

Memo to the Town Manager.

I see two main concerns regarding the proposed WWTF draft permit:

- 1) Richmond's allocation (current) of 405 lbs/year phosphorus is being reduced to 134 lbs/year in the new permit. This number can never be increased, so, as Richmond grows, treatment to meet this limit will get more expensive.

Following are some calculations that show how the facility is currently processing wastewater and some sample projections.

- Explanation of notations in formulas:
 - mgd = million gallons per day
 - 8.34 is the weight of a gallon of water in pounds
 - mg/L is milligrams of phosphorous per liter

Currently the facility process wastewater with 0.2 mg/L. This has the facility operating at well under the new permit limit for phosphorous of 134 lbs/year

- Current flow = $0.070 \text{ mgd} \times 8.34 \times 0.2 \text{ mg/L P} = .11676 \text{ lb/day} \times 365 = 42.6 \text{ lbs/year}$

Currently Richmond reduces phosphorous to 0.2 mg/L, which is lower than the maximum allowable 0.8 mg/L. If current flows were processed at the maximum allowable amount of 0.8 mg/L then the facility would exceed the amount of phosphorous per year allowed in the permit

- Current flow = $0.070 \text{ mgd} \times 8.34 \times 0.8 \text{ mg/L P} = \sim 1/2 \text{ lb/day} \times 365 = 170 \text{ lbs/year}$

The design flow capacity of the wastewater facility is 0.222 mgd. If this were processed at 0.8 mg/L the result would far exceed the annual phosphorus limit

- Current design flow = $0.222 \text{ mgd} \times 8.34 \times 0.8 \text{ mg/L P} = \sim 1.5 \text{ lb/day} \times 365 = 540 \text{ lbs/year}$

If the facility reached maximum design flow and kept levels at 0.2 mg/L then annual phosphorus would be just a bit over the annual limit.

- Current design flow = $0.222 \text{ mgd} \times 8.34 \times 0.2 \text{ mg/L P} = \sim 0.4 \text{ lb/day} \times 365 = 135 \text{ lbs/year}$

Looking to the future, the next calculation considers the scenario where flows increase to double the design flow (0.500 mgd). In this scenario mg/L would need to be reduced to 0.08 mg/L in order to stay compliant with the limit on annual phosphorus allowed in the permit. This would come at a great cost in treatment. While this scenario may seem far fetched, Hinesburg has doubled their flows in the past 10 years and is currently looking at a \$20M facility upgrade. The Richmond system could expand to more users if the connections on West Main St. are completed or of other users join the system

- Future design flow = $0.500 \text{ mgd} \times 8.34 \times 0.08 \text{ mg/L P} = \sim 1/2 \text{ lb/day} \times 365 = 122 \text{ lbs/year}$

There is a "trade" set up where plants with "excess" capacity (lbs) can "sell" to those who need it. In my opinion, there is no chance the larger communities on the Winooski would sell to us. While it is true

our current phosphorus discharge numbers are very low, some of that is due to our low flows related to design. As we increase flows the discharge limit will be more difficult (costly) to meet. I consider it reasonable to expect we can meet the limit up to design, but future growth, certainly any that requires an increase to permit flows, could be challenging.

- 2) Whole Effluent Toxicity (WET) testing of our effluent is included in the permit. This is a \$1000 + test, unless chronic WET is eventually required, which bumps it up to at least \$2000. The state verbally indicated we could request/specify that the WET testing we do during this permit period could/should be used as evidence we will not have to do WET testing in the future. This understanding should be strongly emphasized in writing.

In addition to the above concerns, please also note the following:

- 3) Our normal testing costs will increase to ~\$4000 to ~\$5000 per year for testing required by permit.
- 4) A phosphorus reduction plan (POP) will be needed, which will include a Phosphorus elimination/reduction plan (PERP) with measures the Town must adopt should we approach 80% of the permit limit (~108 lbs).
- 5) An engineering evaluation of the entire system (everything) must be completed by 12/31/2024.