

**REPORT
ON
BARTON MEADOWS
WASTEWATER TREATMENT PLANT**

August 2022

**BY:
ENVIRONMENTAL ENGINEERING &
MANAGEMENT ASSOCIATES, INC.**

Discussion

I have personally reviewed the treatment plant, the pump stations and the operating records including the latest Chapter 94 report. I have been to the facility three times, twice with the operator.

I see no substantial issue with the plant as currently configured. The plant unit processes are appropriately sized based on PADEP design requirements. The plant is permitted for 53,000 gallons per day (gpd) as an annual average. The 2021 flow, from your Chapter 94 report was 32,000 gpd or 60.4% of capacity as an annual/average. The 90-day peak hydraulic flow was 1.13 or 36,000 gpd. This is a very low hydraulic peak (4000 gpd) and is indicative of a very low infiltration rate. The term used is I-I which is inflow-infiltration. With the low infiltration rate the only other possibility is inflow.

Since the plant meets and exceeds all PADEP design requirements, it can process far more sewage than the permitted annual average. The limiting factors are the land application beds and the final clarifiers because of the way the sludge is handled. The land application beds are permitted for 53,000 gpd maximum, and the final clarifiers being cone bottom units with air lift return sludge are not controllable and cannot accept sudden inflow. The seepage beds are receiving filtered, disinfected effluent that meets all PADEP requirements. As discussed in the meeting, this is far different from a sand mound. Unless the plant massively upsets and puts large amounts of solids onto the seepage beds, the beds should outlast the plant. Some of the drip nozzles and piping may fail and require replacement.

Discussions with your operator, John Scully of Private Utility Enterprises, Inc., confirm this. The main source of inflow appears to be due to broken vents/cleanouts on laterals draining lawns during rain events. These vents were constructed with plastic pipe to within 18 inches of the ground surface, then ductile iron pipe to the surface. The two pieces of pipe were connected by a furnco fitting which is a rubber or elastomer sleeve around the two pipes secured by radiator clamps. These are good

connections until they are flexed, then they can separate. A drive by indicates at least half of the vents have been flexed. All of the vents should be examined.

Recommend first step repairs are:

- 1) Inspect and repair vents/cleanouts where required. Cost \$250 permit, 80 units (half of connections) - \$20,000.
- 2) Smoke tests the system. Cost \$10,000 to \$15,000 plus repairs.
- 3) Inspect and remove discharge from sump pumps and downspouts. Cost \$5000 for the inspections. Sump pump removal should be done by the homeowner.
- 4) Install temporary meters in appropriate location to determine inflow source then repair.
- 5) If the first four are not successful, add two days flow capacity (106,000 gallons) offline equalization to the plant with appropriate automatic diversion controls. Conceptual cost \$400,000 to \$600,000.

Enhancements to the plant to accept the occasional inflow include:

- 1) Additional equalization 100,000 gallons, two days flow. Conceptual cost \$400,000 to \$600,000.
- 2) New final clarifiers with scraper mechanism with pumped recycle. Conceptual cost \$800,000 to \$1,000,000.

Lining the entire system will not solve the problem if the problem is in private laterals. Smoke testing will better define the problem if required after fixing the vents/cleanouts.

The Barton Meadows plant is not at risk of failure. Mechanical issues can happen at any time. Pumps and blowers, given good maintenance should last at least 10-15 years. At over 20 years plans should be

in place to replace the units. The ultraviolet light disinfection system may only last 10 years as the electronics will become obsolete.

My personnel who worked on the project include Keith Corson, PE, LO, and Judy Stevenson, LO who physically measured the various unit processes to determine and confirm sizes. Their resumes are attached.

The plant is operating within all permit requirements. One problem is the use of Methanol as a carbon source. Methanol is wood alcohol and is very poisonous. It is also flammable and will detonate. It is not being stored or delivered within safety requirements. There are other chemicals that can be used without the inherent safety issues with Methanol.

Pump Stations

The plants collection system has four pumping stations. Nottingham pumps the plant and receives flow from the school pumping station. Mourar pumps to Duck Pond, which pumps to the plant.

Nottingham and Duck Pond will require refurbishment within the next 5 years. They are original. The school plant is relatively new. The school district pumping station is approximately 5 years old and should last another 15 years with normal maintenance. Mourar has been refurbished. The cost of each refurbishment will range from \$100,000 to \$125,000 as a conceptual estimate.

After the refurbishments, the four pump stations should operate with normal maintenance 15 to 20 years.

The Plant

The plant appears to be in good shape. It is not in danger of failure. New blowers will be needed within the next 5 years. There are two 15Hp units and a 5Hp unit. Conceptual cost now for the large blowers is

\$40,000 to \$50,000 each. The smaller unit will cost \$10,000 to \$15,000. The blowers appear to be the original units. After the existing units are replaced, the system should operate acceptably for the next 10 to 15 years, assuming normal maintenance.

The pumps for the influent and filters will require rebuilding and/or replacement in the range of 5 to 10 years. After the repair/replacement the pumps should last 10 to 15 years assuming normal maintenance.

A project capital expense plan is contained in Table 1.

Observations and Recommendations

The plant is not in danger of failure. Given normal maintenance, the refurbishment of the pump stations and replacement of the blowers and pumps, the plan should operate successfully for another 10 to 15 years with normal maintenance.

The immediate problem with the system is inflow during rainstorm events. Initially.

- 1) Repair cleanouts/vents
- 2) Inspect and remove sump pump discharges to the system
- 3) Smoke tests the lines and repair as appropriate.
- 4) Replace Methanol as a carbon source. Methanol is flammable and can detonate.

As requested, attached are standard details for vent/cleanout protection in paved and unpaved locations.

Table 1

Barton Meadows

Capital Expense Projection

Construction Cost

Years 2022-2027

Years 2028-2033

Blowers \$115,000

Pump Stations \$125,000

\$125,000

In Plant Pumps

\$ 50,000

\$ 30,000

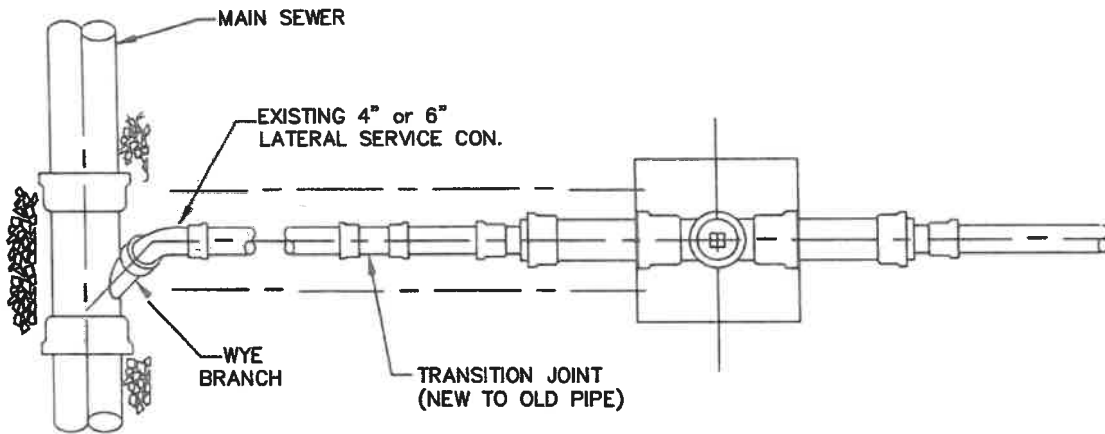
UV System

Totals \$240,000

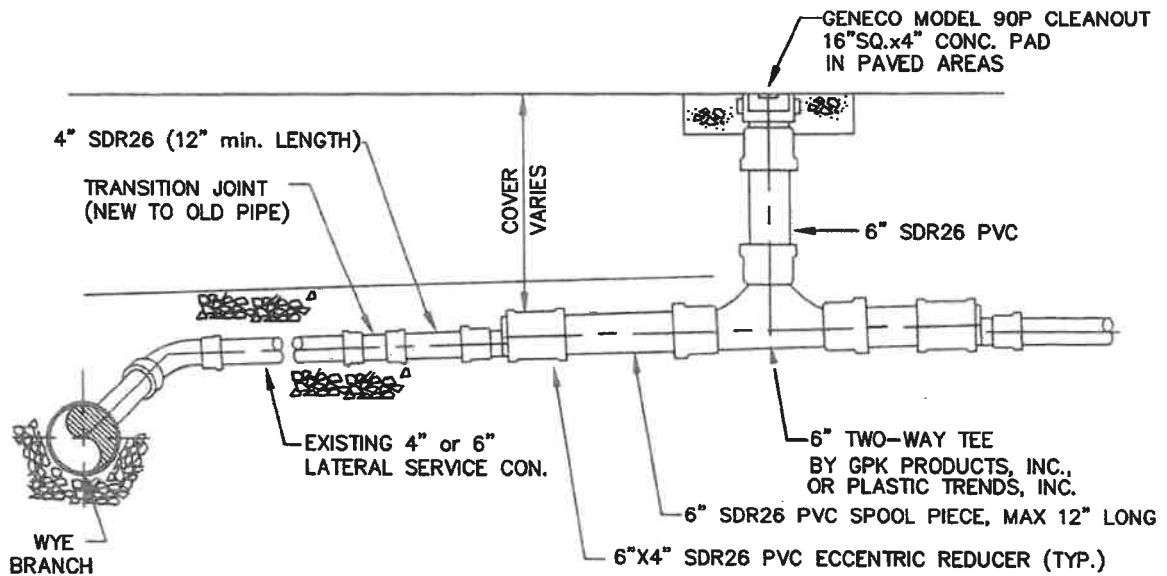
\$205,000

NOTE:

1. CLEANOUT IN NON-PAVED AREAS SHALL BE EAST JORDAN #1574, NEENAH FOUNDRY R-1975-A2, OR APPROVED EQUAL. CLEANOUT CAP PROTECTION CASTING SHALL HAVE A MIN. OF 2-INCH OF SEPARATION BETWEEN CLEANOUT THREADED PLUG AND CASTING.



PLAN

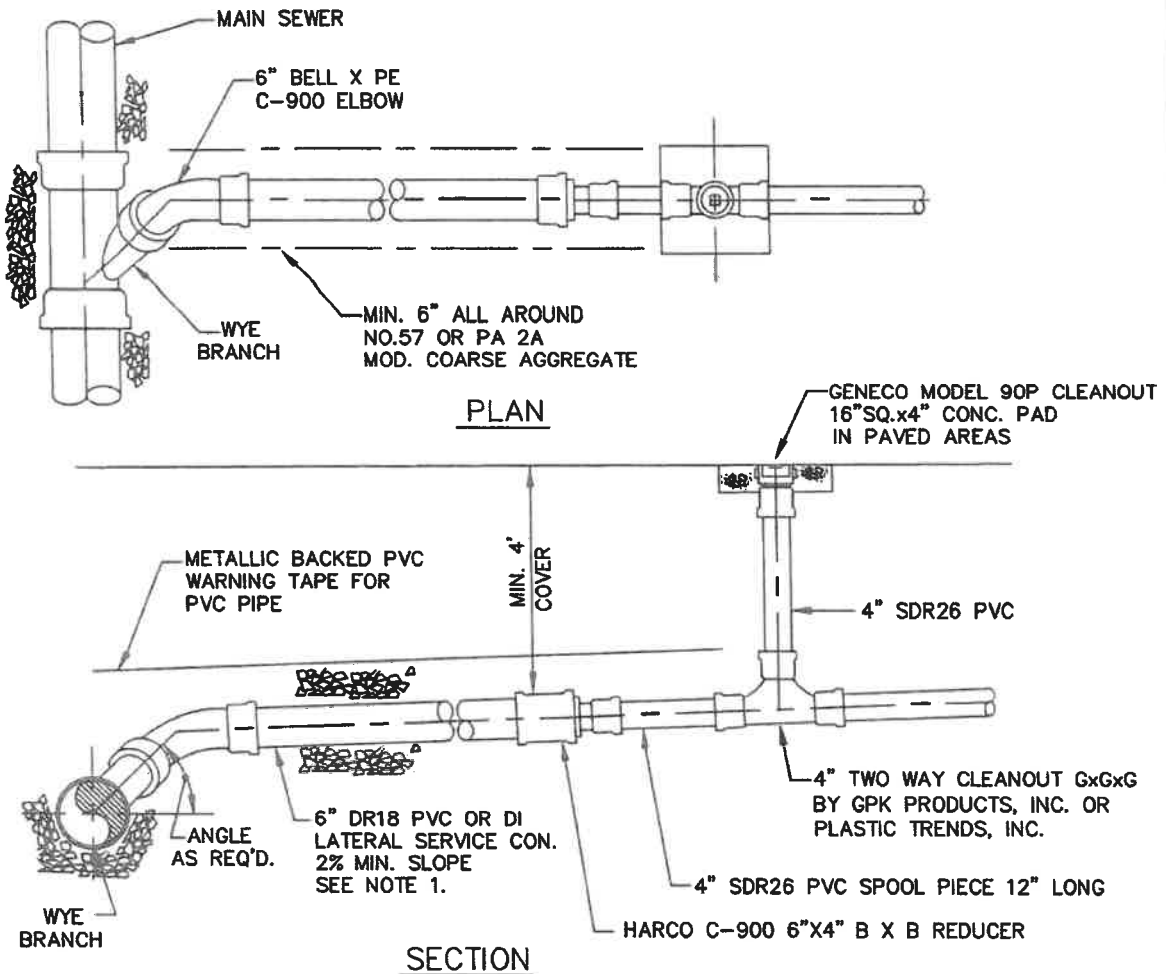


SECTION

LATERAL CONNECTION, TWO WAY CLEAN-OUT
WITH THREADED PLUG, EXISTING LATERAL

NOTES:

1. IF THE SEWER MAIN IS 8" AND AN INSERTA TEE IS REQUIRED FOR THE CONNECTION, THE LATERAL PIPE SIZE SHALL BE REDUCED TO 4".
2. IF CURBING OR PAVING DOES NOT EXIST, LATERAL SHALL BE 10 FEET IN LENGTH OR FOUR (4') FEET PAST THE EDGE OF THE RIGHT-OF-WAY, WHICHEVER IS GREATER.
3. CONNECTION FROM SERVICE LATERAL TO STRUCTURE SHALL BE IN ACCORDANCE WITH TOWNSHIP PLUMBING CODE.
4. PROVIDE STAKE (2"X3") AT END OF LATERAL EXTENDING 1 FT. ABOVE FINISH GRADE.
5. CLEANOUT IN NON-PAVED AREAS SHALL BE EAST JORDAN #1574, NEENAH FOUNDRY R-1975-A2, OR APPROVED EQUAL. CLEANOUT CAP PROTECTION CASTING SHALL HAVE A MIN. OF 2-INCH OF SEPARATION BETWEEN CLEANOUT THREADED PLUG AND CASTING.



LATERAL CONNECTION, TWO WAY CLEAN-OUT WITH THREADED PLUG