

Staff Contact: Dale Lehnig, Director of Engineering, Planning & Development

### **BUDGET IMPACT:**

Below are the updated estimated costs for the Hirst Reservoir Repairs:

Intake repair estimated cost is \$1.4M for FY21 - 23. The most recent inspection report for the dam also noted that the drain to lower the reservoir level is not functional. That will also need to be considered either as a separate project or along with the intake repair. Here are some numbers that Dale suggests based upon information in emails from the water dept this past year:

(\$000s)	FY21	FY22	FY23	TOTAL
<b>Bathymetric study</b>	\$50-\$60			<b>\$50-\$60</b>
<b>Improve access road in prep for work</b>	\$65			<b>\$65</b>
<b>Dredging</b>		\$700		<b>\$700</b>
<b>Drain valve repair or siphon installation</b>			\$120	<b>\$120</b>
<b>Intake Repair</b>			\$500	<b>\$500</b>
<b>TOTAL CIP</b>	<b>\$115-\$125</b>	<b>\$700</b>	<b>\$620</b>	<b>\$1,435-1,445</b>
<b>BUDGET</b>	<b>\$100</b>	<b>\$400</b>	<b>\$850</b>	<b>\$1,350</b>
<b>Note: FY20 was \$80K</b>				

### **DESCRIPTION / ISSUES:**

The Hirst Reservoir provides 300,000 gpd (nearly half) of the Town's water supply. An inspection in early 2020 has recommended, and required several repairs to the dam and the associated piping and intake structure. These include the repair of the multi-level intake structure, and inclusion of a means to drain the reservoir in case of imminent dam failure. The A method to drain the reservoir is a condition to obtain the Dam Operating Certificate (we currently have a 2-year conditional operating certificate). The sequence for the project as a whole is as follows:

- Perform a bathymetric study, which will show the amount of accumulated sediment in the reservoir. This study will not only show how much capacity is lost due to the sediment accumulation, but it will assist in estimating the amount of sediment that will need to be removed (will provide a basis of cost for the dredging), and will allow the intake structure repair to be less difficult since less sediment will be mixed into the water during the work.
- The existing access to the dam will not support the type of equipment that is needed to dredge the dam and perform the intake repairs. The existing roadway will need to be improved.
- The estimated cost of dredging is \$700,000 for both the front and back lakes. This cost may vary depending on the amount of sediment and the disposal method.
- As noted, there is currently not a way to drain the reservoir. The existing drain valve is not functional. There are two options to be considered – one is to repair the valve, and the other is to install a siphon system. Both are viable options, but additional information is needed to determine the best

option. Timing for this work is critical since the Town holds a Conditional Operation and Maintenance Certificate, and the full Certificate is contingent on the completion of this project.

- **Intake Repair.** The Hirst Reservoir was constructed with a multi-level intake structure to allow operators to withdraw water from different levels in the reservoir. This ability gave operators the flexibility to withdraw water with the best quality (least affected by algae or turbidity). Several years ago, the dock leading to the intake structure and the top of the structure became structurally unstable, collapsed and the dock and the top portion of the pipe fell to the bottom of the reservoir. Currently, a simple mesh screen is installed at the top of the intake pipe. Water is always withdrawn from the top portion of the intake; several of the gates and valves in the structure are considered inoperable. Additionally, the sluice gate that would allow operators to remove sediment from the bottom of the reservoir has not been operated for many years and is considered inoperable. This has allowed sediment laden with algae to build up in the reservoir, which further affects the water quality. This project involves the design and installation of a new intake structure and sluice gate to replace the broken and inoperable structures to allow operators to properly manage the reservoir and maximize water quality.

**RECOMMENDATIONS:**

Based on the latest information, Staff recommends resolving the issues above and changing the cost of the overall from \$1,430,000 TO \$1,525,000.