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November 21, 2016

Mr. James L. Mersfelder
Vice President / Treasurer
Woodridge Lake Sewer District
113 Brush Hill Road / P.O. Box 258
Goshen, CT 06756

Re: Response to State Department of Public Health (DPH) Request for Environmental and Public Health Review
Proposed Regional Sewer Connection Project (Project)
Woodridge Lake Sewer District (WLSD)

Mr. Mersfelder:

In response to the DPH letter dated November 2, 2016 requesting a detailed environmental and public health review of the alternatives, including the proposed Project, we provide you with the following information. This engineering review includes issues and concerns presented by the Torrington Water Company (TWC) for WLSD's proposed Regional Sewer Connection Project (Project), and requested by DPH. We offer the following technical information, which includes the attached Project Update Report:

1. Allen Dam Reservoir

We reviewed publicly available records at the Goshen Town Hall to interpret the strategic importance of the Allen Dam Reservoir. This included TWC's Water Supply Plan, dated February 25, 2009, revised in February 2013, as approved by the Connecticut Department of Public Health (DPH) on June 7, 2013. TWC's watershed map was not on file at the Town Clerk's office.

Our review of the available Water Supply Plan, which included information from 2004 through 2008, indicated that the Allen Dam Reservoir was infrequently activated during this period. When tabulated, water from the Allen Dam Reservoir represented approximately one half of one percent (0.5%) of the total potable water produced by TWC for this period. Further, the flow from the Allen Dam Reservoir dropped to only one quarter of one percent (0.25%) of the total potable water produced by TWC in 2008. When water from the Allen Dam is used by TWC during emergency conditions (per its Water Supply Plan), it is pumped to the TWC filtration plant for treatment, prior to being introduced into the TWC water distribution system for use by its customers.

The TWC Water Supply Plan states that there are 44 identified potential sources of pollution tributary to the Allen Dam Reservoir. These potential sources of pollution include septic systems, fuel tanks, farms, and a zoo at the Action Wildlife facility. In addition, the traffic along Route 4, including commercial vehicles, represents additional potential sources of pollution in the TWC watershed. Compared to the highly unlikely potential of a force main break: (1) existing septic systems, farms and the zoo discharge partially treatment wastewater effluent to the watershed every day, including whatever chemicals may have been flushed; (2) existing fuel tanks have the potential to discharge contaminants to the watershed, with little to no safety measures to report such concerns; and (3) daily traffic along Route 4, including commercial vehicles, has to the potential to result in the release of additional debris or fluids, unknowingly, to the TWC watershed. We believe that these known and identified sources of potential pollution in TWC's watershed represent higher risks to the watershed than does the WLSD wastewater transmission main, which will be engineered to include remote monitoring and detection capabilities.

In addition, the TWC Water Supply Plan indicates that "the Company foresees using Allen Dam only in an emergency situation or during a drought" (ref Chapter IV page 21). Finally, the Water Supply Plan shows that TWC "long term goals" do not contain any actions to increase ownership within the Allen Dam watershed (Appendix I-10).

From the point where the force main for the proposed Regional Sewer Connection Project traverses the existing culvert on Route 4 (Goshen Road) closest to the Allen Pond Dam, the proposed pipeline is approximately 9,200 feet (nearly two miles) from the Allen Pond Dam.

Based on our review of the above information, it is clear that TWC infrequently used the Allen Dam reservoir as a drinking water supply source. The Allen Dam Reservoir is not a primary water source utilized by TWC to provide drinking water to its customers. The Allen Dam Reservoir appears to represent a small fraction of the water supplied by the TWC to its customers, and appears to be used infrequently.

2. Wastewater Flows

WLSD's average annual flow has declined year after year from 112,000 gallons per day (gpd) in 2013, to 104,000 gpd in 2014, to 91,000 gpd in 2015 and 84,000 gpd for the first nine months of 2016. This is in large part a result of intensive and proactive inflow and infiltration reduction measures undertaken by the WLSD over the past several years. The proposed WLSD flow allocation with Torrington, 110,000 gpd, accounts for all current and projected future flows from WLSD. This flow allocation will not allow any additional growth of the WLSD beyond current land uses.

On a unit flow basis per home, the 691 current WLSD residences generated an average daily flow of only 131 gpd per home in 2015. Typical State-wide average daily flows per home are closer to 200 gpd.

WLSD has had one day in the past five years where the daily flow was in excess of 300,000 gallons per day. This was in Spring 2011 when regional high groundwater levels, winter snowpack and significant rainfall coincided for some of the highest flow conditions observed throughout the State over the past 10+ years. Based on WLSD's proposed flow allocation of 110,000 gpd, this represents a peak daily flow ratio of approximately three. It is typical for wastewater utilities in Connecticut to experience maximum daily flows of five times (or more) times average daily flows. The maximum daily flow observed in 2016 was 242,000 gpd on February 24, 2016, which is less than three times average daily flow at WLSD.

WLSD residences generate typical amounts of domestic wastewater. Claims of total daily flows in excess of 500,000 gpd are grossly exaggerated as metered flow data as submitted to CT DEEP shows a maximum 10-year high flow of 300,000 gallons.

3. Potential Force Main Leak

In an effort to evaluate the potential for a force main pipe failure, we researched various industry literature and resources on the matter. The Water Environment Research Foundation (WERF) is a 501c3 charitable corporation seeking to identify, support, and disseminate research that enhances the quality and reliability of water for natural systems and communities with an integrated approach to resource recovery and reuse, while facilitating interaction among practitioners, educators, researchers, decision makers, and the public. WERF has conducted extensive research on aging sewer force main pipe in various situations throughout the country.

WERF research shows that sanitary force mains represent approximately 7.5% of our Nation's 60,000 miles of wastewater piping infrastructure. WERF's report entitled "Predicting the Remaining Economic Life of Wastewater Pipes Phase I (SAM3R06)" supports that unlined cast iron pipe with leaded joints from 1952 has an expected useful life of pipe (as a class) of 60 to 80 years. For the proposed Regional Sewer Connection Project, we evaluated several types of "tight pipe," as defined by DPH, including ductile iron, polyvinyl chloride and high density polyethylene. The proposed pipeline materials proposed for the TWC watershed area all have design lives extending for more than 80 years, or beyond the Year 2100. As evidence of these predictive pipe lifetimes, there are countless miles of pipes in the State that have been in use for more than 100 years. Routine maintenance and monitoring, as proposed in WLSD's design, will help extend the duration of such infrastructure.

In the highly unlikely event of a pipe break, the proposed Project includes remote monitoring and control measures to allow operations staff to observe a potential leak, deactivate the pumping system, temporarily store the wastewater at WLSD's pump station, repair the hypothetical break, and clean up any wastewater that were to exit the pipe in this short amount of time. In such highly unlikely event, the short time period that would elapse before the pump system is deactivated, would not be sufficient time for any release to travel the approximate two mile distance to Allen Dam. These are common operational measures which are standard operating procedures utilized by licensed wastewater operators.

The proposed force main piping consists of a modern well manufactured and reliable "tight pipe." These pipes have been proven to have a design life well beyond 80 years without breaks or leaks. Moreover, the proposed design includes remote monitoring and control features to detect a break. The proposed pump station includes an emergency storage volume that can be utilized in the unlikely event of a pipe leak. If a leak were to occur, alarms would notify operation staff immediately and they would utilize standard operating procedures to clean up any loss of wastewater to the area, before any impacts to public drinking water would occur.

4. <u>Alternate Pipe Route(s)</u>

As part of the wastewater planning process, several regional alternatives to Litchfield and Torrington were evaluated. The alternatives analysis included cost and non-cost considerations including downstream utility considerations, land use, floodplains, wetlands, historical and archaeological, biological, water/wetlands, coastal, socio-economic and miscellaneous factors. Relative to the TWC watershed, as a result of the TWC not making watershed mapping publicly available, as required by State law, nor informing us of their watershed area during an early planning meeting with TWC staff, we were unaware that the proposed Project would traverse a corner of the TWC watershed until Summer 2016. Since that time, we have updated our proposed design concept to include design measures used on similar sewer projects in other watershed areas in the State. In addition, we updated our alternatives analysis (see attached Project Update Report) to evaluate alternative pipe routes through Torrington and Litchfield, including the alternative Weed Road route proposed by the TWC.

The updated alternatives analysis (see attached Project Update Report) concludes that the proposed Regional Sewer Connection Project remains the optimal alternative.

5. DEEP Approval

On May 17, 2016 the Connecticut DEEP issued a letter including the words "Facilities Plan Approval" wherein DEEP stated not only that it "concurs with the selection of regional alternative" but also that "in accordance with the requirements of Section 22a-482-3 of the Regulations of Connecticut State Agencies, the report is hereby approved."

In addition to the DEEP Approval letter as referenced herein, DEEP has continued to support the Project as proposed.

6. Watershed Review During Facilities Planning Process

In standard wastewater Facilities Planning, DEEP approves a scope and budget for the planning project. Facilities Planning in Connecticut is required to follow a standard Clean Water Fund checklist. During the facilities planning project, the engineer reviews available records, considers available information, and presents the proposed Project to the public. Our scope of work was approved by DEEP, and the Facilities Planning Summary Report was presented in a format consistent with the DEEP checklist.

During our record review, we now realize that TWC failed to make their watershed maps available as required by law (Conn. Gen. Stat. § 22a-42f). As a result of this non-compliance by the TWC, we did not know work was being proposed in their watershed.

The updated alternatives analysis, which includes a review of all known watershed areas, concludes that the proposed Regional Sewer Connection Project is still the recommended alternative (see attached Project Update Report).

7. Coordination with TWC During Facilities Planning Process

TWC was contacted multiple times during the project planning, including: late in 2013 during the alternatives analysis to inquire of their operations staff as to their past rock/ledge/groundwater observations for their recent water main projects; and during the soil boring program in Summer 2015 when soil borings were advanced at 100-foot increments along the proposed pipe route, including Route 4, as part of the design phase. On both occasions, TWC did not indicate that the proposed work was within their watershed, nor did they express any concerns about the proposed Project. More recently, publicly noticed 8-24 Referrals were conducted with both the Goshen and Torrington Planning & Zoning Commissions (January 2016 and December 2015, respectively).

We believe that TWC was aware of the proposed Project and the pipe route: on several occasions by WLSD representatives over the past two to three years; and never advised or notified WLSD that the proposed pipe route included a portion of the TWC watershed. TWC did not provide comments to WLSD, the City of Torrington, their water users, the DEEP, nor DPH, until Summer 2016. Nevertheless, we have since conducted an updated alternatives analysis (see attached Project Update Report) concluding that the proposed Regional Sewer Connection Project is still the recommended alternative.

8. Proposed Sewers in Watersheds

Although a section of force main piping for the proposed Project traverses the edge of the TWC watershed in Goshen and Torrington (less than 4,000 feet along Route 4), such crossing is not prohibited by local or State guidelines or requirements. Instead, we believe that the use of "tight

pipe" for the force main piping material (i.e. PVC C900 DR18 pipe or SDR11 HDPE pipe) is appropriate and consistent with other sewer force main applications in the State that traverse, or are adjacent to, watershed areas. Based on our review of available sewershed and watershed GIS data, we believe that approximately 40 communities in Connecticut have overlapping sewershed and watershed areas.

It is not uncommon for sewershed and watershed areas to overlap. This happens routinely across the State of Connecticut and is not prohibited by law, statute nor written policy. Although DPH does not offer regulations nor guidelines for these circumstances, measures used on similar projects in other watersheds provide for precedence for this Project.

9. Operations

The design concept for the proposed Project includes additional protective measures, which we believe are consistent with or exceed measures taken for other sewer mains that traverse watershed areas in Connecticut. The majority of the proposed force main traverses unclassified and Class II watershed land. The proposed piping in these areas is 8-inch PVC C900 DR18 pipe, which meets the intent of "tight" pipe per the DPH technical design standards. For the proposed culvert crossing in Torrington, which is designated as Class I land (200 foot width centered on culvert), the proposed design includes two 10-inch HDPE SDR11 pipes (primary and spare force main), with pressure ratings of 160 psi. Both pipes are sleeved in 18-inch SDR11 HDPE carrier pipes, also with pressure ratings of 160 psi. The proposed operating pressure in this section of the force main is approximately 30 psi when the pumps are running, and close to 0 psi when the pumps are off, allowing the force main to drain down the hill as a gravity sewer. At each end of the proposed crossing, we included a precast concrete vault, with valves, to allow the licensed wastewater operations team to switch the flow path, in the event that one of the two pipes is not available. The proposed pipes go over the existing 4-foot diameter culvert, since the culvert is approximately 13-feet deep to invert beneath the roadway surface. This allows for sufficient clearance between the culvert and the proposed pipes, as well as cover over the force main pipes.

In addition to the redundant force main pipes and carrier pipes, all of fusion-welded HDPE piping (without joints), together with upstream and downstream valve pits, we included as part of the Torrington Inland Wetlands Application, additional measures to protect the TWC watershed after construction. For example, in the unlikely event of a force main break, the SCADA control system will shut off the pumps. The proposed control system will include a float system in the downstream vault. Should either of the proposed force main pipes break, the wastewater (approximately 2,000 gallons of volume between the host pipe and the carrier pipe) would be contained in the carrier pipes, which slope downstream to the lower 6-foot by 10-foot vault (interior volume of approximately 3,500 gallons). The float would trigger a secondary alarm condition to stop the pump station pumps, and send alarms via the SCADA system to the Smart phones of the on-call staff. The proposed wetwell at the pump station includes approximately 8,000 gallons of active storage. However, if the wetwell is full at the time of a failure, there is an emergency overflow to the existing WPCF Effluent Equalization Tank, which allows for an additional 20,000 gallons of storage volume. Although a break or failure of the system will be known and measures implemented to terminate the flow, as a redundancy, based on the proposed average daily design flow of 110,000 gallons per day (gpd), the system will have roughly 4+ hours of storage volume to switch the force main valves at the culvert crossing, pump out any accumulated wastewater in the lower vault, and begin addressing the necessary pipe repairs. It should be noted that night-time flows are much lower, and the storage time in the vault, wetwell, and emergency overflow tank will all be longer.

In addition, during the Torrington Inland Wetlands Commission Public Hearing for the proposed Project, TWC's own engineering consultant, Tata & Howard, recommended design improvements to our proposed system, for the portion of the proposed Project traversing the TWC watershed. We agreed to incorporate these design recommendations in our proposed Project.

The proposed Project includes significant additional design measures, including those recommended by TWC, to enhance the functionality of the pipeline, including pipeline redundancy, sleeve pipes, valve vaults with remote monitoring, and advanced SCADA monitoring for operations staff. Final design of the system, however, is subject to approval by the City of Torrington WPCA and different measures could be accommodated as required.

10. Unsubstantiated and Unrelated Data

In their objections to the proposed Project, TWC representatives cited wastewater overflow information from sources unrelated to WLSD's proposed Project. To further understand the TWC position on wastewater overflows, we would request additional detail on the specific reference documents TWC is utilizing to generate this information. In absence of any reference information, we have to assume that the information is related to larger cities in Connecticut and throughout the U.S., where sanitary sewers and storm drains are sometimes connected, allowing combined sewer overflows (CSO) to exist. WLSD has a separate sanitary sewer system, and is not a CSO community, therefore any correlation to the wastewater overflow statistics for CSO communities would be irrelevant

The attempt to correlate various overflow data to WLSD's rural sewer system should be carefully reviewed to clearly correlate overflow potential within a similar system. A broad characterization of sewer overflows is inaccurate and inapplicable to the proposed WLSD pipeline.

11. Future Induced Growth

Both the City of Torrington and the Town of Goshen, through their Planning & Zoning Commissions, have supported the proposed Project, by both issuing positive 8-24 referrals. Neither community is expanding its sewer service area. Calculated flows for the project include only the current approved land use allocations within the WLSD sewer service area.

The proposed force main is serving strictly as a transmission main for WLSD alone. No services will be connected to the proposed pipe from the City of Torrington nor the Town of Goshen.

12. Immediate Threat

We do not believe that the proposed Project represents a threat to the environment or public health. The proposed Project is being designed in accordance with local, State and Federal regulations, the proposed materials are those most appropriate for the pipe route, and the Project was Approved by DEEP in order to address an active Consent Order.

The proposed Project does not constitute a threat to the environment or to public health. In addition, we believe we have undertaken a detailed review of the environmental and public health elements of the proposed Project and the alternatives, including potential impacts each alternative could have on a source of drinking water, if any, and future development induced by the Project as it relates to the environment and public health. In our opinion, the proposed Project is protective of public health and public drinking water supplies and will induce no additional growth along the proposed pipe route.

Please contact me or Dave Prickett anytime to discuss this in greater detail.
Sincerely,

WOODARD & CURRAN INC.

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