

# Surface Water Treatment Plant Capital Improvement Projects

December 4, 2018

# Solids Handling Improvements

# Solids Handling Improvements

## Problem Statement:

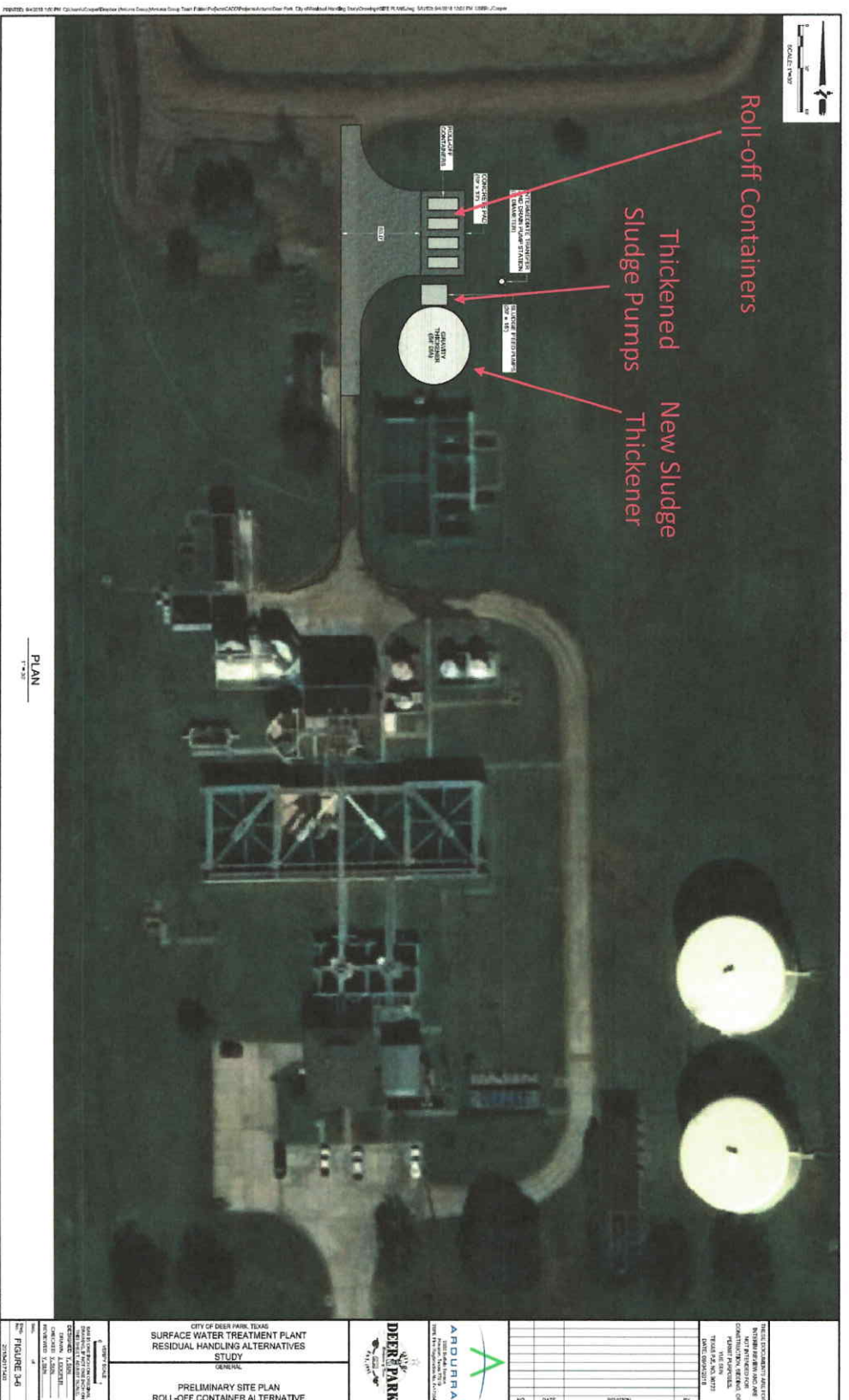
- On-site sludge lagoons near full capacity
- Current sludge operation is costly

## Project Goals:

- Ease operation
- Eliminate cleaning and maintenance of on-site lagoons
- Eliminate the potential overflow of sludge
- Economic solution for onsite dewatering and off-site land fill



# Proposed Improvements



# Improvement Recommendations

## Solids Handling

- Construct a gravity sludge thickener and a thickened sludge pump station.
- Construct a containment curb to house roll-off containers, polymer feed skids, and all ancillary components to make a functional system.

## Residual Liquid Handling

- Construct an intermediate transfer pump station
- Replacement of existing backwash return pumps with larger units
- Construct associated structural, electrical, instrumentation control and SCADA, site civil, and yard piping work for proposed improvements.

# Preliminary Project Cost

Item	Solids Handling Improvements
Site Work/ Site Construction/Concrete	\$568,000
Metal Fabrication/Structural/Architectural	\$75,000
HVAC	\$100,000
Pumps and Equipment	\$769,000
Mechanical	\$596,000
Electrical, instrumentation & Controls	\$738,000
Subtotal (Raw Cost)	\$2,845,000
Contingency (30%)	\$854,000
Subtotal	\$3,699,000
MOB/Bond/Ins (5%)	\$185,000
Subtotal	\$3,884,000
Contractor OH&P (12%)	\$466,000
Subtotal (Present Worth)	\$4,350,000
Inflation to mid-point of construction (6.1%)	\$264,000
TOTAL CONSTRUCTION COST *	\$4,614,000
Engineering and Design (15%)	\$692,100
<b>TOTAL PROJECT COST (CONSTRUCTION + ENGINEERING)</b>	<b>\$5,306,100</b>

\* Based on Surface Water Treatment Plant Residual Handling Alternative Evaluation Report, September 2018.

# Clearwell & Transfer Pump Station Improvements



# Clearwell & Transfer Pump Station Improvements

## Problem Statement:

- Existing Transfer Pump Station firm capacity = 6.84 mgd not meeting operational requirements
- Operation challenges to meet disinfection CT when incoming residual is low from CWA especially during winter time

## Project Goals:

- Meet regulatory compliance
- Enhance operational flexibility



# Proposed Improvements

- Install a new transfer pump, motor and associated piping, fittings, and valves
- Expand existing clearwell to house the new pump
- Existing piping modifications
- New baffle walls for existing GSTs
- Electrical, instrumentation and control, and SCADA integration to accommodate new system
- Yard piping, and site civil improvements

# Preliminary Project Cost

Item	Disinfection Chemical Improvements
<b>TOTAL CONSTRUCTION COST - Proposed improvements including new TP, clearwell expansion, new baffle walls, piping modifications, EI&amp;C and SCADA, site civil work *</b>	<b>\$1,750,000</b>
<b>Engineering and Design (15%)</b>	<b>\$263,000</b>
<b>TOTAL PROJECT COST (CONSTRUCTION + ENGINEERING)</b>	<b>\$2,013,000</b>

*\* Planning/Conceptual level cost estimate.*

# Disinfection Chemical Improvements

# Disinfection Chemical Improvements

## Problem Statement:

- Gas chlorine & aqua ammonia- toxic hazardous gas
- Require RMP and scrubber to handle potential leak
- Public safety concern during chemical transportation
- Operator safety during chemical handling and plant operation

## Project Goals:

- Alternative disinfection chemicals to improve safety
- Reduce potential chemical leak and public exposure



# Proposed Improvements

- Furnish and install two 200 ppd on-site hypochlorite generator units, with brine storage tank, hypo tanks, metering pumps, blowers, and auxiliary components
- Modify existing chlorine building to enclose current chlorine room, new door, HVAC improvement, hydrogen piping roof penetration etc.
- Replace aqua ammonia storage and feed system with new liquid ammonium sulfate system
- Electrical, instrumentation and control, and SCADA integration to accommodate new system
- Chemical containment, metal railing, etc.
- Yard piping, and site civil improvements for chemical unloading

# Preliminary Project Cost

Item	Disinfection Chemical Improvements
<b>TOTAL CONSTRUCTION COST - Proposed improvements including OSHG system, new LAS system, building modifications, containments, EI&amp;C and SCADA, site civil work *</b>	<b>\$3,000,000</b>
<b>Engineering and Design (15%)</b>	<b>\$450,000</b>
<b>TOTAL PROJECT COST (CONSTRUCTION + ENGINEERING)</b>	<b>\$3,450,000</b>

*\* Planning/Conceptual level cost estimate.*

# Prioritization

1. Solids Handling
2. Clearwell and Transfer Pump Station Improvements
3. Disinfection Chemical Improvements

# Cost Review

Project	
Project 1 - Sludge Handling Improvements	\$5,306,100
Project 2 - Clearwell and Transfer Pump Station Improvements	\$2,013,000
Project 3 - Disinfection Chemical Improvements	\$3,450,000
<b>TOTAL PROJECT COST (CONSTRUCTION + ENGINEERING)</b>	<b>\$10,769,100</b>



# Implementation Schedule (Preliminary)

## City of Deer Park WTP Capital Improvements Preliminary Implementation Schedule

ID	Task Name	Duration	Start	Finish	2018	Half 1, 2019	Half 2, 2019	Half 1, 2020	Half 2, 2020	Half 1, 2021	Half 2, 2021				
0	Deer Park WTP CIP	963 days	Mon 12/10/18	Thu 7/29/21	O	N	D	J	F	M	A	M	J	J	A
1	Project 1 - Solids Handling Improvements	633 days	Mon 12/10/18	Wed 9/2/20											
2	Engineering Design & Bid	9 mons	Mon 12/10/18	Thu 9/5/19											
3	Construction	12 mons	Mon 9/9/19	Wed 9/2/20											
4	Project 2 - Clearwell and Transfer Pump Station Improvements	660 days	Wed 10/9/19	Thu 7/29/21											
5	Engineering Design & Bid	10 mons	Wed 10/9/19	Mon 8/3/20											
6	Construction	12 mons	Tue 8/4/20	Thu 7/29/21											
7	Project 3 - Disinfection Chemical Improvements	963 days	Mon 12/10/18	Thu 7/29/21											
8	Alternative Evaluation Study	148 days	Mon 12/10/18	Mon 5/6/19											
9	Engineering Design & Bid	10 mons	Wed 10/9/19	Mon 8/3/20											
10	Construction	12 mons	Tue 8/4/20	Thu 7/29/21											