-20
WG3392901-5 LCS Total Dissolved Solids			91.6		%		85-115	28-AUG-20
WG3392901-4 MB Total Dissolved Solids			<4.0		mg/L		4	28-AUG-20
Batch R5209595								
WG3395986-3 DUP Total Dissolved Solids		**L2495584-1** 336	340		mg/L	1.2	20	02-SEP-20
WG3395986-2 LCS Total Dissolved Solids			97.2		%		85-115	02-SEP-20
WG3395986-1 MB Total Dissolved Solids			<4.0		mg/L		4	02-SEP-20
URBIDITY-WP	Water							
Batch R5208596								
WG3396454-3 DUP Turbidity		**L2495603-8** 0.16	0.15		NTU	3.9	15	01-SEP-20
WG3396454-2 LCS Turbidity			100.5		%		85-115	01-SEP-20
WG3396454-1 MB Turbidity			<0.10		NTU		0.1	01-SEP-20
V-%TRANS-WP	Water							
Batch R5204493								
WG3393568-3 DUP Transmittance, UV (254 nm)		**L2495512-1** 61.8	62.1		%T/cm	0.5	20	28-AUG-20
WG3393568-6 DUP Transmittance, UV (254 nm)		**L2495655-2** 90.8	91.6		%T/cm	0.9	20	28-AUG-20
WG3393568-1 IRM Transmittance, UV (254 nm)		**BLANK**	100.2		%		99.5-100.5	28-AUG-20
WG3393568-4 IRM Transmittance, UV (254 nm)		**BLANK**	100.0		%		99.5-100.5	28-AUG-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
V-%TRANS-WP	Water							
Batch R5204493								
WG3393568-2 LCS								
Transmittance, UV (254 nm)			99.8		%		85-115	28-AUG-20
WG3393568-5 LCS								
Transmittance, UV (254 nm)			103.0		%		85-115	28-AUG-20
OC+F1-HSMS-WP	Water							
Batch R5208746								
WG3394914-3 DUP		**L2495584-1**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
1,1-dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Dichloromethane		<0.0050	<0.0050	RPD-NA	mg/L	N/A	30	31-AUG-20
Ethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
MTBE		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Tetrachloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
Trichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
M+P-Xylenes		<0.00040	<0.00040	RPD-NA	mg/L	N/A	30	31-AUG-20
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	31-AUG-20
WG3394914-2 LCS								
Benzene			87.5		%		70-130	31-AUG-20
1,1-dichloroethene			87.0		%		70-130	31-AUG-20
Dichloromethane			88.7		%		70-130	31-AUG-20
Ethylbenzene			86.4		%		70-130	31-AUG-20
MTBE			101.1		%		70-130	31-AUG-20
Tetrachloroethene			98.6		%		70-130	31-AUG-20
Toluene			89.0		%		70-130	31-AUG-20
Trichloroethene			87.5		%		70-130	31-AUG-20
M+P-Xylenes			92.4		%		70-130	31-AUG-20
o-Xylene			93.1		%		70-130	31-AUG-20
WG3394914-1 MB								
Benzene			<0.00050		mg/L		0.0005	31-AUG-20
1,1-dichloroethene			<0.00050		mg/L		0.0005	31-AUG-20
Dichloromethane			<0.0050		mg/L		0.005	31-AUG-20
Ethylbenzene			<0.00050		mg/L		0.0005	31-AUG-20
MTBE			<0.00050		mg/L		0.0005	31-AUG-20
Tetrachloroethene			<0.00050		mg/L		0.0005	31-AUG-20

ALS Environmental

Quality Control Report

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9

Contact: BARRY BROESKY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OC+F1-HSMS-WP	Water							
Batch R5208746								
WG3394914-1 MB								
Toluene			<0.00050		mg/L		0.0005	31-AUG-20
Trichloroethene			<0.00050		mg/L		0.0005	31-AUG-20
M+P-Xylenes			<0.00040		mg/L		0.0004	31-AUG-20
o-Xylene			<0.00050		mg/L		0.0005	31-AUG-20
Surrogate: 4-Bromofluorobenzene (SS)			92.1		%		70-130	31-AUG-20
Surrogate: 1,4-Difluorobenzene (SS)			88.7		%		70-130	31-AUG-20

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Client: RM of Hanover - Grunthal PWS
Grunthal - PWS 28 Westland Drive
Mitchell MB R5G 2N9
Contact: BARRY BROESKY

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity							
	1	27-AUG-20 11:30	01-SEP-20 10:00	3	5	days	EHT
	2	27-AUG-20 11:30	01-SEP-20 10:00	3	5	days	EHT
pH							
	1	27-AUG-20 11:30	28-AUG-20 12:00	0.25	24	hours	EHTR-FM
	2	27-AUG-20 11:30	28-AUG-20 12:00	0.25	24	hours	EHTR-FM

Legend & Qualifier Definitions:

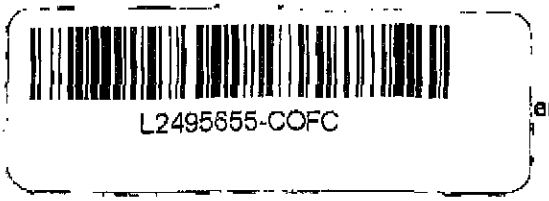
EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2495655 were received on 28-AUG-20 10:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



er Systems

Conservation and Climate
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4

Report to Operator (email PDF):		**Report to Owner (email PDF):**	
Contact:	Barry Broesky	Contact:	Luc Lahaie
Address:	28 Westland Drive, Mitchell, MB R5G 2N9	Address:	28 Westland Drive, Mitchell, MB R5G 2N9
Phone:		Phone:	(204) 346-7121
Email:	barry.broesky@hanovermb.ca	Email:	luc.lahaie@hanovermb.ca

If an update in Owner or Operator contact information is required, please

Client / Project Information:	**Lab:**	**Account:**	Agency Code: 38

Operation Name:	GRUNTHAL - PWS
Operation Code:	86.00
Operation ID:	6700
Sampled by:	

Expected Sample Ti

Please record Free & Total Chlorine residuals for Distribution By-product Samp

DO NOT COPY or RE-USE this form. Sample Number are unique to the Office of and provided by Drinking Water Officer.

Sample Number	Station Number	Sample Identification	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Sample dd-mm
2007SB5003	MB05OED021	Grunthal 1 - Raw			27-0
2007SB5004	MB05OED022	Grunthal 2 - Treated	0.90	1.26	27-08
2007SB5005	MB05OED023	Grunthal 3 - Distribution mid-point	0.68	0.91	27-0

Failure to complete all portions of this form may delay analysis.
Please fill in this form LEGIBLY.

Sample Matrix: 6-Ra
Sample Type: 1-Gra

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laborat
For ALL other testing, please use Laboratory specific forms.

Relinquished By:		Date & Time		Validated By (lab use only)	
				Sample Condition (lab use	
Received By: (lab use only)	GS	Date & Time: (lab use only)	Aug 28/07 10:45 AM	Temperature	16.1°C

Appendix E

Operating License for Public Water System

Manitoba
Conservation and Climate
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba R3H 0W4

OPERATING LICENCE FOR A PUBLIC WATER SYSTEM

LICENCE NUMBER: PWS-09-325-02

THE DRINKING WATER SAFETY ACT CHAPTER D101, C.C.S.M.

WATER SYSTEM CODE:	**86.00**
OPERATION ID:	**6700**
EFFECTIVE DATE:	**MAY 1, 2018**
EXPIRY DATE:	**MAY 31, 2023**

IN ACCORDANCE WITH *THE DRINKING WATER SAFETY ACT*, THIS OPERATING LICENCE IS ISSUED PURSUANT TO SUBSECTION 8(1) TO:

RURAL MUNICIPALITY OF HANOVER: "THE LICENSEE"

FOR THE OPERATION OF THE **GRUNTHAL PUBLIC WATER SYSTEM**, WHICH INCLUDES SECURE WELLS, TREATMENT FACILITIES, WATER STORAGE RESERVOIRS, AND DISTRIBUTION LINES, SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

THIS LICENCE DOES NOT AFFECT THE LICENSEE'S OBLIGATIONS WITH RESPECT TO COMPLIANCE WITH ALL APPLICABLE MUNICIPAL, PROVINCIAL, AND FEDERAL LEGISLATION. THIS LICENCE SUPERSEDES ALL PREVIOUS LICENSES FOR THIS PUBLIC WATER SYSTEM.

DATE: April 30, 2020

Kim Philip, P.Eng.
Director

TERMS AND CONDITIONS

1. GENERAL

1.1. The Licensee shall operate the public water system in accordance with all applicable requirements of *The Drinking Water Safety Act* and its regulations, and the requirements of this Licence. In the event that specific terms and conditions of this Licence imposed under the authority of subsection 8(3) of the Act exceed the general requirements of the Act and regulations, the specific requirements of this Licence shall apply.

1.2. The Licensee shall obtain approval from the Office of Drinking Water prior to making any significant alterations to the water source, the water treatment process, the water storage facilities, or the water distribution system.

1.3. This Licence may be amended by the Director where, in the opinion of the Director, an amendment is necessary and the amendment will not negatively impact the safety of water obtained from the water system, or effective environmental management.

1.4. The Licensee may request an amendment to this licence by submitting an amendment application to the Office of Drinking Water.

1.5. This Licence may be suspended or cancelled by the Director for any of the reasons identified in Section 11 of *Manitoba Regulation 40/2007, Drinking Water Safety Regulation* or due to a failure to comply with any term or condition of this Licence.

1.6. The Licensee shall provide written notice to the Office of Drinking Water of any change in ownership of the water system within seven days of the transfer of ownership.

1.7. The Licensee shall provide written notice to the Office of Drinking Water of any changes in the operational status of the water system, such as a permanent cessation of service, or changing the length of service from year-round to seasonal or the opposite.

1.8. The Director of the Office of Drinking Water, Medical Officer of Health or Drinking Water Officer may enter any water system facility as necessary to carry out the provisions of *The Drinking Water Safety Act* and its regulations.

1.9. The Licensee shall post a copy of the first page of this Licence at the water treatment facility.

1.10. The Licensee shall keep a copy of this Licence in its entirety at a location established by the Drinking Water Officer and ensure all operators are familiar with its terms and conditions.

1.11. The Licensee shall apply for renewal of this Licence at least 60 days prior to its expiry.

2. OPERATION - GENERAL

2.1. The Licensee shall operate all water system facilities, control systems and equipment as efficiently as possible, inspect them on a regular basis, maintain them in good working order, and ensure that the water system is protected from the risks associated with cross-contamination.

2.2. The Licensee shall ensure that all chemicals and components that may come into contact with potable water are certified safe for potable water use through AWWA Standards, ANSI/NSF Standard 60 or 61, Health Canada, or other standards acceptable to the Director.

2.3. No alternate water source shall be brought into service without the consent of the Drinking Water Officer and the maintenance of adequate cross connection control between the alternate source and the primary source.

2.4. The Licensee shall follow the requirements as specified in Operational Guideline ODW-OG-02 Seasonal Water Systems Start-up Shut-down Procedures for any portion(s) of the distribution system that operate on a seasonal basis.

2.5. The Licensee shall have re-assessments of the water system infrastructure and water supply sources completed by a qualified person, who is not an employee of the water system, in accordance with assessment checklist GW by March 1, 2025, and every five years thereafter. The Licensee may instead have the assessment completed by a qualified professional engineer, who is not an employee of the water system, in accordance with terms of reference for engineering assessments.

2.6. The Licensee shall, upon request from the Office of Drinking Water, submit or re-submit a compliance plan, in a form satisfactory to the Director, to address any non-compliance issues identified at the time.

3. OPERATION – EMERGENCIES

3.1. The Licensee shall ensure that disinfection is undertaken following construction, repair or maintenance activities on the water system, in accordance with applicable AWWA standards, or Manitoba Water Services Board specifications, or any other standards approved by the Director. A copy of all associated test results must be kept available for review by the Office of Drinking Water for a minimum of 24 months.

3.2. The Licensee shall ensure that all equipment used for disinfection is maintained in effective working order and keep available for immediate use all spare parts and chemical supplies as may be necessary to ensure continuous disinfection, including a spare disinfection unit, if necessary.

3.3. The Licensee shall immediately notify the Office of Drinking Water of any condition that may affect the ability of the water system to produce or deliver safe drinking water including but not limited to treatment upsets or bypass conditions, contamination of the source water or treated water, a disinfection system failure, or a distribution system failure.

3.4. If a Medical Officer of Health, the Director of the Office of Drinking Water, or a Drinking Water Officer issues a water advisory on the water system, the Licensee shall provide notice of the advisory to all water users in accordance with the Advisory Notification Plan.

4. WATER QUALITY/TREATMENT STANDARDS

4.1. The Licensee shall operate the water system in a manner that achieves the water quality/treatment standards specified in Table 1, as determined through the monitoring requirements specified in Table 2:

Table 1: Water Quality/Treatment Standards

Parameter	Quality Standard
Total coliform	Less than one total coliform bacteria detectable per 100 mL in all treated and distributed water
E. coli	Less than one *E. coli* bacteria detectable per 100 mL in all treated and distributed water
Chlorine Residual	A free chlorine residual of at least 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes A free chlorine residual of at least 0.1 mg/L at all times at any point in the water distribution system
Arsenic	Less than or equal to 0.01 mg/L
Benzene	Less than or equal to 0.005 mg/L
Ethylbenzene	Less than or equal to 0.14 mg/L
Fluoride	Less than or equal to 1.5 mg/L
Lead	Less than or equal to 0.01 mg/L in the water distribution system
Nitrate	Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen)
Nitrite	Less than or equal to 3 mg/L measured as nitrite (1 mg/L measured as nitrogen)
Trichloroethylene	Less than or equal to 0.005 mg/L
Tetrachloroethylene	Less than or equal to 0.01 mg/L
Toluene	Less than or equal to 0.06 mg/L
Total Xylenes	Less than or equal to 0.09 mg/L
Uranium	Less than or equal to 0.02 mg/L

4.2. If a bacteriological standard is not met, the Licensee shall immediately undertake the applicable corrective actions as listed in "Schedule A" of Manitoba Regulation 41/2007, *Drinking Water Quality Standards Regulation*.

4.3. If a microbial, chemical, radiological, or physical standard is not met, the Licensee shall immediately undertake the applicable corrective actions specified in "Schedule C" of Manitoba Regulation 41/2007, the *Drinking Water Quality Standards Regulation*.

4.4. The Licensee shall maintain in effective working order chlorination and treated water storage equipment and controls designed to achieve a minimum of 20 minutes of chlorine contact time prior to water entering the distribution system.

5. WATER QUALITY MONITORING

5.1. The Licensee shall ensure monitoring is completed as set out in Table 2.

Table 2: Monitoring Schedule

Parameter	Monitoring Requirement
Bacteriological (total coliform and *E. coli*)	Biweekly sampling program with each set of samples consisting of one raw, one treated, and a minimum of one distribution sample Consecutive sample sets to be separated by at least 12 days
Free Chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time
Free Chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
Total Chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time
Total Chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling
General Chemistry (parameter list provided by Office of Drinking Water)	One raw and one treated water sample once every three years
Total Metals (distribution system)	One sample taken at the same time(s) as General Chemistry sampling at a mid-point in the distribution system
Other Parameters	As per the instructions of the Drinking Water Officer
Lead	As per the instructions of the Drinking Water Officer

5.2. The Licensee shall ensure that an accredited laboratory, as specified in section 35 of Manitoba Regulation 40/2007 the *Drinking Water Safety Regulation*, undertake the following analysis required in Table 2:

a) bacteriological (total coliform and *E. coli*)
b) general chemistry
c) total metals
d) any other parameter required by the Drinking Water Officer

and that all samples are collected, handled, and submitted in a manner that is satisfactory to the accredited laboratory.

5.3. The Licensee shall ensure that parameters listed in Table 2 but not specified in clause 5.2 are measured utilizing certified water quality monitoring equipment and methods approved by the latest edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Water Works Association and the Water Environment Federation.

5.4. The Licensee shall ensure that raw water samples are taken on an alternating basis in instances where more than one water supply source is used.

5.5. The Licensee shall ensure that all water quality monitoring equipment is properly maintained and calibrated by a qualified person according to manufacturer recommendations and that records are maintained to that effect.

5.6. The Licensee shall ensure that sampling within the distribution system takes place at varied locations acceptable to the Drinking Water Officer.

6. RECORD-KEEPING AND REPORTING

6.1. The Licensee shall maintain in a secure location all construction drawings for the life of the water system components.

6.2. The Licensee shall retain in chronological order for a minimum of 24 months all information specified in subsection 34(2) of *Manitoba Regulation 40/2007, Drinking Water Safety Regulation.*

6.3. The Licensee shall ensure the information identified in clause 6.2 is available for inspection by any member of the public during normal business hours at the office of the water supplier or at a location convenient to the users of the system.

6.4. The Licensee shall record disinfectant residual measurements on the monthly disinfection report or other forms satisfactory to the Director.

6.5. The Licensee shall keep one copy of all monthly report forms required in this licence, and forward the original copy to the Drinking Water Officer within seven days after the end of each calendar month.

6.6. The Licensee shall record all distribution system measurements specified in *Table 2: Monitoring Schedule* on the chain of custody form (laboratory submission form) which accompanies the bacteriological sample bottles to the laboratory.

6.7. The Licensee shall ensure that water metering devices at the water treatment plant or storage reservoir are maintained in good working order and that flow meter readings are recorded on a daily basis and such records are made available for inspection by a Drinking Water Officer.

6.8. The Licensee shall submit an annual report to the Director by March 31st of each year on the operation of the water system in the immediately preceding calendar year. The report shall include the information as set out in subsection 32(2) of *Manitoba Regulation 40/2007, Drinking Water Safety Regulation.*

6.9. The Licensee shall inform the public, in a form satisfactory to the Director, when an annual report has been prepared and identify how a free copy can be obtained.

6.10. The Licensee shall make a copy of each annual report available to the public at no charge on an internet website within two weeks of the issuance of the report, unless otherwise approved by the Director. The annual report shall remain available to the public for at least one year.

6.11. The Licensee shall maintain and submit an Advisory Notification Plan to the Drinking Water Officer by May 1st of each year. The plan must include a detailed description of communication tools and methods to be used to notify the public of a drinking water emergency, considering key contacts, fan-outs, critical customers, susceptible or difficult-to-reach sub-groups, and template notices where applicable.

Appendix F

Disinfection Reports

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: January 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	8:45	R.F.	0.72	1.02	387	1,764,359	401	2,224,663
2	10:15	R.F.	0.74	1.05	394	1,764,753	412	2,225,075
3	9:15	R.F.	0.81	1.25	407	1,765,160	425	2,225,500
4	11:00	B.B.	0.76	1.18	498	1,765,658	488	2,225,988
5	6:15	B.B.	0.80	1.19	374	1,766,032	401	2,226,389
6	6:30	B.B.	0.82	1.28	505	1,766,537	507	2,226,896
7	8:30	B.B.	0.80	1.11	494	1,767,031	424	2,227,320
8	8:00	B.B.	0.84	1.20	448	1,767,479	536	2,227,856
9	10:00	B.B.	0.84	1.17	470	1,767,949	476	2,228,332
10	9:00	B.B.	0.87	1.26	415	1,768,364	401	2,228,733
11	8:00	B.B.	0.80	1.24	416	1,768,780	442	2,229,175
12	7:45	B.B.	0.88	1.25	464	1,769,244	466	2,229,641
13	6:45	B.B.	0.90	1.31	443	1,769,687	439	2,230,080
14	7:30	B.B.	0.83	1.22	463	1,770,150	470	2,230,550
15	8:30	B.B.	0.69	1.04	460	1,770,610	473	2,231,023
16	10:00	R.F.	0.52	0.73	449	1,771,059	463	2,231,486
17	9:00	R.F.	0.55	0.75	406	1,771,465	402	2,231,888
18	7:45	B.B.	0.79	1.12	375	1,771,840	414	2,232,302
19	8:00	B.B.	1.06	1.48	382	1,772,222	350	2,232,652
20	7:00	B.B.	1.07	1.50	350	1,772,572	386	2,233,038
21	6:45	B.B.	0.97	1.41	352	1,772,924	340	2,233,378
22	8:15	B.B.	0.80	1.20	392	1,773,316	398	2,233,776
23	8:15	B.B.	0.74	1.11	361	1,773,677	358	2,234,134
24	9:15	B.B.	0.73	1.05	367	1,774,044	375	2,234,509
25	8:00	B.B.	0.72	1.09	339	1,774,383	342	2,234,851
26	8:00	B.B.	0.71	1.06	381	1,774,764	386	2,235,237
27	7:15	B.B.	0.72	1.04	368	1,775,132	389	2,235,626
28	8:00	B.B.	0.73	1.08	374	1,775,506	370	2,235,996
29	8:15	B.B.	0.69	1.03	386	1,775,892	391	2,236,387
30	10:00	R.F.	0.65	1.00	394	1,776,286	401	2,236,788
31	10:00	R.F.	0.74	1.00	368	1,776,654	400	2,237,188
					12,682		**12,926**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: Feburary 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	08:00	B.B.	0.73	1.07	310	1,776,964	304	2,237,492
2	08:00	B.B.	0.82	1.13	378	1,777,342	387	2,237,879
3	07:15	B.B.	0.83	1.23	348	1,777,690	365	2,238,244
4	08:00	B.B.	0.80	1.21	365	1,778,055	371	2,238,615
5	08:00	B.B.	0.88	1.23	376	1,778,431	386	2,239,001
6	07:00	B.B.	0.85	1.19	348	1,778,779	376	2,239,377
7	08:45	B.B.	0.78	1.18	400	1,779,179	409	2,239,786
8	08:00	B.B.	0.73	1.11	357	1,779,536	329	2,240,115
9	08:00	B.B.	0.77	1.14	413	1,779,949	420	2,240,535
10	07:15	B.B.	0.78	1.09	366	1,780,315	396	2,240,931
11	08:00	B.B.	0.73	1.07	386	1,780,701	374	2,241,305
12	08:00	B.B.	0.76	1.12	369	1,781,070	375	2,241,680
13	10:15	R.F.	0.77	1.11	419	1,781,489	427	2,242,107
14	11:30	R.F.	0.94	1.27	387	1,781,876	393	2,242,500
15	08:00	R.F.	0.99	1.45	280	1,782,156	304	2,242,804
16	08:00	B.B.	0.94	1.32	415	1,782,571	393	2,243,197
17	05:45	B.B.	0.87	1.25	355	1,782,926	382	2,243,579
18	07:30	B.B.	0.85	1.28	454	1,783,380	430	2,244,009
19	07:00	B.B.	0.84	1.25	393	1,783,773	426	2,244,435
20	07:30	B.B.	0.91	1.31	372	1,784,145	379	2,244,814
21	10:00	B.B.	0.96	1.29	448	1,784,593	465	2,245,279
22	07:00	B.B.	0.98	1.37	361	1,784,954	334	2,245,613
23	07:00	B.B.	0.94	1.37	450	1,785,404	481	2,246,094
24	07:15	B.B.	0.92	1.32	415	1,785,819	388	2,246,482
25	07:15	B.B.	0.93	1.34	424	1,786,243	441	2,246,923
26	07:00	B.B.	0.88	1.30	423	1,786,666	428	2,247,351
27	11:00	R.F.	0.99	1.30	456	1,787,122	471	2,247,822
28	09:00	R.F.	0.84	1.34	357	1,787,479	373	2,248,195
29					(1,787,479)		(2,248,195)	
30								
31								
					10,825		**11,007**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: March 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	7:00	B.B.	0.81	1.11	349	1,787,828	342	2,248,537
2	7:00	B.B.	0.91	1.24	415	1,788,243	442	2,248,979
3	7:00	B.B.	0.90	1.33	385	1,788,628	382	2,249,361
4	7:00	B.B.	0.92	1.31	396	1,789,024	384	2,249,745
5	7:00	B.B.	0.91	1.27	392	1,789,416	407	2,250,152
6	8:15	B.B.	0.87	1.23	421	1,789,837	425	2,250,577
7	9:30	B.B.	0.86	1.25	456	1,790,293	463	2,251,040
8	8:30	B.B.	0.90	1.28	396	1,790,689	429	2,251,469
9	8:00	B.B.	0.92	1.33	413	1,791,102	372	2,251,841
10	7:15	B.B.	0.97	1.36	453	1,791,555	503	2,252,344
11	8:30	B.B.	0.94	1.32	436	1,791,991	426	2,252,770
12	7:00	B.B.	0.93	1.35	380	1,792,371	371	2,253,141
13	8:00	R.F.	0.88	1.25	448	1,792,819	460	2,253,601
14	7:45	R.F.	0.83	1.07	363	1,793,182	386	2,253,987
15	8:00	B.B.	0.86	1.24	393	1,793,575	396	2,254,383
16	8:00	B.B.	0.90	1.26	457	1,794,032	453	2,254,836
17	7:30	B.B.	0.90	1.29	376	1,794,408	411	2,255,247
18	8:00	B.B.	0.87	1.21	455	1,794,863	449	2,255,696
19	7:00	B.B.	0.87	1.26	380	1,795,243	403	2,256,099
20	8:00	B.B.	0.91	1.26	444	1,795,687	416	2,256,515
21	10:45	B.B.	0.92	1.27	459	1,796,146	507	2,257,022
22	8:00	B.B.	0.96	1.19	330	1,796,476	296	2,257,318
23	7:45	B.B.	0.92	1.28	467	1,796,943	493	2,257,811
24	7:00	B.B.	0.92	1.21	380	1,797,323	382	2,258,193
25	7:15	B.B.	0.87	1.17	429	1,797,752	435	2,258,628
26	7:30	B.B.	0.81	1.21	388	1,798,140	426	2,259,054
27	10:30	R.F.	1.00	1.14	506	1,798,646	490	2,259,544
28	9:30	R.F.	0.94	1.16	353	1,798,999	364	2,259,908
29	8:30	R.F.	0.87	1.08	358	1,799,357	378	2,260,286
30	8:30	R.F.	0.93	1.10	433	1,799,790	421	2,260,707
31	6:00	R.F.	0.89	0.96	347	1,800,137	371	2,261,078
					12,658		**12,883**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: April 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	8:15	R.F.	1.02	1.04	470	1,800,607	460	2,261,538
2	7:45	B.B.	0.92	1.28	450	1,801,057	460	2,261,998
3	9:00	B.B.	0.91	1.23	412	1,801,469	445	2,262,443
4	9:00	B.B.	0.86	1.23	413	1,801,882	394	2,262,837
5	7:30	B.B.	0.88	1.25	378	1,802,260	417	2,263,254
6	7:45	B.B.	0.94	1.31	529	1,802,789	505	2,263,759
7	7:30	B.B.	0.97	1.34	481	1,803,270	507	2,264,266
8	8:15	B.B.	0.90	1.27	449	1,803,719	439	2,264,705
9	8:00	B.B.	0.96	1.36	412	1,804,131	436	2,265,141
10	9:45	R.F.	1.01	1.14	435	1,804,566	428	2,265,569
11	11:30	R.F.	1.11	1.24	434	1,805,000	449	2,266,018
12	7:45	B.B.	0.91	1.23	327	1,805,327	333	2,266,351
13	8:15	B.B.	0.86	0.93	482	1,805,809	473	2,266,824
14	7:00	B.B.	0.82	0.93	389	1,806,198	429	2,267,253
15	8:00	B.B.	0.81	1.13	459	1,806,657	435	2,267,688
16	8:00	B.B.	0.81	1.13	441	1,807,098	438	2,268,126
17	7:30	B.B.	0.80	1.14	396	1,807,494	415	2,268,541
18	8:30	B.B.	0.83	1.11	414	1,807,908	428	2,268,969
19	7:00	B.B.	0.78	1.10	387	1,808,295	400	2,269,369
20	7:00	B.B.	0.75	1.08	437	1,808,732	453	2,269,822
21	7:00	B.B.	0.77	1.10	418	1,809,150	407	2,270,229
22	7:30	B.B.	0.76	1.08	421	1,809,571	426	2,270,655
23	7:30	B.B.	0.67	1.00	448	1,810,019	484	2,271,139
24	10:30	R.F.	0.69	0.92	492	1,810,511	464	2,271,603
25	8:00	R.F.	0.98	1.24	452	1,810,963	477	2,272,080
26	8:00	B.B.	1.03	1.09	414	1,811,377	430	2,272,510
27	8:00	B.B.	1.07	1.44	429	1,811,806	411	2,272,921
28	7:15	B.B.	1.22	1.67	447	1,812,253	453	2,273,374
29	8:15	B.B.	1.27	1.73	450	1,812,703	490	2,273,864
30	7:00	B.B.	1.20	1.70	390	1,813,093	366	2,274,230
31					(1,813,093)		(2,274,230)	
					12,956		**13,152**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: May 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	8:15	B.B.	1.16	1.44	414	1,813,507	432	2,274,662
2	8:00	B.B.	1.10	1.51	455	1,813,962	448	2,275,110
3	7:45	B.B.	1.14	1.59	410	1,814,372	426	2,275,536
4	8:45	B.B.	1.03	1.21	432	1,814,804	419	2,275,955
5	6:45	B.B.	1.00	1.43	402	1,815,206	433	2,276,388
6	8:15	B.B.	1.02	1.37	457	1,815,663	449	2,276,837
7	7:30	B.B.	1.04	1.39	397	1,816,060	434	2,277,271
8	8:00	R.F.	0.95	1.06	474	1,816,534	446	2,277,717
9	6:30	R.F.	0.95	1.06	443	1,816,977	464	2,278,181
10	7:00	B.B.	0.93	1.31	420	1,817,397	418	2,278,599
11	8:15	B.B.	0.93	1.29	536	1,817,933	548	2,279,147
12	7:30	B.B.	0.98	1.31	498	1,818,431	512	2,279,659
13	8:15	B.B.	0.94	1.33	616	1,819,047	621	2,280,280
14	8:15	B.B.	0.99	1.32	542	1,819,589	537	2,280,817
15	8:00	B.B.	0.95	1.31	475	1,820,064	483	2,281,300
16	9:45	B.B.	1.00	1.36	732	1,820,796	745	2,282,045
17	8:00	B.B.	0.97	1.36	542	1,821,338	546	2,282,591
18	8:00	B.B.	1.00	1.36	688	1,822,026	693	2,283,284
19	7:00	B.B.	0.96	1.35	525	1,822,551	547	2,283,831
20	7:00	B.B.	0.78	1.14	736	1,823,287	737	2,284,568
21	8:15	B.B.	0.52	0.80	585	1,823,872	589	2,285,157
22	10:00	R.F.	0.67	0.80	419	1,824,291	415	2,285,572
23	7:00	R.F.	0.86	1.12	319	1,824,610	324	2,285,896
24	9:45	R.F.	0.93	1.21	415	1,825,025	427	2,286,323
25	9:00	B.B.	0.97	1.27	454	1,825,479	435	2,286,758
26	7:00	B.B.	0.97	1.32	379	1,825,858	379	2,287,137
27	7:45	B.B.	0.94	1.24	433	1,826,291	464	2,287,601
28	7:15	B.B.	0.77	1.08	437	1,826,728	414	2,288,015
29	7:45	B.B.	0.84	1.15	502	1,827,230	490	2,288,505
30	8:45	B.B.	0.77	1.15	481	1,827,711	486	2,288,991
31	8:15	R.F.	0.92	1.05	528	1,828,239	552	2,289,543
					15,146		**15,313**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal | Plant Code: 86.0
Month/Year: June 2021 | Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	07:00	B.B.	0.96	1.25	598	1,828,837	576	2,290,119
2	07:00	B.B.	0.91	1.27	517	1,829,354	539	2,290,658
3	08:15	B.B.	0.97	1.23	671	1,830,025	658	2,291,316
4	08:00	B.B.	0.92	1.26	722	1,830,747	673	2,291,989
5	09:15	R.F.	0.51	0.57	857	1,831,604	898	2,292,887
6	11:30	R.F.	0.65	0.73	749	1,832,353	747	2,293,634
7	07:30	B.B.	1.52	1.88	387	1,832,740	424	2,294,058
8	08:00	B.B.	1.64	>2.00	569	1,833,309	601	2,294,659
9	07:00	B.B.	1.04	1.35	556	1,833,865	567	2,295,226
10	08:00	B.B.	0.86	1.10	511	1,834,376	504	2,295,730
11	07:45	B.B.	0.79	0.98	510	1,834,886	536	2,296,266
12	08:00	B.B.	0.71	0.94	468	1,835,354	456	2,296,722
13	09:30	B.B.	0.75	0.98	519	1,835,873	549	2,297,271
14	08:00	B.B.	0.81	1.15	458	1,836,331	444	2,297,715
15	08:00	B.B.	0.94	1.20	589	1,836,920	603	2,298,318
16	07:00	B.B.	0.94	1.20	588	1,837,508	590	2,298,908
17	07:45	B.B.	0.91	1.30	893	1,838,401	926	2,299,834
18	08:30	B.B.	0.99	1.32	782	1,839,183	716	2,300,550
19	10:00	R.F.	0.84	0.98	612	1,839,795	682	2,301,232
20	10:00	R.F.	0.75	0.97	531	1,840,326	551	2,301,783
21	08:00	B.B.	0.86	1.12	455	1,840,781	483	2,302,266
22	08:00	B.B.	0.74	1.15	662	1,841,443	645	2,302,911
23	07:00	B.B.	0.88	1.19	695	1,842,138	650	2,303,561
24	07:30	B.B.	0.84	1.18	695	1,842,833	693	2,304,254
25	08:00	B.B.	0.71	1.00	758	1,843,591	833	2,305,087
26	08:30	B.B.	0.62	0.92	610	1,844,201	628	2,305,715
27	09:15	B.B.	1.13	1.48	591	1,844,792	608	2,306,323
28	8::00	B.B.	1.24	1.71	523	1,845,315	532	2,306,855
29	07:30	B.B.	1.10	1.57	707	1,846,022	653	2,307,508
30	06:00	R.F.	0.89	1.03	689	1,846,711	758	2,308,266
31								
					18,472		**18,723**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: July 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	10:15	R.F.	0.52	0.67	941	1,847,652	914	2,309,180
2	8:30	R.F.	0.98	1.23	749	1,848,401	772	2,309,952
3	10:00	R.F.	0.72	0.94	872	1,849,273	835	2,310,787
4	10:00	R.F.	0.61	0.79	650	1,849,923	752	2,311,539
5	8:30	R.F.	1.18	1.40	499	1,850,422	488	2,312,027
6	8:30	R.F.	1.26	1.64	618	1,851,040	626	2,312,653
7	5:30	R.F.	1.26	1.52	512	1,851,552	537	2,313,190
8	8:00	R.F.	1.22	1.55	717	1,852,269	709	2,313,899
9	9:00	R.F.	1.10	1.50	729	1,852,998	690	2,314,589
10	10:45	R.F.	0.62	0.80	955	1,853,953	950	2,315,539
11	6:30	R.F.	0.89	1.08	747	1,854,700	855	2,316,394
12	8:00	B.B.	1.27	1.68	970	1,855,670	985	2,317,379
13	8:00	B.B.	1.15	1.53	900	1,856,570	874	2,318,253
14	6:45	B.B.	1.29	1.60	779	1,857,349	813	2,319,066
15	8:00	B.B.	1.09	1.59	825	1,858,174	685	2,319,751
16	9:00	B.B.	1.00	1.30	890	1,859,064	981	2,320,732
17	9:30	R.F.	1.20	1.49	805	1,859,869	861	2,321,593
18	10:00	R.F.	1.57	1.86	721	1,860,590	678	2,322,271
19	8:00	B.B.	0.96	1.31	745	1,861,335	830	2,323,101
20	8:00	B.B.	0.93	1.31	524	1,861,859	561	2,323,662
21	7:00	B.B.	0.90	1.26	446	1,862,305	453	2,324,115
22	7:30	B.B.	0.93	1.20	650	1,862,955	665	2,324,780
23	7:00	B.B.	0.73	1.17	722	1,863,677	642	2,325,422
24	6:45	B.B.	0.84	1.12	613	1,864,290	659	2,326,081
25	9:30	B.B.	0.74	1.12	757	1,865,047	744	2,326,825
26	7:45	B.B.	0.70	0.96	668	1,865,715	743	2,327,568
27	7:00	B.B.	0.75	0.98	688	1,866,403	649	2,328,217
28	7:15	B.B.	0.79	1.08	851	1,867,254	944	2,329,161
29	8:00	B.B.	0.96	1.15	794	1,868,048	651	2,329,812
30	8:00	B.B.	0.96	1.35	825	1,868,873	895	2,330,707
31	10:00	R.F.	0.80	1.05	788	1,869,661	850	2,331,557
					22,950		**23,291**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: August 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	6:30	R.F.	0.82	1.17	599	1,870,260	563	2,332,120
2	10:00	R.F.	0.70	1.02	817	1,871,077	750	2,332,870
3	8:00	B.B.	0.76	0.91	776	1,871,853	912	2,333,782
4	7:30	B.B.	0.74	0.89	814	1,872,667	840	2,334,622
5	8:00	B.B.	0.64	0.86	600	1,873,267	621	2,335,243
6	7:45	B.B.	0.58	0.86	472	1,873,739	484	2,335,727
7	8:00	B.B.	0.68	0.92	492	1,874,231	506	2,336,233
8	9:00	B.B.	0.66	1.02	617	1,874,848	610	2,336,843
9	7:45	B.B.	0.79	1.03	562	1,875,410	604	2,337,447
10	8:00	B.B.	0.68	0.94	504	1,875,914	498	2,337,945
11	5:30	B.B.	0.63	0.94	368	1,876,282	366	2,338,311
12	8:15	B.B.	0.81	1.03	448	1,876,730	473	2,338,784
13	8:00	B.B.	0.83	1.16	399	1,877,129	399	2,339,183
14	9:00	B.B.	0.85	1.12	417	1,877,546	415	2,339,598
15	10:30	B.B.	0.84	1.23	502	1,878,048	505	2,340,103
16	8:00	B.B.	0.88	1.13	417	1,878,465	448	2,340,551
17	8:30	B.B.	0.87	1.20	506	1,878,971	503	2,341,054
18	5:45	B.B.	0.76	1.14	542	1,879,513	574	2,341,628
19	8:00	B.B.	0.64	0.98	839	1,880,352	841	2,342,469
20	8:00	B.B.	0.71	1.03	623	1,880,975	634	2,343,103
21	7:45	B.B.	0.78	1.00	407	1,881,382	409	2,343,512
22	10:00	B.B.	0.64	1.05	479	1,881,861	467	2,343,979
23	8:00	B.B.	0.71	0.94	357	1,882,218	383	2,344,362
24	8:00	B.B.	0.70	1.03	457	1,882,675	445	2,344,807
25	6:00	R.F.	0.75	0.90	384	1,883,059	402	2,345,209
26	8:00	R.F.	0.70	0.86	479	1,883,538	474	2,345,683
27	8:30	R.F.	0.75	0.99	430	1,883,968	472	2,346,155
28	9:45	R.F.	0.73	0.96	439	1,884,407	456	2,346,611
29	8:30	R.F.	0.73	0.99	392	1,884,799	393	2,347,004
30	8:45	B.B.	0.63	0.91	438	1,885,237	438	2,347,442
31	8:00	B.B.	0.68	0.95	459	1,885,696	476	2,347,918
					16,035		**16,361**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: September 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	5:45	B.B.	0.76	0.98	405	1,886,101	385	2,348,303
2	8:00	B.B.	0.70	0.92	503	1,886,604	840	2,349,143
3	8:00	B.B.	0.75	0.98	476	1,887,080	575	2,349,718
4	7:30	B.B.	0.71	1.06	430	1,887,510	431	2,350,149
5	10:15	B.B.	0.72	0.96	466	1,887,976	478	2,350,627
6	9:00	B.B.	0.66	0.98	377	1,888,353	389	2,351,016
7	8:00	B.B.	0.77	1.00	447	1,888,800	438	2,351,454
8	5:45	B.B.	0.71	1.01	430	1,889,230	463	2,351,917
9	7:30	B.B.	0.67	0.98	534	1,889,764	541	2,352,458
10	8:00	B.B.	0.64	0.90	576	1,890,340	1,057	2,353,515
11	10:30	R.F.	0.52	0.78	563	1,890,903	516	2,354,031
12	9:30	R.F.	0.92	1.26	424	1,891,327	433	2,354,464
13	8:30	B.B.	0.98	1.25	480	1,891,807	478	2,354,942
14	8:00	B.B.	0.88	1.20	525	1,892,332	537	2,355,479
15	5:30	B.B.	0.87	1.17	445	1,892,777	452	2,355,931
16	8:00	B.B.	0.81	1.21	560	1,893,337	586	2,356,517
17	8:30	B.B.	0.91	1.16	539	1,893,876	522	2,357,039
18	8:00	B.B.	0.67	1.00	462	1,894,338	448	2,357,487
19	9:00	B.B.	0.74	0.98	500	1,894,838	495	2,357,982
20	8:00	B.B.	0.77	1.13	464	1,895,302	489	2,358,471
21	8:00	B.B.	0.71	0.91	488	1,895,790	481	2,358,952
22	5:45	B.B.	0.76	1.10	442	1,896,232	476	2,359,428
23	8:00	B.B.	0.91	1.16	542	1,896,774	543	2,359,971
24	8:45	B.B.	0.90	1.27	513	1,897,287	495	2,360,466
25	10:30	R.F.	0.68	0.88	497	1,897,784	502	2,360,968
26	10:00	R.F.	0.79	1.09	490	1,898,274	524	2,361,492
27	8:00	B.B.	0.85	1.14	443	1,898,717	439	2,361,931
28	7:45	B.B.	0.90	1.24	518	1,899,235	533	2,362,464
29	5:45	B.B.	0.92	1.23	529	1,899,764	532	2,362,996
30	7:30	B.B.	0.91	1.33	566	1,900,330	569	2,363,565
31					-		-	
					14,634		**15,647**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal | Plant Code: 86.0
Month/Year: October 2021 | Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m^3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	8:00	B.B.	1.01	1.26	552	1,900,882	557	2,364,122
2	7:00	B.B.	0.69	1.00	468	1,901,350	494	2,364,616
3	10:00	B.B.	0.75	0.98	653	1,902,003	651	2,365,267
4	8:00	B.B.	0.84	1.20	517	1,902,520	517	2,365,784
5	8:00	B.B.	1.06	1.30	529	1,903,049	535	2,366,319
6	5:45	B.B.	1.08	1.30	464	1,903,513	478	2,366,797
7	8:00	B.B.	1.28	1.67	600	1,904,113	599	2,367,396
8	8:00	B.B.	1.12	1.51	512	1,904,625	531	2,367,927
9	10:00	R.F.	0.72	0.95	538	1,905,163	529	2,368,456
10	10:30	R.F.	0.83	1.09	514	1,905,677	545	2,369,001
11	10:00	R.F.	0.86	1.20	456	1,906,133	473	2,369,474
12	7:45	B.B.	0.97	1.32	456	1,906,589	470	2,369,944
13	5:45	B.B.	0.72	1.05	477	1,907,066	472	2,370,416
14	8:00	B.B.	0.84	1.23	551	1,907,617	363	2,370,779
15	8:00	B.B.	1.22	1.56	490	1,908,107	698	2,371,477
16	8:00	B.B.	0.82	1.19	470	1,908,577	606	2,372,083
17	10:45	B.B.	0.77	1.14	543	1,909,120	603	2,372,686
18	8:00	B.B.	0.71	1.08	392	1,909,512	403	2,373,089
19	8:00	B.B.	0.76	1.14	506	1,910,018	515	2,373,604
20	5:45	B.B.	1.24	1.72	494	1,910,512	481	2,374,085
21	8:00	B.B.	1.34	1.69	794	1,911,306	915	2,375,000
22	6:15	B.B.	1.74	2.00	604	1,911,910	524	2,375,524
23	10:45	R.F.	1.32	1.58	567	1,912,477	563	2,376,087
24	6:30	R.F.	1.02	1.19	394	1,912,871	410	2,376,497
25	8:00	B.B.	1.04	1.35	479	1,913,350	456	2,376,953
26	8:00	B.B.	1.08	1.51	499	1,913,849	531	2,377,484
27	5:45	B.B.	1.12	1.46	422	1,914,271	399	2,377,883
28	7:45	B.B.	0.97	1.30	514	1,914,785	540	2,378,423
29	8:00	B.B.	0.90	1.21	521	1,915,306	503	2,378,926
30	8:30	B.B.	0.85	1.18	483	1,915,789	520	2,379,446
31	10:00	B.B.	0.96	1.22	506	1,916,295	472	2,379,918
					15,965		**16,353**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: November 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	7:45	B.B.	0.91	1.30	404	1,916,699	415	2,380,333
2	8:00	B.B.	1.00	1.28	529	1,917,228	527	2,380,860
3	5:45	B.B.	1.11	1.34	491	1,917,719	534	2,381,394
4	8:15	B.B.	1.01	1.38	581	1,918,300	548	2,381,942
5	8:00	B.B.	1.03	1.35	511	1,918,811	525	2,382,467
6	7:30	B.B.	1.00	1.33	479	1,919,290	500	2,382,967
7	9:45	B.B.	0.96	1.34	554	1,919,844	545	2,383,512
8	8:00	B.B.	0.86	1.14	442	1,920,286	465	2,383,977
9	8:00	B.B.	0.80	1.17	505	1,920,791	504	2,384,481
10	6:30	B.B.	0.81	1.08	467	1,921,258	471	2,384,952
11	10:30	R.F.	0.86	1.11	581	1,921,839	603	2,385,555
12	7:30	R.F.	0.91	1.04	419	1,922,258	435	2,385,990
13	9:00	R.F.	0.86	1.06	514	1,922,772	506	2,386,496
14	8:30	R.F.	0.84	1.19	451	1,923,223	436	2,386,932
15	8:00	B.B.	0.96	1.25	470	1,923,693	494	2,387,426
16	8:00	B.B.	1.05	1.47	512	1,924,205	531	2,387,957
17	6:30	B.B.	0.85	1.24	484	1,924,689	488	2,388,445
18	7:45	B.B.	0.63	0.79	527	1,925,216	506	2,388,951
19	8:30	B.B.	0.60	0.91	530	1,925,746	538	2,389,489
20	10:00	R.F.	1.00	1.16	527	1,926,273	563	2,390,052
21	11:30	R.F.	0.87	1.03	520	1,926,793	508	2,390,560
22	8:00	B.B.	0.66	0.85	428	1,927,221	448	2,391,008
23	8:00	B.B.	0.64	0.85	510	1,927,731	509	2,391,517
24	5:45	B.B.	0.60	0.82	462	1,928,193	470	2,391,987
25	6:45	B.B.	0.62	0.95	561	1,928,754	568	2,392,555
26	7:00	B.B.	0.68	0.94	582	1,929,336	584	2,393,139
27	8:00	B.B.	0.64	0.96	568	1,929,904	591	2,393,730
28	9:15	B.B.	0.73	1.01	522	1,930,426	525	2,394,255
29	8:30	B.B.	0.76	1.14	457	1,930,883	452	2,394,707
30	8:00	B.B.	0.85	1.13	521	1,931,404	518	2,395,225
31								
					15,109		**15,307**	

Operator Comments:

Monthly Water Chlorination Report

Community: Grunthal
Month/Year: December 2021
Plant Code: 86.0
Operators: Barry Broesky; Rob Friesen

Date	Time	Operator's Initial	Chlorine Residual (mg/L)		Distribution (m3)		Raw (m^3)	
			Free	Total	Daily	Cumulative	Daily	Cumulative
1	5:45	B.B.	0.90	1.14	472	1,931,876	512	2,395,737
2	7:45	B.B.	0.88	1.24	617	1,932,493	605	2,396,342
3	6:45	B.B.	0.94	1.22	560	1,933,053	563	2,396,905
4	10:15	R.F.	0.89	1.23	645	1,933,698	640	2,397,545
5	6:45	R.F.	1.01	1.33	406	1,934,104	434	2,397,979
6	6:00	B.B.	1.24	1.53	494	1,934,598	498	2,398,477
7	7:45	B.B.	1.20	1.59	624	1,935,222	633	2,399,110
8	6:45	B.B.	1.10	1.51	522	1,935,744	535	2,399,645
9	8:00	B.B.	0.86	1.14	593	1,936,337	613	2,400,258
10	9:30	B.B.	0.79	1.16	639	1,936,976	619	2,400,877
11	8:30	B.B.	0.79	1.05	440	1,937,416	475	2,401,352
12	8:45	B.B.	0.67	1.06	498	1,937,914	490	2,401,842
13	8:00	B.B.	0.75	1.00	449	1,938,363	444	2,402,286
14	8:00	B.B.	0.83	1.17	520	1,938,883	522	2,402,808
15	7:15	B.B.	0.85	1.19	510	1,939,393	535	2,403,343
16	7:45	B.B.	0.87	1.10	512	1,939,905	530	2,403,873
17	7:30	R.F.	0.73	1.08	592	1,940,497	557	2,404,430
18	10:00	R.F.	0.60	0.79	504	1,941,001	531	2,404,961
19	6:45	R.F.	0.59	0.91	433	1,941,434	463	2,405,424
20	9:30	R.F.	0.91	1.16	530	1,941,964	512	2,405,936
21	7:00	R.F.	1.11	1.25	435	1,942,399	441	2,406,377
22	6:00	R.F.	1.10	1.34	492	1,942,891	518	2,406,895
23	7:30	R.F.	0.98	1.27	550	1,943,441	563	2,407,458
24	7:30	R.F.	0.89	1.15	518	1,943,959	498	2,407,956
25	7:00	R.F.	0.88	1.11	521	1,944,480	557	2,408,513
26	7:00	R.F.	0.61	1.05	457	1,944,937	469	2,408,982
27	10:00	R.F.	0.71	1.07	508	1,945,445	474	2,409,456
28	10:00	R.F.	0.77	1.08	500	1,945,945	519	2,409,975
29	8:30	R.F.	0.73	1.06	520	1,946,465	526	2,410,501
30	7:30	R.F.	0.86	0.99	506	1,946,971	526	2,411,027
31	8:00	B.B.	0.81	1.13	536	1,947,507	516	2,411,543
					16,103		**16,318**	

Operator Comments: