

January 31<sup>st</sup>, 2024

**M. Jean-François Durocher**

*Water Inspector – Provincial Officer*

Ministry of the Environment, Conservation and Parks

**Subject:**

**2023 - Performance Report for the Limoges Wastewater Facility**

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M. Durocher,

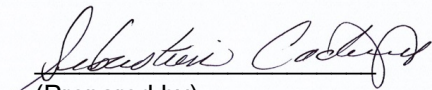
The following document includes the 2023 Performance Report for the Limoges Wastewater Facility.

In this Performance Report, a summary of the Limoges Wastewater Facility will be discussed.

- Volumes and daily flow rates of wastewater
- Results of raw sewage and final effluent parameters
- Summary of operation and environmental challenges
- Maintenance and calibration of monitoring equipment

This document follows schedule C of the Environmental Compliance Approval No. 9447-B3AL5X approved on September 21<sup>st</sup>, 2018.

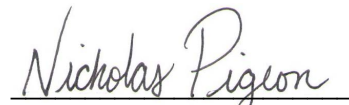
Sincerely,



(Prepared by)

Sébastien Cadieux,

Senior Water & Wastewater Operator



(Reviewed & Approved)

Nicholas Pigeon,

Director of Water & Wastewater (Acting)

## 2023 Annual Performance Report for the Limoges Wastewater Facility

**a) A summary and interpretation of all Influent, monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;**

The average daily flow of wastewater entering the Limoges Wastewater Facility in 2023 was 1356m<sup>3</sup>/day. This represents 39% of the average day design capacity rated at 3500m<sup>3</sup>/day. The maximum daily flow of wastewater entering the Limoges facility was 3711 m<sup>3</sup> during the month of April and the minimum was 744 m<sup>3</sup> in September.

See Appendix I, for a summary of all the Influent monitoring.

**b) A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in the Approval, including an overview of the success and adequacy of the Works;**

See Appendix II, this includes all the effluent sampling results and loadings of required ECA parameters.

**c) A summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;**

- The surface water sample table "Schedule D" as per ECA 9447-B3AL5X was sampled during 2023, no deviations to report.

Please see Appendix III for the schedule of 2024.

**d) A summary of all operating issues encountered and corrective actions taken;**

During the operating year for 2023, the treatment facility didn't encounter any major issues other than the Effluent limits for certain parameters. Those non-compliances were mainly for the Total Ammonia and CBOD5.

Our operational staff performed additional sampling throughout the treatment process and are working with a new process engineer to help mitigate the exceedances in the future. A consultation with MECP was conducted in May. An Assimilative capacity Study is currently ongoing for the Castor River.

The following reference numbers were reported to the MECP during 2023; 1-30K1QJ, 1-32GN6C, 1-3COM6A, 1-3G6BI4, 1-3J6LFP, 1-3N4LS6, 1-3PGEEZ, 1-3TYO9M, 1-3XUQY6,

**e) A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;**

In addition to regular preventative maintenance, the following operational duties were performed.

- **January,**  
SPS cleaning with the Nation Personnel
  
- **April,**
  - Started to empty West Biocord Cell.
  
- **May,**
  - Cleaned all West Biocord cell with Lamoureux pumping and Nation hydroVac. Clean all biocord cages. Installed a new Alum line at the Effluent of the Biocord cell. Install a sampling line directly on the Effluent pipe of the Cell. Inspected for any deficiencies and put back into service.
  
  - Moved the Filter backwash pipe discharge from the polishing cell to the Equalization cell to the East.
  
  - Cleaned all East Biocord cell with Lamoureux pumping and Nation hydroVac. Clean all biocord cages. Installed a new Alum line at the Effluent of the Biocord cell. Install a sampling line directly on the Effluent pipe of the Cell. Inspected for any deficiencies and put back into service.
  
- **July,**
  - Installed saddle and sampling line on settling cell effluent pipe.
  - Bishop onsite for sludge removal in settling cell with dredger – 5 day operation.
  - Re-installed 2 existing blowers in alum building for aerators in the polishing cell.
  
- **August,**
  - Cleaned all SPS with Nation's personnel.
  
- **September,**
  - Started flushing and cleaning all sanitary sewer lines of Limoges with Nation hydrovac.
  
- **October,**
  - Start annual maintenance program.
  - Flow meter calibration with Capital Control
  
- **November,**
  - Install new generator on concrete slab at SPS#2 with Electrotek

- **December,**
- Upgraded all Radios & PLC on SCADA system.
- Clean air release collection system in Limoges

**f) A summary of any effluent quality assurance or control measures undertaken;**

Monitoring and recording of Effluent was taken during the 2023 period and the results are presented in the Analytical survey 2023, see Appendix II.

An average of 288 mg/L of coagulant (Aluminium sulphate) was the dosage added to the inlet wastewater pipe for the Limoges wastewater facility this year.

Additional in-house sampling was performed throughout the treatment process to identify all process are performing well. Ammonia levels are still a challenge in 2023 and we are still working towards a solution to improved results in 2024.

**g) A summary of the calibration and maintenance carried out on all Influent and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;**

- **October,**
- Annual Calibration of Flow meters.

**h) A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:**

**i. When any of the design objectives is not achieved more that 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;**

The Final Effluent quality reoccurring challenge in 2023 was with Total Ammonia levels. The levels were non-compliant throughout many months. Data was gathered and will be analyzed in 2024 with our process engineer to present options and solutions to the issue. MECP will be part of the consultation process.

**ii. When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;**

We are now at 39% of the rated inflow capacity of 3500m<sup>3</sup>/day.

**i) A tabulation of the estimated volume of the sludge generated in the lagoon cells. Sludge volume is to be measured every five (5) years but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period.**

The wastewater total influent flow and the average quality of parameters was used to calculate the amount of sludge produced in 2023.

	Alum (mg/L)	TSS (mg/L)	Flow (m3)	Total KG	
2023	288	175	486474		
KG	30822	85132		115954	Sludge

As per this table a total of 115954 Kg of sludge was produced in 2023.

No disposal of sludge was brought outside of the facility. The De-sludging operation was performed in the Settling cell and was pumped with a hose directly in the East cell which is currently not in use.

**j) A summary of any complaints received, and any steps taken to address the complaints.**

No complaints received.

**k) A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;**

There was no Bypasses, Overflows or other abnormal events.

**l) A summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.**

N/A.

**m) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted;**

The collection sewer system was flushed and inspected by the Nation's personnel to mitigate any issues in the infrastructure.

**n) Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works;**

N/A.

**Appendix I: Analytical Survey, Influent**

**Appendix II: Limoges, Wastewater Effluent & Loadings**

**Appendix III: Sampling schedule 2024**

# APPENDIX I

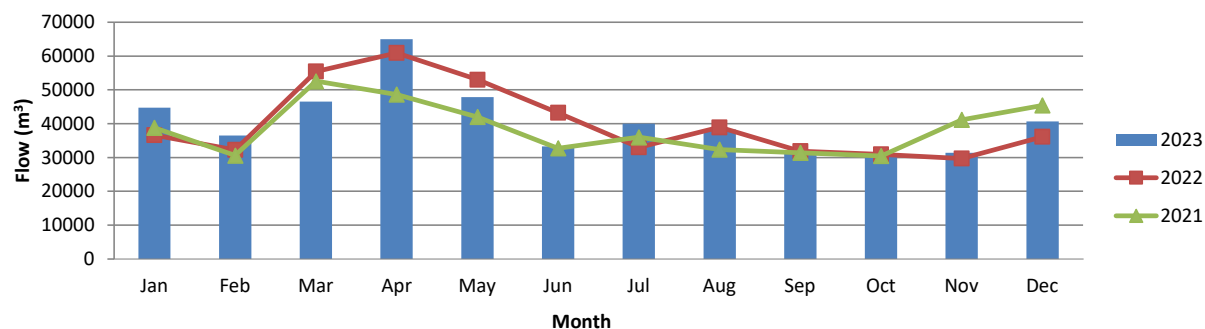
## Waste Water - Analytical survey



Limoges

		2023	Limit	Limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
RAW SEWAGE		C of A	Federal														
Total Flow	$m^3$			44686	36543	46535	64971	47885	33321	39955	38281	31331	30918	31400	40649	486474.7	
Daily Ave. Flow	$m^3/d$	3500		1441	1305	1501	2166	1545	1149	1289	1367	1080	1031	1083	1311	1356	
Max Flow	$m^3/d$			2106	1778	2260	3711	2246	1404	1813	1584	1319	1142	1298	1660	3711	
Min Flow	$m^3/d$			1024	956	1085	1292	1072	1043	1011	1210	744	908	850	994	744	
CBOD <sub>5</sub>	$mg/l$			113.4	132.8	107.0	79.5	106.4	119.5	151.3	138.2	135.5	114.4	141.5	120.0	121.6	
TSS	$mg/l$			151.6	164.8	125.5	112.3	165.4	187.5	190.0	252.8	162.3	206	212.5	170.0	175.0	
TKN	$mg/l$			36.0	44.2	35.8	23.2	33.5	41.5	44.8	37.5	44.9	47.0	45.8	39.2	39.4	
Ph at 25°C	<i>Ph unit</i>			7.5	7.8	7.7	7.7	7.8	7.7	7.7	7.6	7.8	7.7	7.7025	7.72	7.69	
Ptot	$mg/l$			7.5	4.2	3.7	3.3	3.4	4.3	4.8	4.5	4.6	4.9	5.16	4.38	4.56	
EFFLUENT																	
Total Flow	$m^3$			49872	39926	50437	72304	47365	30979	38686	41925	29401	27843	31392	43129	503258.4	
Daily Ave. Flow	$m^3/d$			1609	1426	1627	2410	1528	1033	1248	1352	980	928	1046	1391	1382	
Max Flow	$m^3/d$			2160	1790	2402	4197	2739	1733	2137	1716	1294	1109	1294	2028	4197	
CBOD <sub>5</sub>	$mg/l$	5.0	25.0	1.20	0.00	1.00	7.50	8.60	4.50	2.75	0.80	0.00	0.00	4.25	0.00	2.55	
TSS	$mg/l$	5.0	25.0	5.40	4.75	3.25	11.75	14.80	12.50	9.75	2.00	1.25	3.60	0.75	1.50	5.94	
Ptot	$mg/l$	0.3		0.14	0.15	0.19	0.26	0.29	0.28	0.17	0.44	0.09	0.08	0.13	0.12	0.19	
Unionized Ammonia	$mg/l$		1.25	0.32	0.54	0.45	0.58	0.23	0.20	0.10	0.09	0.02	0.01	0.03	0.04	0.22	
T. Ammonia	$mg/l$	Summer 1 Winter 5		11.03	15.38	19.23	12.78	5.70	8.39	6.47	3.95	7.21	0.41	0.40	0.85	7.65	

### WasteWater Flow - Raw Sewage





# APPENDIX II

Effluent	Sampling Frequency	Limit	2023-01-04	2023-01-10	2023-01-17	2023-01-24	2023-01-31	Monthly average	2023-02-07	2023-02-14	2023-02-21	2023-02-28	Monthly average	2023-03-07	2023-03-14	2023-03-21	2023-03-28	Monthly average	2023-04-04	2023-04-11	2023-04-18	2023-04-25	Monthly average	2023-05-02	2023-05-09	2023-05-16	2023-05-23	2023-05-30	Monthly average	2023-06-06	2023-06-13	2023-06-20	2023-06-27	Monthly average	
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CBOD5	8hr comp. - Weekly	5 mg/L	3	0	0	3	0	1.20	0	0	0	0	0.00	0	0	4	0	1.00	3	4	9	14	7.50	5	6	8	10	14	8.60	3	10	0	5	4.50	
TSS	8hr comp. - Weekly	5 mg/L	5	5	7	4	6	5.40	5	6	3	5	4.75	4	4	0	5	3.25	10	8	11	18	11.75	13	10	11	16	24	14.80	8	14	18	10	12.50	
Total phosphorus	8hr comp. - Weekly	0.3 mg/L	0.16	0.12	0.16	0.11	0.14	0.14	0.16	0.16	0.14	0.14	0.15	0.17	0.16	0.2	0.22	0.19	0.22	0.18	0.29	0.34	0.26	0.19	0.19	0.32	0.41	0.34	0.29	0.27	0.38	0.22	0.23	0.28	
Total Ammonia Nitrogen	8hr comp. - Weekly	1 mg/L (May 1 - October 31), 5mg/L (November 1 - April 30)	9.77	8.9	10.1	12.5	13.9	11.03	13.2	15.3	16	17	15.38	17.6	20.5	20.1	18.7	19.23	19	15	9.89	7.23	12.78	7.1	4.82	4.51	5.34	6.72	5.70	6.81	8.04	8.73	9.97	8.39	
Nitrate as Nitrogen	8hr comp. - Weekly	None	4.3	3.5	3.2	3	2.29	3.26	0	1.2	0.5	0	0.43	0.11	0.08	17.1	0.15	4.36	0.17	0.44	0.39	0.77	0.44	1.4	1.81	1.58	0.48	0.16	1.09	0	0	0	0	0.00	
Nitrite as Nitrogen	8hr comp. - Weekly	None	0	0	0.2	0.4	0.53	0.23	0.5	0.12	0.3	0	0.23	0	0	0	0	0.00	0	0.06	0	0.07	0.03	0.23	0.28	0.54	0.41	0.09	0.31	0	0.08	0	0	0.02	
Unionized Ammonia	8hr comp. - Weekly	Federal (1.25 mg/L)	0.02	0.25	0.41	0.46	0.46	0.32	0.51	0.5	0.59	0.54	0.54	0.52	0.48	0.46	0.34	0.45	0.31	0.4	0.65	0.97	0.58	0.42	0.24	0.23	0.22	0.02	0.23	0.28	0.02	0.29	0.22	0.20	
E. Coli	8hr comp. - Weekly	200 org. per 100 ml	0	0	2	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00	1	0	0	2	0.00	0	0	0	0	0	0.00	0	0	0	0	0.00	
pH	8hr comp. - Weekly	Between 6.0 - 9.5 (Single sample result)	6.45	7.7	7.87	7.83	7.78	7.53	7.85	7.78	7.83	7.76	7.81	7.73	7.63	7.62	7.52	7.63	7.47	7.82	8.09	8.37	7.94	8.04	7.97	7.98	7.87	7.79	7.93	7.82	7.76	7.78	7.59	7.74	
Hydrogen Sulphide	8hr comp. - Weekly	mg/L	0	0.01	0.01	0.03	0.02	0.01	0.11	0.07	0	0.24	0.11	1.25	0.8	0.97	0.76	0.95	0.9	0.16	0.04	0	0.28	0.03	0.02	0.04	0.07	2.43	0.52	0.02	1.13	0.64	0.48	0.57	
Toxicity to Rainbow trout and Daphnia magna	Grab sample - Quarterly																																		

E.Coli (Monthly Geometric Mean Density)  $\sqrt[n]{x_1 x_2 x_3 \dots x_n}$

Effluent	Sampling Frequency	Limit	2023-07-04	2023-07-11	2023-07-18	2023-07-25	Monthly average	2023-08-01	2023-08-08	2023-08-15	2023-08-22	2023-08-29	Monthly average	2023-09-05	2023-09-12	2023-09-19	2023-09-26	Monthly average	2023-10-03	2023-10-10	2023-10-17	2023-10-24	2023-10-31	Monthly average	2023-11-07	2023-11-14	2023-11-21	2023-11-28	Monthly average	2023-12-05	2023-12-12	2023-12-19	2023-12-27	Monthly average		
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CBOD5	8hr comp. - Weekly	5 mg/L																																		
TSS	8hr comp. - Weekly	5 mg/L	5	0	3	3	2.75	4	0	0	0	0	0.80	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	17	0	4.25	0	0	0	0	0.00		
Total phosphorus	8hr comp. - Weekly	0.3 mg/L	28	0	7	4	9.75	3	0	0	7	0	2.00	5	0	0	0	1.25	4	6	8	0	0	3.60	3	0	0	0	0.75	3	0	3	0	1.50		
Total Ammonia Nitrogen	8hr comp. - Weekly	1 mg/L (May 1 - October 31), 5mg/L (November 1 - April 30)	0.22	0.12	0.19	0.16	0.17	1.71	0.13	0.12	0.13	0.13	0.44	0.12	0.1	0.08	0.07	0.09	0	0.16	0.11	0.08	0.04	0.08	0.21	0.1	0.11	0.11	0.13	0.14	0.08	0.12	0.13	0.12		
Nitrate as Nitrogen	8hr comp. - Weekly	None	9.38	5.8	5.15	5.53	6.47	4.34	4.11	4.66	3.47	3.15	3.95	21.9	1.94	0.75	4.26	7.21	0.3	0.57	0.36	0.4	0.4	0.41	0.35	0.38	0.38	0.49	0.40	0.66	0.81	0.9	1.04	0.85		
Nitrite as Nitrogen	8hr comp. - Weekly	None	0	0.09	0.09	0	0.05	0.41	0.84	0.83	1.12	0.74	0.79	1.17	1	2.04	1.26	1.37	2.09	1.79	3.47	3.22	2.86	2.69	3.9	5.14	5.22	5.28	4.89	6.49	7.28	7.52	8.02	7.33		
Unionized Ammonia	8hr comp. - Weekly	Federal (1.25 mg/L)	0	0	0.11	0	0.03	0.29	0	0	0.13	0	0.08	0.23	0	0	0.62	0.21	0.07	0.15	0	0	0	0.04	0	0	0	0.11	0.03	0	0.06	0.05	0.05	0.04		
E. Coli	8hr comp. - Weekly	200 org. per 100 ml	0	0.12	0.14	0.12	0.10	0.13	0.07	0.14	0.1	0.02	0.09	0.04	0.03	0.02	0	0.02	0	0.02	0	0.02	0.02	0.01	0.02	0.03	0.02	0.03	0.03	0.04	0.04	0.05	0.03	0.04		
pH	8hr comp. - Weekly	Between 6.0 - 9.5 (Single sample result)	0	1	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00		
Hydrogen Sulphide	8hr comp. - Weekly	mg/L	7.71	7.85	7.68	7.58	7.71	7.74	7.49	7.73	7.73	7.09	7.56	7.56	7.46	7.51	7.22	7.44	7.27	7.72	7.27	7.89	7.97	7.62	8.06	8.16	8.04	8.11	8.09	8.07	7.99	8.02	7.69	7.94		
Toxicity to Rainbow trout and Daphnia magna	Grab sample - Quarterly		1.71	0.02	0.02	0.05	0.45	0.01	0	0	0	0	0.00	0	0	0	0	0.00	0	0	0	0.02	0	0.00	0	0	0	0	0.00	0	0	0	0	0.00		

Limoges



		CBOD5	TSS	Total phosphorus	Total Ammonia Nitrogen
<b>Limit</b>	<b>Effluent Flow Average(m3)</b>	<b>17.3 kg/day</b>	<b>17.3 kg/day</b>	<b>1.0 kg/day</b>	<b>3.5 kg/day (May 1 - Oct.31), 17.3 kg/day (Nov. 1 - April 30)</b>
January	1609	1.9	8.7	0.2	17.8
February	1426	0.0	6.8	0.2	21.9
March	1627	1.6	5.3	0.3	31.3
April	2410	18.1	28.3	0.6	30.8
May	1528	13.1	22.6	0.4	8.7
June	1033	4.6	12.9	0.3	8.7
July	1248	3.4	12.2	0.2	8.1
August	1352	1.1	2.7	0.6	5.3
September	980	0.0	1.2	0.1	7.1
October	928	0.0	3.3	0.1	0.4
November	1046	4.4	0.8	0.1	0.4
December	1391	0.0	2.1	0.2	1.2

# APPENDIX III

