# CITY OF MARYSVILLE AGENDA BILL

## EXECUTIVE SUMMARY FOR ACTION

**CITY COUNCIL MEETING DATE: 04/13/2015**

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|---|---|
| **AGENDA ITEM:**<br>Supplemental Agreement No. 2 to the Professional Service Agreement with BHC Consultants | |
| **PREPARED BY:**<br>Kari Chennault, Water Resources Manager<br>**DEPARTMENT:**<br>Public Works | **DIRECTOR APPROVAL:** |
| **ATTACHMENTS:**<br>2 signed copies of Supplemental Agreement No. 2 | |
| **BUDGET CODE:**<br>40142480.541000 | **AMOUNT:**<br>$85,380 |

**SUMMARY:**

The Membrane Filtration Pilot Study done at the City's Wastewater Treatment Facility was complete in 2014. The findings of the Project were presented to the City's Public Works Committee on January 9, 2015 and a Report of the findings was finalized in January 2015. Based on the recommendations in the Membrane Treatment Pilot Testing Report and the feedback from the Committee, City Staff have worked with the consultant to develop a Scope of Services that will provide a schematic level design for membrane treatment. A Report will be prepared that will outline an implementation proposal for the treatment facility and provide an updated opinion of probable construction cost, schematic and layout for the facility. The Report will also provide an overview of permitting issues and considerations regarding distribution of reclaimed water and managing reclaimed water infrastructure.

| **RECOMMENDED ACTION:** |
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| Staff recommends that Council authorize the Mayor to sign and execute Supplemental Agreement No. 2 to the Professional Services Agreement between the City of Marysville and BHC Consultants. |

# SUPPLEMENTAL AGREEMENT NO. 2
# TO
# PROFESSIONAL SERVICES AGREEMENT
# FOR
# CITY OF MARYSVILLE AND
## BHC CONSULTANTS

This Supplemental Agreement No. **2** is made and entered into on the ____ day of _____, _____, between the City of Marysville, hereinafter called the "City" and **BHC Consultants**, hereinafter called the "Consultant."

WITNESSETH THAT:

WHEREAS, the parties hereto have previously entered into an Agreement for **the Membrane Filtration Pilot Study at the City's Wastewater Treatment Facility**, hereinafter called the "Project," said Agreement being dated **April 14, 2014**; and

WHEREAS, both parties desire to supplement said Agreement, by expanding the Scope of Services to provide for **the addition of the Membrane Treatment Schematic Design** for this Agreement,

NOW THEREFORE, in consideration of the terms, conditions, covenants and performance contained herein or attached and incorporated, and made a part hereof, the parties hereto agree as follows:

Each and every provision of the Original Agreement for Professional Services dated **April 14, 2014**, shall remain in full force and effect, except as modified in the following sections:

1. Article II of the Original Agreement, "SCOPE OF SERVICES", shall be supplemented to include the Scope of Services as described in Exhibit A1, attached hereto and by this reference made part of this Supplemental Agreement No. **2**.

2. Article IV of the Original Agreement, "OBLIGATIONS OF THE CITY", Paragraph VI.1 Payments, Section (a), the second sentence is amended to include the additional Consultant fee of **$85,380** and shall read as follows: "....shall total payment under this agreement exceed **$219,169**."

The Total Amount payable to the Consultant is summarized as follows:

| | |
|---|---|
| Original Agreement | **$133,789.00** |
| Supplemental Agreement No.1 | **$0.00** |
| Supplemental Agreement No.2 | **$85,380** |
| Grand Total | **$219,169** |

3. Article III, Section III.3 of the Original Agreement, Term is amended to add that the parties agree to extend the term of the agreement to terminate at midnight **March 1, 2016**.

IN WITNESS WHEREOF, the parties hereto have executed this SUPPLEMENTAL AGREEMENT NO. **2** as of the day and year first above written.

CITY OF MARYSVILLE

By:_____
Mayor

BHC CONSULTANTS

By: Craig P. Chambers
Its President

ATTEST/AUTHENTICATED:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

# Exhibit A1
# Scope of Services

# City of Marysville
# Membrane Treatment Schematic Design

## Statement of Understanding

This Scope of Work for continued BHC Consultants, LLC (BHC) engineering planning services includes development of a schematic design based on recently pilot tested hollow-fiber membrane bioreactor (MBR) technology to produce Class A reclaimed water and reduce nitrogen from effluent at the City of Marysville's (City's) wastewater treatment plant (WWTP). The schematic design will be based on conclusions and recommendations from the December 2013 Class A Reclaimed Water Feasibility Study (Feasibility Study) and the January 2015 Membrane Treatment Pilot Testing Report (Pilot Report). The new MBR facility will consist of MBR feed from one of the complete mix lagoon cells, screening/straining for protection of the membranes, anoxic tanks for denitrification, aerobic tanks for nitrification, membrane tanks, membrane and aeration blowers, permeate and return pumping. Additionally, the facility will ultimately include equalization storage, ultraviolet (UV) disinfection and conveyance pumping for Class A reclaimed water. The inclusion of these latter components in the initial implementation phase will depend on potential demand and the City's ultimate plans for reclaimed water. At the conclusion of the schematic design effort, a report will be prepared that will outline an implementation plan for the new MBR facility (including integration with the existing lagoon process, location and phasing of the facility) and provide an updated opinion of probable construction cost, schematic and layout for the facility. The report will also provide an overview of permitting issues and considerations regarding distribution of reclaimed water and managing reclaimed water infrastructure.

The purpose of developing a Schematic Design Report is to provide a long-range plan for implementation and expansion of the MBR facility. In doing so, the City can plan appropriately when making future decisions on a number of wastewater utility issues: replacement of equipment at the WWTP that will ultimately become obsolete, use of available space on the WWTP site, future funding requirements, future changes in regulatory requirements, continued use of the City of Everett's outfall, and the availability of and demand for reclaimed water. Because the schematic design is being developed at the request of the City and for the City's consideration only at this point, the Schematic Design Report will not be submitted for review or approval by Washington State Department of Ecology (Ecology). However, it is recommended that the City invite Ecology to participate in the project meetings to gain their feedback, so that it might be incorporated into this effort and further considered moving forward.

Following schematic design, the next phase of the project would be to prepare an amendment to the current Sewer Comprehensive Plan and a WWTP Facility Plan Update for review and approval by Ecology. Much of the effort that would go into the WWTP facility plan update will have already been completed as part of the Feasibility Study, Pilot Report and this schematic design.

## City Responsibilities

The following items are specific responsibilities of the City in support of this Scope of Work:

- Participate in project meetings.
- Provide consolidated review comments on the draft Schematic Design Report.
- Help identify areas to be considered for locating the new MBR facility.
- Provide requested information, as available, pertaining to items including: record drawings for the WWTP, WWTP operating data and discharge monitoring reports, potential reclaimed water users, utility information, geotechnical reports, GIS/critical areas information, operation and maintenance (O&M) costs for pumping to Everett, future Everett outfall improvement, existing sand filter O&M costs, sand filter equipment replacement costs, established or potential plans for areas within and surrounding the WWTP, and potable water pricing structure.
- Collect samples from existing lagoon Complete Mix Cell 2A during spring 2015 and test for TSS, total COD, soluble COD and time-to-filter.

- Provide necessary composite samplers for sample collection.
- Cost and labor associated with collection, delivery, and testing of samples at an accredited laboratory.

## Schedule

BHC Consultants, LLC (BHC) will undertake to complete the Scope of Work based on the milestones listed below, assuming notice-to-proceed (NTP) is provided on or before April 15, 2015.

- Kickoff Meeting – 04/29/2015 (2 weeks following NTP)
- MBR Facility Location Workshop – 06/24/2015 (8 weeks following Kickoff Meeting)
- MBR Facility Phasing Workshop – 09/02/2015 (10 weeks following MBR Facility Location Workshop)
- Submit draft Schematic Design Report – 10/28/2015 (8 weeks following MBR Facility Phasing Workshop)
- Draft Report Review Workshop – 11/11/2015 (2 weeks following submittal of the draft report)
- Submit Final Report – 12/09/2015 (4 weeks following the Draft Report Review Workshop)

BHC shall perform these services with reasonable diligence and expediency consistent with the standard of care for professional engineering services. If necessary, this schedule shall be equitably adjusted to allow for changes in scope or for delays beyond BHC's reasonable control.

## Exclusions

The following items are excluded from this work scope, but can be included in a future Scope of Work:

- Preparation of a Sewer Comprehensive Plan Amendment and WWTP Facility Plan Update meeting the requirements of WAC 173-240-050 and -060. However, the information included in the previously prepared Feasibility Study, Pilot Report and this schematic design can be utilized and expanded to meet many of the requirements for a WWTP Facility Plan Update. These documents will need to be submitted to Ecology for review and approval before proceeding beyond schematic design.
- Geotechnical investigations and site survey.
- Outfall analysis, including a mixing zone study for the Steamboat Slough.
- Preparation of a SEPA checklist, SERP, and cross-cutter review. The SEPA checklist and SERP would be completed as part of the WWTP Facility Plan Update. The cross-cutter review, required for any project to be eligible for federal funding, would be conducted following completion of a 30% design. These steps must be completed if federal funding through the state revolving fund is desired.
- Cultural resources survey, biological assessment and environmental permitting.
- Final design and construction services.

## Budget

The budget for this Scope of Work is $85,380. BHC will be compensated by the City on a time and materials basis based on the attached budget estimate. Compensation shall not exceed the budgeted amount without prior authorization from the City.

## Scope of Services

### Task 1- Project Coordination and Management

Receivables:

- Invoicing requirements, as applicable, from the City.

Work Tasks:

1.1 Project setup, invoicing and communication with City staff.
1.2 Manage the project and coordinate the project team.
1.3 QA/QC review of the draft Schematic Design Report and workshop presentation materials.

Deliverables:

- Invoices

**Task 2 – Schematic Design Development**

Receivables:

- Identification of areas to be considered for location of the new MBR facility.
- Test results for samples collected from Complete Mix Cell 2A.
- Responses to requests for information, pending availability of requested information.

Work Tasks:

2.1 BHC will conduct a cost/benefit analysis of potential areas identified by the City for location of the new MBR facility and recommend the apparent best location. It is assumed that the City will select up to 3 locations for analysis, which will be identified during the project kickoff meeting. BHC will consider the following as part of the analysis:

1) Impacts to delineated critical areas and resulting mitigation requirements and permitting implications.
2) Proximity of the area to 100-year flood plain limits and anticipated soil conditions, based on available geotechnical information.
3) Accessibility (staff and delivery vehicles, operations work flow) and suitability of the areas under consideration given established or potential plans for the WWTP site and surrounding area.
4) Amount of space available for further expansion.
5) Scale of earthwork and dewatering required to make the area suitable for construction, based on available geotechnical and site survey information.
6) Necessary yard piping modifications and resulting impacts to current treatment processes.
7) Assessment of power supply and distribution to serve the new MBR facility.
8) Potential for reuse of existing structures (e.g., sand filter structure for MBR tanks, existing CCT for reclaimed water storage, etc.).

2.2 BHC will conduct a cost/benefit analysis of up to four (4) different phasing alternatives using different initial sizes for the new MBR facility and different implementation timelines for expansion and incorporation of reclaimed water production into the new MBR facility. Incorporation of reclaimed water would include addition of equalization storage, a separate UV disinfection system, and conveyance pumping and piping.

1) BHC will confirm or modify the overall phasing approach, as described in the Feasibility Study and Pilot Report, with the City. The current approach is based on an initial phase in which the new MBR facility would provide filtration and nitrogen removal for a portion of the influent flow and blend the permeate with the remaining effluent. The next phase would expand the MBR facility to treat all of the dry weather flow in the same manner, such that the WWTP could meet the permit requirements for discharge to Steamboat Slough year-round. The final phase would further expand the MBR facility to replace the biological treatment function of the lagoons, so that all influent year-round flows would be equalized and treated through the MBR facility.
2) BHC will identify current and future wastewater flow and load projections based on the 2011 Sewer Comprehensive Plan.
3) BHC will develop sizing criteria based on the conclusions and recommendations included in the Pilot Report (e.g., longer SRT, cleaning regimen, flux rates) and obtain updated quotes from vendors for major equipment items with sufficient breakdown to calculate equipment costs for the different phasing alternatives.
4) BHC will assess the potential impacts of MBR feed from Complete Mix Cell 2A on flux rate, sizing and costs by comparing test results for TSS, total COD, soluble COD and time-to-filter taken from this location in spring 2015 with test results of the pilot study feed taken from the second facultative lagoon during summer 2014. Given that the samples will be collected before significant seasonal algae growth, it is expected that results would also be reflective of a potential alternate backwash discharge into the second facultative lagoon.
5) BHC will refine sizing of support systems and equipment (i.e., UV disinfection, process blowers and aeration, mixing, pumping, storage and conveyance) from the earlier Feasibility Study.

6) BHC will develop an overall schematic, site layout, and opinion of probable construction cost to treat all projected flows and loads through a new MBR Facility, ultimately replacing the existing lagoon treatment process. This will serve as the basis for phasing alternatives and also be used to determine space requirements for the analysis of facility locations.
7) BHC will identify and quantify offset costs (e.g., pumping to Everett, future Everett outfall improvement, sand filter O&M costs, sand filter equipment replacement costs, potential future nitrogen removal requirements, and cost of reduced potable water demand) and incorporate these into the cost/benefit analysis. Filter replacement costs will be calculated based on life expectancy of 16 existing filters that are approximately 20 years old and 32 which are approximately 10 years old.
8) BHC will develop and compare opinion of probable costs for phased construction, O&M costs and 20-year life-cycle costs for each phasing alternative.
9) BHC will summarize differences in costs, effluent quality impacts and blending, suitability for future expansion, and impacts on initial capacity for each phasing alternative and recommend the apparent best alternative.

Deliverables: None

**Task 3 – Prepare Schematic Design Report**

Receivables:
- City comments on draft Schematic Design Report.

Work Tasks:

3.1 BHC will prepare a phased process schematic and phased site layout for the selected phasing alternative, which will be in addition to the overall schematic and overall site layout for the ultimate facility.

3.2 BHC will provide an overview of anticipated permitting requirements and considerations regarding future production of reclaimed water in the Schematic Design Report.
1) BHC will provide an overview of NPDES permit requirements that would likely be implemented for production of reclaimed water and discuss considerations for design and construction in light of the anticipated Reclaimed Water Rule.
2) BHC will communicate with Ecology to confirm that a water rights impairment analysis would not be required prior to using reclaimed water.
3) BHC will identify other project permitting requirements (e.g., building permit, electrical permit, shoreline permit, etc.).
4) BHC will summarize potential operational, design, utility management and public involvement considerations that would be applicable to implementation of reclaimed water infrastructure.

3.3 BHC will prepare a draft Schematic Design Report. Comments from the City on the draft report will be incorporated into a final Schematic Design Report.

Deliverables:
- Draft Schematic Design Report
- Final Schematic Design Report

**Task 4 – Meetings and Site Visits**

Receivables: None

Work Tasks:

4.1 Kickoff Meeting – Two representatives from BHC will attend the kickoff meeting. The purpose of the kickoff meeting is to discuss project scope and schedule, discuss and confirm evaluation criteria for

MBR facility location, identify up to 3 locations to evaluate for placement of the new MBR facility and confirm or modify the overall phasing approach outlined in the Feasibility Study and Pilot Report.

4.2 Workshop Meetings – Two representatives from BHC will attend each of three (3) workshop meetings. BHC will provide workshop materials to the City in advance of the meeting summarizing initial results of analyses and recommendations. These materials will be provided as a PowerPoint presentation and may include figures, graphs, opinions of probable cost, comparison tables, etc.

1) The first workshop meeting will focus on discussion of results from evaluation of facility locations and identify up to four (4) phasing alternatives for the new MBR facility based on a combination of different initial sizes and timelines for expansion and incorporation of reclaimed water. This workshop meeting will also involve discussion and confirmation of evaluation criteria for analysis of phasing alternatives.
2) The second workshop meeting will focus on discussing analysis of MBR facility phasing alternatives.
3) The third workshop meeting will provide an overview of the draft Schematic Design Report and involve discussion of City comments on the draft report.

4.3 Site Visits – Two representatives from BHC will make two (2) site visits during the project. One site visit will be for the purpose of reviewing potential facility locations and the second site visit will be for the purpose of reviewing existing infrastructure to assess its potential for modification and reuse.

Deliverables:

- Meeting agendas
- Meeting minutes
- Presentation materials for the workshop meetings

## BUDGET SPREADSHEET

**P.M.:** Tom Giese **Project No.:** 15-10329.02

**Date:** 2/26/15 **Project Name** Marysville WWTP Membrane Treatment Schematic Design

| Task No. | Task Description | Princ. Eng. *Dorn/Howard* $210 | | Proj. Manager *Giese* $193 | | Sr. Proj. Engr. *Kelsey/Gibson/Dahl* $195 | | Staff Engineer *McClaskey/Love* $115 | | CAD Drafter *Caldwell* $100 | | Project Admin *Pierson* $103 | | Clerical/WP *Sifferman* $78 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hourly Billing Rate: | Hours | Cost | Hours | Cost | Hours | Cost | Hours | Cost | Hours | Cost | Hours | Cost | Hours | Cost | Hours | Cost |
| 1 | **Project Coordination and Management** | | | | | | | | | | | | | | | | |
| 1.1 | Project Setup, Invoicing and Communication with City | | $0 | 16 | $3,088 | | $0 | | $0 | | $0 | 12 | $1,236 | | $0 | 28 | $4,324 |
| 1.2 | Project Management and Coordination | 4 | $840 | 16 | $3,088 | | $0 | | $0 | | $0 | | $0 | | $0 | 20 | $3,928 |
| 1.3 | QA/QC Review of Schematic Design Report | 16 | $3,360 | | $0 | | $0 | | $0 | | $0 | | $0 | | $0 | 16 | $3,360 |
| 2 | **Schematic Design Development** | | | | | | | | | | | | | | | | |
| 2.1 | MBR Facility Location Cost/Benefit Analysis | | $0 | 48 | $9,264 | 22 | $4,290 | 28 | $3,220 | 4 | $400 | | $0 | | $0 | 102 | $17,174 |
| 2.2 | MBR Facility Phasing Cost/Benefit Analysis | | $0 | 64 | $12,352 | 2 | $390 | 64 | $7,360 | 16 | $1,600 | | $0 | | $0 | 146 | $21,702 |
| 3 | **Prepare Schematic Design Report** | | | | | | | | | | | | | | | | |
| 3.1 | Phased Schematic and Site Layout | | $0 | 2 | $386 | | $0 | 8 | $920 | 12 | $1,200 | | $0 | | $0 | 22 | $2,506 |
| 3.2 | Overview of Permitting and Reclaimed Water Considerations | | $0 | 4 | $772 | 20 | $3,900 | | $0 | | $0 | | $0 | | $0 | 24 | $4,672 |
| 3.3 | Prepare Draft and Final Schematic Design Report | | $0 | 36 | $6,948 | 20 | $3,900 | 6 | $690 | | $0 | | $0 | 10 | $780 | 72 | $12,318 |
| 4 | **Meetings and Site Visits** | | | | | | | | | | | | | | | | |
| 4.1 | Kickoff Meeting | | $0 | 8 | $1,544 | 5 | $975 | | $0 | | $0 | | $0 | | $0 | 13 | $2,519 |
| 4.2 | Workshop Meetings (3 Total) | | $0 | 27 | $5,211 | 15 | $2,925 | | $0 | | $0 | | $0 | | $0 | 42 | $8,136 |
| 4.3 | Site Visits (2 Total) | | $0 | 10 | $1,930 | 10 | $1,950 | | $0 | | $0 | | $0 | | $0 | 20 | $3,880 |
| **TOTAL DIRECT LABOR** | | 20 | **$4,200** | 231 | **$44,583** | 94 | **$18,330** | 106 | **$12,190** | 32 | **$3,200** | 12 | **$1,236** | 10 | **$780** | 505 | **$84,519** |
| **TOTAL REIMBURSABLE EXPENSES** | | **$783 (Mileage, reproductions, mailings)** | | | | | | | | | | | | | | | **$783** |
| | **Markup @** | **10%** | | | | | | | | | | | | | | | **$78** |
| **TOTAL BUDGET** | | | | | | | | | | | | | | | | | **$85,380** |