CITY OF COOS BAY CITY COUNCIL

Agenda Staff Report

MEETING DATE	AGENDA ITEM NUMBER
August 1, 2017	8.

TO: Mayor Benetti and City Councilors

FROM: Jennifer Wirsing, Wastewater Project Engineer

THROUGH: Jim Hossley, Public Works and Community Development Director

ISSUE: Award of Contract for Facility Planning for Wastewater Treatment Plant 1 by Public Works & Community Development Director Jim Hossley

SUMMARY:

In April, Council directed staff to begin negotiations of a scope and fee with CH2M to prepare a Facility Plan Amendment for Wastewater Treatment Plant 1. A scope and fee has been negotiated for an amount of $267,444. This will include analyzing the flows and load for the next 20-year period, a current condition assessment of Plant 1, analyzing the regulatory drivers, analyzing and develop treatment alternatives for the upgrade, and prepare a facility plan document that is in conformance with the Department of Environmental Quality's requirements.

ACTION REQUESTED:

If it pleases the Council, award the contract to CH2m to prepare a Facility Plan Amendment for a total project cost not to exceed $307, 561 ($267,444 plus a 15% contingency of $40,117).

BACKGROUND:

Plant 1 was originally constructed in 1954 as a primary treatment plant. Secondary treatment was added in 1973 and the plant was extensively upgraded in 1990. It is anticipated that a plant will need an upgrade every 20 years. The plant is past its 20-year cycle and showing signs of age. Each year, operations and maintenance costs for the plant increase. A Facility Plan (FP) for Plant 1's upgrade was prepared by West Yost and was originally submitted in 2007 to the Department of Environmental Quality (DEQ). After several DEQ reviews, the report was finaled in 2011. According to DEQ, if a FP is older than 10 years a new FP must be prepared. However, if the FP is between 5 and 10 years then the jurisdiction can submit a report called a Facility Plan Amendment (FPA). In February 2017, Council directed staff to advertise a request for qualifications for Facility Planning services for Plant 1. The City received one SOQ from CH2M. CH2M is a qualified firm with extensive experience in

wastewater. The team that CH2M has put together has many years of experience working together. Because CH2M is in tune to the needs of the City, they also proposed two additional subconsultants. One being a financial consultant that can provide Council with potential rate impacts for the various options that will analyzed. The other subconsultant is a person with over 20 years of operational experience. This consultant is not affiliated with CH2M and would bring a fresh set of eyes and experience to the project with an operational slant. Council approved staff to begin negotiations with CH2M for this facility planning effort at the April 25, 2017 Council Work Session. CH2M proposed a meeting with DEQ to discuss the design requirements that will be placed on the Plant 1 upgrade. They proposed to do this as part of their preparation of scope and fee. This meeting occurred and as a result a more detailed and project specific scope of work was prepared (see attached).

BUDGET IMPLICATIONS:

Staff has proposed funding this project from three different sources:

Project Phase	Funding Source	Amount	Account Number
30% Submittal	IFA Loan 1	$75,000	29-810-530-3013
90% Submittal	IFA Loan 2	$167,750	29-810-530-3017
Final Submittal	WW Emergency	$24,694	29-810-530-3010
Contingency	WW Emergency	$40,117	29-810-530-3010

- CH2M's Scope and Fee

City of Coos Bay, Oregon

WWTP1 Facility Plan Addendum

Scope of Work

The City of Coos Bay (City), Oregon has been working with Oregon Department of Environmental Quality (DEQ) related to identifying updates needed to the City's DEQ approved 2011 Facility Plan for Wastewater Treatment Plant 1 (WWTP1). The planning is a part of anticipated improvements at the plant consistent with formal agreements in place between the City and DEQ. During a May 16, 2017 meeting with the City and DEQ, DEQ agreed that the 2011 Facility Plan could have certain portions updated and some new analysis done, and that this work could be an addendum to the facility plan and serve as the documentation needed as the City moves forward with treatment plant improvements that could be eligible for State Revolving Loan Fund (SRF) project financing.

It is CH2M's understanding that the Facility Plan Addendum will build upon and incorporate previous work to the extent practical from the 2011 Facility Plan and will comply with the 2013 DEQ Guidance document "Preparing Wastewater Planning Documents and Environmental Reports for Public Utilities". The collection system will not be evaluated within this Facility Plan Addendum, other than some updates to the system description contained in the 2011 Facility Plan.

Review workshops will be conducted with City personnel, DEQ and key individuals from the CH2M project team throughout the project to ensure that the direction of the project is understood and endorsed. DEQ will be invited to participate in key workshops so that their input can be incorporated on an ongoing basis, thus minimizing the scope and scale of their comments on the draft Facility Plan Addendum.

The proposed Facility Plan Addendum outline is as follows.

1) Purpose of Facility Plan Addendum
2) Current Facilities
    a) Improvements since 2011 Facility Plan.
    b) Flows and Loads (current vs 2011 projections)
    c) Permit compliance summary
    d) Condition Assessment
        i) Identified deficiencies
        ii) Corrective actions
3) Regulatory Drivers for Projects
    a) Reasonable potential analysis based on 2011 to 2016 plant data
4) Liquids Treatment Alternatives
    a) Alternatives development
    b) Alternatives evaluation
    c) Proposed projects
5) Solids Treatment
    a) Confirm liquids treatment alternatives are consistent with the biosolids planning the City completed in 2015.
6) Conclusions and Recommendations

The following tasks outline the scope of work necessary to complete the Facility Plan Addendum.

Task 1 Current Facilities

Task 1.1 Improvements since the 2011 Facility Plan

The purpose of this task is to summarize the improvements made to the WWTP. Specific activities include:

- Review of historical design documentation for the plant since 2011.
- Meet with plant staff to document other improvements made by operations staff that are not documented on as-built drawings.
- Provide a description of the existing major unit treatment processes, major equipment, and timeline of historical liquids and solids process improvements.

Assumptions:

- City will furnish CH2M a copy of as-built drawings for facility improvements since 2011.
- Site visit will be performed by one CH2M engineer for one day.

Deliverables:

- Treatment plant existing conditions and treatment capacity will be included as part of the Current Facilities section of the Addendum.

Task 1.2 Flows and Loads

Develop and summarize wastewater influent projections for flow and loads for the 20 year planning period based on existing wastewater characteristics, land use, and population projections. Historical flow and load data will be obtained from plant Discharge Monitoring Reports (DMRs) to characterize plant wastewater and to develop projected future loads to WWTP1 based on flow projections. Flow and load projections will be presented in 10 year increments over the planning period.

Summarize historical wastewater influent flow and loads over the past 5 years (2011 to 2016) and compare them against the 2011 projections.

Assumption:

- Historical peaking factors will be compared with values derived from the analysis of the recent 5 year's data.

Deliverables:

- Flows and loads will be included as part of the Current Facilities section of the Facility Plan Addendum.

Task 1.3 Permit Compliance Summary

CH2M will review Daily Monitoring Reports (DMRs), will discuss historical permit compliance with plant operations staff, and will prepare a WWTP permit compliance history from 2011 to date.

Assumption:

- City will provide record of permit violations and reporting documentation for review.

- Plant operations staff will be available for questions.

Deliverables:

- A permit compliance summary will be included as part of the Current Facilities section of the Addendum.

Task 1.4 Condition Assessment

A WWTP1 Condition Assessment will be conducted by the CH2M including our subconsultant Mark Walter. The Condition Assessment will report performance issues; facility and process and mechanical system deficiencies; electrical and instrumentation and control problems, deficiencies, and needed upgrades; and operators' assessment of end of useful life for all equipment. The report will include identified deficiencies and planned corrective actions. A condition assessment of the existing plant effluent outfall pipe will not be performed.

Assumption:

- The CH2M team will meet onsite with operations staff for three days to perform the condition assessment.

Deliverables:

- The condition assessment report will be included as part of the Current Facilities section of the Addendum.

Task 2.0 Regulatory Drivers for Projects

Under this task, CH2M will document the changes to regulations that have occurred since the last permit renewal which become drivers for future projects over the next permit cycle:

- Water Quality Criteria
  - Define effluent discharge criteria and limitations.
  - Describe DEQ's 303(d) listings in upper Coos Bay, Total Maximum Daily Load (TMDL) process and planning, and potential impacts on the WWTP.
  - Define current regulatory picture and timing.
  - Define the discharge criteria for toxics based on current water quality criteria and available effluent chemistry and background ambient data (refer to assumptions for data collections), by applying DEQ's Internal Management Directive - Reasonable Potential Analysis (RPA) Process for Toxic Pollutants.
  - Evaluations of potential treatment process impacts due to regulatory changes and discharge requirements will be documented and evaluated. Based on changes to DEQ guidelines and policies since the 2011 MP update and industry trends, projected regulatory requirements will be documented.
  - Review other water quality concerns in Coos Bay including, bacteria, ammonia, and microconstituents.
- Develop updated dilution modeling runs based on current (2011 to 2016) and projected (2037) effluent flows to validate dilution factors applied in the current RPA and provide a projected (2037) RPA for planning purposes.
- Develop a concise Quality Assurance Project Plan (QAPP) for collection and analysis of effluent and background ambient samples to be used in the RPA. QAPP to be submitted to DEQ for approval.

These analytical results will be used in the RPA and are expected to forestall DEQ requirement for this sampling in the next NPDES permit.

- Summarize the reliability and redundancy requirements for the facilities.
- Meet with appropriate Regulatory Agencies such as Oregon DEQ and City's Planning Department to define existing, emerging, and potential future regulatory issues and requirements and their effect on current and proposed facilities.

Assumptions:

- One onsite meeting in Coos Bay, Oregon with DEQ and City staff attended by 3 CH2M team members
- City will authorize CH2M to collect and analyze eight (8) effluent grab samples over a two-month period in the dry season of 2017 for analysis of the following parameters by the Applied Sciences Lab in Corvallis: ammonia, total recoverable metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc). Effluent sampling using clean methods employed by ASL.
- City will authorize CH2M to collect and analyze four (4) receiving water samples over a two-month period in the dry season of 2017 for analysis of the following parameters by the Applied Sciences Lab in Corvallis: ammonia, dissolved and total recoverable metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc). Receiving water sampling will use clean methods employed by ASL. Two samples will be collected south of the outfall site three hours after start of ebb tide, and two samples will be collected north of the outfall site three hours after start of flood tide. Samples will be collected off docks in free-flowing water.

Deliverable:

- The applicable criteria will be documented in the Regulatory Project Drivers section of the Addendum.
- The RPA tables and dilution modeling input/output would be included in appendixes to the Addendum.

Task 3.0 Treatment Alternatives

This Task involves reviewing and updating liquids treatment process alternatives. The task includes the following steps and workshops:

1. Initial liquids treatment alternatives identification and Develop and Screen Alternatives Workshop
2. Detailed development of up to four liquids treatment alternatives
3. Compare Alternatives & Select Recommend Alternative Workshop

Task 3.1 Alternatives Development and Screening

After completion of the work under Tasks 1 and 2, liquids treatment alternatives will be developed and presented during an initial Develop and Screen Alternatives workshop. The outcome from this workshop will be to identify up to four liquids treatment alternatives for more detailed evaluation

Deliverables:

- Workshop materials including:
    - Flow and load data summary

  - Anticipated regulatory driver summary
  - Preliminary list of liquids treatment technologies suited to the flow, load and regulatory criteria identified by tasks 1 and 2
- Workshop meeting notes summarizing screened alternatives to carry into more detailed development

Assumptions:

- At least four liquids treatment alternatives will be identified that can meet the treatment objectives for the planning period.
- DEQ will participate in the workshop
- Up to four liquids treatment alternatives will be carried forward for more detailed development.

Task 3.2 Alternatives Development and Evaluation

Under this task, up to four alternatives for liquids treatment will be further developed that meet the treatment objectives. This task will also incorporate evaluating the screened alternatives for compatibility with the existing digesters and planned dewatering improvements, consistent with biosolids planning work completed for the City in 2014, by others. CH2M will begin with a review of work completed since the 2011 FP, namely the Solids Process Improvement Predesign Report (June 19, 2014) and the Solids Process Improvements Preliminary Design and Ten Percent Design Technical Memorandum (December 1, 2014). CH2M will avoid rework and only suggest additional areas of study and/or evaluation if it appears beneficial to the City based on new industry technology developments and/or new WWTP performance information that is discovered through the process of conducting this MP update.

Task activities will include:

- Define and develop complete alternatives that fully meet operational and regulatory goals for the planning period.
- Develop full plant hydraulic requirements associated with each alternative to better support capital cost estimating
- Address non-cost evaluation criteria such as reliability and operational constraints. Identify regulatory, legal, and institutional requirements for each of the alternatives.
- Develop order of magnitude capital cost estimates for each alternative using CH2M Cost Parametric Estimating System (CPES).
- Develop operational and maintenance costs based on vendor equipment O&M recommendations and plant operations staff input.
- Determine the present worth costs for each alternative.
- Develop rate impacts of each alternative.
- Develop a long term (20-year) wastewater system financial planning model. The financial plan will include 2-3 year of historical financial data, along with projections of system-wide costs (operation and maintenance and capital), revenues and financial performance indicators (e.g., fund balances and debt service coverage ratios) over a 20-year period. The model will be user-friendly and will facilitate evaluation of alternative financing scenarios, capital improvement schedules, and forecast assumptions with respect to rate impacts and other financial indicators.

- Once the financial model has been developed, evaluation of treatment options and capital funding strategies can be developed to assess the impacts on projected rate increases. Up to three scenarios are assumed in the financial analysis budget. A 20-year strategy of rate adjustments will be developed to meet the revenue requirements for the selected alternative.
- A Compare Alternatives & Select Recommend Alternative Workshop

Deliverables:

- Workshop materials including:
    - Draft Technical Memorandum summary the alternatives, advantages, disadvantages, costs and treatment differences
- Workshop meeting notes summarizing screened alternatives to carry into more detailed development
- The Subconsultant will prepare draft and final financing plan technical memoranda. The memoranda will include documentation of the technical analysis and findings.

Assumptions:

The majority of the Work performed under this task will be completed after the Develop and Screen Alternatives workshop and prior to the Compare Alternative & Select Recommend Alternative workshop. Up to four system alternatives will be evaluated. Minor modifications and refinements to the alternatives analysis results will be made if necessary to respond to additional findings/comments which are revealed at the Compare Alternatives & Select Recommend Alternative workshop. A draft Technical Memorandum (TM) will be developed prior to the workshop and finalized after the workshop. The City will provide one set of consolidated comments on the TM prior to finalization. This TM will be incorporated into the draft Facility Plan Addendum document under Task 4 as appropriate. .

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- Build on 2011 Facility Plan work but consider other liquids treatment alternatives and specific wet weather treatment alternative that can integrate with the existing treatment facilities
- The facility has sufficient open area to expand required process facilities and no additional land is required for facility expansion at the existing location.
- Environmental impacts for onsite facility expansion are the same as described in the 2011 Facility Plan.

Task 3.3 Recommended Alternative

The purpose of this task is to summarize the recommended alternative and any potential phasing possible, and present the estimated capital and annual O&M costs. Task activities include:

- Develop conceptual project design, AACE Level 5 cost estimate and order of magnitude annual O&M costs for the recommended project.
- Develop a project phasing approach based on capacity, reliability and redundancy and performance criteria.
- Develop a detailed description of improvements of each phased project including permit requirements and Engineer's opinion of Probable Cost. The cost will include contract administration and professional services (engineering) as a typical percent of construction.

- Develop a CIP schedule showing start and end of each phased project.
- Develop updated phased process flow diagram and site layout showing recommended improvements.
- Summarize sustainability considerations.

Assumption:

- The proposed project description, phasing, project opinions of cost, and permit requirements will be documented in the Treatment Alternatives section of the Addendum.

Task 4 Prepare Facility Plan Addendum document

A draft and final Facility Plan Addendum will be developed that incorporates all the elements outlined in Tasks 1 through 3. This document is intended to meet the requirements of this project by addressing all addendum elements that have been agreed upon with DEQ. CH2M will also assist the City in obtaining approval of the addendum from DEQ.

Task 4.1 Prepare Draft Facility Plan Addendum document

A Draft Facility Plan Addendum will be developed and submitted to the City for review. Following incorporation of City comments, the Draft Addendum will be submitted to DEQ.

Task activities include:

- Compiling results from Tasks 1 through 3 and assembling into a comprehensive planning document.
- Documentation of additional reports or special studies needed for the planned project(s).
- Documentation of additional considerations for the development of the planned project(s).
- Providing conclusions and recommendations summarizing major items from each section and final recommendations.
- Incorporate City comments into the draft addendum.
- Submit electronic Draft Facility Plan Addendum to DEQ

Assumptions:

- Five hard copies and one electronic, searchable and bookmarked PDF of the draft document will be provided to the City.

Deliverable

- Hardcopy and electronic Draft Facility Plan Addendum

Task 4.2: Prepare Final Facility Plan Addendum document

CH2M will compile, print, bind, and submit the final Facility Plan Addendum to the City and DEQ. The Final Facility Plan Addendum will address City and DEQ comments provided on the draft.

Assumptions:

- Five hard copies and one electronic, searchable and bookmarked PDF of the draft document will be provided to the City.
- City and DEQ comments are received within the same timeframe such that the draft addendum only has to be revised and finalized once.

- CH2M will submit a hard copy and electronic copy of the final Facility Plan Addendum to DEQ with City's approval.

Task 5: Project Management and Coordination

CH2M will perform project management activities including monitoring and administration duties, participation in regularly scheduled progress meetings with the City, and project quality assurance and quality control (QA/QC) activities, as needed. Monthly progress reports and progress billings will be prepared in a format approved by the City. CH2M will attend City Council meetings and/or work sessions to support staff to status the project with the City Council.

Assumptions:

- Assume bi-weekly coordination meetings with City's project manager and CH2M project manager.
- Three City Council meetings would be attended in Coos Bay over the course of the project.

Deliverables:

- Monthly invoices
- Meeting agenda and minutes

Schedule

The Draft Facility Plan Addendum will be submitted to the City 7 months after notice to proceed. The Final Facility Plan Addendum will be submitted to the City and DEQ a month after DEQ comments are received.

A detailed project schedule will be developed by CH2M and will be provided to the City at the initiation of the project to define key interim milestones and to help in scheduling and coordination of meetings with and review required from City and DEQ staff.

Compensation

This scope of work will be performed on a time and materials basis not to exceed $. A summary of the level of effort is provided in Table 1.

Table 1. Level of Effort and Costs for the Facility Plan Addendum