



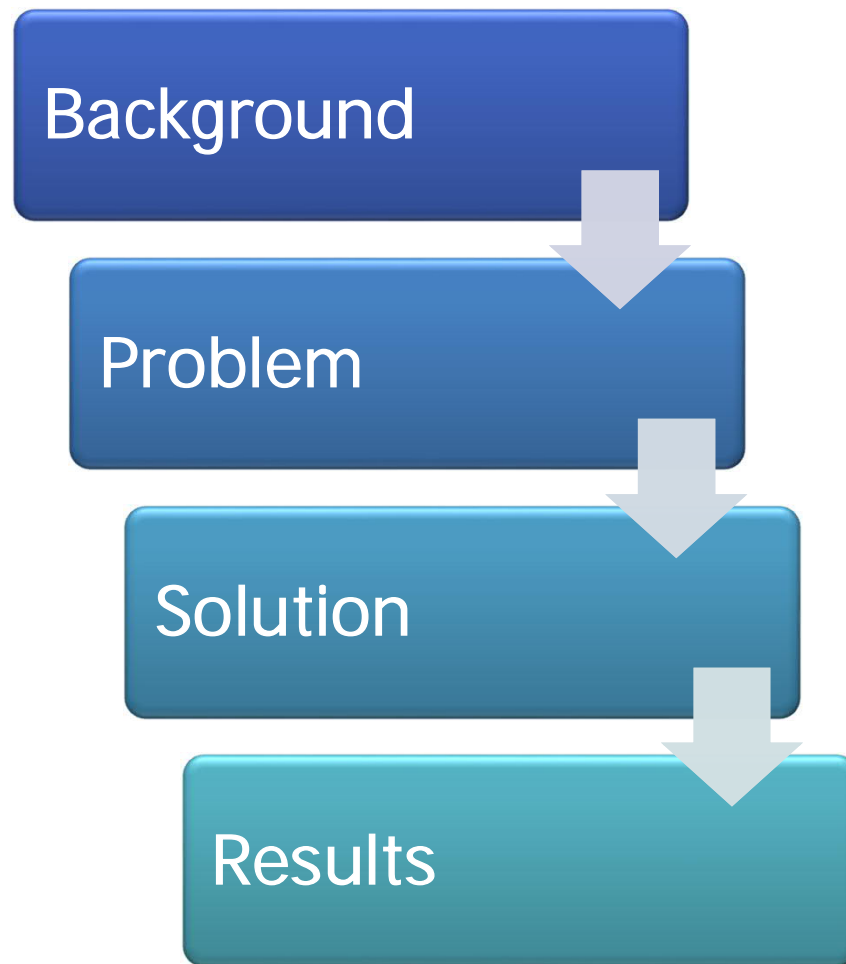
2019
NEWEA Annual Conference

Fighting Floatable Solids In Small Town Pump Stations

Presented by:
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January 30, 2019

Presentation Outline



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graph TD; A[Background] --> B[Problem]; B --> C[Solution]; C --> D[Results];
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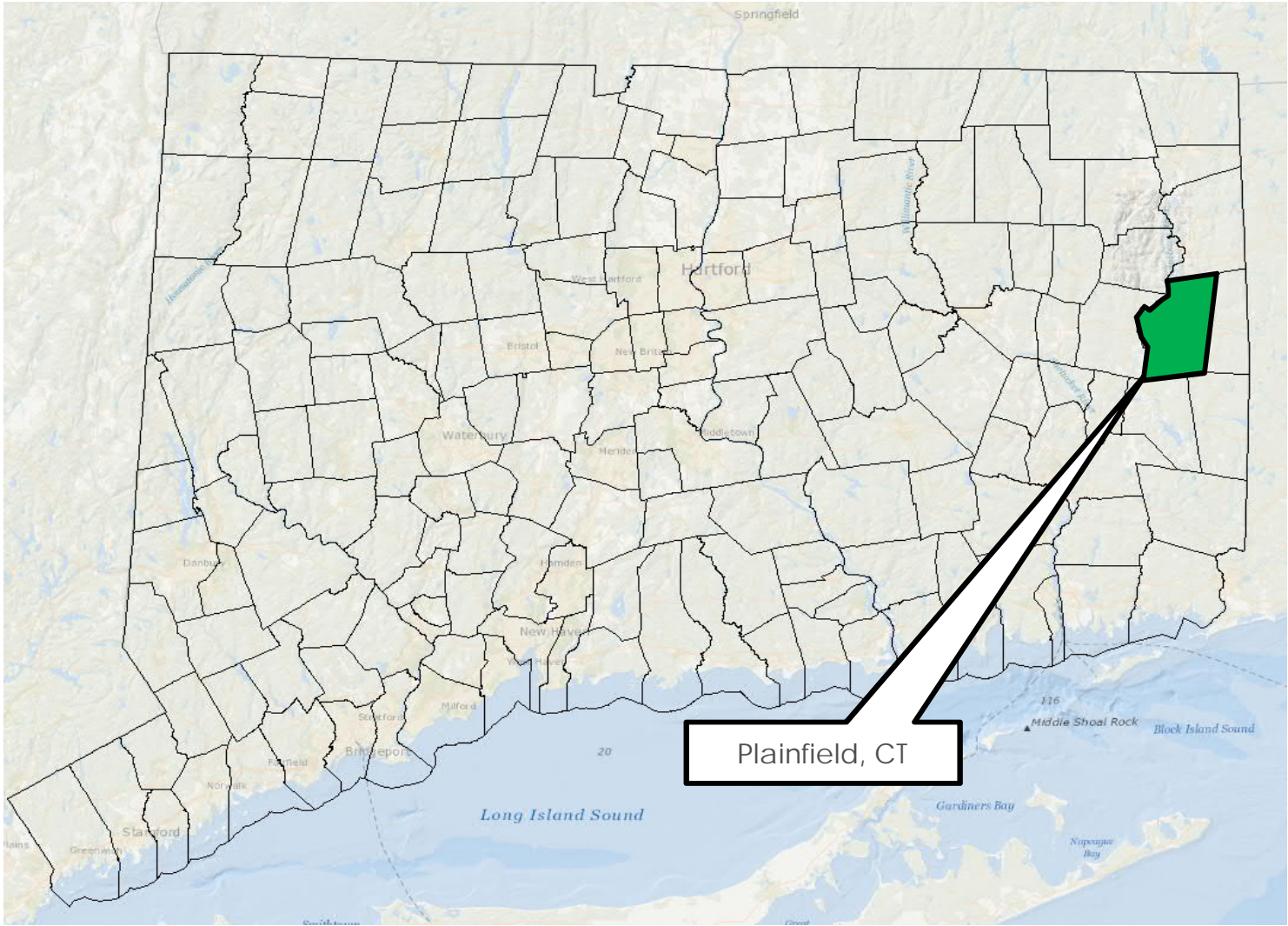
Background

Problem

Solution

Results

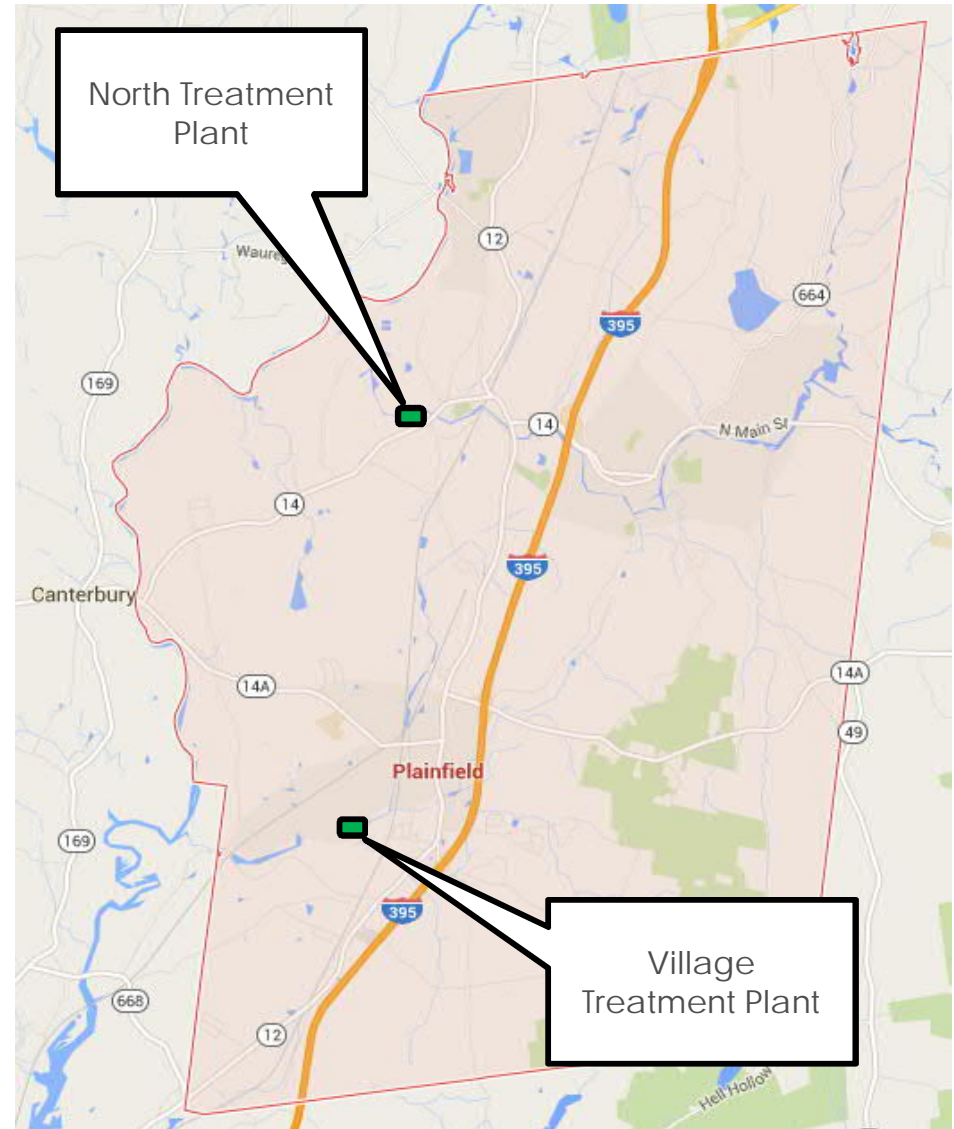
Background



Background

Town of Plainfield

- Area: 43 Square Miles
- Population: 15,400
- Villages:
 - Plainfield
 - Moosup
 - Wauregan
 - Central Village



Background



Village Plant
Design Flow = 0.71 MGD

Background



Village Plant

1. Headworks
2. Aeration Tanks
3. Secondary Clarifiers
4. Disinfection Facility
5. Rapid Infiltration Sand Beds
6. Receiving Water (Mill Brook)



Background



Village Treatment Plant

Headworks

Horse Brook Horse Brook

Background



New mechanical screen installed at headworks in 2015

Background

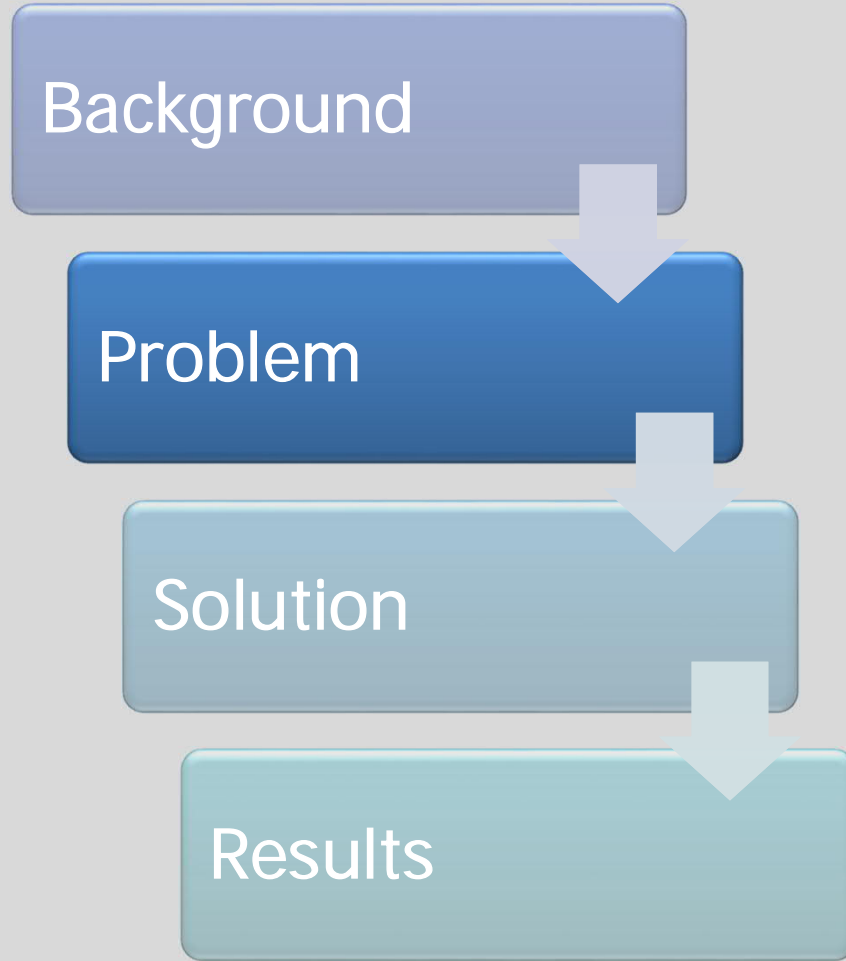


Background

Problem

Solution

Results



The Problem

FLOATABLE SOLIDS MAT

Grease

Rags

Sanitary Wipes

Plastic Gloves

Paper Towels



The Problem

- Effects 3 pump stations
- Required confined space entry for manual removal
- Efforts included:
 - 5 to 6 personnel
 - 4 to 6 hours of work per station
 - 4 cleanings a year
- Required use of confined space entry equipment, PPE, and disposable gear



“That reminds me, I wonder what Mildred’s cooking for dinner tonight?”

The Problem

- Previously mixed with septage prior to disposal
- One time there were more solids than usual mixed in...
- ...The mixture clogged the pumps at the disposal facility



The Problem

- The disposal facility would no longer accept the waste
- Other disposal facilities would only accept the waste at a steep cost
 - \$50,000 total to dispose of waste from cleaning all three pump stations
 - \$67,500 for annual disposal costs

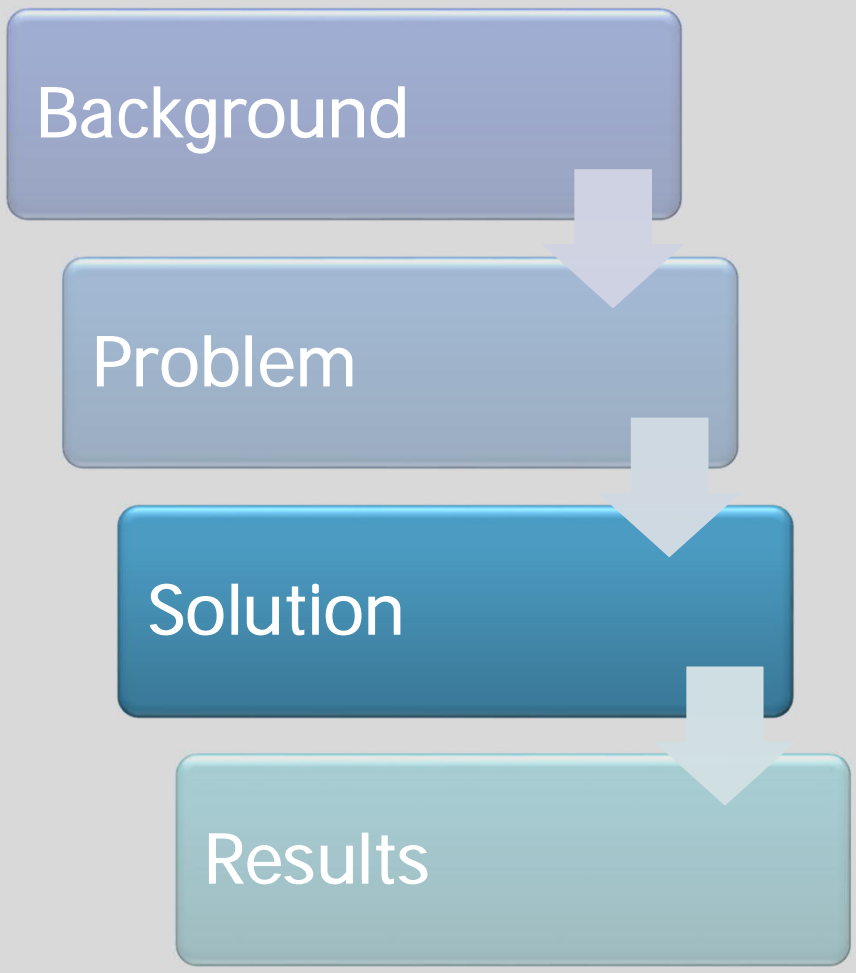


Background

Problem

Solution

Results



The Solution



Portable Chopper Pump



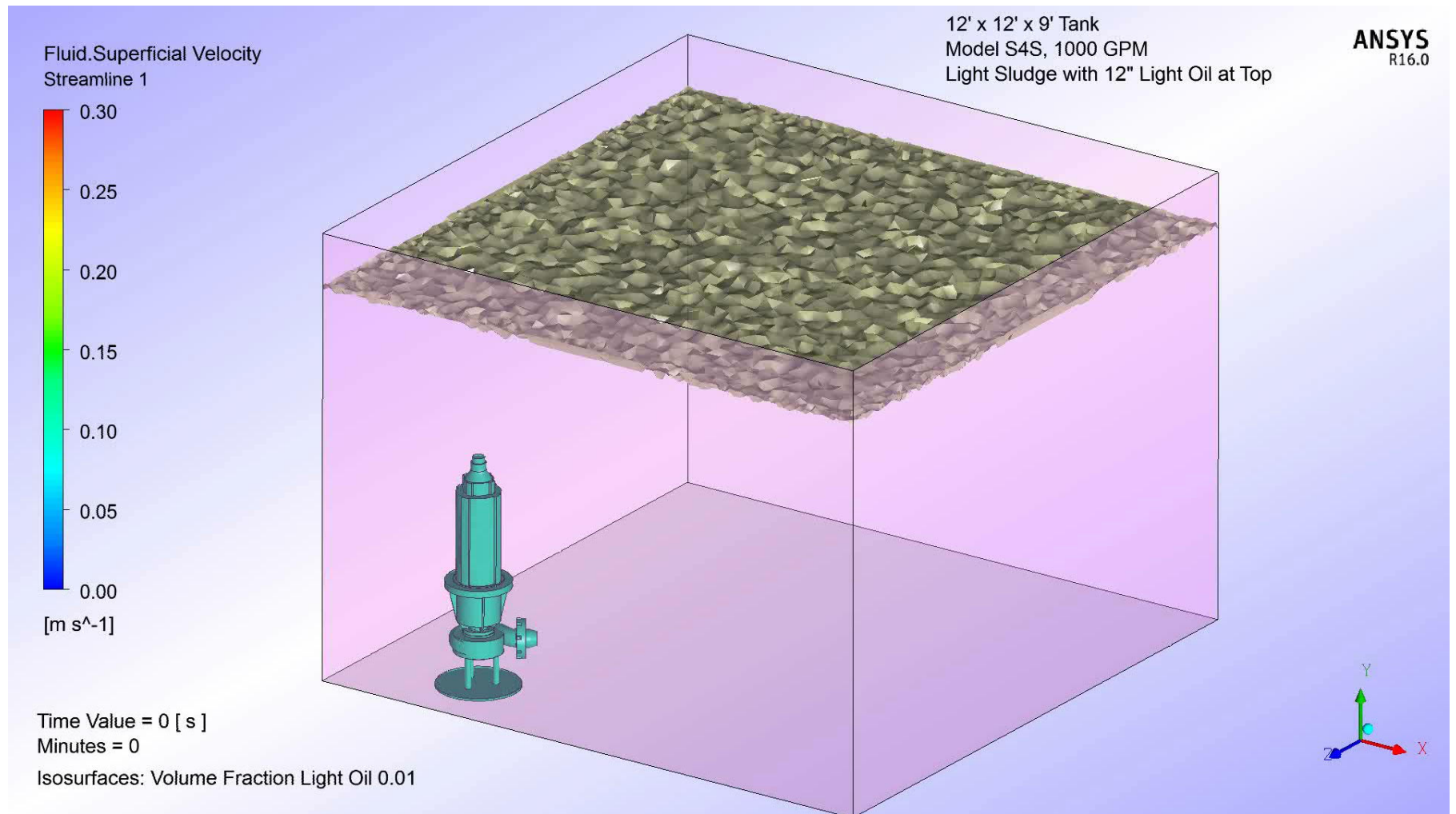
The Solution



- Generator for power
- Hoist for implementation
- Portable control panel for operation



The Solution



The Solution

Capital Costs

	Portable Pump	Three In-Place Pumps
Pump(s)	\$11,000	\$33,000
Control Panel(s)	\$7,000	\$21,000
Installation/Electrical Work	Not Applicable	\$15,000 - \$30,000
Generator	\$0	Not Applicable
Hoist	\$0	Not Applicable
Total	\$18,000	\$69,000-\$84,000

➤ Capitol Cost Savings of \$51,000-\$66,000

The Solution

Labor Costs

- Man hours to implement and operate the portable pump are the same as previous methods
- In-place pumps would require less time to operate
- Labor costs were not evaluated as part of this project



The Solution

- Annual Disposal Cost – \$67,500
- Portable Pump Setup Total Capital Cost – \$18,000
- Savings of \$49,500 in the first year alone!



The Solution

- Testing at Cemetery Road pump station
- Mat reached 3" to 4" thick prior to testing
- Test ran for 48 hours

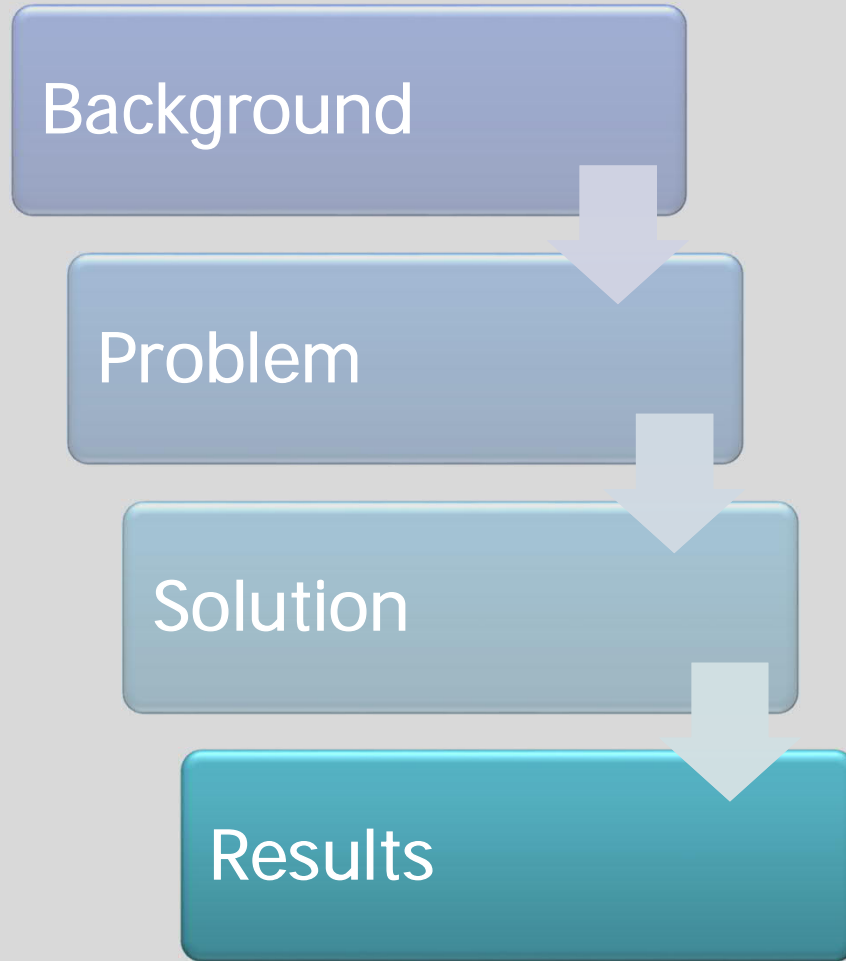


Background

Problem

Solution

Results



The Results

- All that remained was a thin, small section of the floatable solids mat
- A vac truck removed and dispose at headworks what remained
- No major upsets to the system!



The Results

The pumps at Cemetery Road did not clog



The Results

No settling was observed in the manholes



The Results

An increase in solids collected at the mechanical screen



The Results

An increase in grit was collected at the grit chamber



The Results

Minor foaming was found at the aeration tanks...



...but the MLSS concentration was stable

The Results

- The Town purchased the pump 1 year ago
- Only drawback is the pump leaves behind hard white grease and grit
 - Vac truck used to clean out grit and grease
 - Minor confined space entry for breaking up grease prior to removal
- Grease consuming enzymes have not been evaluated
- Both grease and grit are mixed with dumpster garbage for disposal with garbage



The Results

Recap:

- Portable pump is over \$50,000 cheaper than in-place pumps at each station
- Pump paid for itself in one year
- Cost saving of nearly \$50,000 in disposal fees the first year
- Majority of solids are handled at headworks
- Minimal confined space entry



Contact Information

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Visits to observe the cleanups are welcome!

Call ahead to coordinate.