LUCAN BIDDULPH WATER DISTRIBUTION SYSTEM

WDS # 260003071

2024 ANNUAL SUMMARY REPORT OF OPERATIONS

Managed, Operated and Maintained by:

Jacobs

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1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2024 Annual Report is to document the operation and maintenance data for the Lucan Biddulph Water Distribution System for review by the Ministry of the Environment, Conservation and Parks (MECP) in accordance with O. Reg 170/03. This report covers the period from January 1, 2024, to December 31, 2024. A copy of this report is to be made available on the Municipalities website and/or provided to interested parties upon request.

2.0 DESCRIPTION OF WATER SYSTEM

A summary of the Lucan Biddulph Water Distribution System is outlined below:

Drinking Water System Number:	260003071
Drinking Water System Name:	Lucan Biddulph Water Distribution System
Drinking Water System Owner:	Township of Lucan Biddulph
Drinking Water System Category:	Large Municipal Residential
Water Supply	Lake Huron Water Supply System
Population:	5,680
Population Serviced with Water:	3,171
2024 Average Daily Demand:	981.97 m^3/day
2024 Peak Day Demand:	1,924 m^3

Lucan Biddulph is supplied water from the Lake Huron Water Supply System (LHWSS). The Lucan Booster Station transmits the supplied water to a 2270 m3 (500,000 gal) elevated storage tank where it provides water to residence at roughly 68psi. The distribution system extends 8km to the Granton Re-Chlorination Facility in the Village of Granton, where it is re-chlorinated and stored in a 415 m3 (110,000 gal) reservoir for distribution to residence.

The Lucan Booster Station includes three (3) booster pumps, continuous chlorine analysis equipment, an emergency stand-by generator and a fully controlled supervisory control and data acquisition system (SCADA).

The system operation is such that the pipeline water delivered from the LHWSS is pumped via the booster pumps to the elevated water tower where gravity returns it to the distribution system. The water from the LHWSS is continually monitored from free chlorine levels and should the levels drop below a present setpoint, an alarm is sounded, and an operator is alerted.

The Granton re-chlorination facility receives water from Lucan. If needed, based on incoming free chlorine levels, the water is re-chlorinated and pumped from the reservoir to the distribution system in Granton. To ensure proper free chlorine levels, the facility includes two (2) continuous chlorine analyzers and two (2) chlorine injection pumps. 12% Sodium Hypochlorite is used to raise the free chlorine levels.

3.0 SUMMARY OF WATER QUALITY MONITORING

3.1 Water Quality Equipment Operation and Monitoring

One (1) distribution sample is collected daily and analyzed inhouse for free chlorine from both the Lucan and Granton distribution systems. For the reporting year a total of 787 samples were collected in conjunction with the weekly bacteriological sampling with all analysis within normal operating range. A summary of the results can be found in table 1 below.

Lucan Booster Station and Granton Re-Chlorination Facility water chlorine residuals are measured using continuous online analyzers which records data at 5-minute intervals as per the requirements of O. Reg 170/03. The regulations designate that a value of 8760 be used for number of samples when utilizing continuous monitors. A summary of the results can be found in table 1 below and were all within normal operating ranges.

Table 1 –Free Chlorine Residual Results

Month	Lucan Booster Station Online	Lucan Distribution Grab	Granton Inlet Online	Granton Outlet Online	Granton Distribution Grab
Jan	0.99	0.77	0.67	0.67	0.63
Feb	0.96	0.75	0.70	0.68	0.57
Mar	0.99	0.80	0.66	0.72	0.56
Apr	0.97	0.75	0.68	0.64	0.58
May	0.95	0.76	0.73	0.86	0.69
Jun	0.89	0.75	0.69	0.61	0.65
Jul	0.85	0.69	0.61	0.60	0.62
Aug	0.87	0.89	0.59	0.62	0.57
Sept	0.81	0.67	0.60	0.59	0.58
Oct	0.85	0.67	0.56	0.75	0.71
Nov	1.00	0.76	0.54	0.78	0.74
Dec	1.09	0.85	0.56	0.88	0.80
# of Samples	8760	366	8760	8760	421
Annual Average	0.94	0.76	0.63	0.70	0.64
Annual Min	0.69	0.39	0.41	0.39	0.42
Annual Max	1.21	1.08	1.43	1.35	1.32

*Annual Minimum and Maximum values for online analyzers represent all 5-minute data for the year, and captures data while cleaning sensors, flushing units, preforming calibrations and power outages.

3.2 Microbiological Sampling and Testing

Six (6) distribution samples are collected weekly and send out for analysis of Total Coliforms, E. Coli and HPC (Heterotrophic Plate Count) in accordance with Schedule 10 of O. Reg 170/03. A total of 319 samples were collected in the reporting year for the Lucan Biddulph WDS. A summary of the results can be found in table 2 below. It is noted that current population only requires a minimum of eleven (11) distribution samples to be collected monthly under O. Reg 170/03.

On July 25th, 2024, the Operating Authority was contacted by SGS Laboratories and was notified that a sample collected on July 23rd, at the Lions Hall was found to have two (2) total coliforms, while the MAC (Maximum Allowable Concentration) is zero (0). All applicable parties were notified of the adverse event and AWQI-165762 was initiated as a result while the Operating Authority flushed and collected resamples. The results of the resample came back free of coliforms, rectifying the event.

Table 2 –Microbiological Sampling Results

Month	Total Coliforms			E. Coli			HPC	
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples > 10
Jan	30	30	0	30	30	0	10	1
Feb	24	24	0	24	24	0	8	0
Mar	24	24	0	24	24	0	8	0
Apr	29	29	0	29	29	0	10	0
May	24	24	0	24	24	0	8	0
Jun	23	23	0	23	23	0	8	0
Jul	33	32	**1**	33	33	0	13	0
Aug	24	24	0	24	24	0	8	1
Sept	24	24	0	24	24	0	8	0
Oct	30	30	0	30	30	0	10	0
Nov	24	24	0	24	24	0	8	0
Dec	30	30	0	30	30	0	10	0
TOTAL	319	318	**1**	319	319	0	109	2

3.3 Chemical Sampling and Testing

3.3.1 – Schedule 13 Sampling

Two (2) distribution samples are collected quarterly in accordance with Schedule 13 and analyzed for THMs (Trihalomethanes) and HAAs (Haloacetic Acids). The samples collected during the 2024 calendar year were collected Jan, Apr, Jul and Oct. The results can be found in table 3 below.

Table 3 – THM and HAA Results

Month	Distribution	
	THMs (ug/L)	HAAs (ug/L)
Jan	35	19.0
Apr	36	20.6
Jul	47	19.1
Oct	58	5.3 <MDL
Average	**44.00**	**16.00**
MAC	**100**	**80**

MDL- Minimum Detection Limit
MAC – Maximum Allowable Concentration

3.3.2 – Schedule 15.1 Sampling (Lead)

One (1) distribution water sample is collected per sample season and sent out for Lead analysis in accordance with Schedule 15.1 of O. Reg 170/03. Samples were collected April 2nd and October 1st during the reporting year. All results were under the Maximum Allowable Concentration (MAC) for Lead in the distribution system. A summary of results can be found in table 4 below.

Table 4 – Lead and Alkalinity Results

Season	Alkalinity (mg/L)	pH	Lead (ug/L)
Dec - Apr	85	7.02	0.54
Jun - Oct	80	7.04	0.93
MAC			**10**

MAC - Maximum Allowable Concentration

4.0 WATER AND CHEMICAL USE

4.1 Chemical Usage

As per the Municipal Drinking Water License, all chemicals and materials used in the operation of a drinking water system shall meet all applicable standards set by both the American Water Works Association (AWWA) and the American National Standards Institute (ANSI) safety criteria stands NSF/60, NSF/61, and NSF/372.

Sodium Hypochlorite 12% (NaOCl) is used as a secondary disinfectant for the treated water and boosts the residual within the Village of Granton distribution system. Chemical use to increase free chlorine levels to desired levels is minor.

4.2 Summary of Flow Rates, Annual Volumes and Capacities

A summary of water supplied to the Lucan Biddulph Water Distribution System in 2024 can be found in table 5 below. Volumes received from the Lake Huron Water Supply System (LHWSS) are recorded daily entering the Lucan Booster Station. Volumes of water used within the Village of Granton are also recorded daily.

Table 5 – Lucan Biddulph Flows

Month	Lucan Booster Station			Granton Booster Re-Chlorination Station		
	Total Flow (m3)	Daily Average (m3/day)	Daily Max (m3)	Total Flow (m3)	Daily Average (m3/day)	Daily Max (m3)
Jan	24443	788.48	1181	1791	57.77	77
Feb	22582	778.69	1126	1629	56.17	89
Mar	24460	789.03	1031	1746	56.32	75
Apr	24666	822.20	1078	1790	59.67	100
May	31850	1027.42	1615	2834	91.42	159
Jun	32507	1083.57	1363	2454	81.80	133
Jul	34768	1121.55	1919	2331	75.19	118
Aug	31419	1013.52	1924	2219	71.58	107
Sept	32994	1099.80	1601	2231	74.37	107
Oct	31189	1006.10	1690	2095	67.58	200
Nov	31440	1048.00	1332	1856	61.87	77
Dec	37364	1205.29	1753	1863	60.10	91
Total	**359682**	-	-	**24839**	-	-
Average	-	**981.97**	-	-	**67.82**	-
Min	**22582**	**778.69**	-	**1629**	**56.17**	-
Max	**37364**	**1205.29**	**1924**	**2834**	**91.42**	**200**

5.0 IMPROVEMENTS TO SYSTEM AND ROUTINE / PREVENTATIVE MAINTENANCE

A Computerize Maintenance Management System (CMMS) is utilized to predict and track regular maintenance tasks associated with the Water Distribution System in conjunction with the Townships Maintenance Management System. The Operating Authority and the Township work together to complete all distribution flushing to ensure the overall health of the distribution system is maintained. All hydrants are inspected during the flushing programs, and any deficiencies are noted at the time so that repairs can be planned and scheduled. The Operating Authority completes all necessary repairs to hydrants in a timely manner, to ensure hydrants are always ready for use.

For the 2025 reporting year, the Township of Lucan Biddulph has budgeted to take on some capital projects,

- Water Street Watermain Replacement $400,000
- Lucan Booster Station Pump Repairs $30,000
- Granton Chemical Injection Pump Replacements $5,000

6.0 MINISTRY INSPECTION AND REGULATORY ISSUES

The MECP was onsite to complete its annual regulatory inspection on October 18th, 2024. A final inspection report was provided with an inspection rating of 98.26%. There was one (1) non-compliance issue identified during the inspection and one (1) recommendation received.

NC-1

It was noted that the Drinking Water System Profile was not updated within ten (10) days of a change occurring as per O. Reg 170/03 section 10.1. Due to management turnover within the Operating Authority, some lack of oversight occurred resulting in these documents not being submitted to the MECP. It was noted during the inspection that these System Profile updates were slated to occur immediately.

R-1

It was noted that only two (2) of the three (3) facilities had intrusion alarms installed at the time of inspection. It is recommended that the Owner ensure intrusion alarms are installed at all facilities identified in the Drinking Water Works Permit to comply with the "Recommended Standards for Water Works" guidance document.