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ENGINEERING **PLANNING**
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MEMORANDUM

(223740)

TO: Jonathan Harries, P.E., RD State Engineer

DATE: April 23, 2019

RE: SAFD2 Response to PER Review Comments

We offer the following responses to your questions. Once you have reviewed, please let me know if you would like to discuss further or if anything else is needed. Thank you.

Question 1. The following missing information from the joint RD/DEC preliminary engineering report guide (please reference Bulletin 1780-2 for more specific information needed) needs to be provided:

- a. Section 2, d – Financial status of existing facilities

Response 1a: Significant financial information from SAFD2 was included in the RD Apply application that was submitted on December 21, 2018. Additional information to address “Financial Capacity” was included in an email from me entitled, “SAFD2 ‘RD Apply Addendum’ Information” and dated April 5, 2019.

- b. Section 3, a – Need for project (please include any regulatory documentation, poor water quality, etc. in support of health issues)

Response 1b: Significant documentation and written personal testimonies to document poor water quality and public health risks were included in the RD Apply application that was submitted on December 21, 2018.

- c. Section 4, h – Construction cost estimates

Response 1c: Attached is an updated Total Project Cost Estimate (Table 4, updated 4-5-2019), which reflects the following adjustments:

- Construction costs were projected (using an ENR Cost Index approach) to August 2020, which we anticipate will be the “mid-point of construction”.
- The third filter was removed from the project based on an updated review of remaining reserve capacity, using metered data from 2018 (the past reserve capacity assessment used metered data from 2017) – see response to comment 2 for further information.
- The total pipe length was updated to reflect D&K’s further understanding of the pipe alignments originally developed by Phelps Engineering.
- Project costs include an allowance for a small residual chlorine booster station (\$75,000) – see response to comment 9 for further information.
- A cost allowance for Additional Permitting has been added to account for archaeology work that will be required on Middle Road (\$20,000 allowance) and to prepare an Act 250 permit amendment (\$10,000 allowance).
- The updated total project cost estimate “consumes” all of the remaining \$4.38 million bonding authorization from the previous bond vote. See response to comment 5 for inclusion of Route 129 Spur as a “bid alternate”.

d. Section 6, f – Annual operating budget

Response 1d: Attached is a copy of the 2018 annual operating budget.

Question 2. Section 5.4 of the BFD, calculation of current and future water demands appears to deserve reconsideration. The SAFD2 should have close to 5 years metered data that could serve as the basis of the ADD/MDD, which is likely significantly less than the WSR standards. If not, the basis for ADD being 240 GPD based on a minimum of 60 GPD/ person is unsubstantiated by assuming 4 persons per connection. This is most likely less and should be revised or substantiated with real numbers. Either one of these scenarios would point towards a lower, more reasonable ADD/MDD which in turn would not require the Alburgh WTF to install an additional treatment unit in turn removing the additional treatment component from the scope.

Response 2: The only water meter that is read on a daily basis is the master meter at the Village water treatment facility. The PER was prepared using metered water use data from 2017. Given the passage of time, we have updated this analysis to reflect metered water use data from 2018. This analysis is summarized in Table 1, updated 4-11-2019, attached. Given the seasonal nature of water use in Alburgh, we discussed a suitable approach to data analysis with Cindy Parks, from the DWGWPDP. The approach that was used is based on the following:

- Establish a design Average Daily Demand (ADD) by averaging daily metered water use during the “peak occupancy” months of July and August. Using 2018 metered data, the ADD = 111,518 gpd (this number is larger than the value calculated in 2017, due in part to the addition of a couple new connections).
- Establish a design Maximum Daily Demand (MDD) by identifying the single day largest metered data. For 2018, the MDD = 163,500 gpd (this number is smaller than the 2017 value. The Operator reports that the larger 2017 value was skewed by a large water leak and subsequent refilling the water storage tank).
- Metered water data shows average water use per ERU at 224 gpd, which is less than the value previously identified.
- The target number of ERU’s in the Phase 2 project has been scaled back to a more realistic value of 85 ERU’s. The previous value of 140 was determined to be unrealistically high.
- Based on the water production capacity of the existing Village of Alburgh water treatment facility (220,875 gpd), when the projected water use demands of SAFD2 Phase 2 (27,963 gpd) are applied, together with the existing demand from the Village and SAFD2 Phase 1 (163,500 gpd), the reserve capacity in the Village of Alburgh treatment system is nearly 30,000 gpd. This appears to be a significant reserve capacity and it has been concluded that there is no need to add another filter at this time. D&K understands that both the Village of Alburgh and SAFD2 concur with this conclusion and project direction.

Question 3. Per comment 2 a tabulation of individual metered data with yearly averages, etc. should be included in the BFD.

Response 3: See response to comment 2 above. Daily water use data from the master meter is used to assess current and projected water demands, not individual customer meters which are read quarterly.

Question 4. If there are soil conditions, as noted in the BFD, that would preclude certain pipe materials from consideration in the bidding specifications, then that would be acceptable to RD. However, any other acceptable pipe materials should be allowed to be specified.

Response 4: Concur. We understand the requirement for a competitive bidding situation and will try to identify more than one acceptable pipe material in the specifications during the design phase.

Question 5. Option 2 pipe alignment appears to be discarded due to high cost of a long boring through swamp like conditions. Being along the corridor of a main road would it not be possible to install at or just off the shoulder of this road? It is understood ledge is also a concern for this route. Are ledge depths known and is there consideration for higher depth of bury with insulation? Without more in depth project knowledge and knowing this route is shorter and has more connections it seemed reasonable to ask.

Response 5: SAFD2 scheduled a field-meeting on March 28, 2019 to review the Option 1 (Middle Road) and Option 2 (Swamp Crossing) with a local contractor who routinely performs directional borings. D&K understands that Route 129 through the “swamp” is an old “corduroy road” (constructed on top of trees laid perpendicular to the road), so placing the water main within the road or shoulder is likely not feasible without significantly disrupting or destroying this road base. Handling ground water in an open cut method of installation through the swamp also could prove to be a significant and costly issue. A local resident noted the road has been overlaid multiple times as it continues to settle. Following discussions, the directional drilling approach does appear feasible but there are concerns associated with the potential for encountering ledge along the boring route, drilling fluid “fracking” to the surface during installation, and the potential for the crossing needing to be accomplished through two borings, with a center open-cut connection (with associated wetlands impacts). Phelps Engineering did perform ledge probes in an earlier phase of the project, which did identify significant ledge in the water main route along Route 129 south of the Golf Course, and west of the swamp crossing.

The Middle Road alignment is longer by comparison, but there are no obvious ledge outcrops along this route, and locating the water main at the edge of this gravel road (previously disturbed area) would appear to minimize disruption to local farming operations and reduce the potential for archaeological impacts. The Middle Road route will require ledge probes and an archeological study. Cost allowances for these tasks have been included in the updated cost estimate. The Middle Road route does provide water service to Route 2 further north of Wagner Point (as compared to the swamp crossing route), and there are numerous potential connections along this northern segment of Route 2. The number of potential connections between Option 1 and 2 are very similar.

Following this field meeting and follow-up discussion, SAFD2 and D&K continue to support Option 1 (Middle Road) as the more economical route and with the least environmental impacts, as compared to Option 2 (Swamp Crossing) route.

If total project costs “under-run” the current estimate and additional funds remain at the conclusion of constructing Phase 2, SAFD2 would like to extend the water main south of the Golf Course (along Route 129) as far as possible within the limits of available funding. This can be called the “Route 129 Spur”. Environmental

review has already occurred in this area. This could be included as a "Bid Alternate" to establish pricing for this spur during a competitive bid phase. Please confirm if this bid alternate approach is viable.

Question 6. RD strongly recommends adequate consideration to ownership, responsibility and payment of service installations and including some information in the BFD.

Response 6: Under Phase 1, the project paid for (and SAFD2 is responsible for) the water service from the main to the limits of the public (road) right-of-way, including installation of a customer water meter in a meter vault at the right-of-way limit. The individual homeowner was responsible for arranging for and the costs of making the extension of the water service from that location, to the home. This procedure worked well for Phase 1 and will repeated for Phase 2. This cost responsibility has been communicated to prospective connections through the recently distributed "Interest Survey".

Question 7. Enforceable user agreements are required with a penalty clause except for users presently receiving service or where mandatory use of the system is required.

Response 7: SAFD2 believes the survey performed in 2016 provides reasonable documentation of interest in connecting to a Phase 2 extension. However, following additional coordination with Misty Sinsigalli, an "Interest Survey" letter was recently distributed to landowners along the Phase 2 water system extension route. The specific wording on document was coordinated with Misty.

Question 8. Are there any known issues and/or expected impacts on on-site wastewater systems?

Response 8: We are not aware of any significant or widespread issues with existing on-site wastewater treatment/disposal systems, and no impacts are anticipated as a result of the Phase 2 water system expansion. Obviously, individual homeowners will need to avoid impacts to their wastewater system when extending water service piping to their homes.

Question 9. Is it possible to determine at this stage, prior to PER acceptance, if a disinfection booster station is needed and is there any concern for potential of DBP?

Response 9: A unique "two stage" disinfection system is utilized at the Village of Alburgh treatment facility consisting of ultraviolet (UV) disinfection followed by liquid sodium hypochlorite. The result is that very little sodium hypochlorite is utilized to maintain an appropriate residual within the distribution system. A 30-gallon sodium hypochlorite storage tank is provided at the treatment facility for the entire distribution system. It is anticipated a similar/smaller size sodium hypochlorite tank will be used at a residual chlorine booster station at a suitable location along the water main extension route. I reviewed the potential for

Disinfection Byproduct (DBP) concerns with Ray Soloman and he suggested some water quality testing be completed to confirm if this could be an issue, which he is willing to participate in. If the project moves forward, we will coordinate with him to have this accomplished early in the design phase. If DBP's are a concern, he sounded pretty confident it could be addressed by making some adjustments at the water treatment facility (i.e., polymer adjustments or similar).

Question 10. If not already being undertaken, RD strongly suggests that the Alburgh Village system engage in leak detection and a formal water audit in an effort to lower lost and unaccounted for water.

Response 10: I discussed this suggestion with the Alburgh Village Water System Operator. He reports that he closely monitors the Village water distribution system, metered water production, and metered water usage. When a leak is suspected, he utilizes leak detection services provided by Vermont Rural Water Association. They "listen" to the entire water system approximately every two years, and leaks are repaired when discovered. From the perspective of the distribution system in SAFD2 (Phase 1), that piping is only 5-years old and believed to be "very tight" with limited leakage.