

Scope of Work  
WWTP and Pump Station Condition Assessment  
and Preventative Maintenance Program  
for City of Camas  
HDR Engineering, Inc.

## **BACKGROUND**

The City of Camas (City) has expressed an interest in developing a condition assessment and preventative maintenance program at the Wastewater Treatment Plant (WWTP) and 23 pump stations in the collection system.

The scope of this project is to conduct a condition assessment of the City's above-ground infrastructure at the WWTP and 23 pump stations, provide recommendations for system repair or replacement, and assist in developing an equipment preventative maintenance program.

A condition assessment will field verify above-ground and accessible WWTP and pump station systems, including mechanical, electrical instrument and control (EI&C) and structural components; and will assess below-ground infrastructure based on a Remaining Useful Life (RUL) analysis. A prioritized condition assessment with recommendations on system repair or replacement will be prepared, along with preliminary cost estimates for recommendations.

This scope includes the following tasks:

## **TASK 1 PROJECT MANAGEMENT**

### **Activities**

- Prepare an internal project management plan to include schedule, budget, roles, project team contact information, and procedures.
- Prepare monthly invoices
- Prepare monthly progress reports to advise City project manager of project status.
- Conduct internal team meetings to review progress, coordinate disciplines, and identify information needs.

### **Assumptions**

- Project duration is 6 months.

### **Deliverables**

- Monthly invoices and progress reports

## **TASK 2 COMPILE FACILITY INFORMATION**

### **Activities**

- Participate in a kickoff meeting to confirm project goals and review information request and data collection.

- Compile existing information on facilities, including size, material, manufacturer, age, and known issues.
- Prepare facility evaluation worksheets to aid in facility tour.
- Develop and discuss asset class Original Useful Life (OUL) estimates to be used later in RUL analysis.

### **Assumptions**

- City will provide information on existing facilities including record drawings, operations and maintenance manuals, equipment replacement/repair records, and other relevant information. See Appendix A for a complete list of information requested.
- Information compilation will only occur for the facilities and pump stations being inspected as part of Task 2.
- City will review and comment on evaluation worksheets to confirm the inspection criteria meets their goals.
- Kickoff meeting will last 2 hours and will be attended by three HDR staff.

### **Deliverables**

- Facility evaluation worksheets
- Kickoff meeting agenda and minutes

## **TASK 3 FACILITY TOUR AND SITE VISITS**

- Coordinate a tour of the WWTP facilities and collection system pump stations listed in Table 1. Verify and note the general condition of infrastructure for use in condition assessment.

**Table 1. Facilities to be Evaluated**

<b>WWTP Facilities</b>	
Main Pump Station	UV Disinfection
Primary Clarifiers (exposed/above-ground portion only)	Effluent Pumping
WPS Pumping	Chemical Feed Systems
Secondary Treatment System (splitter box, basins, blowers, mixers, exposed piping)	Grit Removal System
Secondary Clarifiers 1, 2 & 3 (exposed/above-ground portion only)	Gravity Thickener
RAS/WAS Pumping	Centrifuge and Centrate Handling
Scum Handling Systems	Plant Drain PS
Septage Handling System	Odor Control Systems 1 & 2
Standby Power System	Headworks Screens
Waste Activated Sludge Thickener and associated equipment	Anaerobic Digesters and associated equipment
Biosolids Dryer	Effluent Disc Filters
<b>Collection System Pump Stations</b>	
23 Pump Stations	

The following components for each process/building will be inspected where applicable:

- Mechanical – includes process piping and equipment; heating, ventilation, and air conditioning (HVAC); odor control; and other mechanical support facilities.
- Electrical – includes electrical, instrumentation, controls, and power source/backup facilities.
- Structural – includes structural building components (e.g., concrete, steel) as well as building envelope components (e.g., windows, doors, skylights).

### **Assumptions**

- Facility tours assume the following level of effort for HDR staff:
  - 24 hours each at the WWTP for two process mechanical engineers
  - 16 hours each at the WWTP for electrical and structural engineers
  - 1 hour per pump station for three HDR staff (process mechanical, electrical and structural).
- It is assumed – that all 23 pump stations will be inspected. Inspectors will not enter wet wells for the inspections, but will observe wet well conditions with the use of a field camera
- Below-grade or submerged structures/equipment will not be visually inspected. Condition of assets not visible from the surface will not be included in the assessment. This condition assessment will not document changes in the condition of assets that occurs after the date of inspection.
- Inspections will be visual observation and will not include destructive or nondestructive testing.
- Electrical and control cabinets will be opened by City staff. Electrical inspections will be visual observation and no testing will be performed.
- Pump stations and treatment plant will be inspected in current operating configuration,

### **Deliverables**

- Site visit schedule

## **TASK 4 CONDITION ASSESSMENT TECHNICAL MEMORANDUM**

- Prepare a high-level condition assessment of above-ground facilities using data gathered during facility tours. Complete evaluation worksheets for each facility. Develop recommendations for the repair, replacement, or upgrade of facilities. HDR will work with the City to establish an overall RUL of each facility to aid in calculating risk and prioritizing recommendations.
- Develop conceptual-level cost estimates for the recommendations (Class 5 based on Association for the Advancement of Cost Engineering [AACE] 18R-97)
- Document condition assessment activities in a Technical Memorandum (TM). TM will include photos documenting the conditions as well as a GIS file with the pump station locations.
- Attend condition assessment review meeting to discuss the results of the condition assessment. Discuss estimate of risk for above-ground facilities based on facility RUL and criticality. Criticality will be established during the condition assessment meeting with City staff using a scale of low, medium, and high. A numeric estimate will be based on RUL

multiplied by criticality. Prioritize recommendations based on input from the City into the 6-year, 10-year, and 20-year planning horizons. Review and update prioritization of recommendations.

### **Assumptions**

- Review meeting will last 4 hours and be attended by two HDR staff.
- The City will provide one set of consolidated comments for its review of the Draft Condition Assessment TM.
- The condition assessment TM will be based upon visual observation and best professional judgment.

### **Deliverables**

- Draft Condition Assessment TM (electronic PDF submittal)
- Final Condition Assessment TM (electronic PDF submittal)
- Review meeting minutes (electronic PDF submittal)
- Electronic GIS shapefile with pump station locations

## **TASK 5 PREVENTATIVE MAINTENANCE PROGRAM EVALUATION**

- Facilitate a preventative maintenance program workshop to present options for creating an electronic preventative maintenance program. Up to three options will be compared. The workshop agenda will include discussion with City staff on the ability of the electronic preventative maintenance program to satisfy the needs of other departments beyond the wastewater utility.
- After selection of the preferred program, HDR will populate the database with the preventative maintenance activities for two systems: the Class A Solids Drying System and the Main Pump Station.
- A second workshop will be conducted to train City staff on the use of the new system and procedures for populating it with data.

### **Assumptions**

- Two 4-hour workshops will be conducted for this task.
  - Workshop 1 will include Camas staff from multiple City departments and will be attended by four HDR staff.
  - Workshop 2 will include Camas staff representing the wastewater utility and will be attended by three HDR staff.
- Software purchase is not part of this scope of work.
- Additional training and/or support can be provided under addendum.
- The intent of this task is to develop a foundational computerized maintenance management system that will schedule, document and report preventative maintenance activities.

## **Deliverables**

- Meeting minutes for both workshops
- Preventative Maintenance Database



# Appendix A. Information Request

The following is a list of requested information to assist the team in data review. It is assumed that not everything on this list will be available; however, it will serve as a starting point for the data request.

1. Asset Inventory, by facilities, including original installation dates and/or replacement dates
2. Record drawings as up to date as possible
3. Concept reports that contain original concepts and criteria
4. Operating records and standard operating procedures (SOPs) – flow rates; chemical feeds; daily and weekly changes
5. Maintenance records and SOPs for the WWTP
6. Equipment submittals and descriptions
7. Operations and maintenance (O&M) manuals
8. Any special reports that were prepared for the facility (e.g., inspections, cleaning, noise, odor)
9. Any performance tests that were performed on the facility (e.g., pump tests, unit process loading and head loss, other)
10. Results of any pilot tests and special water quality studies
11. Reports routinely submitted to health or environmental agencies for regulatory compliance
12. Sanitary survey or other reports from state, federal or other governmental agencies
13. Photos taken throughout the years that may depict changes
14. Consent decrees, legal mandates or negotiated arrangements related to the facility
15. Community/neighborhood issues associated with the facility (e.g., noise, chemical deliveries, odor)
16. Zoning ordinances or planning requirements for the facility
17. Building, plumbing, fire, electrical and safety code requirements
18. Contracts with other districts that influence quantity, flow, pressure, water quality, etc.
19. Flood zone and earthquake requirements, and any other natural or site issues
20. Painting and coating requirements and history
21. Lead, asbestos, or other potentially hazardous materials at the facilities
22. Power and electrical supply – existing situations and future needs
23. Electric rate structures, demand charges, and usage charges
24. Water/wastewater planning documents that may reflect future changes in demands/flows or other requirements
25. Capital funding requirements that may influence the level of inspection or report requirements
26. Architectural requirements or special designations
27. Listing of corrosive chemicals used or on-site
28. Ventilation requirements or issues related to moisture
29. Security and vandalism issues
30. Instrumentation, controls and data acquisition and storage requirements

31. Special formats or needs related to cost estimates
32. Special issues related to protection of intakes or outfalls, diffusers, etc.
33. Issues or reports related to surge issues, pressure fluctuations, breaks, etc.
34. Permit requirements including National Pollution Discharge Elimination System (NPDES), Total Maximum Daily Loads (TMDLs), other
35. Any violations of codes or permits noted
36. Facility shutdown/outage requirements
37. Safety requirements – ingress and egress, confined space requirements