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February 3, 2025

Kip Walby, SEMSD Director of Operations
Southeast Macomb Sanitary District
20001 Pleasant Avenue
St. Clair Shores, Michigan 48080

Reference: MRIDDD 2024 End of Year System Summary

Dear Mr. Walby:

The system data for 2024 has been reviewed and compared with previous years data in effort to evaluate the facilities operational performance over the past year. The primary goals for managing the wastewater are to prevent basement backups and limit retention treatment basin (RTB) discharges to the waters of the State. This letter is intended to provide a summary of the findings and observations for calendar year 2024.

Rainfall Data
The rain gauge located at the Milk River RTB (R-5) was reviewed and compared with previous years. A total of 38.16 inches of rainfall was recorded at the gauge in 2024. The total rainfall was 102% of the 9-year average of 37.3 inches.

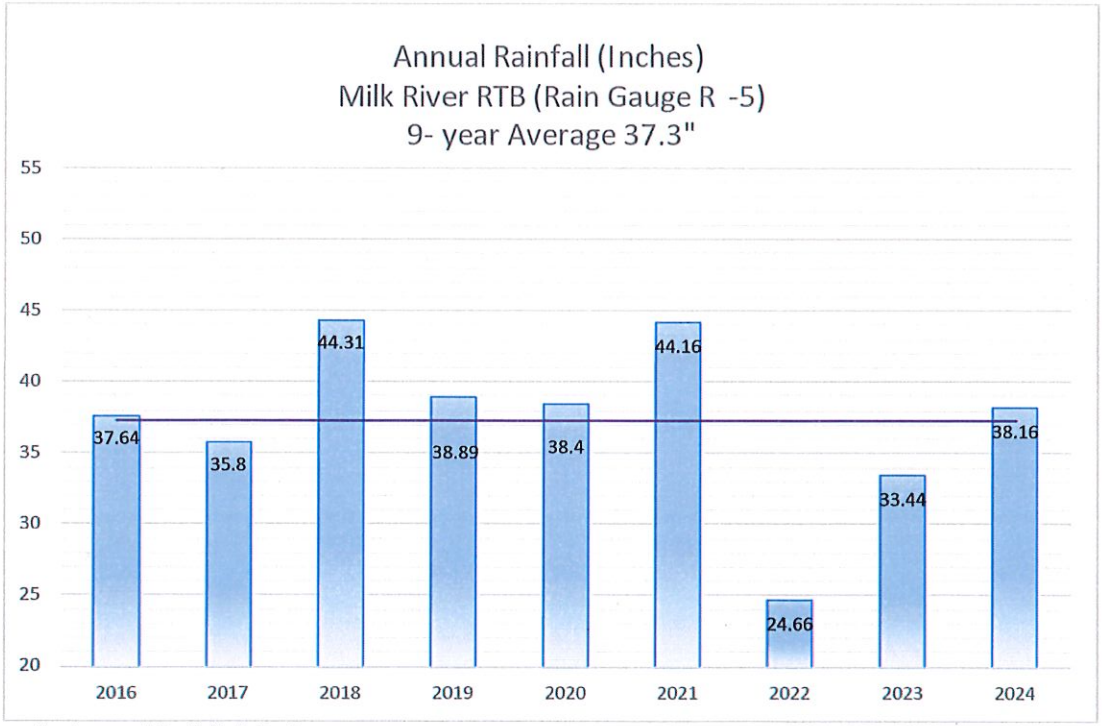


Figure 1: Annual Rainfall Data

Milk River Total Flows for 2024

In calendar year 2024, a total of 2.5 billion gallons of combined sewage was delivered to the Milk River System. Of these 2.5 billion gallons, 2.0 billion gallons were delivered to the Fox Creek for treatment at the Great Lakes Water Authority's Water Resource Recovery Facility (WRRF). Of these 2.0 billion gallons, 900 million gallons were stored in the RTB or in-pipe system. The remaining 500 million gallons were treated at the RTB and discharged to the Milk River during nine events.

The tables below summarize the CSO discharges by facility for the 2024 calendar year.

Tables 2-4: 2024 System RTB Discharges

Martin RTB		
2024 CSO Discharges		
Date	**Volume (MG)**	**Rainfall (in)**
01/09/24	11.4	1.13
01/13/24	8.7	1.12
01/26/24	71.2	1.5
04/12/24	13.4	1.57
05/27/24	28.8	2.48
05/29/24	3.1	0.9
06/20/24	15.1	1.72
06/29/24	22.8	1.74
07/10/24	71	3.31
07/23/24	14.4	1.74
08/02/24	58.3	3.2
08/06/24	37.2	1.78
12/29/24	45.7	1.74
2024 Total	**401.1**	-

*Chapaton Bypass Utilized

Chapaton RTB		
2024 CSO Discharges		
Date	**Volume (MG)**	**Rainfall (in)**
01/26/24	63.9	1.37
07/10/24	58	3.19
07/23/24*	40.26	2.48
08/02/24*	79.5	2.24
08/06/24	13	1.55
12/29/24	22.1	1.83
2024 Total	**276.76**	-

Milk River RTB		
2024 CSO Discharges		
Date	**Volume (MG)**	**Rainfall (in)**
01/26/24	111.4	1.34
01/28/24	10.3	0.22
04/12/24	8.15	1.3
07/10/24	59.4	2.22
07/23/24	119.9	3.26
08/02/24	99.5	2.46
08/06/24	23.8	1.34
10/14/24	21.7	2.24
12/29/24	45.8	1.67
2024 Total	**499.95**	-

Table 5: Annual Discharge Summary

Milk River Retention Treatment Basin			
Year	Annual Rainfall (in)	Number of Discharges	Volume of Discharge (MG)
2017	35.80	15	327.20
2018	44.31	16	603.70
2019	38.89	5	210.80
2020	38.40	9	425.60
2021	44.16	12	799.10
2022	24.66	2	55.50
2023	33.44	6	314.85
2024	38.16	9	499.95

Based on Milk River discharge data through December 2024 and our evaluation, the RTB and system is expected to retain up to a 0.79-inch rainstorm, depending on storm intensity.

When evaluating the time period between January 2016 to October 2018, this threshold was about 0.20 inches. October 2018 was a period of operational procedure changes and therefore was selected as a logical period break for analyzing the data. The chart below displays the Milk River RTB discharges versus reported rainfall totals for the other time periods.

Table 6: Summary of Rainfall Causing Milk River RTB Overflow

Timeline	Approximate Rainfall Total Causing an RTB Overflow at Milk River (inches)
January 2016 - October 2018	0.20
October 2018 – December 2021	0.78
October 2018 – December 2022	0.76
October 2018 – December 2023	0.76
October 2018 – December 2024	0.79

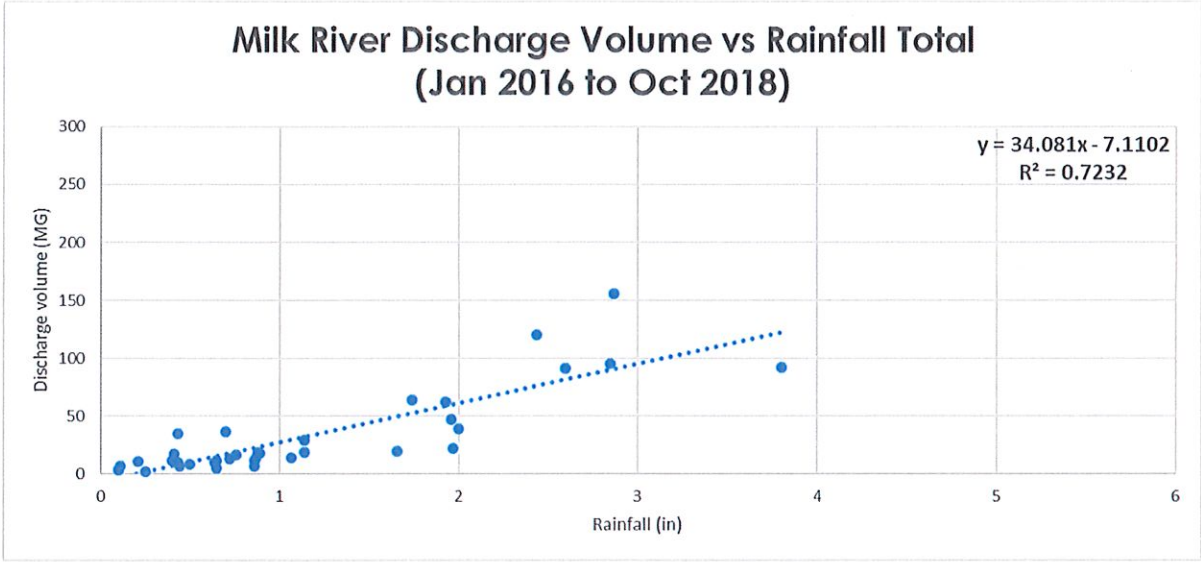
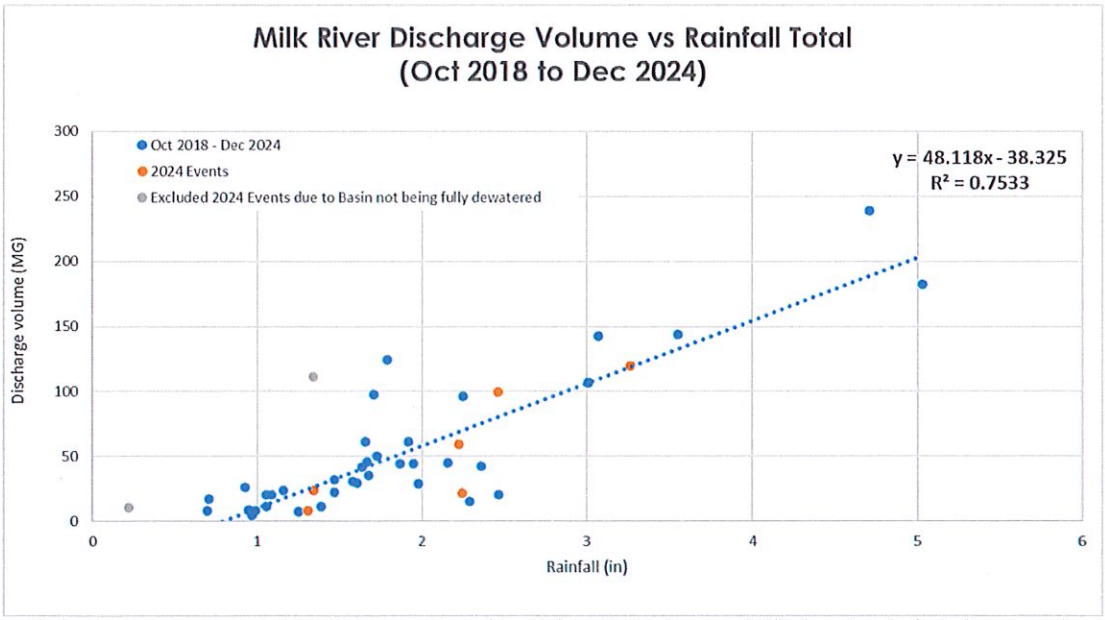


Figure 2: Threshold determination of Rainfall Total causing RTB Discharge at Milk River (Jan 2016-Oct 2018)

Data was updated this year by adding the nine storms from 2024 to the trend from October 2018 to present. Events from 2024 are shown in orange on Figure 3.



Discharges on January 26 and 28, 2024 were not considered since the basin was not fully dewatered prior to these events.

Figure 3: Threshold determination of Rainfall Total causing RTB Discharge at Milk River (Oct 2018-Dec 2024)

NPDES Permit

E. Coli

The 2024 discharge events from the Milk River RTB met their National Pollution Discharge Elimination System (NPDES) permit requirements for Escherichia coli (E. coli). The permit allows a maximum limit for E. coli of 300 cts/100ml between May to October and 1,000 cts/100ml between November and April. The following table summarizes the maximum E. coli limits discharged to the Milk River from the RTB during the 2024 discharge events.

Table 7: E coli.

	Max Limit E. coli (cts/100ml)	
Date	NPDES Permit Maximum	Event Geometric Mean
01/26/24	1,000	18
01/28/24	1,000	21
04/12/24	1,000	66
07/10/24	300	11
07/23/24	300	31
08/02/24	300	6
08/06/24	300	113
10/14/24	300	16
12/29/24	1,000	26

Total Residual Chlorine (TRC)

The 2024 discharge events from the Milk River RTB met their National Pollution Discharge Elimination System (NPDES) permit goal for TRC. The permit goal is to be below an event average of 1.50 mg/L for TRC. The following table summarizes the event average TRC discharged to the Milk River from the RTB during the 2024 discharge events.

Table 8: Total Residual Chlorine (TRC)

	TRC Event Average (mg/L)	
Date	NPDES Permit Maximum	Actual Measured
01/26/24	1.50	1.11
01/28/24	1.50	1.09
04/12/24	1.50	1.05
07/10/24	1.50	1.29
07/23/24	1.50	1.10
08/02/24	1.50	1.16
08/06/24	1.50	1.13
10/14/24	1.50	1.10
12/29/24	1.50	1.22

Total Suspended Solids

The Milk River RTB Total Suspended Solids (TSS) was reviewed. Table 9 summarizes the event average Effluent TSS by year.

Table 9: Total Suspended Solids Yearly Average

Milk River RTB	
Year	Event Average Effluent TSS (mg/L)
2018	88.4
2019	85.2
2020	66.4
2021	51.7
2022	80.8
2023	61.9
2024	46.3

Since the final removal of the sludge build up from the retention treatment basin around 2020, we have seen the total suspended solids effluent reduced to 46.3 mg/l in 2024. This is likely attributed to the cleaning activities and flushing improvements made to the RTB in the Priority 1b Project and the active flushing completed by the SEMSD after each RTB Event.

2024 Summary
The overall analysis indicates that the SEMSD is continuing to operate in an efficient manner, meeting NPDES permit requirements, containing smaller sized storms, containing more volume with in-line storage and in some cases preventing RTB discharges.

We will continue to review operations and evaluate opportunities to improve operations within the Milk River system.

Sincerely,

Taylor Sting, PE, CFM
Project Manager

Kyle Seidel, PE
Project Manager

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