

**MONTPELIER WASTEWATER
POST JULY 2023 FLOOD
TREATMENT PLANT ASSESSMENT
WASHINGTON COUNTY,
VERMONT**

**NPDES PERMIT NUMBER VT0100196
STATE OF VERMONT PERMIT NUMBER 3-1207**

September 25, 2023

This report was prepared based on observations made during July 19, 2023, site visit by Heather Collins, VT DEC, WSMD, WWMP in conjunction with Army Corps of Engineers and US EPA Region 1 representatives.

REPORT LIMITATIONS

This report was prepared from visual observations and operator conversations during site visits. No testing of equipment or measuring of components was performed.

MAIN PLANT

FACILITY DESCRIPTION

The facility is an activated sludge treatment plant with a design flow of 3.97 MGD. Peak design flow is 12 MGD. The operator stated incoming average plant flows are approximately 1.5 MGD (million gallons per day). Flow at the plant the day of the flood was 10 MGD and on the day of the assessment was 2.8 MGD.

OBSERVATIONS

On the day of the assessment, the plant appeared to be fully operational. The facility contracted 36,000 gallons of waste activated sludge that had been delivered from South Burlington in order to restart biological activity (that was washed away) within the plant and the facility had restored its hauled waste program and began accepting hauled waste from neighboring communities. The plant did not flood as the berm around Dog River Road kept the river back. River water did back up into the effluent pipe. The facility received minimal damage as a result of the flooding event due to preventative actions of the operational staff to pull the step screen from the headworks and dismantling and removing the UV equipment to avoid potential damage. Three pumps that were damaged had already been rebuilt on site. It is expected that more pumps will need to be rebuilt due to heavy silt and grit in valves and that will cause premature wear.

HEADWORKS: The headworks received a large amount of grit and debris. The auger grit drive chain in the grit chamber was damaged due to heavy solids loadings.

TREATMENT TANKS: All clarifiers, aeration, sludge holding, etc tanks received large amounts of debris, sand and silt and will need to be drained and cleaned.

PUMP STATIONS

Three of the eight pump stations in the collection system were heavily damaged. Communication via supervisory control and data acquisition (SCADA) had been lost between the plant and pump stations.

LOWER STATE STREET #1 PUMP STATION

OBSERVATIONS

The pump station and grade mounted control panel were both completely submerged in flood water. Pumps and electrical components (switches and relays) were damaged. The wet well received silt and debris accumulation, and likely damaged conduits. Subsequently, pump performance should be checked for accelerated wear. Replace or recondition.

LOWER STATE STREET #2 PUMP STATION

OBSERVATIONS

The pump station had a highwater mark of approximately 4 feet inside. Pumps, control panel and electrical components (switches and relays) were damaged. The wet well received silt and debris accumulation, and likely damaged conduits. Subsequently, pump performance should be checked for accelerated wear. Replace or recondition.

INTERSTATE EQUIPMENT PUMP STATION #4

OBSERVATIONS

This pump station was not functional on the day of the assessment and was pumping water from the wet well via portable pump to the force main which flows to the treatment plant. The pump station and grade mounted control panel were both completely submerged in flood water. Pumps and electrical components (switches and relays) were damaged. The wet well received silt and debris accumulation, and likely damaged conduits. Subsequently, pump performance should be checked for accelerated wear. Replace or recondition.

COLLECTION SYSTEM

FACILITY DESCRIPTION

The gravity collection system is approximately 47 miles long consisting of varying sizes of piping with 1166 manholes. There are 5 water crossings consisting of two siphons, a force main crossing and a gravity underwater crossing to pump station #4. The total length of sewer force mains is approximately 4.2 miles. All force mains and siphon lines are constructed of cast iron pipe. The system receives all of the wastewater from the Town of Berlin through a single 12" diameter force main and conveys the flows from the discharge point on Rte. 302 to the Montpelier Water Resource Recovery Facility. Montpelier's collection system is still partially a combined stormwater and sewer system with six overflow structures remaining.

OBSERVATIONS

Overall, the collection system received large amounts of grit/silt/debris.

RECOMMENDATIONS

SHORT TERM

- The facility will need to drain all treatment tanks to remove silt, sand, and grit.
- In order to prevent river water from backing up into the facility, the three manholes should be bolted down. Current practice is to put large concrete blocks on the manhole but a more permanent solution would be much more effective.
- Complete replacement or professional rehabilitation of all electrical and mechanical equipment and instrumentation below the high-water mark at the pumpstations. Evaluate all pump station pumps for future efficiency.
- An appreciable amount of grit and sediment was conveyed into the plant. All treatment tanks will need to be drained and cleaned.
- Jetting and camera inspection of low-lying collection system areas as the collection system received an appreciable amount of grit/silt/debris. Camera inspections should be explored to ascertain collection system damages.
- Have Reduced Pressure Zone Backflow Preventers (RPZBP) at the facility inspected and tested to ensure they are properly functioning.

LONG TERM

Long term recommendations to potentially mitigate future flooding impacts include:

- The facility should install a back flow preventer on the effluent pipe to the river to prevent the back up of river water from entering the facility.
- Controls for pump stations should be elevated above flood stage.
- High flows may exceed the working capacity of chemical pumps. Additional pumps should be provided to deliver process and disinfection chemicals during high flows. Larger day tanks and supplies of chemicals on hand may be needed.
- Outfall pipes should have valves or duckbills to prevent river water from backing into plant components.
- Consider portable or fixed pumps to discharge effluent if gravity flow is no longer possible.

PHOTOS



1- Interior of Lower State Street Pump Station No.2. Note Highwater Mark at Approximately 4 Feet



2- Control Panel of Lower State Street Pump Station No.2. Note Highwater Mark at Approximately 4 Feet



3- Pumps in Lower State Street Pump Station No.2 that Were Completely Submerged in Flood Waters



4- Lower State Street Pump Station No.1. Entire Unit was Submerged in Flood Water



5- Lower State Street Pump Station No.1 Control Panel Which Was Submerged in Flood Water



6- Interstate Equipment Pump Station No.4 Entire Unit Was Submerged in Flood Water



7- Interstate Equipment Pump Station No.4 With Portable Pump Being Used