



**COUNTY OF PRINCE EDWARD,
VIRGINIA**

**Prince Edward County
PPEA -Sandy River Reservoir
Water Project Review**

Wiley|Wilson Commission No. 209021

May 11, 2009



11 May 2009

Mr. W.W. Bartlett
County Administrator
County of Prince Edward, Virginia
Post Office Box 382
Farmville, Virginia 23901

Dear Mr. Bartlett:

We are pleased to transmit herewith our Prince Edward County PPEA -Sandy River Reservoir Water Project Review.

This review incorporates the County's review comments.

Wiley|Wilson appreciates the opportunity to provide engineering services to Prince Edward County and we look forward to continuing to work with you.

Please contact me if you have any questions regarding this review.

Sincerely,

Wiley|Wilson

A handwritten signature in black ink, appearing to read "Tom M Slaydon".

Thomas M. Slaydon, P.E.
Project Manager



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PURPOSE of REVIEW

Prince Edward County received an unsolicited proposal from Crowder Construction Company teamed with Draper Aden Associates, (Team) entitled Sandy River Reservoir Water Treatment and Distribution Project dated October 17, 2008. The County in accordance with its Guidelines and Procedures and in accordance with the Code of Virginia sought alternative proposals and received none. The County has accepted the Team's proposal.

The County retained Wiley|Wilson to review portions of the PPEA PROPOSAL. Wiley|Wilson's tasks were to review Section II Project Characteristics which includes the detailed conceptual plan with its schedule and Section III Project Financing which includes estimation and estimating methodology. This review was intended to be a high or planning level review to assist the County in determining if the project characteristics, conceptual plan, schedule and project financing are reasonable and appropriate for the design, permitting, construction and ultimate operation by the County or the Virginia's Heartland Water and Sewer Authority.

SUMMARY

Based upon the information in the October 2008 PPEA Proposal, Wiley|Wilson finds the conceptual plan to be reasonable. Wiley|Wilson found that for the sections reviewed:

- technical aspects of the proposed facilities were sound and defined with sufficient detail for study and report phase levels of certainty;
- cost estimates were within twelve percent of our opinions of probable cost;
- durations and sequencing for the proposed projects activities were reasonable; and
- risks for delays and increases in costs plus proposed assignments of the risks were reasonably defined.

A finding that a component of the PPEA Proposal was reasonable was not necessarily a concurrence or a recommendation that project proceed as proposed. Yet it was a determination that the item reviewed was within an expected range, was reasonably expected to be successful, and that the component was appropriate as a starting point for more detailed engineering as would be done during the preliminary engineering stage.

Projections of water demand are fundamental to determining how large a facility has to be and what the revenues and expenses are going to be. Wiley|Wilson has made several comments related to projections. These comments do not suggest that the PPEA proposal is deficient, but to identify opportunities to clarify uncertainties. Many of the water resource projects that are undertaken by local governments are intended to serve future customers. Major capital projects are one of the areas that local governments bear the risks of what the future holds. Projections can range from guesses for characteristics that cannot be controlled or known - such as the economy or human behavior, to detailed estimates based upon carefully controlled aspects. No matter how detailed the projections are, they remain uncertain and as such can cause discomfort as decisions are made on whether or not to proceed.

For the project at hand, as with many water resource endeavors, water demands in the early years will be low and the timing of future demands is uncertain. Thus, the County should



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expect typical technical, administrative, and financial burdens in the early years of operations. Yet as the system matures, the County will enjoy the benefits that the project will provide.

Within the sections reviewed, Wiley|Wilson identified the following uncertainties that could have significant time, financial and operational impacts:

- The Virginia Department of Health review and approval process could be longer and require more pilot testing and engineering involvement than anticipated.
- The withdrawal and minimum flow-by restrictions contained in the Virginia Water Protection Permit have superseded the minimum release requirements in the Clean Water Act §401 certification so the safe yield needs to be recalculated.
- The intended water service area and associated water demands are uncertain. This uncertainty could be reduced with the inclusion of the contingency projects to serve Hampden Sydney College.
- During the initial years of operation, low water demands and long water ages will need to be monitored due to water quality issues. Such issues are typical for new water facilities.

Each of the uncertainties can be reduced to levels that are more comfortable by additional efforts, and none of the uncertainties, if handled properly, would be fatal flaws for the successful completion and utilization of the project.

Wiley|Wilson has, for the sections of the PPEA Proposal that were reviewed, concluded that the PPEA Proposal is sound enough to be used as a starting point for the County to proceed to negotiate an interim agreement that will define in greater detail, the scope of the work to be performed, the costs of the work, risks to be mitigated and born, and who will bear the risks.

Public water supply for Prince Edward County is critical if the County has goals for public health, fire protection, economic development, and independence as a water purveyor. Prince Edward County's Board of Supervisors is the agency responsible for setting these goals. The advancement of the proposed Sandy River Reservoir Water Treatment and Distribution Project seems to be consistent with the intent of the County when it created the Virginia's Heartland Water and Sewer Authority. **If the County's intentions are to become much more involved and proactive in the attainment of the goals as set forth above, then the proposed project is a good starting point.**

If the County's intentions are to become much more involved and proactive in the attainment of the goals as set forth above, then the proposed project is a good starting point.

REVIEW OF SECTION II – PROJECT CHARACTERISTICS

Project Descriptions and Conceptual Designs

Sandy River Reservoir Water Treatment Facility

This part of Section II gives a general definition of the problems the project is seeking to solve, identifies the availability of water demand information, describes a treatable water



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source, and defines the physical components of the solution. More detail on the water treatment facility is provided in PPEA Proposal Appendix A – Conceptual Design Overview. A reference is made to the Draft Regional Water Supply Plan for long-term flow projections for the County. *Because water demand projections are so critical to the design and financing of the project, considerable effort should be made to understand how the ranges of demands will impact the design, operation and financing of the project.*

Water Distribution System

The design basis for the water transmission and distribution system is described in this subsection. Water main sizing is to be based upon 20-year projections of average daily water demands and fire flows. Again, a reference is made to the Draft Regional Water Supply Plan. A brief discussion of the need for a Preliminary Engineering Report (PER) is included. The PER is intended to address the design considerations for the water treatment plant, select a preferred treatment process, and satisfy requirements of the Virginia Department of Health. *Because the water transmission mains will be long and water demands in the early years will be low, designs and processes should also consider water age and the potential for disinfectant byproduct formation.* More detail on the water distribution system is provided in PPEA Proposal Appendix A – Conceptual Design Overview.

Because water demand projections are so critical to the design and financing of the project, considerable effort should be made to understand the how the ranges of demands will impact the design, operation and financing of the project.

PPEA Proposal Appendix A - Conceptual Design Overview

Wiley|Wilson's review of Appendix A was a high or planning level review to assist the County in determining if the project characteristics and conceptual plan are reasonable and appropriate. Many of the design considerations will be determined during preliminary engineering. Appendix A identifies issues that are to be resolved during preliminary engineering and provides planning level cost estimates.

Sandy River Reservoir Water Treatment Facility

1. Design Flow for Treatment and Distribution Components

According to Appendix A, the 2030 flow projection, based upon moderate growth for the northern part of the County is 1.3 MGD. Elsewhere in the report the 2030 projection is cited as 1.1 MGD. The 1.1 to 1.3 MGD projections are close to those listed in the 2005 Joint Permit Application for the Sandy River Reservoir Intake system. Appendix A alludes to the flow projections in the Draft Regional Water Supply Plan. The Draft Plan's mid-range projections for the Northern sector of the County are 0.55 to 1.10 MGD depending on percentage of total water demand met by public waterworks. Neither the PPEA Proposal nor Appendix A contains sufficient information to determine what the 2030 service area will be. For purposes of this review, Wiley|Wilson will accept the 2030 projected water demand. As is recognized in Appendix A, and as was stated above, demand projects are critical to the design and financial analysis of the proposed project so Wiley|Wilson recommends that demand projections be addressed rigorously during preliminary engineering.

Appendix A implies that Hampden-Sydney College, the Manor Golf Club community and the Prince Edward County Business Park will be served by the proposed waterworks. The County would need to negotiate capital and operational costs terms with the college in order to provide service to Hampden-Sydney. The booster pumping station and two of the contingent water line projects were proposed to provide service to the College. The Manor



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area is already within the County's new waterworks. Currently served by the Town, the Prince Edward County Business Park is also included. However, there is concern that the November 2008 Agreement between the County and the Town may have included that part of the County that the Town will continue to serve.

Regardless of the 2030 or the ultimate service area, near term projections of water demand will also be essential to allow development of plans and procedures to mitigate the problem of excess water age during very low demand periods. This issue too should be addressed during preliminary engineering.

The recommendation to size the treatment facility to meet 2030 demands with accommodations for expansion is reasonable. Appendix A also provided recommendations on the initial and upgrade increments for the major components of the project. These data are reasonable for advancing the project to preliminary engineering.

2. Withdrawal from Reservoir

The 8.0 MGD safe yield was based upon a minimum downstream release value of 0.054 CFS/ square mile of drainage area. This value was provided in the 1979 §401 certification from the Virginia State Water Control Board. Since then, the Virginia Department of Environmental Quality issued the County a Virginia Water Protection Permit for withdrawals from the Sandy River Reservoir. (VWP 05-1464). Wiley|Wilson recommends that a safe yield analysis be performed using the withdrawal limitations and minimum instream flow requirements set forth in VWP 05-1464. Such reanalysis should be an early component of preliminary engineering.

Appendix A describes a multilevel withdrawal structure with three screens placed at different depths. Each screen would be designed to pass eight MGD. Appendix A also speaks to initial wetwell and pump station capacity, expandability, potassium permanganate feed, controls, continuity of operations during expansion, and power supply. Wiley|Wilson finds this approach and subsequent discussion to be reasonable. Wiley|Wilson shares the concern about sediment accumulation in the pipe headers that will be sized for eight MGD while the initial plant pumping rate may be as low as one MGD. A similar concern exists for the raw water mains all the way to the treatment plant. The discussion regarding the challenges and methods for constructing the intake are reasonable and will need to be more fully developed during preliminary engineering.

Diffused aeration is proposed to mitigate the levels of iron and manganese as identified in the two studies by Gary C. Schafran. Wiley|Wilson finds the localized course bubble aeration approach to be reasonable. This in-reservoir treatment process will need to be addressed more fully in preliminary engineering.

3. Reservoir Water Quality

The Team has reasonably acknowledged the iron, manganese, and disinfectant precursor challenges the Sandy River Reservoir water will present. Diffused aeration either with submerged diffusers or floating solar-powered aerators is mentioned as a mitigation option for the iron and manganese. Disinfection using chloramines is proposed to limit the formation of disinfectant byproducts. Later in the PPEA Proposal the issues associated with an interconnection to the chlorinated Farmville waterworks are acknowledged. The Team



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has stated that the iron, manganese and precursor challenges are similar to those in other source waters that have been successfully treated. The solutions proposed are reasonable and they will be need to be further refined during preliminary engineering. The VDH has expressed concern over the total organic carbon levels observed in the reservoir water, so the County and the Team can expect significant discussions with VDH on the matter.

A matter that is not addressed in the PPEA Proposal is the abandoned 1980's era landfill that existed on the eastern side of the reservoir. Wiley|Wilson is aware that the potential impacts to water quality are currently being discussed by the regulatory agencies. VDH will also need to resolve any challenges to water quality that the abandoned landfill might impose.

4. Proposed Treatment Options

The opening discussion of this section of Appendix A states the importance of pilot testing during the preparation of the preliminary engineering report. In the preliminary treatment section, use of the proprietary MIEX system was discussed. The consideration of using the MIEX system to reduce TOCs to allow compliance with the Stage 2 Disinfection-Disinfectant Byproduct Rule is reasonable as are the contactor sizing, redundancy and deployment proposals.

Two treatment options were identified, i.e. 1) adsorption clarification with conventional filters and 2) gravity clarification followed by membranes. These are two reasonable processes to be considered during preliminary engineering. Under the membrane option, the PPEA Proposal states that membranes have a 5-log removal for giardia and cryptosporidium. VDH working memo 880 allows a 3-log credit. Some concern also exists related to water age arising from sizing the clearwell for ultimate demands.

4. (SIC) Treatability and Pilot Studies

The items addressed in the Treatability and Pilot Studies section are reasonable.

5. Expandability of the Treatment Plant

The items addressed in the Expandability of the Treatment Plan section are reasonable.

6. Waste Disposal Options

The items addressed in the Waste Disposal section are reasonable.

7. Treatment Facility Utility Options

The items addressed in the Treatment Facility Utility Options section are reasonable.

8. Disinfection Options

The PPEA Proposal to use chloramines because of anticipated long water age is reasonable.

9. Plant Start up Logistics

The plant start-up logistics are reasonable.



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10. Operational and Maintenance Considerations

The operational and maintenance considerations as stated are reasonable. The occupation of the plant site by administrative staff is an issue for the County to determine during preliminary engineering.

11. Water Plant Building Concepts

The water plant building concepts are reasonable.

Water Distribution System

The PPEA Proposal speaks to the service area extending to Hampden-Sydney College, but projects A-E do not extend to Hampden-Sydney. However an extension to Hampden-Sydney College is provided by contingency projects. Appendix A does not provide a geographic or temporal distribution of projected water demands therefore only very general remarks can be made at this time. Sizings, routings, and timing for projects A-E followed by the contingency projects are reasonable; however water age will likely be a problem during the early years of operation. Connecting the proposed pipelines to the Town system will be a problem because the Town does not chloraminate. Also if the Town and County systems are interconnected, the County will need to consider the provisions of the 2008 Water and Sewer Service Agreement between the Town and the County.

Water Storage Tanks

The design criteria given in Appendix A are reasonable. Details on initial and future tank heights and volumes will need to be addressed during preliminary engineering. Water age can become too old in tanks that are sized to accommodate fire demands plus system equalization based upon demands twenty years in the future. The County should also decide how it wishes to use antenna space on the water tanks so tank designs can accommodate such antennas.

Booster Pumping Station/Chlorination Facility

This section of Appendix A speaks to providing water service to Hampden-Sydney College. The booster pump sizing is reasonable for the anticipated system pressures and demands. Wiley|Wilson has concerns about controlling the ammonia and chlorine feeds in a remote disinfection station. In subsequent discussions, the Team stated that the remote disinfection station would likely be eliminated. A connection to provide water service to the community of Rice does not appear technically unfeasible.

Metering Stations

If the project is to be connected to the Farmville water system, then metering facilities will be needed. Providing automatic pressure control valves is reasonable. For system interconnects to occur, issues with respect to energy grade lines, disinfection process, and provisions of the 2008 Water and Sewer Service Agreement between the Town and the County should be considered.



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Identify and Describe the Work to be Performed by the County

The County's role in advancing the proposed project is described in this subsection. Every successful project includes an active and well informed owner who, among many other responsibilities, understands and performs his role. *Depending upon the owner's resources, the role can vary and Prince Edward County should assess the resources it can apply to its responsibilities for the proposed project.* The acquisition of land and easements is relegated to the County in this subsection. Many local governments perform this role well, while others do not. Land and easement acquisition can be out-sourced or can be reassigned to the Team. The decision on who should obtain land and easements should be based on the County's particular circumstances related to land owner relationships, the number of easements needed, and the complexity of land acquisition.

The roles and responsibilities of the County's project representative during the development of the anticipated interim agreement through project start-up and acceptance of construction should be well thought out and clearly defined so as to optimize the benefits of the design-build process while protecting the County's best interests.

The PPEA Proposal recommends that the County provide a full-time project representative during the construction of the project. For a successful project to occur, the County will need to have someone engaged full time. *The roles and responsibilities of the County's project representative during the development of the anticipated interim agreement through project start-up and acceptance of construction should be well thought out and clearly defined so as to optimize the benefits of the design-build process while protecting the County's best interests.*

The PPEA Proposal indicates that the project will be operated by the newly formed Authority that will be responsible for annual debt service and operations and maintenance costs. The PPEA Proposal also indicates that the County will bear legal costs associated with land acquisition, project financing, and agreement negotiation. Bearing the costs of debt service, legal assistance, operations and maintenance, land acquisition, and other assistance such as engineering and financial are ultimately borne by the owner regardless of whether the project is delivered by a design-build or a design-bid-build method.

Reference was made to third party review where such costs are to be covered by the PPEA review fee that has an upper limit of \$50,000. The County has shown that it understands the eligible costs for the referenced review and for the scope of the review. To advance the project the County should obtain additional assistance or provide a qualified full-time project representative.

Include a List of All Federal, State, and Local Permits Required

This subsection identifies many of the permits that will need to be obtained. All of the water resources related permits begin with the Virginia Marine Resources Commission (VMRC) Joint Permit Application (JPA). A JPA was submitted to VMRC in 2005 for a Sandy River Reservoir Intake System. In 2006, the Virginia Department of Environmental Quality issued a Virginia Water Protection Permit that expires in 2021. Because the work shown in the JPA



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did not involve a discharge or a large enough wet-lands disturbance, the County will not need an individual §404 permit from the U.S. Army Corps of Engineers (CoE). Should the design change, then an individual permit could be required. The listing of permits is comprehensive and the recognition of risks arising from the permitting process is appropriate. The design-build process, because of the involvement of the builder, can provide a better way to quantify the cost impacts of permitting risks.

Identify Any Anticipated Adverse Social, Economic and Environmental Impacts

From a county-wide perspective, these impacts are anticipated to be minimal. However property owners whose land is disturbed by the construction and occupation of their land by the proposed facilities will not consider the impacts minimal. Damages (to the residual) will ultimately be determined by the courts for some condemnations. Other disgruntled land owners may seek relief through negotiations, through the political process, or by exercising their rights to take part in the public participation processes required for various permits. While a macro overview suggests few adverse impacts, the County should not underestimate the commitment of resources required to mitigate localized impacts. These local impacts may not become evident until construction occurs, but they are inevitable. *The County should consider addressing the risks and mitigation of such localized impacts in the comprehensive agreement. Since many of the localized impacts arise from unforeseen conditions and contractor behavior, the County should place many of these risks on the Team.*

Identify Projected Social, Economic and Environmental Impacts

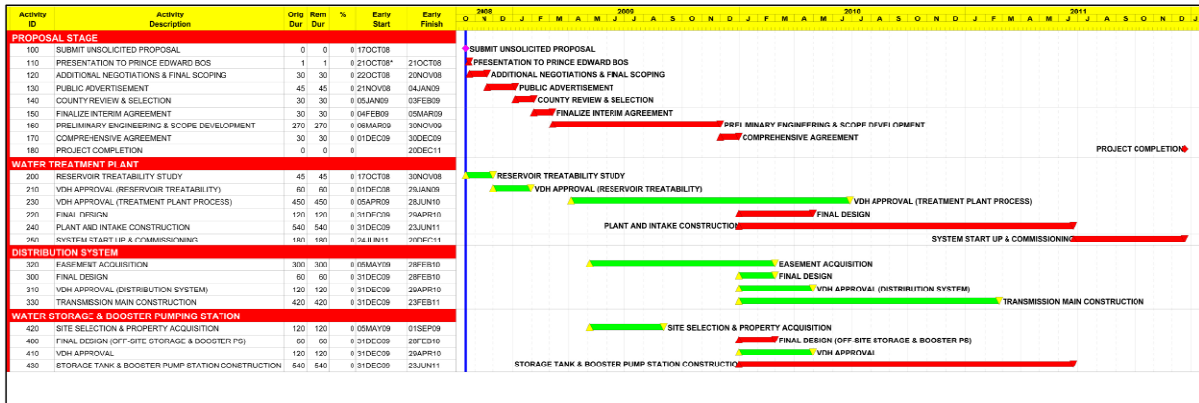
The benefits described are typical of water supply projects. The idea of a backup water supply for Farmville is a significant benefit and the County should understand the relationship of such a backup water supply to the recent water and sewer services agreement between Farmville and the County.

Identify the Proposed Schedule for the Project

Appendix B - Conceptual Schedule describes the project schedule. The schedule comprises four categories of the work, i.e. PPEA Proposal, water treatment plant, distribution system, and water storage & booster pumping station stages. Three assumptions were made by the Team in developing the schedule. First, a high level of communication with VDH and other regulatory agencies was assumed. Communications with VDH will be essential for this project to advance. However, predicting the time required to work through any regulatory procedure is very difficult, especially when the procedure involves potential impacts to human health, new techniques, or issues that tend to be defined more by agency policies or guidance than regulations. The Gantt chart given in the PPEA Proposal shows about 60 days for VDH to review and approve the reservoir treatability study, 450 days for the treatment plant process, and 120 days each for the distribution and storage components. Durations for VDH review appear generous, yet the



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seventeen months predicted for the approvals related to source water and treatment may be understated because of the reasons cited above.

Proposal Stage

Tasks in the proposal stage can be categorized into 4 phases, i.e. receipt of PPEA Proposal through County review and selection, interim agreement, preliminary engineering, and comprehensive agreement phases.

If the County is willing to bear the costs of completing this phase without a customer base large enough to generate sufficient revenues to support the operating and financing of the proposed waterworks, then the nine-month period is reasonable.

The County is essentially complete with the process through selection and upon their review of this PPEA Review; they will decide whether to proceed with the development of an interim agreement. As shown in the Gantt chart, the durations were optimistic yet reasonable.

During the interim agreement phase the County and the Team will negotiate the scope of the work to be performed during the preliminary engineering and scope development phase, costs to the County, and other tasks that will start the sharing of risks and costs with the County. One month is the proposed duration of the interim agreement phase. This activity has begun. One-month duration is also possible yet overly optimistic because this step is the point at which the County commits to bear significant costs and risks.

In Appendix B, nine months are estimated for preliminary engineering and scope development. Among the major questions to be answered during the preliminary engineering phase are the proposed service area for the project, the financial feasibility, what the treatment process will include, and the fees that the County will pay to the Team for this phase of the project. Service area definition has great impact on water demands and economic feasibility. Few immediate water customers exist within the service area shown in the PPEA Proposal, but outside the proposed service area are several existing customer bases, namely Hampden Sydney College and two towns. The County could either proceed with the project with the proposed service area, or not proceed until commitments could be obtained from the existing customer bases. *If the County is willing to bear the costs of completing this phase without a customer base large enough to generate sufficient*



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revenues to support the operating and financing of the proposed waterworks, then the nine-month period is reasonable. However, if the County does not wish to proceed without customer commitments, the nine month period will more than likely be too short. This is not to say that the Team cannot perform the work, rather it is a recognition that the scope development and obtaining of customer commitments are beyond their control. Some of these issues overlap with the categories discussed below. The overlap and concurrent efforts are some of the reasons that the design-build process can decrease overall project duration and potentially save money, but time and money risks are associated with the overlaps.

The projected duration for the development and execution of the comprehensive agreement is one month. The County has guidelines for the provisions of a comprehensive agreement. Wiley|Wilson's anticipated times to negotiate and adopt each of the fourteen required provisions are tabulated below.

B. Comprehensive Agreement Terms		Time to Negotiate and Adopt
The scope of the comprehensive agreement shall include but not be limited to:		
1	The delivery of maintenance, performance and payment bonds or letters of credit in connection with any acquisition, design, construction, improvement, renovation, expansion, equipping, maintenance, or operation of the qualifying project;	Up to 1 month
2	The review of plans and specifications by the County, its agencies or instrumentalities	More than 1 month
3	The rights of the County to inspect the project to ensure compliance with the comprehensive agreement and any development plans and specifications;	N/A
4	The maintenance of a policy or policies of liability insurance or self-insurance reasonably sufficient to insure coverage of the project and the tort liability to the public and employees and to enable the continued operation of the qualifying project;	Up to 1 month
5	The monitoring of the practices of the operator by the County, its agencies or instrumentalities to ensure proper maintenance	N/A
6	The terms under which the Contractor will reimburse the County for services provided	N/A
7	The policy and procedures that will govern the rights and responsibilities of the County and the Contractor in the event that the comprehensive agreement is terminated or there is a material default by the Contractor including the conditions governing assumption of the duties and responsibilities of the Contractor by the County and the transfer or purchase of property or other interests of the Contractor by the County;	More than 1 month
8	The terms under which the Contractor will file appropriate financial statements on a periodic basis	Up to 1 month
9	The mechanism by which user fees, lease payments, or service payments, if any, may be established from time to time upon agreement of the parties. Any payments or fees shall be set at a level that is the same for persons using the facility under like conditions and that will not materially discourage use for the qualifying project;	More than 1 month
	a. A copy of any service contract shall be filed with the County	N/A
	b. A schedule of the current user fees or lease payments shall be made available by the Contractor to any member of the public upon request	N/A
	c. Classifications according to reasonable categories for assessment of user fees may be made.	N/A



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B. Comprehensive Agreement Terms		Time to Negotiate and Adopt
The scope of the comprehensive agreement shall include but not be limited to:		
10	The terms and conditions under which the County may be required to contribute financial resources, if any;	More than 1 month
11	The terms and conditions under which existing site conditions will be addressed, including identification of the party responsible for conducting assessments and taking necessary remedial action;	1 month
12	The terms and conditions under which the County will be required to pay money to the private entity and the amount of any such payments for the project.	More than 1 month
13	A periodic reporting procedure that incorporates a description of the impact of the project on the County	Up to 1 month
14	Such other terms and conditions as the County may deem appropriate.	Up to 1 month

Agreement between the County and the Team will likely require more than one-month for provisions 7, 9, 10, and 12. However if the form of comprehensive agreement and as many provisions as possible are negotiated as a concurrent activity during the preliminary engineering phase, the overall project schedule should not be impacted.

Water Treatment Plant

The duration of VDH reviews for both the reservoir treatability and treatment plant process

The Team intends to “integrate VDH into our team during the design stage...”

VDH has limited design-build experience so the Sandy River project will be pioneering work for them.

shown on the Gantt chart are within the realm of possibility. The Gantt chart depicts an aggressive and optimistic scenario however. The Team intends to “integrate VDH into our team during the design stage...” VDH as a rule likes to follow the same processes it has used for decades and if the proposed integration can be made consistent with the VDH process, then time might be saved. However if VDH resists the integrating idea, then the times could increase. VDH approvals could take longer if the duration of pilot testing is greater than anticipated, if VDH takes greater issue than anticipated with the treatability study, plant processes, source water assessments or sanitary surveys associated with the reservoir. Additional time will be needed if

the Team has to elevate the issues to the VDH central office. VDH’s approach to, what is to them, a new form of project delivery will have a significant impact on the PPEA Proposal’s schedule. The Team is taking an open and collaborative approach with VDH that can yield time savings if VDH is willing to proceed in a comparable manner. Because the current economic downturn has reduced VDH’s plan review workload, VDH should be able to dedicate itself more to the Sandy River project.

When compared with the time requirements for other projects of comparable complexity and recognizing the design process differences between design-build and design-bid-build, the design durations shown in Appendix B appear reasonable.

Fast-tracking items such as site work, utilities and administration building construction are shown in the Gantt chart by the construction activity beginning at the execution of the comprehensive agreement, concurrently with the initiation of final design and before the



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completion of the VDH approval process. For this fast-tracking to happen, the County and the Team will have to have agreed upon the preliminary design and be confident enough that VHD approvals are coming. Regardless of when the construction of the intake and plant begins, the projected eighteen-month construction period is reasonable for the proposed work.

Distribution System

Of the four activities shown on the Gantt chart for the distribution system, easement acquisition has been identified as the step most likely to cause delays. Experience has shown that obtaining easements can be one of the most time consuming and frustrating activities. In the current PPEA Proposal, easement acquisition is the County's responsibility. Any of the following obstacles can result in delays in obtaining easements:

- the easement grantors are not amenable to granting the easements at costs the County is willing to pay
- the County Board of Supervisors is reluctant to use condemnation to obtain easements
- the title search reveals issues that delay execution of the deed of easement
- lien holders are reluctant to approve encumbrances on the properties
- the County cannot dedicate staff to devote to easement acquisition

Without knowing the number of easements to be acquired, the number and disposition of the landowners, and the County's process for obtaining easements or acquiring land, a determination of reasonableness for the projected duration is difficult. For the 44,000 LF of line work proposed, 300 days is a very optimistic duration. An option for the County to consider is to assign more easement acquisition tasks to the Team.

The construction duration is reasonable, especially when considering that the pipeline route does not appear to be difficult and the Team will not face the conventional shop drawing review/RFI process. The Gantt chart shows the construction beginning concurrently with the VHD approval process. While VDH approvals for pipelines should present less opportunity for delays than the treatment plant, the County should be careful in these concurrent activities. According to the Virginia Waterworks Regulations at 12VAC5-590 et. Seq.

No owner or other person shall cause or allow the construction or change in the manner of transmission, storage, purification, treatment, or distribution of water (including the extension of water pipes for the distribution of water) at any waterworks or water supply without a written construction permit from the commissioner.

The VDH approval duration is projected to be 120 days or 29% of the 420-day construction period. Wiley|Wilson recommends that the County and design builder have a written understanding with VDH regarding the concurrent construction and approval periods. With water plant construction, preapproval activities can be limited to those outside the scope of the waterworks regulations, but few out-side-the-regulations construction activities exist for water line construction.

Water Storage & Booster Pumping Station

The Team's approach for the storage and pumping component is similar to the approach for the other components. Wiley|Wilson's remarks are also similar, i.e., durations are



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reasonable, easement acquisition can be problematic, fast tracking may offer some schedule compression, and VDH approvals are concurrent with construction. Wiley|Wilson notes that the booster pumping station is included in the schedule but that both the suction and discharge side distribution system projects are not.

Identify Contingency Plans for Addressing the Public Needs

Prince Edward County’s guidelines and procedures state that the PPEA Proposal must identify contingency plans for addressing public needs in the event that all or some of the project is not completed according to projected schedule. The PPEA Proposal acknowledges the November 2008 Water and Sewer Service Agreement between the Town and the County.

Allocation of Risk/Liability for Work Completed Beyond the Agreed Schedule

Within the Section II, the Team included a table that identifies typical risks associated with water resource projects and that proposes who is to bear the risks should the item not be completed within the agreed upon schedule. Wiley|Wilson finds the allocations to be reasonable for starting negotiations for either the interim or the comprehensive agreements. Assignments of risks and liability for work completed beyond the agreed schedule for several items previously assigned to the Owner as tabulated below could be modified.

Wiley|Wilson finds the allocations to be reasonable for starting negotiations for either the interim or the comprehensive agreements.

Item	Remarks
Easements	The County could expand the vendor’s responsibilities to include all acquisition activities up to condemnation. These activities are easily outsourced.
Environmental Permits	<p>1. Since the Engineer submitted the unsolicited PPEA Proposal based upon a 2005 VMRC Joint Permit Application, the County could insist that the vendor bear risks associated with changes in the permits that could arise from design or construction changes not contemplated in the JPA.</p> <p>2. Should a re-evaluation of safe yield based upon the provisions given in the Virginia Water Protection Permit, the County should consider not bearing risks associated with any changes arising from changes in the safe yield.</p>
System Capacity	The County could consider carefully that the vendor makes the assumptions at the County’s risks. The components of the project that have capacities could be identified and assignment of risks be negotiated. For example, the capacities of pumps and some treatment units, even with assumptions, should be borne by the Vendor.
Hazardous/toxic chemicals and wastes	Without suggesting that the 1980’s era landfill poses any water quality or health threat, its existence is now known and as such the risks to the project arising there from, should be defined.



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State Assumptions of Ownership Related to Use of the Project

A warranty by the Team of at least one year should be acknowledged or a longer period negotiated.

Provide Information Related to Potential Phased Openings of the Project

The phased openings provided in this section are reasonable.

List Other Assumptions Relied on for Successful Project Completion

The assumptions that customers will exist when and where projected are typical for water resource projects as is the assumption that financing can be obtained so their inclusion is reasonable but are ones that need to be carefully considered by the County.

List any Contingencies that must Occur for the Project to be Successful

Customers must connect to the water system for the project to be successful. The PPEA Proposal explicitly states that Hampden-Sydney College is to be a customer and a booster pump station project is included, but the pipeline extensions to the college are not included except as contingency projects. These two contingency projects proposed to extend service to Hampden-Sydney would increase the estimated project costs for distribution by about twelve percent. Since a marginal cost of 12% would be offset by potential cost sharing and a significant increase in customer and revenue certainties, the County should consider asking that the two contingency projects be made a part of the PPEA project.

REVIEW OF SECTION III – PROJECT FINANCING

Preliminary Estimate and Estimating Methodology

Appendix C to the PPEA PROPOSAL Section III Project Financing addresses estimation and estimating methodology. However neither Section III nor Appendix C includes explicit information on the estimating methodology, so reasonableness was based upon an evaluation of the items estimated and the estimates. The estimates, provided were for a range of capital cost and did not include any annual costs. Estimated components included:

- project direct costs that are assumed to include all of the costs of labor, materials, equipment, installation/construction, surveying, engineering, permitting, mark-up, profit and risk that the Team will include in the fees charged to the County either through the interim or comprehensive agreements;
- potential direct project costs reductions that could occur if project components' capacities or sizes are reduced, project components are deferred and not considered part of the project, project components are eliminated, or if project components are modified; and
- project indirect costs to be borne by the County.

Wiley|Wilson's planning-level opinions of the direct costs for the raw water intake were greater than those given by the Team. For the distribution/storage projects, Wiley|Wilson's opinions of cost were slightly higher. Water plant estimates were comparable. Given the



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level of uncertainties, Wiley|Wilson concludes that the Team's estimates are reasonable. This comparison assumed that the construction occurred as given in the PPEA Proposal's schedule.

Additional scope or contingency items were listed, but estimates were not provided. Given that the contingency projects would likely involve cost sharing arrangements with third parties, not including these additional capital costs is reasonable because the costs that would be allocated to the County is uncertain. However, since the PPEA Proposal includes explicit statements that Hampden-Sydney College is considered to be a customer, estimates of costs for the projects needed to serve Hampden-Sydney would have been useful.

Wiley|Wilson finds the estimates of project indirect costs to be reasonable for those costs estimated.

If the project is to be bond funded, some allowance for the net effect of bond discounts, underwriting, cost of issuance, etc. should have been included. Also some allowance for contingencies should be considered if the high range estimate is not intended to cover contingencies. Wiley|Wilson also noted that this section was silent to potential project cost increases that could arise from scope changes such as those that the County might consider.

Plan for Financing and Operation of the Project

The services that the Team offered related to financing are reasonable and will need to be considered in the interim agreement and in preliminary engineering. Nothing in the PPEA Proposal states that the project is economically feasible for the County and the services offered in this section can address this issue. The County could also consider having a third party determine economic feasibility.

List and Discuss Assumptions

Because project financing and operation are not included as a part of the PPEA Proposal, then no financial assumptions have been applied yet. The Team stated that assistance in planning the project financing could be made a part of the Team's activities to be performed during preliminary engineering.

Identify the Proposed Risk Factors and Methods for Assessing

The Team identified two financial related risks. First, the terms and conditions of the proposed financing may differ from those assumed. This is a real risk, but as yet a financial plan has not been developed. The Team also noted that, "The growth and development projected for the service area may not occur, or may occur at a pace that is different from the projections." The risks identified are reasonable financial concerns.

"The growth and development projected for the service area may not occur, or may occur at a pace that is different from the projections."

Identify any Local, State or Federal Resources

The identifications made by the Team are reasonable.

Identify Revenue Sources for the Project

The identifications made by the Team are reasonable.



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Tax-Exempt Financing

This issue can be addressed with the development of the financing plan.

CONCLUSIONS

Wiley|Wilson has concluded that for the sections of the PPEA Proposal that were reviewed, the PPEA Proposal is sound enough to be used as a starting point for the County to proceed to the development of an interim agreement that will define in greater detail, the scope of the work to be performed, the costs of the work, risks to be mitigated and born, and who will bear the risks.