

# City of Longview Dissolved Oxygen Design and Construction Support

Engineering Services Scope of Work, Fee and Schedule

Amendment No. 2 to the Executed Agreement of August 28<sup>th</sup>, 2014

City of Longview, WA

October, 2016



# EXHIBIT A

## Scope of Work

### Understanding

The City of Longview and the Beacon Hill Water and Sewer District (BHWSO) (jointly referred to as City), developed a new water drinking water supply between 2011 and 2013, changing the source water from the Cowlitz River surface water supply to the Mint Farm Groundwater Source. In January 2013, construction was completed of the new groundwater source, and the change of source was initiated. Chemistry changes and directional flow changes from the new source caused spotting/scale and taste, odor, and color (T&O/Color) issues resulted in a significant number of complaints from the customers.

In September 2014, the City retained CH2M to assist with a community outreach and water supply evaluation process/study. Following this work, the City decided, based on community recommendation, to proceed with an evaluation to determine potential water quality and water supply yield by using a horizontal collector well(s) along the banks of the Cowlitz River with the intent to replace the Mint Farm water supply. After conducting this work, it was determined that the water quality was not superior to the existing Mint Farm Groundwater Source, and the City ceased further exploration and evaluation of this option.

The City has now requested CH2M to provide the design of a dissolved oxygen injection system at the Mint Farm Groundwater treatment plant to improve the aesthetic quality of the finish water delivered from the plant. Pilot testing conducted by Confluence Engineering Group LLC of the treated water with the addition of dissolved oxygen has shown positive water quality benefits. This scope includes the development of plans and specifications for the City to advertise the construction of a dissolved oxygen system installation. The installation will include the ability to inject dissolved oxygen (DO) into either the raw water or finish water pipeline. The system will include a constant speed pump with proportional control air injection eductor, air injection system, controls, and the inclusion of a DO meter to which the controller will increase or decrease the flow rate to meet a requirement set point determined by the operator.

## City Staff Involvement

It is anticipated that the City will take the lead role in the following activities of the project:

- Community outreach (as desired by the City)
- Provide CAD drawing files for the basemap files.
- Development of the Division 0 Specifications from Advertisement through Supplement General Conditions (use of CSI formatted 49 division specifications and EJCDC General Conditions will be used)
- DOH Report Submittal and Coordination
- Preparation of the SEPA per WAC 246-290-110
- Building and electrical permit applications and payment of fees
- Advertising and Issuance of Contract Documents
- Conducting the Bid Opening and Bid Award
- Perform the duties of Construction Manager/Observer overseeing the work of the Contractor to assure adherence to the specifications of the project.
- Reviewing a majority of the submittals (with the exception of electrical and controls)
- Conduct integration services including the programming of the Programmable Logic Controllers (PLCs) and Human Machine Interface (HMI) to control the newly installed dissolved oxygen injection equipment.
- Materials testing will be contracted direct by the City

## General Project Elements

The City will provide the existing as-built CAD drawings of the Mint Farm Water Treatment plant for use on the project. Drawings for this project will be produced at a sheet size of 22" x 34".

The technical specifications will use the Construction Specifications Institute (CSI) 49 Division standards as modified by CH2M and reviewed by the City for acceptance. The project Division 0 specifications will be the City's standard documents (Invitation to Bid, Instruction to Bidders, Bidder Responsibility, Non-Discrimination Clause, List of Subcontractor Form, Apprenticeship Form, Proposal Form, Contract Form, and others) as prepared by the City. Conditions of the Contract will use the EJCDC standard general conditions with supplements as created by the City.

The construction project is anticipated to be delivered using a single construction contract using a single standard design/bid/build delivery method ready for advertisement in the Winter 2016.

## Scope Elements

To deliver services for this water treatment sidestream project, we propose the following tasks and work breakdown structure:

- **Task 10—Dissolved Oxygen Design / Bidding Services**
  - Project Orientation and Team Meeting
  - Engineering Report and Preliminary Design
  - 50% Design
  - 95% Design
  - 100% Sealed Plans/Specifications
  - Bidding Phase Services (Clarifications/ Addenda)
  - Cost Estimates
  
- **Task 11 – Dissolved Oxygen System Construction Support Services**
  - Submittal and RFI's Review
  - Limited Site Visits
  - Startup Support
  - Record Drawings
  
- **Task 12 – Project Management**

# Work Plan

The Plans, Specifications, and Estimates (PS&E) deliverables at each stage of preliminary design, 50%, 95%, and 100% will include varying stages of Contract Document development delivered to the City for review. Following each of the intermediate design delivery milestones, a review meeting will be held with the City and consultant.

The anticipated drawings for the dissolved oxygen injection project are shown below:

Sheet Number	Sheet Title
1	Cover
2	Structural Legend
3	Structural General
4	Civil Legend
5	Process Legend
6	Electrical Legend
7	Control Legend 1
8	Control Legend 2
9	Civil - Yard Piping, Elect, Surface Repairs
10	Structural Details
11	Process Plan
12	Process Section and Details
13	Electrical Plan & Schedules
14	Electrical Details
15	I&C PID
16	I&C Details
17	PLC I/O Analog Input Card
18	PLC I/O Analog Output Card
19	PLC I/O Discrete Input Card
20	PLC I/O Discrete Output Card
21	DO Analyzer Panel Layout
22	DO Analyzer Panel Schematic

Following completion of the single Contract Document package, we will compile a completed, Adobe format PDF file package of drawings and specifications, together with the final engineer’s cost estimate and submit it to the City. Drawing files will also be provided in AutoCAD format, and specifications will also be provided in Word format. Calculations, if needed for building permit approval, will be provided. All final deliverables will be electronically certified/sealed by the appropriate registered design engineer.

The accuracy and confidence level of the construction cost estimates will be conducted to the levels as defined by the American Association of Cost Estimators (AACE) for Levels 4 thru 1, pending the level of design completion.

The following tasks further detail each of the tasks to be provided by CH2M.

## **Task 10—Dissolved Oxygen System Design**

The purpose of this task is to ensure that all consultant and City staff members are apprised of the scope of the project thru a team kick-off meeting. This task will also include overall project planning and initiation of field investigations, project delivery services, and permitting support.

### **Task 10.1 Project Orientation and Team Meeting**

CH2M will lead and participate in a project orientation meeting with the City staff. The purpose of the meeting is to ensure that team members are aligned to the project and its requirements. We anticipate this meeting to be a telecon discussion using shared screens. Key milestones, deliverables, and schedule will also be discussed as well as critical project issues that are important for project completion. This meeting will be hosted at City facilities.

***Deliverables:***

- Project Orientation Meeting

### **Task 10.2 Preliminary Design and Engineering Project Report**

Following the project orientation meeting, CH2M will develop the preliminary design and Engineering Report. The design stage will include design drawings without specifications, sufficient to support the development of the Engineering Report and an initial construction cost estimate. The Project Report will address the requirements of WAC 246-290-110 and be suitable for submission to the DOH. A review by the City will be conducted following the delivery of this initial effort. The City will provide comments back to CH2M following their review.

***Deliverables:***

- Preliminary Design Drawings
- Project Report
- Initial Cost Estimate - (Level 4)

### **Task 10.3 Design Development – 50% Design**

The design development stage will include drawings completed to the 50% design level, and draft versions of the technical specifications. This level of design will also include an engineer's Class 4 construction cost estimate.

At the close of this work effort, we will provide drawings, specifications and cost estimate for City review. Following this review, City staff and CH2M (up to 2 staff) will hold a design review workshop in Longview to review City comments.

***Deliverables:***

- Design Development Drawings
- Draft Technical Specifications
- Class 4 Cost Estimate

### **Task 10.4 Pre-Final Design – 95% Design**

The pre-final design development stage will include drawings completed to the 95% design level, and draft versions of the technical specifications. This level of design will also include an engineer's Class 2 construction cost estimate.

At the close of this work effort, we will provide drawings, specifications and cost estimate for City review. Following this review, City staff and CH2M (up to 2 staff) will hold a design review workshop in Longview to review City comments.

**Deliverables:**

- Pre-Final Design Drawings
- Pre-Final Technical Specifications
- Class 2 Cost Estimate

**Task 10.5 Final Design – 100% Design**

This final design development stage will include electronically sealed drawings and specifications for building permit application and advertisement. This task will also include a Class 1 construction cost estimate. The City will incorporate their “front-end” documents to the technical specifications and create the final Construction Contract Document set.

**Deliverables:**

- Certified Design Drawings
- Certified Technical Specifications
- Class 1 Cost Estimate

**Task 10.6 Bidding Services**

At the completion of the design package, the City will make application to the building department for permits and will administer, advertise and direct the bidding process. CH2M has allotted 64 hours to provide support to these City led activities by providing the following during this phase/task of the project:

- Provide clarifications and answers to questions during bid period as requested by City’s PM.
- Assist with development of addendum to bid documents.
- Assist with analysis of project bids received

Tasks to be completed by City during this phase:

- Reproduce the project Contract Documents for distribution
- Provide consultant team with finalized Contract Documents (drawings and specifications)
- Advertise the project for Bid
- Reproduce and distribute documents to prospective bidders and subcontractors.
- Coordinate and host pre-bid meeting
- Maintain and coordinate construction project document distribution and storage
- Issue and distribute addenda
- Coordinate and host bid opening
- Issue Notice of Award
- Conduct City contracting process thru Notice to Proceed

## Task 11 —Construction Support Services

During this task, we will assist the City in assuring the awarded contractor constructs the project as intended and defined by the Contract Documents providing limited construction support services in support of the City led activity. The City will provide the on-site, full time Construction Management and Inspection services, and special inspection services. CH2M will provide design engineering support services and limited site reviews, and assist with startup as requested.

During submittal and RFI review, the City will initially accept and distribute the electronic submittals/RFIs and decide which submittals may need further attention. As received, CH2M will review the technical submittals provided by the City, and return the documents for final approval and distribution by the City. The submittal and RFI process will be managed by the City.

We will also prepare the record drawings of the project, based on information provided by the City and Contractor for changes that occurred during construction. The record drawings will be provided in electronic format of PDF and AutoCAD (dwg files) to the City.

Each of the following activities will be provided by CH2M in support of the construction of the project.

### Task 11.1 Design Engineering Construction Services

CH2M will provide the following design engineering services as requested by the City, in support of the construction phase as identified below. CH2M has allotted a total of 48 hours for the following services:

- Plans and specification interpretation
- Shop drawing review
- RFI Consultation

### Task 11.2 Construction Observation Services

We will provide limited onsite observation services, as determined by the City. CH2M has allotted 40 hours for these services. Materials testing and specialty inspections that will be required by the building department is to be provided by the City.

### Task 11.3 Post Construction Services

Following formal construction activities, the following services will be provided in support of the project closeout.

**Record Drawings.** CH2M will finalize the project drawings to reflect the construction of the project. These record drawings will represent the redline information collected by the City's on-site observer, and the contractor. The drawings will be provided electronically in PDF and in AutoCAD format. Hardcopies of the drawings will be created by the City as desired from these records.

**Start-up/Commissioning.** For startup services, we have budgeted 16 hours of time for the project. The City will direct the desired commissioning services of CH2M on an as-needed basis.

## Task 12 —Project Management

Project management will be ongoing throughout the duration of the project as we work closely with the City to ensure the project meets schedule, budget, and technical requirements.

We will provide a summary report of work completed for each monthly invoice.

Overall project management of the consultant team will be the responsibility of CH2M which includes coordinating and communicating to ensure the project team is meeting scope, schedule, and budget. The project manager will be supported by a multi-person team including an overall quality assurance manager, senior advisors, and support staff.

To initiate communications and guide all team members, a series of guiding plans will be created, and will include:

- Project design management plan
- Health and safety plan (H&SP)
- Quality management plan

Ongoing monthly status reports will be provided by the consultant for the consultant team's work efforts. These monthly updates will provide a summary of the progress completed in the preceding month and identify unresolved or changed issues that need to be addressed. This report will be provided with the monthly invoice and tracking schedule.

Periodic project manager meetings (in-face or telecon as mutually agreed) will be held between the client and consultant project manager through the design phase. The intent of these meetings will be to maintain communications and address overall project issues. Other design team members may be included in these meetings, to address specific issues. These meetings will have a standing agenda.

# EXHIBIT B

## Schedule

### Project Schedule

In general, the design services will occur in 2016/17 taking approximately four months to complete with construction occurring during spring 2017.

# EXHIBIT C

## Fee Proposal

### Basis for Compensation

The basis of compensation is shown as per the original contract terms dated August 28<sup>th</sup>, 2014 as updated in Table 1. The fee estimate for the project is presented below. The fee is based on a time and materials basis for the work defined in the above scope for project Tasks 10 thru 12.

As mutually agreed, the Consultant and City may adjust budgets between tasks as needed to address changes in the work requested or performed.

**Table 1**  
**CH2M 2016 Rate Schedule**

Cost Type	Basis of Compensation
<b>Labor Rates</b>	
Labor Costs	Raw Salary Labor times 3.15 Adjustments (ranging from 3% to 6%) to employee raw salary labor rates occur in April of each year.
<b>Expenses</b>	
Personal Automobile Mileage Reimbursement	Federally Accepted Rate
Mark-up on Direct Expenses	Cost
Mark-up on Outside Services	10%

Total Fee	\$ 166,564
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