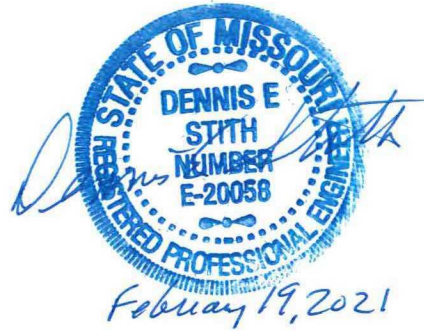


REVIEW AND ANALYSIS OF MAWC'S PROPOSED PURCHASE OF THE CITY OF HALLSVILLE'S WASTEWATER TREATMENT FACILITY

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Existing Treatment Facility Capacity

The Public Service Commission staff investigation and the Missouri American Water Company information do not address the treatment capacity of the existing lagoon and land application systems. The following is a high-level review of the treatment system utilizing information found in the Hallsville Missouri State Operating Permit (MSOP), the Hallsville Request for Proposals (HRFP), and the PSC Staff Investigation (PSC). The source of the information used in the analysis is shown in parenthesis ().

In addition I have reviewed MAWC's Application for Certificate of Convenience and Necessity, MAWC's Objection to the Boone County Regional Sewer District's ("District") Application to Intervene and the District's Response, PSC Staff Recommendation to Grant Certificate of Convenience and Necessity and Official Case File Memorandum, the District's Response to the PSC Staff Recommendation, MAWC's responses to data requests of the Boone County Regional Sewer District and MO PSC Staff, and all Direct Testimony and Schedules filed in Case No. SA-2021-0017.

Design Flow

Design Flow: 212,622 gallons per day (Design flow plus 10-year rainfall minus evaporation, does not account for inflow and infiltration) (MSOP)

Design Population Equivalent 2,085 (MSOP)

Actual Flow: 149,568 gallons per day (MSOP)

Current population connected 1,491 (MSOP Form B2)

Currently 676 customers (PSC) or 665 customers (HRFP).

Currently approved additions to the collection and treatment system result in a projected growth of:

Douglas Pointe Subdivision 72 lots (HRFP)

Echo Ridge Subdivision 226 lots (HRFP)

Silver Creek Subdivision 7 lots (HRFP)

Sunny Slope Subdivision 17 customers (HRFP)

Total additional lots = 322

PSC investigation mentions Meadow Lake Subdivision without listing additional lots. Since this is an unknown quantity it is not included in the review.

The estimated additional flow that will need to be treated is based on the MDNR Wastewater and Standards Document February 2019.

Assuming a 3-bedroom single-family house, use 3.7 persons per house.

Single Family house 75-100 gallons per person per day. Use 100 gallons per person per day as it reflects current flows.

Additional flow = 322 lots x 3.7 persons/lot x 100 gal/day/person = 119,100 gallons per day (rounded)

Current reported flow + additional flow = 149,568 + 119,100 = 268,668 gallons per day

268,668 gpd exceeds the permitted design flow of 212,622 gpd by 26%.

Note that the above is based on currently approved additions to the system. Projections of growth from other areas are not included in the above calculations and are not addressed the PSC staff comments or MAWC proposals.

Wastewater Storage Capacity

Storage lagoon capacity 53,992,426 gallons (MSOP)

Storage capacity with 1 in 10-year flows = 253 days (MSOP)

This storage capacity is based on the Design Flow of 212,622 gpd

Reduced storage capacity with additional 119,100 gpd of flow from new subdivisions =

268,668 gpd – 212,622 gpd = 56,046 gpd

56,046 gpd x 365 days/year = 20,456,790 gallons/year additional

New volume to store = 268,668 gpd x 365 days = 98,063,820 gallons

Revised lagoon storage capacity = 53,992,426 gallons/98,063,820 gpd = 0.55 years = *201 days*

MDNR Wastewater and Standards Document require a minimum of 105 days plus 30 days when irrigation fields are leased, for a total of 135 days in Boone County.

My experience is that at least 180 days are needed, and it would be better to have 210 days storage when applying to row crops. 210 days covers the time from the beginning of November through the end of May.

This does not account for additional storage needed for infiltration and inflow as mentioned in the MSOP description of the design flow.

Land Application

Wastewater Irrigation Rates from MSOP:

Fields #004, #005, #006, and #008 24-inches per year

Field #007 36-inches per year

It would appear that Field #007 is in grass and Fields #004, #005, #006 and #008 are row crops.

My experience is that much lower application rates are typical for fields that are not owned by the permit holder (city) and are in row crop.

The MSOP and PSC both state there are 395 acres for irrigation.

My review suggests there are 340 acres in Fields #004, #005, #006 and #008 and 55 acres in Field #007.

Using 6" per year for row crop and 24" per year for grass cover:

Field #007 - 55 acres, 24"/year, = 35,841,168 gallons per year.

Field #004, #005, #006 and #008 - 340 acres, 6"/year = 55,390,896 gallons per year

Total available land application capacity = 91,232,064 gallons per year

Amount wastewater to land apply = 98,063,820 gallons per year

Comments

1. The MSOP states the design flow does not include infiltration and inflow. The above high-level summary of the system does not include estimates of infiltration and inflow that would require additional storage and land application area.
2. The current design flow of the facilities as stated in the MSOP will be exceeded with the addition of wastewater flow from the currently approved subdivisions. The PSC staff comments do not raise an issue with this. The MAWC proposal does not specify how the system will be operated or how the proposed capital investment will address treatment, infiltration and inflow, or collection systems concerns.
3. The PSC staff investigation states that one of the landowner agreements was extended to November 30, 2020 and the agreement with the other landowner expires September 15, 2023. Neither the PSC staff comments or MAWC proposal address continuation of the landowner agreements or acquisition of additional land application fields. How the MSOP holder will address the issues with the landowners not taking wastewater when the permit holder needs to land apply to prevent storage lagoon discharges is not addressed.
4. PSC staff comments reference the changes the farmer has made to the fields near Cell No. 2, which are fields #004, #005, #006, and #008. Waterways were constructed on the fields that which have resulted in partially treated wastewater entering the receiving stream. This points out a concern that the permit holder does not have control over the fields used for land application of wastewater.
5. The PSC staff comments state the City's Consent Judgement gives the city time to acquire land. It appears the city has not acquired the land for application of wastewater.
6. Based on the above high-level review of the treatment system components there are concerns regarding the capacity of the storage lagoons and there being adequate land for application of wastewater.