

December 1, 2017

Mr. Sam Adams, P.E.
City of Camas
616 NE 4th Avenue
Camas, WA 98607

Subject: Water System Plan Update Amendment

Dear Mr. Adams:

The Carollo Team has been assisting the City with the development of the Water System Plan. Additional tasks have been requested by City staff that enabled Task 900 Water System Analysis to exceed the original budget. Additionally, the project has taken longer than anticipated due to data collection and system evaluation that caused Task 1500 Project Management to also exceed the original budget. These activities have been noted on the monthly Progress Report. A brief description of each out-of-scope task and hours associated with the effort are detailed below:

- Task 900 - Calibration of the Hydraulic Model. A macro hydraulic model calibration was made using SCADA data provided by the City, which checked that wells, pumps, and tanks were operating as expected. A total of 8 hydrant flow test locations were calibrated. For this plan, a micro hydraulic model calibration was performed at five (5) of the hydrant flow test locations. The micro calibration adjusts pipe roughness and other factors to match the results seen in the distribution system. A budget of 40 hours was used to perform the calibration and provide Quality Assurance/Quality Control (QA/QC). Note, as part of the OTAK North Shore Water Main project, three (3) additional hydrant flow test locations were calibrated and the effort for these 3 tests were included in a separate project budget.
- Task 900 - Establishing PRV control settings for the Slow Sand Filtration Plant. The system tie-in for the Slow Sand Filtration Plant was incorporated into the hydraulic model. Control settings were tested for summer, winter, and year-round operation between three pressure zones (544, 455, and 343). Final year-round control settings were used in subsequent modeling. A budget of 24 hours was used to set the controls and perform QA/QC activities.
- Task 900 - In February and March of 2017, City staff requested assistance siting new reservoir in the Green Mountain development and a site at NE 222nd Avenue. Carollo reviewed prior reservoir studies and conducted extended period and fire flow simulations at both sites for the near- and long-term simulations for the ADD and MDD. Carollo found substantial operational issues with the sites and attempted to find solutions using the hydraulic model. A budget of 34 hours was used to update the model to simulate the new reservoir locations, conduct the simulations, attempt to resolve operational issues, and perform QA/QC.
- Task 1500 - Project Management activities were originally assumed a project duration of 18 months. As the project has been extended, an additional 12 months of project management is needed to finish the Water System. The additional Project coordination and invoicing is approximately \$6,000.

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This out of scope effort for Task 900 equates to a budget of \$16,600. Task 900 is \$35,693.80 over budget, where the remaining \$19,093.80 budget was used due to greater than anticipated difficulty of modeling the system. We are not requesting reimbursement for this additional modeling effort, as no additional scope was performed and the extra level of effort and challenge is hard to quantify and measure compared to the initial scope and budget. We are requesting the City provide additional budget of \$22,600 for out-of-scope efforts.

Sincerely,

CAROLLO ENGINEERS, INC.



Daniel L. Reisinger
Lead Water Resource Engineer

DLR:sm

cc: Lara Kammereck