

## Summary of WRF upgrades meeting 12-4-18

### **Oxidation Equipment:**

- Jet Aeration is the preferred method
  - Includes removal of large section of discs, retain both short sections as a backup system
    - Retention of the two short sections of discs allows for continued mixing and aeration in the event that the Jet Aeration system goes down
  - Operates using 2 submersible pumps that push liquid for mixing and pull air from above for aeration. Pumps installed on a rail system for easy removal for maintenance
    - By introducing air at the bottom of the Oxidation Ditch, the system ensures that regardless of the level in the ditch, full mixing and aeration will take place. This currently is an issue during low flow times when the level in the Oxidation Ditch can be at a point that the discs are no longer submerged, which prevents proper mixing and aeration from occurring, causing a negative impact on the biological processes in the plant, including the ability to biologically remove phosphorous
  - Estimate includes spare pump for backup
  - Aeration Controls included in this line item allow for the controlled aeration of each of the three rings (zones) in the oxidation ditch individually
    - This allows the operators control over the amount of Dissolved Oxygen (DO) in each of the three zones, increasing the effectiveness of the biological process, including the ability to biologically remove phosphorous

### **Oxidation Ditch Modifications for Hydraulic Improvements**

- Gates in Oxidation ditch to the Clarifiers
  - Includes an addition inlet from the center ring to the center island of the Oxidation Ditch where the discharge to the Clarifiers is located
  - Removal of section of concrete wall to improve flow to the discharge to the Clarifiers
    - Currently, the gates do not control all of the flow to the Clarifiers. A significant amount of the flow bypasses the gates and spills into the discharge to the Clarifiers, causing more flow to go to Clarifier 2. The operators have adjusted the gate on Clarifier 2 to be much higher than Clarifier 1 to try to accommodate for this extra flow, but it is not physically possible with our current setup to split the flow evenly to the Clarifiers, which is ideal for control of the biological process

- May be possible to adjust gates to maximum flow after the concrete work here is done. If not, gates will be removed entirely from center island where the discharge to the Clarifier splitter box will be located

### **Clarifier Splitter Box**

- Control the level in the Oxidation Ditch with the splitter box
  - Replaces the inefficient gates located at the center island where the discharge to the Clarifiers is located
  - 
  - Will have a spot for a third gate in the splitter box to allow for future growth and the addition of a third clarifier (phase 2)

### **Chemical Feed System for Phosphorous Removal**

- Add chemical to inlet of splitter box for phosphorous removal
  - 10' x 10' metal building with a concrete pad floor
  - Short Driveway to allow bulk chemical delivery near the gate to the plant
  - Double wall tank with a 1000 gallon capacity
  - Day tank and pump with a scale for chemical use tracking

### **Piping, Valves, etc.**

- Piping to the splitter box and from RAS pit
  - Gather the separate discharge pipes from the Oxidation Ditch to the Clarifiers and combine them into one inlet point to the new splitter box
  - Upsize the pipes from the RAS pit to the Oxidation Ditch to reduce discharge head on the pumps, increasing their output flow by an estimated 150 gpm
    - This helps with the biological process by allowing a better control of the life cycle of the “bugs” in the plant
    - Helps increase the life of the pumps as they would not need to run as often or for as long per cycle

## VFD's

- Lift Station VFD's (Alternative 1)
  - Three pumps at Creek Road and two pumps at Eastside
    - All influent to the WRF comes from these two stations
    - Allows for control of flow into the plant, providing a more consistent environment for the biological process to take place, improving the overall performance of the plant, including the ability to biologically remove phosphorous
    - Increases the life of the pumps at the lift station by preventing a “full on” start cycle (pump slams on)
    - Reduces the electrical draw caused by a pump during start up
- RAS (Alternative 2)
  - Two pumps in the RAS pit
    - Allows for control of flow from RAS pit to Oxidation Ditch, providing a more consistent environment for the biological process to take place, improving the overall performance of the plant, including the ability to biologically remove phosphorous
    - Increases the life of the pumps at the lift station by preventing a “full on” start cycle (pump slams on)
    - Reduces the electrical draw caused by a pump during start up

## Timeline Moving Forward

- New Estimate to be received by January 7
- Schedule Utility Committee meeting for mid January
- Present to council at February 4<sup>th</sup> meeting
- Loan application to OEPA by mid Feb for design
- Present design to Utility Committee and Council for approval
- Construction Loan application to OEPA by September to allow for OEPA review and approval