

Keller Associates has reviewed the modeling/planning efforts previously completed with a focus on exploring other improvement options to correct deficiencies in the Dromore area. As part of this evaluation, we also wanted to better understand impacts around the Post Office area when this develops.

Below are the key takeaways in reviewing the prior consultants modeling efforts:

- The model we were provided included only the Project A alternative rather than the Project E alternative that was chosen in the Facility Plan. Keller Associates recreated the Project E alternative to serve as a baseline comparison. Note several of the smaller distribution projects listed in Project E do not appear to be captured in the overall budget of costs.
- Future 2037-year water demand increases reported in the facility plan were not reflected in the model. This was confirmed in an email from the prior engineer. Keller Associates updated the model to reflect the future demands reported in the facility plan.
- Proposed improvements in Alternative E projects do not appear to completely satisfy system minimum pressures > 40 PSI and minimum fire flows >500 GPM in The Dromore area for the future conditions.
- Future model conditions were based on simulating the future 2037 Peak Hour Demand (759 gpm) and 2037 Max Day + Fire Flow conditions and all of Alternative E projects being implemented. Model results showed that the Dromore area would have between 296 and 424 gpm of available fire flow and a small area below 40 psi.

After understanding the systems current and future deficiencies we developed a variety of improvements that combined will resolve most the Dromore area deficiencies (the eastern most portion of Dromore can only reach 463 gpm for future 2037 Fire flow condition without more line upsizing). Note these improvements do not include a 12-inch diameter transmission line on the West side of the City but include all the other improvements in Alternative E project lists.

Figure 1: Keller Associates Improvements (including Project E Improvements but excluding the 12" West Main)

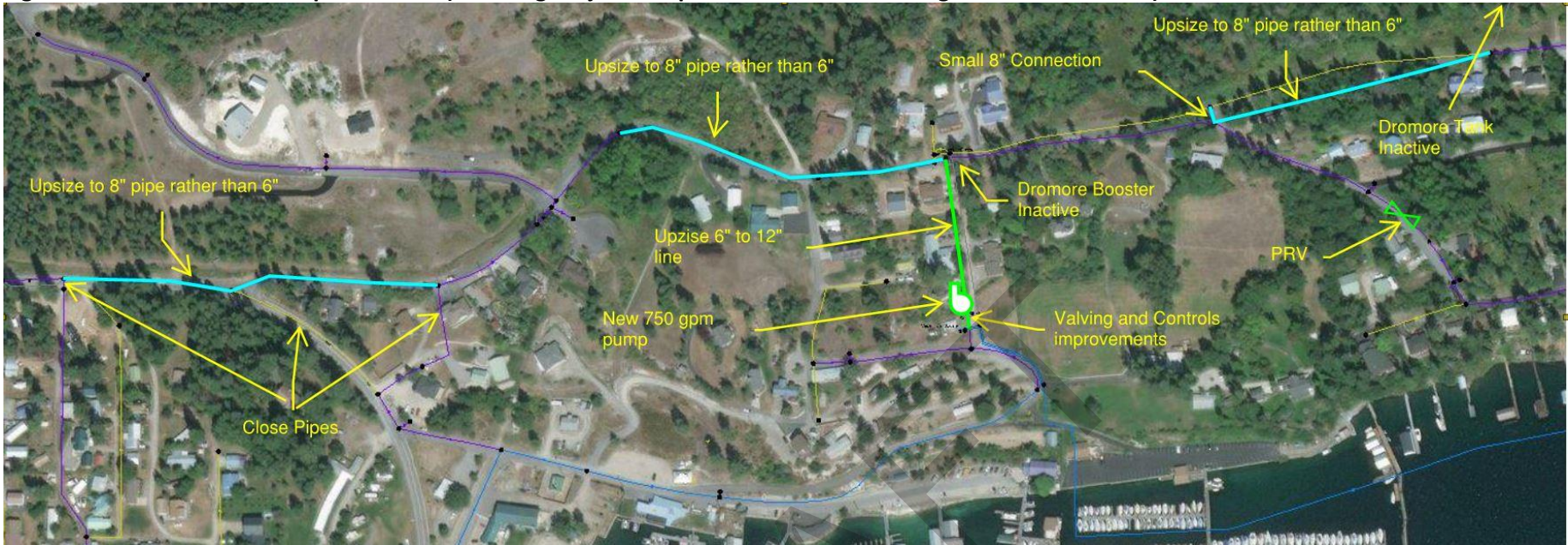
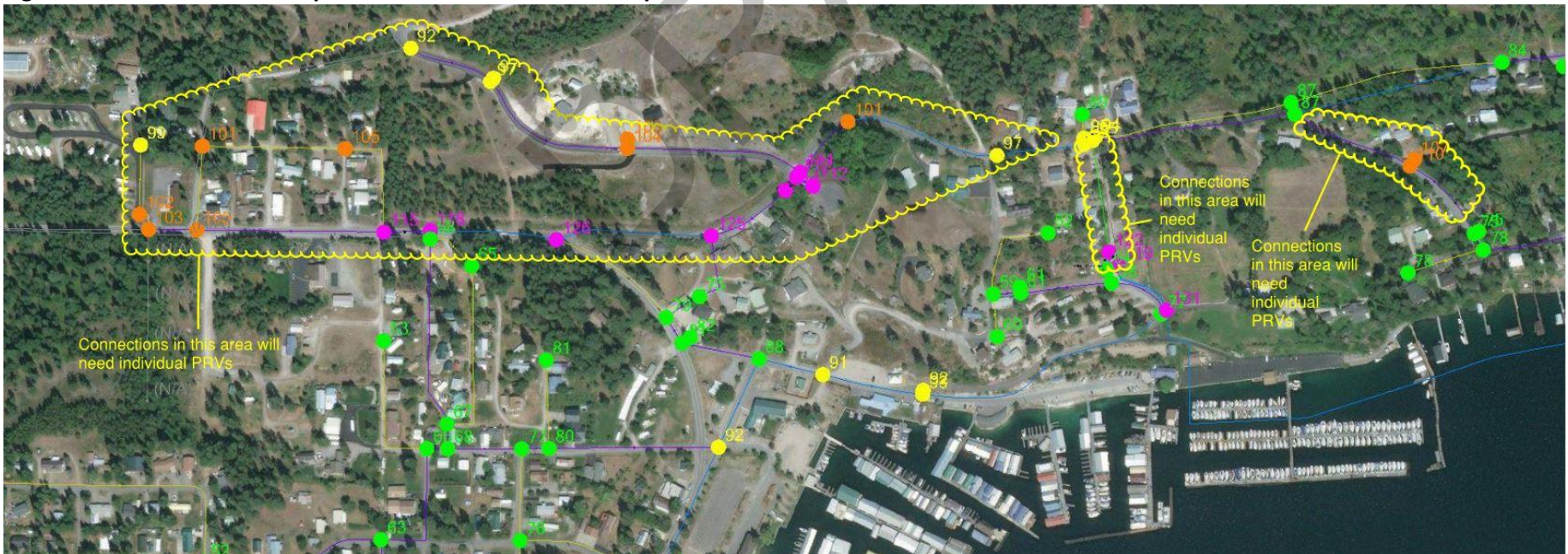


Figure 2: Keller Associates Improvements - Areas that will require individual PRVs at Connections



It should be noted that the proposed solution modifies existing pressure boundaries to raise pressures in the North West Bayview and Dromore areas. The Northern West portion of Bayview would be disconnected from the lower Bayview zone to keep pressures high. Pressure and flow would be supplied by a new 750 gpm pump (or pumps) at the Cape Horn booster Station which will allow the Dromore pump and tank to be taken offline; valving and control improvements at/around the Cape Horn booster would supplement the new pump(s). This could result in some long-term operating and maintenance cost savings.

In order to supply higher fire flows and pressures, the 6" line between the Cape Horn and Dromore Boosters should be upsized to a 12" line (this significantly contributes to higher pressures in the Dromore area). Keller Associates also recommends that the District consider sizing any new or replacement lines from Alternative E as 8" to keep pressures high and deliver adequate fire flows.

This solution results in a few areas exceeding 80 and even 100 psi pressure in the Northwest and Dromore areas. Individual PRVs at connections (as shown in **Figure 2**) are recommended. Valving and controls improvements are also recommended to be made for the area.

Based on these new improvements that replace the 12" West transmission line, we believe there is potential for more than \$250,000 in capital cost savings while improving the system. Would the District like us to develop life cycle cost estimates associated with these improvements for the District to review?

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