

MEMO TO: Mayor Jeyes & Council

MEMO FROM: Michelle Allen, Chief Administrative Officer

DATE: July 19, 2016

SUBJECT: PREDESIGN STAGE FOR WATER TREATMENT PLANT PROJECT

Background

The Village of Ashcroft has received a grant of \$5.7 million towards the cost of a water treatment plant. Council has reviewed the filtration options and chose to proceed with a membrane system. The next step of the project is to complete a predesign stage.

Discussion

Urban Systems Ltd. (USL) has provided a draft work program and cost estimate to complete the predesign stage of the project. A copy is attached to this memo.

The predesign stage will include the following items:

1. **Project Field Work**

This task involves further water testing to ensure that the membrane filtration system is designed for the water that will be used from the Thompson River. Testing involves collecting silt samples for particle counting and to determine settleability of residuals. These tests will also assist in determining the amount of residual process water and what treatment or disposal systems will have to be designed.

The second part of this phase includes the geotechnical investigation of the proposed location within Legacy Park Campground.

2. **Building Concept and Park Integration**

Council has expressed a desire to have the water treatment plant building designed as more than a concrete box. As it will be visible to everyone who crosses the bridge into the downtown area Council would like it to be aesthetically pleasing and integrate into the existing park. This phase of the project will develop a site plan and high quality architectural renderings and landscape concepts for the building.

3. **Membrane Filtration Treatment Predesign**

This task will refine the design criteria for the plant including a realistic flow requirement. The top three suppliers of membrane systems will be determined and invited to bid on the project. Suppliers will be determined from a number of items including O & M requirements, manufacturer service and support, warranty, references and cost. These details will be required when reviewing options for handling the residual process water.

This stage will also involve working with an electrical engineer to determine power requirements and energy savings opportunities. Preliminary equipment layout drawings will be developed and will be reviewed with public works staff.

4. **Reporting and Review Meetings**

USL will summarize the results of the predesign study and prepare a detailed cost estimate. This report will be presented to Council for review and discussion as well as at a public meeting to ensure the community is informed of the project development. A copy of the report will be forwarded to Interior Health for their review and comment.

Summary

Administration has reviewed the draft predesign stage for the water treatment plant and confirm that the scope of the work program and the budget are in line with water master plan and the grant application.

Administration recommends a motion approving the predesign work program for the water treatment plant as presented in the report dated June 10, 2016 and further that Urban Systems Ltd. be authorized to proceed with the development and design of the water treatment plant.

Respectfully submitted,

J. Michelle Allen,
Chief Administrative Officer

June 10, 2016

File: 1093.0041.01

The Village of Ashcroft
P.O. Box 129
Ashcroft B.C. V0K 1A0

Attention: Michelle Allen, Chief Administrative Officer

RE: PREDESIGN FOR WATER TREATMENT PLANT

1.0 BACKGROUND INFORMATION

The Village of Ashcroft (Village) was successful in receiving funding through the New Building Canada Fund – Small Communities Fund for a new water treatment plant (WTP). The proposed WTP will address two key aspects of water quality that currently do not meet the Guidelines for Canadian Drinking Water Quality:

1. Turbidity, and
2. Microbiological parameters including protozoa, bacteria and viruses.

The conceptual design for the WTP was completed in the spring of 2016. Based on the findings of the conceptual design, the Village selected membrane filtration, in addition to chlorination, as the preferred treatment technologies to meet the above water quality guidelines.

The next phase in the project is to complete a predesign study. The Village has requested the assistance of Urban to undertake this predesign and the proposed work program for this next phase follows. Upon completion of the predesign, the subsequent phases will be piloting, design, tendering and construction administration.

2.0 PROJECT UNDERSTANDING – PREDESIGN

Predesign is a thorough preliminary design analysis used to refine the design criteria, establish the project scope and the associated cost estimate. In addition to the technical aspects of the project, the Village is interested in going above and beyond a typical utility building design to integrate the WTP within Legacy Park in an aesthetically pleasing manner.

In general, the predesign study for the Ashcroft Water Treatment Plant will include:

- Confirming design criteria, including a review of:
 - Recent water quality test results.
 - Village water usage.
- Developing an architectural building concept working with Wood Works BC;
- Preparing architectural renderings suitable for public viewing and communication;

- Developing a site plan with conceptual landscaping design;
- Preparing process performance criteria and design refinement for equipment pre-qualification and selection;
- Preparing preliminary equipment layouts and process diagrams that incorporate operator input and preferences;
- Preliminary electrical design and energy savings assessment;
- Conducting a geotechnical investigation, report and summary;
- Preparing a detailed cost estimate;
- Preparing a predesign report to summarize the study; and
- Presenting results at community and staff meetings for review and discussion;

The proposed tasks to complete predesign for the WTP are as follows.

3.0 WORK PROGRAM – PREDESIGN

Task 1 –Field Work and Water Quality Testing

The first task of the proposed work is to gather field information. During predesign, this will include coordinating water sampling and reviewing new water quality data, conducting jar testing and a geotechnical investigation.

The water testing will include specific tests recommended for designing membrane filtration treatment systems such as silt samples for particle counting and jar testing. Jar testing will be completed with silt samples to estimate settleability of process residuals. The settleability and water quality information will assist with determining the impact of the residual process water on the sanitary sewer system or treatment required to discharge to the environment.

The predesign study will also incorporate the geotechnical investigation to identify sub-surface conditions required for detailed design and construction. This will involve digging test pits and drilling holes around the proposed building site at Legacy Park.

Task 2 – Building Concept and Park Integration

The Village is interested in integrating the proposed WTP with Legacy Park to ensure that the park remains aesthetically pleasing with the new building. Urban is proposing to work with Owen & Hunter Architects, the Village and Wood Works BC to design an aesthetically pleasing building that provides the utility and longevity required for a long lasting water treatment plant.

Urban will work with the architect and Village to finalize and develop a site plan and high quality architectural renderings for the water treatment plant suitable for public viewing and engagement. The site plan will include a landscaping concept to integrate the new facility within the park.

Task 3 – Membrane Filtration Treatment Predesign

Task 3 will focus on refining design criteria for the WTP. Recent water quality data and water usage will be reviewed and taken into account to create a comprehensive water quality profile and confirm the design flow rate of the plant. The design flow will be dictated by realistic water conservation practices.

Membrane filtration was selected as the preferred treatment technology during conceptual design. There are many reputable membrane filtration equipment manufacturers and the predesign study will include a prequalification process to approve three suppliers. The prequalification process will take into account:

- A technical review;
- Operations and maintenance requirements;
- Manufacturer and supplier service and support;
- Equipment warranty;
- Manufacturer references; and
- Equipment cost.

Prequalified manufactures will be provided with the opportunity to bid on the project during detailed design, at which point pricing will be set. This methodology will facilitate a streamlined design while maintaining competitive pricing.

An item identified as requiring further study during conceptual design is the treatment and disposal of process residuals. The predesign study will review options for handling process residuals based on treatability, disposal requirements and potential impacts on the sanitary sewer system.

In addition to prequalification and residual disposal, Urban will prepare preliminary equipment layout and process drawings for review with operations staff. We will also work with an electrical engineer to review items such as power servicing requirements and energy savings opportunities.

Task 4 – Reporting and Review Meetings

Urban will summarize the results of the predesign study in a report and prepare a detailed cost estimate. Once the report is completed, Urban will meet with the Village to review the report and address any questions or comments. We have also included time for Urban to attend a public community meeting with the Village and discuss the project and preliminary design. A copy of the report will also be provided to the Interior Health Authority for their comments.

4.0 PROJECT TEAM

Our proposed project team includes the following members:

Project Manager and Engineer	Peter Coxon, P. Eng.
Senior Review and Client Liaison	Rick Collins, P. Eng.
Design Engineer	Travis Pahl, EIT
Process Designer	Jen Adair, A.Sc.T.
Project Coordinator	Connie Blair
Architect	Owen & Hunter Architects
Structural Engineer	CWMM Consulting Engineers
Geotechnical Engineer	Thurber Engineering
Electrical Engineer	ICI Electrical Engineering

5.0 PROJECT SCHEDULE – PREDESIGN

The proposed schedule is based upon completion of the predesign study in early November, 2016. Piloting and detailed design will follow in 2017 with tendering in early 2018. The various tasks of the predesign will be completed as per the following timing:

Task 1 – Field Work and Jar Testing	June – July 2016
Task 2 – Building and Landscape Concept Development	July – August 2016
Task 3 – Water Treatment Predesign	August – October 2016
Task 4 – Reporting and Review Meetings	September – November 2016

6.0 FEE ESTIMATE

Based on the tasks outlined in the Section 2.0, the fee estimate to complete this work is outlined in Table 6.

Table 6. – Fee Estimate

TASK		FEES
1	Project Field Work	
	Geotechnical Investigation	\$ 24,400
	Water Quality Review and Jar Testing	\$ 5,600
2	Building and Landscape Concept Development	
	Building Architecture Concept Design	\$ 28,600
	Overall Site Plan	\$ 9,700
	Landscaping Concept and Design	\$ 9,100

Table 6. – Fee Estimate (continued . . .)

TASK	FEES
3 Water Treatment Predesign	
Prepare Design Criteria	\$ 8,800
Filtration Design and Manufacturer Prequalification	\$ 6,600
Process Residual Treatment Assessment	\$ 7,200
Plant Layout and P&ID Drawings	\$ 9,200
Electrical Predesign	\$ 33,900
Confirm Construction Sequencing, Schedule and Estimate	\$ 3,100
4 Summary Reporting	
Predesign Report and Cost Estimate	\$ 11,500
Community Meeting	\$ 3,500
Review Meeting with Staff	\$ 2,300
TOTAL¹	\$ 163,100

¹ Please note the cost estimate above excludes taxes, but includes all disbursements and travel costs.


Please note that this budget aligns with the budget outlined in the Master Plan and grant application.

The next project phases after predesign will be pilot testing and detailed design. Separate work programs will be prepared for piloting and detailed design based on the results of the predesign study.

We look forward to working with the Village on this project. Should you have any questions regarding this work program and the information contained within, please feel free to contact us.

Best Regards,

URBAN SYSTEMS LTD.



Travis Pahl, EIT
 Design Engineer



Peter Coxon, P. Eng.
 Project Manager and Engineer

/TP