ARCATA WASTEWATER TREATMENT FACILITIES – IMPROVEMENTS PROJECT
COUNCIL UPDATE
NOVEMBER 29, 2018

Agenda

- Project goals
- Project status
- Permit status
- Project update
- Project cost update
- Implementation plan
- Next steps
Project Goals

Provide reliable service to community now and in future (envisioned by the City General Plan 2020).
  - Replace aging infrastructure

Meet permit/regulatory requirements that protect public health and the environment
  - Convert from chlorine to ultraviolet light disinfection
  - Add secondary system with ammonia removal
  - Improve the natural treatment system

Meet City’s goals for sustainability as much as possible
  - Provide a resilient system for future sea level rise
  - Reduce energy requirement
Project Status

- Predesign started in January 2018
- Administrative draft Predesign Report completed in September 2018
- Final draft completed in November which incorporated City staff comments
**Project Status**

- Site topographic survey and mapping completed in May 2018
- Geotechnical field and lab work completed, draft report is under review

**Permit Status Update**
RWQCB Discharge Permit Status

- Existing NPDES permit expired in July 31, 2017
- City filed required Report of Waste Discharge in January 2017

Permit Uncertainty

- City has been in discussion with RWQCB staff regarding:
  - New Ammonia limits - progress has been made with RWQCB staff
  - UV disinfection system design requirements
  - Compliance schedule
  - Use of enhancement wetlands, Marsh and Wildlife Sanctuary, to meet enhancement requirements
Likely Permit Requirements

• Time schedule order to meet previous and new permit requirements
  − Address non-compliance - UV / Flow reconfiguration / new discharge

• Ammonia removal limits
  − Originally projected at 4 mg/l average and 10 mg/l maximum based on Eureka permit
  − New floating limit method proposed by RWQCB based on receiving water quality
  − New limit will be based on receiving water conditions
  − Driver for early completion of new discharge (003)

Project Updates
Progress since the 2017 Facility Plan
Completed Predesign including:

- Modeled with 7 scenarios to finalize design criteria and size process facilities
- Hydraulic modeling to size pump station upgrades and pipelines
- Site plan challenges addressed including relocation of: Bus Barn, Maintenance Shop, and Sludge Drying Beds
- Assessment of new electrical facilities and develop of an electrical / control system for reliability and energy efficiency
- Updated cost estimate based on likely permit requirements and predesign facility sizing

Developed process model for 7 scenarios
Hydraulic model

• Developed model for 4 flow scenarios and completed 6 iterations to fine tune sizing and reduce costs

• Address sea level rise (SLR) for new facilities and new discharge location (Brackish Marsh)

Sea level rise planning

• New facilities: design above flood elevation plus projected sea level rise (2050)

• Existing mechanical facilities: modified to accommodate flood elevation & sea level rise

• Plant levee improvements - address under a separate FEMA project

• Coastal Commission permit will require a resiliency plan
Updated site plan – Central Plant

New Electrical Facilities

• Replacement of existing outdated electrical equipment

• System capacity increase for the new equipment

• Upgraded control system to automate process and allow staff to virtually see the entire plant
Cost Update Basis

- Process and hydraulic model used to develop new cost estimate:
  - Developed quantities of site work, piping, pumps, valves, structures, and equipment quotations from suppliers
- Escalated to construction mid-point, increased cost over 8% from today’s cost
- Geotechnical recommendations for foundations, increased foundation costs due to poor soils
- Assessment of electrical facilities increased costs based on need to replace existing facilities
### Project Cost Update

<table>
<thead>
<tr>
<th>Description</th>
<th>Construction Cost Estimate</th>
<th>Facility Plan Cost Estimate</th>
<th>Project Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Reconfiguration / Site work</td>
<td>$5,540,000</td>
<td>$3,200,000</td>
<td>Permit Requirements</td>
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<tr>
<td>Headworks / Primary Clarifier Rehabilitation</td>
<td>$6,500,000</td>
<td>$8,650,000</td>
<td>Rehabilitation</td>
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<tr>
<td>Ponds and Wetland</td>
<td>$6,370,000</td>
<td>$5,860,000</td>
<td>Rehabilitation/deferred maintenance</td>
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<tr>
<td>Secondary Treatment</td>
<td>$12,800,000</td>
<td>$7,380,000</td>
<td>Permit Requirements</td>
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<tr>
<td>Disinfection – UV and Wet Weather System</td>
<td>$2,840,000</td>
<td>$4,510,000</td>
<td>Permit Requirements</td>
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<tr>
<td>Digesters/Solids</td>
<td>$3,180,000</td>
<td>$2,140,000</td>
<td>Rehabilitation</td>
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<tr>
<td>Corporation Yard Modifications</td>
<td>$2,710,000</td>
<td>$400,000</td>
<td>Modifications</td>
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<tr>
<td>Electrical, Controls, SCADA and Utilities</td>
<td>$4,080,000</td>
<td>Included in above costs</td>
<td>Rehabilitation and permit</td>
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<tr>
<td>TOTAL CONSTRUCTION COSTS</td>
<td>$44,020,000</td>
<td>$32,200,000</td>
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<td>TOTAL PROJECT COSTS (35%)</td>
<td>$59,430,000</td>
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### Cost Updates – Flow Reconfiguration/Site Work

- Flow Reconfiguration - added piping for flexibility and to handle wet weather flows
- Site work - more extensive
Cost Updates – Headworks and Primary Clarifier

- **Headworks**
  - New influent pumps and equipment replacement in place, at higher elevation for SLR
  - Added cost for temporary bypass pumping

- **Primary Clarifier**
  - Primary clarifier rehabilitation reduced cost versus replacement

Cost Updates - Headworks Site Plan
Cost Updates - Ponds
- Pond solids removal has been deleted
- More extensive pond and wetland improvements for optimization
- Aerator improvements costs increased

Cost Updates - Wetlands
- Treatment wetlands improvements to be performed as separate City maintenance projects
- Wetland and wetland pump stations
  - Increased capacity for wet weather flexibility
  - Higher efficiency pumps and motors
Cost Updates - Oxidation Ditch

- New secondary treatment additions
  - Upsized to 3.6 mgd to meet low ammonia limit
  - Secondary clarifiers upsized for peak flows
  - Need for new alkalinity addition chemical facilities TBD

Cost Updates – UV Disinfection

- Reduced cost based on current technology
- Reduced operations costs based on increased efficiency
- Award Block grant for UV disinfection system
Cost Update – Wet Weather Disinfection

- Wet weather disinfection using liquid chlorine (bleach) instead of gaseous chlorine
- Exploring UV option for wet weather in final design, demolish old chlorine contact basin.

Cost Update - Digesters

- Boiler replacement added
- Added upgrades to heating and pumping system
- Valve replacement added
Cost Updates – Solids Treatment

• More extensive digester rehabilitation including new boiler
• Confirmed rotary drum thickener selection

Cost Updates - Electrical and Controls

• Existing electrical equipment replacement
• New service will be required
• Control system upgrade to modernize and reduce labor cost
• Additional standby generator
**Cost Updates - Corporation Yard modifications**

- Multi-use needs for corporation yard addressed
- Replacement bus barn
- Replace material storage

![Corporation Yard](image1)

**Cost Update –Demolition/Relocation**

- Demolish old septage receiving
- Relocate maintenance shop

![Demolition/Relocation](image2)
## Implementation Schedule

<table>
<thead>
<tr>
<th>Task Name</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
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<td>Wet Weather Season</td>
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*Note: The schedule is indicative and subject to change.*
Implementation plan still in development

- Single project
- Single project with phased milestones
- Single design project with multiple construction packages
- Separate City project for phased pond and wetland upgrades
- Early deliverable for new discharge and flow reconfiguration

Plan will be driven by City needs and funding constraints

Constraints & drivers for implementation plan

- Permit time schedule order for compliance
  - UV / flow reconfiguration / new discharge
  - New secondary treatment facilities to address ammonia removal
- Block grant schedule for new UV disinfection system
- State Revolving Loan Fund / Grant approval
- Environmental permitting: CEQA and resource agency permits approvals
Next Steps

• Finalize design completion
• Review operations costs and staffing needs
• Finalize permit negotiation
• Complete environmental review
• Rate study
  – Capital cost
  – Operating costs
• Finalize State Revolving Loan fund application
Operation costs and staffing needs

- WWTP classification will require Grade 3 operator for Chief Plant Operator (CPO).
- Need to complete a preliminary staffing study
- Need to develop updated operations costs for recommended project

Finalize UV disinfection system

- Review pros and cons of alternative supplier
- Finalize procurement options
- Review potential for use of UV for wet weather flows
- Get RWQCB feedback on dose and finalize disinfection criteria