

CITY OF YUBA CITY  
STAFF REPORT

**Date:** November 20, 2018  
**To:** Honorable Mayor & Members of the City Council  
**From:** Public Works Department  
**Presentation by:** Mandeep Chohan, Senior Engineer

---

**Summary**

**Subject:** Professional Services Agreement with West Yost Associates for the Wastewater System Master Plan Update and Biosolids and Organic Waste Management Alternatives Analysis

**Recommendation:** Award a Professional Services Agreement to West Yost Associates of Davis, CA in the amount of \$548,052 plus \$55,000 contingency to prepare the Wastewater System Master Plan Update and Biosolids and Organic Waste Management Alternatives Analysis, with the finding that it is in the best interest of the City.

**Fiscal Impact:** \$603,052 Account No. 981249 (Wastewater System Master Plan Update)  
\$548,052– Professional Services  
\$55,000 – Contingency (Professional Services)

---

**Purpose:**

To anticipate and prepare for current and future City wastewater customer and infrastructure needs.

**Background:**

The Wastewater Treatment Facility (WWTF) was originally constructed in 1972. Significant improvements and expansion of the facility have taken place since the original construction. The WWTF has a permitted capacity of 10.5 million gallons per day (mgd). The current average dry weather wastewater flow to the WWTF is approximately 6.5 mgd. The wastewater system serves approximately 15,000 service connections through approximately 200 miles of sewer main.

The most recent Wastewater System Master Plan Update (Master Plan Update) was completed in March 2006 by Kennedy/Jenks Consultants. The Master Plan Update identified and recommended programmed improvements to the Wastewater System. Since the completion of 2006 Master Plan Update, several of the recommended improvements and other related projects have been completed, are under construction, or are in the design phase (Attachment 1).

## Need for Master Plan Update

The 2006 Master Plan Update was based on the adopted General Plan and the City's development growth rates at the time (a rate of new construction of 750 to 1,000 homes per year). Significant economic, environmental, and legislative changes have occurred since the 2006 Master Plan Update.

A new Wastewater System Master Plan Update is necessary to reflect current and anticipated future development trends, wastewater flow projections, regulatory requirements, and expansion and improvements to the existing wastewater system infrastructure. In addition, the completion of the Master Plan Update will also position the City to take advantage of future applicable grants and low interest loans; in the last 8 years, the Wastewater System has received over \$6 million in grants and approximately \$10 million in low interest loans from the State Revolving Fund.

The proposed Master Plan Update will provide the following information:

- Update wastewater system flow projection estimates based on the recently-completed water demand flow projections for the Water System Master Plan and recent wastewater flow data.
- Provide information related to meeting anticipated future regulatory requirements, such as those related to advanced wastewater treatment.
- Determine wastewater infrastructure necessary to serve new development.
- Determine improvements necessary for existing wastewater infrastructure.
- Develop new wastewater service connection fees to provide wastewater infrastructure to serve new developments, as recommended by the National Resource Network.
- Update information needed to establish future wastewater rates.
- Develop a comprehensive long-term Capital Improvement Program.

The scope of work also includes an alternative analysis to evaluate the City's long-term options for bio-solids management and organic/solid waste management as required by the State's SB 1383 regulations.

A full scope of work is attached in Attachment 2.

## **Analysis:**

On April 4, 2017, City Council awarded a Professional Services Agreement to West Yost Associates (West Yost) to update the Water System Master Plan. West Yost was selected through a competitive Request for Proposal (RFP) process. The Water System Master Plan is anticipated to be complete by the end of December 2018.

In order to capture work efficiencies and the West Yost proposed team's knowledge from the recently-completed Water System Master Plan Update, staff recommends awarding a Professional Services Agreement for the Wastewater System Master Plan Update to West Yost. West Yost is a highly-qualified and well-respected firm in the region for specialized services for water, wastewater, and stormwater infrastructure. West Yost's proposed team for the Wastewater Master Plan Update is highly-qualified and familiar with the City's water and wastewater infrastructure and is available to start the work immediately. West Yost's billing

rates are competitive with other firms providing similar professional engineering services in the region.

The main benefits for selecting West Yost without a competitive RFP process include:

- Work efficiency
- In-depth working knowledge of the City's wastewater hydraulic model
- Knowledge of Yuba City's water and wastewater system
- Projected completion of the Wastewater System Master Plan Update by June 30, 2019, much earlier than possible with other consultant firms

**Fiscal Impact:**

The contract shall not exceed \$548,052. Staff is also requesting contingency in the amount of \$55,000. The contract will be funded through the adopted Fiscal Year 18/19 Capital Improvement Program's Wastewater System Master Plan Update project (Account No. 981249).

**Alternatives:**

1. Reduce the scope of work.
2. Direct staff to conduct an RFP process.

**Recommendation:**

Award a Professional Services Agreement to West Yost Associates of Davis, CA in the amount of \$548,052 plus \$55,000 contingency to prepare the Wastewater System Master Plan Update and Biosolids and Organic Waste Management Alternatives Analysis, with the finding that it is in the best interest of the City

**Attachments:**

1. Major Improvements Since 2006 Master Plan Update
2. Professional Services Agreement with Scope of Services

Prepared by:

*/s/ Mandeep Chohan*

Mandeep Chohan  
Senior Engineer

Submitted by:

*/s/ Steven C. Kroeger*

Steven C. Kroeger  
City Manager

Reviewed by:

Department Head

DL

Finance

RB

City Attorney

TH via email

# ATTACHMENT 1

## **Major Improvements Since 2006 Master Plan Update**

### **Completed:**

- Aeration Basins 1, 2 and 3 rehabilitation
- New Sludge Thickening System construction
- New 12 kV Switchgear
- Collection System rehabilitation
- Primary Clarifier improvements
- Vactor Truck dump station
- Recycled Water Study
- Site lighting
- 650 kW solar project (purchased in 2013/14)
- 1.75 MW solar system (anticipated to be operational within the next 2-3 months)
- Lift Station No. 10 and Lift Station No. 2 electrical improvements
- Storm-related damage repairs to evaporation/percolation ponds in 2007 (FEMA/OES funded project)
- No. 3 Water System improvements

### **Under Construction:**

- Replacement of digester floating covers with fixed covers
- Plant-wide Electrical Instrumentation and Control System/SCADA System improvements
- Influent Bar Screen improvements
- New Dewatering Facility

### **Under Design:**

- New Outfall Structure
- Secondary Clarifier No. 4

## ATTACHMENT 2

# SCOPE OF SERVICES

## 2019 Wastewater Treatment Plant and Collection System Master Plan Update

---



### INTRODUCTION

This Scope of Services describes West Yost Associates' (West Yost's) proposed services for the City of Yuba City (City) 2019 Wastewater Treatment Plant (WWTP) and Collection System Master Plan Update (Wastewater Master Plan). The update of the City's Wastewater Master Plan will guide the City's implementation of required wastewater treatment plant and collection system capital improvement projects.

West Yost's scope of work for the Wastewater Master Plan is provided below.

### SCOPE OF SERVICES

West Yost's scope of work for the preparation of the City's Wastewater Master Plan includes the following tasks.

- Task 1. Project Management and Meetings
- Task 2. Data Collection and Review
- Task 3. Hydraulic Performance Criteria Development
- Task 4. Parcel Loads and Flow Projections Development
- Task 5. Hydraulic Model Update
- Task 6. Existing and Future Water System Evaluation
- Task 7. Asset Evaluation/Condition Assessment/R&R Plan
- Task 8. WWTP Evaluation
- Task 9. Capital Improvement Program Development
- Task 10. Master Plan Report Preparation

Each of these tasks is described below. Optional tasks will only be performed after receipt of written authorization from the City along with an associated budget augmentation.

#### **Task 1. Project Management and Meetings**

Use project management tools, including systems for tracking work progress and expenditures, proactive communications, and quality assurance and quality control to keep the project on schedule and budget.

##### Task 1.1: Conduct Kickoff Meeting

Conduct a kickoff workshop with City staff to review initial goals and priorities of the Project, present an up-to-date project schedule with key milestones identified for the project, and conduct an in-depth review of the wastewater system with engineering and operations staff to collect information on system operation, adequacy, areas of concern, and known deficiencies.



#### Task 1.2: Progress Check-Ins

Conduct bi-weekly conference calls to review project status, including work completed during the latest report period, work anticipated to be completed during the next reporting period, identified problems/issues that could affect Project budget/expenditures and/or schedule, outstanding issues to be resolved, and action items. A total of fourteen one-hour conference calls are anticipated.

#### Task 1.3: Project Workshops

Four face-to-face meetings/workshops will be facilitated to present and discuss key findings with City staff. It is assumed that three of these workshops will be conducted at the West Yost offices in Davis. The following workshops are assumed:

- **Workshop #1. Flow and Loading Evaluation:** The goal of this workshop will be to gain consensus on the wastewater flow and load projections.
- **Workshop #2. Collection System Rehab/Replacement Program:** Meet with City collection system staff to gather existing pipeline and manhole data; identify areas of concern; review the City's existing list of rehab/replacement needs; and gain consensus on the methodology for prioritizing rehab/replacement projects.
- **Workshop #3. Facilities Evaluation:** Present the findings of the WWTP performance evaluation and capacity assessment. The goal of this workshop will be to gain consensus regarding facility improvements to be included in the Master Plan.
- **Workshop #4. Capital Improvement Program:** The goal of this workshop will be to gain consensus regarding the recommended CIP.

#### Task 1.4: Internal Planning Meetings

Conduct internal planning meetings for coordination purposes.

#### Task 1.5: Prepare Monthly Invoices

Prepare monthly invoices and progress reports.

**Deliverables:** Meeting agendas and minutes from meetings, workshops and conference calls; Monthly status reports, monthly invoices and project schedule; and, Kickoff meeting presentation materials.

**Assumptions:** Budgeting assumes a seven-month schedule for completing the Wastewater Master Plan.

### **Task 2. Data Collection and Review**

Collect and review data needed for analysis.

#### Task 2.1: Review Data

West Yost will review available materials and supplement or update these materials, as needed, to gain a better and more complete understanding of the major facilities in the City's wastewater system, the basic operation of the wastewater system, existing facility status, flows, and flow



trends. This will include working with City staff to identify and collect additional information, studies, reports, designs and operational data. This information includes, but is not limited to:

- 2006 Wastewater Master Plan and relevant planning documents developed since 2006;
- WWTP drawings;
- “To scale” wastewater collection system mapping information including, atlas maps and collection system information in ESRI ArcGIS format, including a parcel-level base map with latest revisions, identifying:
- Pipeline diameters and invert elevations;
- Locations of manholes, lift stations and cleanouts;
- Lift Station Pump Data - Rated speed, rated discharge, rated head, pump head versus discharge curve, horsepower rating, manufacturer, constant or variable speed motor;
- Historical daily wastewater flows and influent concentrations at the WWTP for 2010 through 2018;
- Short interval (5 or 15 minute) WWTP influent flow data for selected wet weather periods.
- Historical WWTP performance data, including: primary effluent water quality, internal plant flows (e.g. RAS, WAS, etc.); and WWTP process data (e.g. mixed liquor concentration data, internal plant flow solids concentrations, SVI, etc.).
- Currently planned or designed capital improvement projects and future pending projects identified from previous evaluations; and
- Historical collection system flow monitoring data.

#### Task 2.2: Interview Staff and Tour System

West Yost will meet with City staff and participate in a tour of the existing WWTP to gain a better understanding of the existing facilities, potential issues/deficiencies, changes in operation since previous planning documents were completed and/or known operational concerns.

Over the course of one additional day, West Yost will visit critical collection system pump stations (up to four) and meet with City staff to discuss known rehabilitation needs.

#### Task 2.3: Prepare Existing System Chapter

Prepare draft chapter describing the WWTP and collection system, including key facilities (lift stations) and collection system piping. For the WWTP, this chapter will reference relevant information included in the 2006 Master Plan and provide a brief summary of upgrades/changes that have occurred since the Master Plan was developed.

**Task 2 Deliverables:** Data request list; Electronic copy of draft Master Plan chapter describing the City's existing system for City review and comment.

### Task 3. Hydraulic Performance Criteria Development

Document hydraulic performance criteria to evaluate the City's wastewater treatment plant and collection system, based on previously established criteria.

#### Task 3.1: Document Collection System Performance Criteria

Collaborate with City staff to identify previous hydraulic performance criteria and confirm they will be used for assessing the capacity of the system. These criteria may include Manning's 'n' factor, maximum d/D values and/or allowable surcharge, minimum and maximum velocities, or other criteria developed during the collaboration. A key factor to be documented will be how the criteria impact the City's ability to effectively evaluate development and redevelopment impacts on the sanitary sewer system.

#### Task 3.2: Document WWTP Performance Criteria

Collaborate with City staff to document the performance criteria to be used for assessing the capacity of the WWTP.

#### Task 3.3: Prepare Draft Criteria Chapter

Prepare draft chapter summarizing the selected criteria.

**Deliverables:** Electronic copy of draft Master Plan chapter summarizing the selected criteria for City review and comment.

**Assumptions:** West Yost assumes that criteria will be drawn from documents previously prepared for Yuba City.

### Task 4. Parcel Loads and Flow Projections Development

Develop flow and load projections for the City's wastewater system.

#### Task 4.1: Develop Hydraulic Model Flow Scenarios

Flow scenarios will be developed for each of three development horizons. During the analysis of the collection system capacity, a sensitivity analysis will be performed to determine whether potential variations in flow would affect the recommended improvements.

#### *Existing Flows*

West Yost will use the existing water billing to parcel/land use link developed for the Water Master Plan to develop updated, spatially allocated water demands. With the updated water demands, West Yost will use the influent flow data from the WWTP flow meter to determine Return-to-Sewer Ratios and thereby determine sewer flows to represent average dry weather flow (ADWF). West Yost will also use the daily influent flow data from the WWTP to determine annual average flow (AAF), maximum daily flow (MDF) and maximum monthly flow (MMF). Finally, continuous flow data from the WWTP will be used to develop a diurnal pattern that can be used

to define peak dry weather flow (PDWF). Flow factors will be developed to correlate each flow condition to the defined ADWF.

#### *Near-Term Flows*

West Yost will use the demand projections developed in the Water Master Plan for the Near-Term scenario along with the return-to-sewer ratios to develop a Near-Term flow scenario for ADWF, AAF, MDF, MMF, and PDWF.

#### *Buildout Flows*

West Yost will use the demand projections developed in the Water Master Plan for the Buildout scenario along with the return-to-sewer ratios to develop a Buildout flow scenario for ADWF, AAF, MDF, MMF, and PDWF .

#### Task 4.2: Wet Weather Flows

West Yost will analyze data from the WWTP flow meter during historical wet weather events to determine appropriate inflow and infiltration (I/I) factors for Yuba City. It is expected that one set of I/I factors will be used for the entire city, as there is no recent flow monitoring data that will allow unique sets of I/I factors for different areas within the city. These factors will then be used in conjunction with an appropriate design storm to produce peak wet weather flow (PWWF) conditions. PWWF will be defined for the Existing, Near-Term and Buildout scenarios.

#### Task 4.3: Develop WWTP Flow and Load Scenarios

West Yost will calculate influent Biochemical Oxygen Demand (BOD), total suspended solids (TSS) and ammonia loads for the WWTP. Loads will be defined separately for large industrial contributions and for the combined domestic/commercial/minor industrial contributions. For these two sources of flow, the average dry weather, annual average, maximum month and maximum day load conditions will be defined. A range of up to four flow and load scenarios will be defined for each development horizon (existing, near term and buildout).

#### Task 4.4: Outfall Design Flow Memorandum

West Yost will compile the available information and recommendations related to design flows (low flow and peak flow) for the City's new outfall system. The basis of the recommendations, potential variability and associated risks will be presented. The information will be presented in a separate technical memorandum delivered in advance of the draft master plan chapter.

#### Task 4.5: Prepare Draft Flow and Load Projection Update Chapter

Prepare draft chapter that summarizes the flow and load projections.

**Deliverables:** Draft and final technical memorandum presenting the input data, assumptions and conclusions regarding low flow and peak flow design parameters for the planned WWTP outfall system; and, Electronic copy of draft Master Plan chapter describing the development of flow and load scenarios for Existing, Near-Term and Buildout conditions for City review and comment.

**Assumptions:** West Yost will use the Existing, Near-Term and Buildout demand scenarios developed in the Water Master Plan to develop corresponding flow scenarios.

### **Task 5: Hydraulic Model Update**

Update the current hydraulic model with information from the most current GIS data. The model will include trunk mains and lift stations that connect to the trunk mains but will not include all pipes and manholes. The extent of the hydraulic model will generally match the extent of the current hydraulic model.

#### Task 5.1: Update Model

Update the hydraulic model of the City's sanitary sewer collection system that will be used to assess the design flows in the system in comparison to the capacity of the facilities to identify potential capacity deficiencies. The extent of the modeled network will be all trunk mains, lift stations that connect to the trunk mains, and force mains in the collection system.

Data for the model update will be drawn from available GIS data, sewer maps, and sewer project record drawings delivered to West Yost as part of Task 2.

#### Task 5.2: Validate Model

The flows in the Existing model scenario will be compared to daily influent flow data from the WWTP flow meter for both ADWF and PDWF conditions to validate the model.

#### Task 5.3: Prepare Draft Model Update Chapter

Prepare draft chapter that summarizes the update and validation of the model.

**Deliverables:** Electronic copy of draft Master Plan appendix describing the update and validation of the model.

**Assumptions:** Modeling software to be used is Infosewer; City will provide missing rim and invert elevation data required to complete the model; and, City will provide SCADA data for influent flows at the WWTP flow meter in electronic format (such as .csv or Excel data files) for flow validation.

### **Task 6: Existing and Future Water System Evaluation**

Evaluate the existing and future system under a variety of flow scenarios to identify system deficiencies and propose system improvements.

#### Task 6.1: Identify Capacity Deficiencies

West Yost will use the hydraulic model to analyze the capacity of the sewer system under Existing, Near-term and Buildout flow scenarios for both dry and wet weather flows. Capacity deficiencies will be identified and presented graphically on maps. Where a deficiency is identified, a range of up to four potential future flow scenarios will be evaluated to determine the sensitivity of the finding to potential future flow changes.

Task 6.2: Develop Preliminary Improvements

West Yost will review the model results to identify potential solutions for predicted deficiencies. Solutions may include upsizing or paralleling existing pipes, upsizing existing pump stations, or implementing flow diversions at critical locations. West Yost will discuss and document these preliminary solutions with City staff and test them using the hydraulic model.

Task 6.3: Meeting with Selected City Staff

West Yost will present and discuss information from Tasks 6.1 and 6.2.

Task 6.4: Develop Project Alternatives

West Yost will identify specific projects to relieve predicted capacity deficiencies or inefficiencies in the sewer system, including pump stations. Potential sewer alignments will also be evaluated in cases where existing alignments would be difficult to access or rehabilitation or replacement. West Yost will also identify up to two separate alternatives for trunk sewer alignments providing service for the west side of the City where much of the future growth is expected to occur. West Yost will then analyze the buildout system with Near-Term flow to determine which improvement projects will be required to serve the Near-Term flows.

Task 6.5: Prepare Draft Master Plan Chapters

Prepare two separate draft chapters that summarize the evaluation of the existing and future wastewater systems.

**Deliverables:** Figures and table of model simulations; Electronic copy of draft Master Plan chapter summarizing the evaluation of the existing system for City review and comment; and, Electronic copy of draft Master Plan chapter summarizing the evaluation of the future system for City review and comment.

**Task 7. Asset Evaluation/Collection Assessment/R&R Plan**

*Objective:* Document the City's rehabilitation and replacement needs for the existing collection system using City data and information collected during cursory pump station site visits.

Task 7.1 Pump Station Rehab/Replacement Needs

Conduct a one-day site visit (budget under Task 2.2) to up to four of the City's highest-priority wastewater pump stations for the express purposes of scoping and budgeting civil and mechanical rehab/replacement needs at each pump station. For lower-priority pump stations that are not included in the site visits, the City will provide as-built drawings and a detailed scope of work for rehabilitation needs at each low-priority pump station - from which West Yost will estimate costs for rehab/replacement. Thorough condition assessments, confined-space entries, and specialty structural and electrical/instrumentation/controls evaluations will not be performed.

### Task 7.2: Sanitary Sewer Rehab/Replacement Needs

Conduct Workshop No. 2 (budget in Task 1) with City collection system staff to gather condition and performance data available for sanitary sewers and manholes; identify areas of concern including previous failures/overflow locations; gather the City's existing list of gravity sewer, manhole, and force main rehab/replacement needs; and document a methodology for prioritizing rehab/replacement projects. Based on the results of the workshop, develop a list of spot repairs, rehabilitation, and/or replacement improvements and annual expenditures prioritized according to the methodology developed in Workshop No. 2.

### Task 7.3: Review and Document Findings

Workshop No. 4 will be conducted with City staff (budgeted under Task 1) to discuss the rehabilitation and replacement recommendations. The resulting Rehab/Replacement Plan will be documented in the Capital Improvement Plan chapter (Task 9).

Deliverables: Workshop materials and minutes.

Assumptions: City pump station operators will accompany West Yost on the one-day site visits to provide access and to convey operational issues and rehab/replacement needs; City decision makers will attend Workshop No. 2 and Workshop No. 4 to provide critical input in the rehab/replacement plans and their prioritization systems; City will provide recent pump station and sanitary sewer bid results; Formal risk assessments with likelihood and consequence of failure analyses will not be conducted; and, The City has already performed gravity sewer, manhole, and/or force main condition assessments and will provide a list of needed improvements.

## **Task 8. WWTP Evaluation**

Evaluate the WWTP expansion and improvement needs. Develop updated estimated costs for identified projects, allocating costs to existing rate payers and growth development.

### Task 8.1: Summarize Current and Anticipated Regulatory Requirements

West Yost will review the recent Report of Waste Discharge and current/anticipated NPDES Permits and identify current and potential future requirements that apply to the City's Feather River discharge. Relevant information will be briefly summarized.

### Task 8.2: Compile Process Data and Develop Solids Balance

West Yost will compile available process data for the most recent five-year period to assess current performance of key facilities. West Yost will discuss with the City staff any identified potential deficiencies in process performance as compared to theoretical performance.

The available WWTP process data will be used to develop and calibrate a plant-wide solids balance model for the WWTP facilities, which can then be used to predict operations at a range of influent conditions. A simple BioWIN model of the secondary process will be used to support the development of the solids balance model. These modeling tools will be used to predict plant loadings at the near-term and buildout influent flow and load conditions.

#### Task 8.3: Evaluate Process Capacity and Identify Expansion Triggers

The solids balance model results will be used in combination with relevant WWTP flow and load data to define the remaining available capacity of each unit process based on previously defined process rating criteria. If the performance data review conducted under Task 8.2 suggests that there is a potential performance issue that could impact the previously defined design criteria, West Yost will bring this issue to City staff for discussion. However, the scope does not include analysis of performance deficiencies or development of new design criteria based on observed data.

Using the flow or load projections developed under Task 4, West Yost will identify anticipated expansion triggers for each unit process and whether new treatment process units will be required to provide additional capacity required to satisfy future increases in wastewater flows and loads. The analysis will not include an assessment of whether there are performance improvements or other alternatives available for addressing the identified capacity limitations. Expansion triggers will be keyed to loads and/or flow, rather than a specific timeline.

#### Task 8.4: Review Improvements Projects

Following the site visit under Task 2.2, the City will provide West Yost with a list of condition-related improvement projects anticipated in the Master Plan planning period. West Yost will review this list and conduct follow up discussions with staff to gain an adequate understanding of the condition-related improvements to support development of cost estimates for these projects.

#### Task 8.5: Prepare Planning-Level Cost Estimates

West Yost will prepare conceptual-level opinions of probable project cost to design and construct the required improvements and new facilities identified under the tasks listed above. Improvements costs will be limited to major pieces of equipment and major structures that require repair or replacement during the Master Plan planning period. Operating costs will not be defined. The project list will rely on electrical and instrumentation evaluations performed by others, including identification of projects and estimated costs, which will be incorporated without review.

#### Task 8.6: Prepare Conceptual Site Layout Plan

West Yost will develop a conceptual WWTP site plan identifying anticipated locations for recommended projects.

#### Task 8.7: Advanced Treatment Evaluation

West Yost will develop conceptual-level opinion of probable project costs and facility layouts for advanced treatment improvements at the WWTP. For this analysis, the following improvements are assumed to be necessary:

- Convert the existing pure oxygen aeration basins to a biological nitrogen removal facility capable of meeting an effluent target for total nitrogen of less than 10 mg/L.
- Install new sand filtration facilities to meet effluent target of 10 mg/L BOD and TSS.



[Task 8.8: Prepare WWTP Evaluation Chapter](#)

Prepare draft chapter summarizing WWTP evaluation.

[Task 8.9 \(OPTIONAL\): Control System and Cybersecurity Evaluation](#)

As an optional task, West Yost's Operations Technology and Cybersecurity experts are available to provide a screening level or in-depth cybersecurity assessment of the citywide SCADA network.

**Deliverables:** Electronic copy of draft Master Plan chapter describing the WWTP evaluation for City review and comment.

**Task 9: Capital Improvement Program Development**

Develop a Capital Improvement Program that identifies and prioritizes required wastewater system improvements using the results of the previous tasks.

[Task 9.1: Develop Cost Criteria](#)

West Yost will develop criteria for estimating probable construction and capital costs based on West Yost's database of sewer construction costs from projects throughout Northern California, as well as input from City staff on costs of local construction projections. Unit construction costs will be developed to the detail normally used in master planning. Cost allowances (percentages of estimated construction cost) for construction contingencies and for design engineering, construction administration and inspection, and legal costs will also be included.

[Task 9.2: Develop Project Descriptions and Costs](#)

Drawing from the various technical evaluations, develop a list of capital improvement projects, including project description, location, size and costs. Cost estimates will be conceptual, planning-level costs consistent with order of magnitude cost guidelines as defined by the Association of Cost Estimating Engineers.

[Task 9.3: Develop Capital Improvement Program](#)

Prioritize projects based on the results of the WWTP evaluation, and the system analysis of existing and buildout conditions. Link the recommended timing for future system improvements, where possible, to the development horizons identified in Task 4. Identify cost allocations to existing and future customers for future rate and impact fee evaluations. Develop a program implementation schedule.

[Task 9.3: Prepare Capital Improvement Program Chapter](#)

Prepare a draft chapter that summarizes the capital improvement program.

**Deliverables:** Electronic copy of draft Master Plan chapter summarizing the recommended capital improvement program for City review and comment.



### Task 10. Master Plan Report Preparation

Document the evaluations conducted in the previous tasks and prepare a draft and final Master Plan Report.

A proposed table of contents for the Wastewater Master Plan is provided below:

- Chapter 1 – Introduction
- Chapter 2 – Service Area and System Facilities
- Chapter 3 – Existing and Future Flow and Load Development
- Chapter 4 – Hydraulic Performance Criteria
- Chapter 5 – Existing Collection System Evaluation
- Chapter 6 – Future Collection System Evaluation
- Chapter 7 – Wastewater Treatment Plant Evaluation
- Chapter 8 – Recommended Capital Improvement Program

#### Task 10.1: Prepare Draft Report

Submit Wastewater Master Plan Report outline to City for review.

Integrate City comments to the previously submitted chapters that have been prepared in the above tasks into the appropriate chapters of the Wastewater Master Plan to develop the draft report. Following City review of the draft report, meet with City to discuss review comments and questions.

#### Task 10.2: Prepare Final Report

Update the draft report to integrate appropriate comments and prepare the final report and submit to the City.

**Deliverables:** Five (5) hard copies and one (1) electronic copy in PDF format of the draft Master Plan report will be submitted to the City for review and comment; Twenty (20) hard copies and one (1) electronic copy in PDF format of the final Master Plan report will be submitted to the City; Electronic copy of supporting modeling and spreadsheet files.

**Assumptions:** City to provide consolidated comments within ten business days of draft submittals (draft Master Plan chapters enumerated in tasks above and draft Master Plan report).

# SCOPE OF SERVICES

## 2019 Biosolids and Organic Management Alternatives Analysis

---



### INTRODUCTION

This Scope of Services describes West Yost Associates' (West Yost's) proposed services for the City of Yuba City (City) 2019 Biosolids and Organic Management Alternatives Analysis.

West Yost's scope of work for the Biosolids and Organic Management Alternatives Analysis is provided below.

### SCOPE OF SERVICES

Based on our understanding of the project and the City's objectives for this initial study, we have developed the following scope of work. It is anticipated that this is an initial effort that will likely have subsequent phases of work depending on the findings of this work and decisions made by the City.

- Task 1. Biosolids Disposal/Reuse Alternatives Evaluation
- Task 2. Organics Waste Diversion Guidance
- Task 3. Regional Opportunity Investigation
- Task 4. Technical Memorandum
- Task 5. Meetings
- Task 6. Project Management

Each of these tasks is described below. Optional tasks will only be performed after receipt of written authorization from the City along with an associated budget augmentation.

#### **Task 1 – Biosolids Disposal/Reuse Opportunities**

##### Subtask 1.01 – Biosolids Disposal/reuse Alternatives Evaluation

West Yost will perform a high-level, feasibility evaluation of biosolids reuse and disposal options that are applicable to the City based on quantity and type of biosolids produced from the facility. The evaluation will include information in the following areas:

- Biosolids disposal/reuse process description
- Discussion of potential impact or changes to the current WWTP solids treatment/handling processes
- Qualitative cost implications for the City (i.e. large capital improvements required, significant changes in operation type or skillset required)
- Current level of maturity of technology
- Recommendations for negotiations with landfill on receipt of biosolids

A matrix of options will be developed and will be included as part of a Technical Memorandum (TM). It is anticipated that the following major categories would be investigated as part of this evaluation:

- Land application options:
  - Direct land application (considering local and County regulations) on City-owned facility. This could also be part of a regional biosolids management facility.
  - Composting and/or land application at a third-party site (sending to Synagro site in Sacramento County).
  - Composting at a City-owned site. This could also be part of a regional biosolids management facility.
- Drying and pyrolysis options
- Hydrolysis options (Lystek)
  - On-site facility: this could also be part of a regional biosolids/organics processing facility.
  - Off-site (sending to Fairfield). This would not be an option if regional facility considered

**Task 1 Deliverables:** Information developed in this task will be included in the Technical Memorandum (Task 4)

## **Task 2 – Organics Waste Diversion Guidance**

### Subtask 2.01 – Readiness Assessment

This task will include discussions with City staff to make an assessment of the City’s readiness to deal with requirements of the pending regulations, which is expected to include increased monitoring and reporting requirements from what staff is already doing for solid waste management. This will be a qualitative comparison of the City to similar sized agencies and what preparation efforts other agencies have already undertaken.

### Subtask 2.02 – Near-term Actions

This task includes development of recommendations based on the Readiness Assessment. These recommendations would be presented to the City at a meeting which is described in Task 5.

**Task 2 Deliverables:** Information developed in this task will be delivered in a meeting with City staff

## **Task 3 – Regional Opportunity Investigation**

West Yost will perform a high-level evaluation of regional wastewater sludge and organics processing solutions that could be available to the City. The alternatives that may be available to the City are dependent on quantity and type of feedstocks, residual management requirements, resource recovery opportunities, and process technologies that are currently available and are

comfortably mature. The following tasks will be used to develop a preliminary understanding of the processes that might be available to the City.

#### Task 3.01 – Feedstock Assessment

This task includes developing a preliminary understanding of feedstocks that could be available to the City for a regional biosolids and/or organics management project. The feedstocks would include both biosolids from municipal wastewater treatment facilities and organics that are being diverted from landfills by communities. This would also include possible organic sources from nearby industries.

For this assessment we anticipate investigating the following possible sources:

- Biosolids and organics from Yuba City
- Biosolids and organics from surrounding communities (contact up to three nearby communities)
- Organics from surrounding industries (contact up to three nearby industries)

Depending on the availability of information and willingness to disclose, we hope to gather the following for each possible feedstock source:

- Availability of feedstock (year-round or seasonal, available now or in the future)
- Amount (tonnage)
- Organic value: this will be a high-level estimation based on available information in literature.

#### Task 3.02 – Process Options

The process options for biosolids and organics is anticipated to include the following:

- Role of existing anaerobic digesters:
  - Do the digesters have a role in the regional alternative?
  - What is the capacity of the existing digesters to receive additional organic material?
  - What is the capacity to receive additional organics with a digester capacity enhancement?
- Identification of up to three possible processes:
  - Residuals generated from process
  - Energy input required
  - Resource recovery possibilities

- Heat (this includes fuel such as digester gas that could be used for heat generation or possible sale to nearby industry or utility)
- Energy
  - Concept level opinion on costs
  - Concept level opinion on possible revenue streams or savings
  - Siting considerations
- Stage of technology development

The information developed on the possible processes in this task will be based on material and information that is received from the technology providers. Detailed heat and energy balance calculations to confirm validity of provider claims could be accomplished in subsequent work efforts depending on which processes seem most promising by the City.

**Task 3 Deliverables:** Information developed in this task will be included in the Technical Memorandum (Task 4)

#### **Task 4 – Technical Memorandum (TM)**

A technical memorandum will be developed to summarize the performed in the previous tasks. The following is a preliminary outline for the TM.

- Biosolids Disposal/reuse Opportunities
  - Assessment of timeline for City of elimination of ADC and ban on landfill of biosolids and cost impacts to these changes.
  - Possible alternatives for biosolids disposal/reuse
- Regional Opportunity
  - Feedstock assessment
  - Process options
- Next Steps

A Draft TM will be developed for one round of City review and comment. We will incorporate City comments into a Final TM.

**Task 4 Deliverables:** Electronic copy (Word and pdf) of Draft and Final TM

#### **Task 5 – Meetings**

##### Subtask 5.01 – Biosolids and Regional Facility Initiation Meeting

West Yost will conduct a meeting with the City to review and confirm project objectives and desired outcomes. We anticipate that this meeting would be used to discuss both biosolids disposal/reuse alternatives investigation and regional opportunity investigation.

To facilitate discussion at this meeting, we will develop the following prior to the meeting:

- Preliminary list of biosolids reuse and disposal options that are currently available and that could be considered in the next 5, 10, and 20-year time frame.
- Preliminary list of possible feedstock sources and possible process options that could be considered

During this meeting we will review the preliminary material with the City to refine the focus and direction of the subsequent evaluation efforts.

#### [Subtask 5.02 - Biosolids and Regional Facility Alternatives Review Meeting](#)

West Yost will meet with City staff to review major findings prior to the development of a Draft TM. A preliminary outline will be developed for the TM will be developed for discussion and confirmation in the meeting.

#### [Subtask 5.03 – Feedstock Stakeholder Meeting](#)

We estimate that up to one (1) meeting with possible stakeholders may be needed to facilitate information gathering. It is anticipated that two (2) West Yost staff members would attend the meeting. We also anticipate that a City staff member would be present at the meeting. West Yost would schedule and coordinate the meeting.

#### [Subtask 5.04 – Organics Waste Diversion Guidance Initiation Call](#)

We anticipate initiating Task 2 activities with a conference call with the City staff. This call would be used to identify information that would be needed and the appropriate person to talk with to conduct the readiness assessment. It is anticipated that prior to the call, the City would identify the appropriate people to have on the call. The West Yost team would take the lead in setting up the conference call.

#### [Subtask 5.05 – Organics Waste Diversion Guidance Presentation](#)

This is anticipated to be a presentation with City staff to review the findings of the readiness assessment and discuss near-term actions. It is anticipated that one (1) member of the West Yost team would attend this presentation and that the City would identify the appropriate people to have at the presentation. It is anticipated that the City would take the lead on organizing this presentation due to the number of City staff that might attend.

#### [Subtask 5.06 – TM Review Call](#)

We anticipate conducting a 90-minute call with the City to review the comments on the draft TM. It is anticipated that two (2) people from West Yost will attend the call.

**Task 5 Deliverables: Meeting agenda and notes will be provided for each meeting and call.**



### **Task 6 – Project Management**

This task includes effort to initiate, track, and manage the project including development and review of project invoices and budget tracking and management. This task also includes effort for quality control review of deliverables. It is anticipated that this project will have an approximate duration of six (6) months.

DRAFT