Treatment Plant Optimization

"Where Do I Start?"

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Define Optimization:

- **An act, process, or methodology of making something as fully perfect, *specifically* as it relates to treatment processes, pumping systems and energy use**

Why Should You Optimize Your Treatment Processes

- **Because it is the smart thing to do**
- **Because it is the ecological thing to do**
- **Because it is the economical thing to do**
- **Because it is the sustainable thing to do**

Where Are Your Operating $$$ Being Spent

- Labor
- Electricity
- Chemicals
  - Other

Where Do You Start?

- **Start by selecting the low-hanging fruit**
  - **Where are you most likely to see an immediate impact**
  - **Where will you see the most immediate savings**
  - **Take an inventory of where your $$$ are being spent**

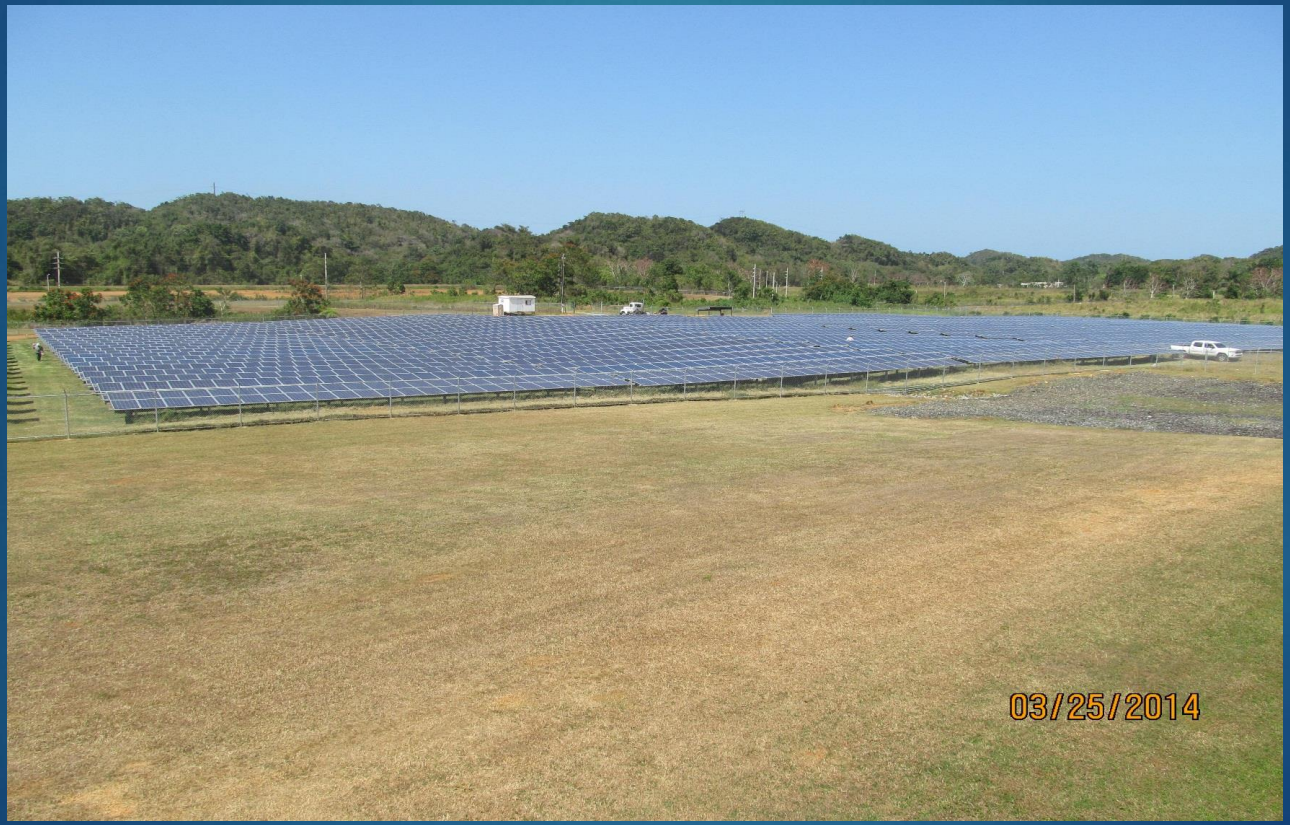
Most Likely Processes

- Filter Backwash
- Pumps Systems
- Energy Demand
- Chemical Feed
- Aeration Basins
- Residuals Managements

Pumping Systems

- Reduce starting and stopping pumps
- Use of VFDs
- Vary the sizing of pumps
- Install soft starts
- Consult you electrical provider for suggestions

NCSA Solar Field



Santa Fe County, NM

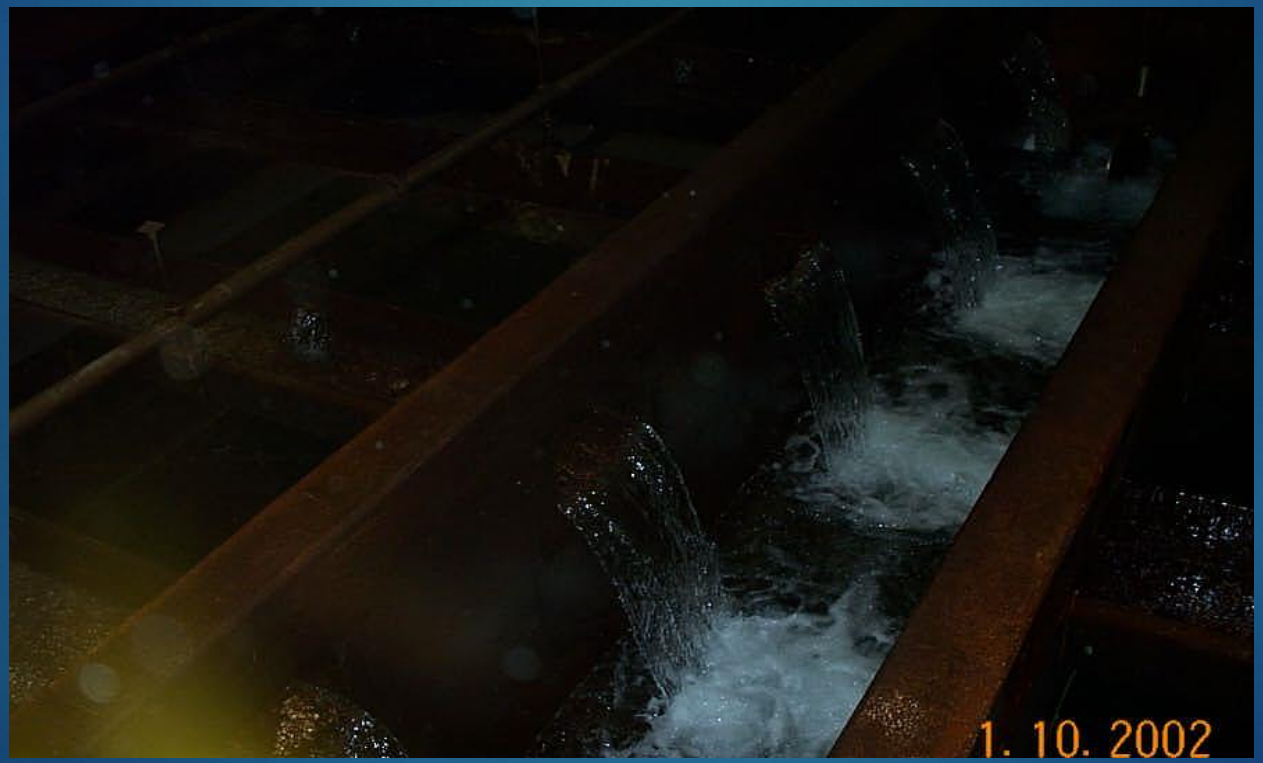
Hydraulic Mixing

Hydraulic Treatment

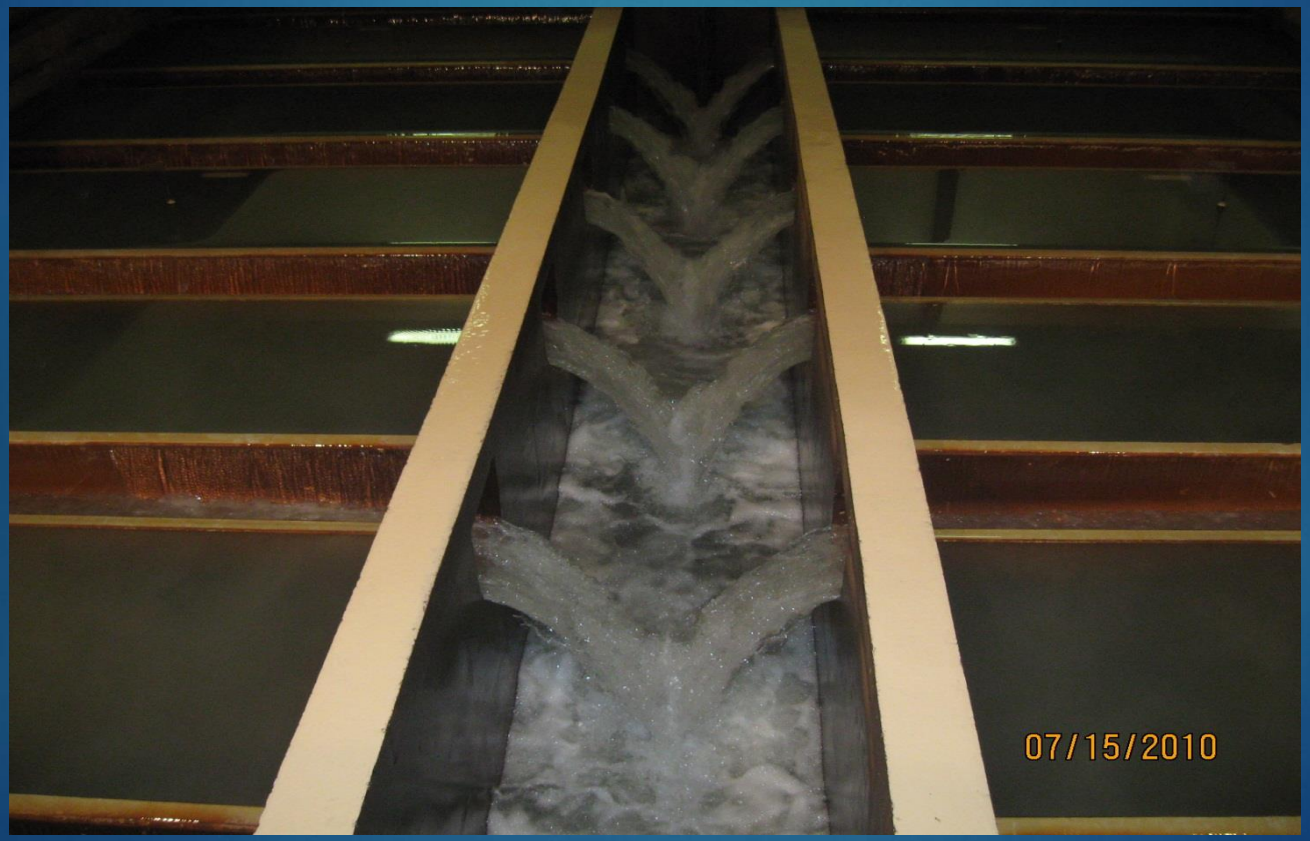
Filter Backwash

- Evaluate filter backwash protocol
- Reduce backwash volume
- Reduce filter to waste time
- Maximize filter runtime
- Capture filter backwash and recycle
- Consider a filter aid polymer

Over Backwashing



Backwash to 20 – 30 NTU



Chemical Feeding Systems

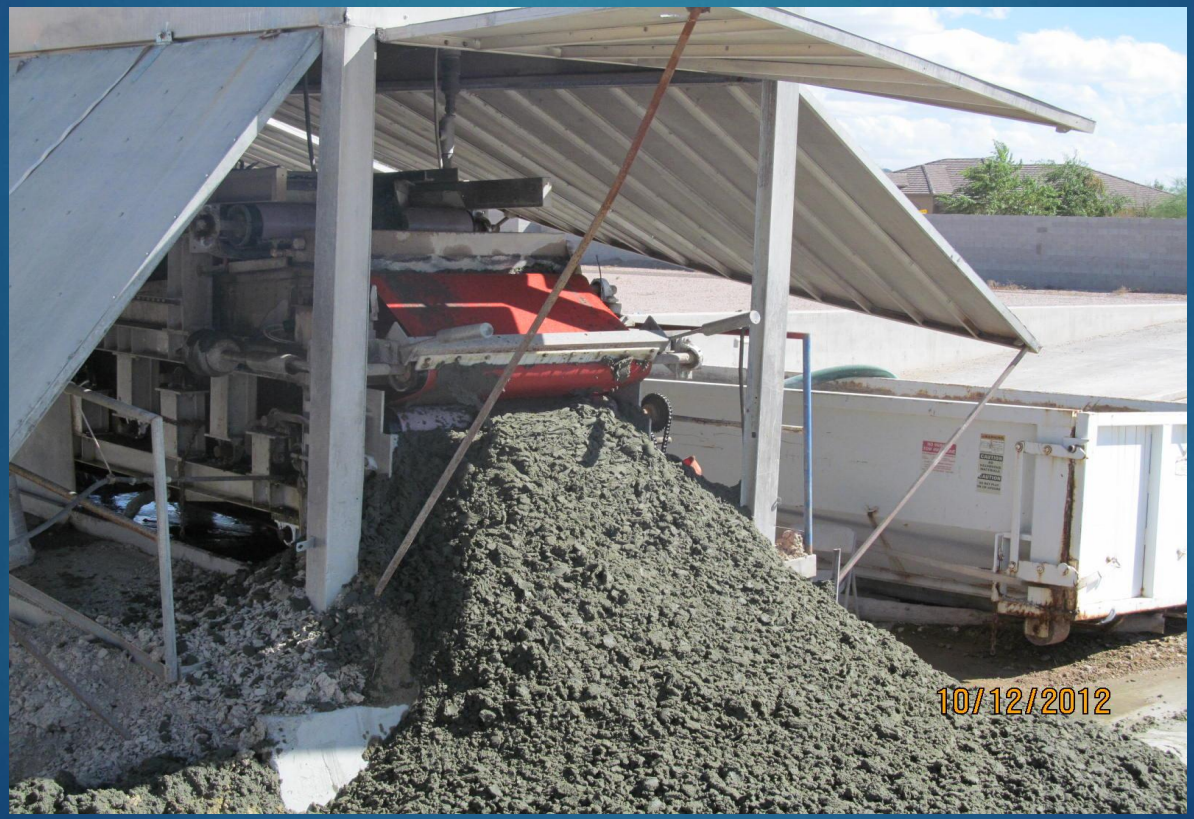
- Verify the accuracy of the chemical feeders and the chemical metering pumps
- Verify the concentration of the liquid chemicals
- Perform numerous jar tests to verify optimal coagulant dosages
- Evaluate alternate coagulants
- Perform determine the filterability index on each sample

Use Calibration Columns

Residuals Management

- Optimize sludge blowdown cycles
- Thicken or concentrate the sludge before discharge to dewatering facility
- Evaluate polymers used
- Consider beneficial reuses

Dewatered Sludge



Dewatered Sludge

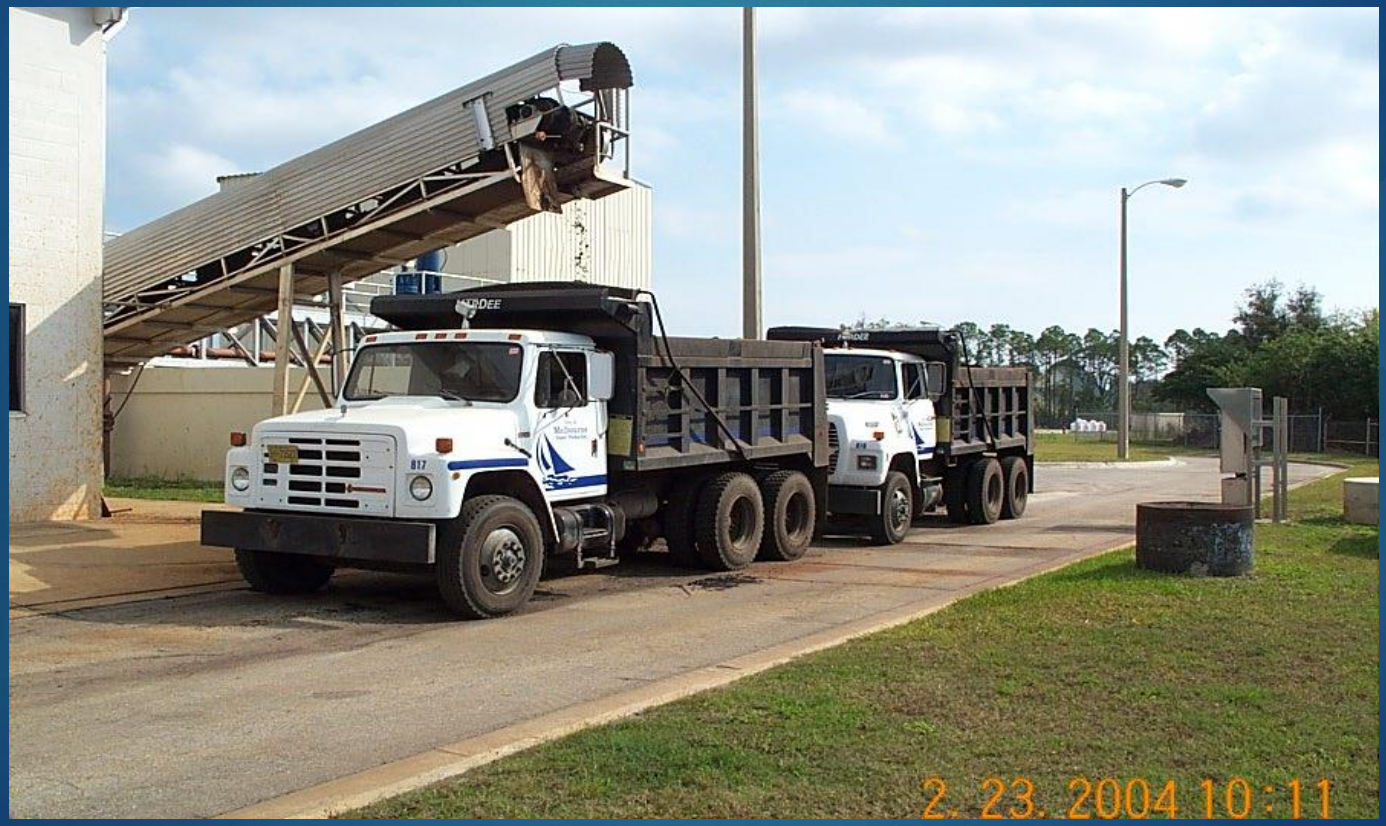
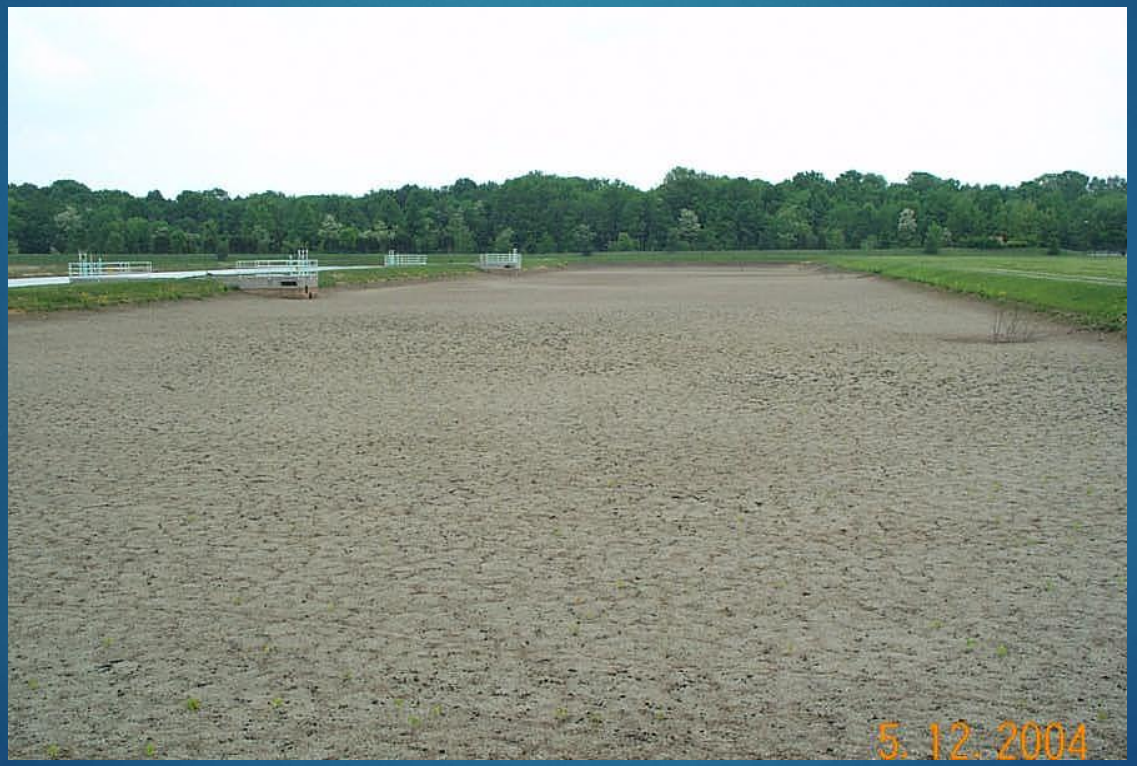
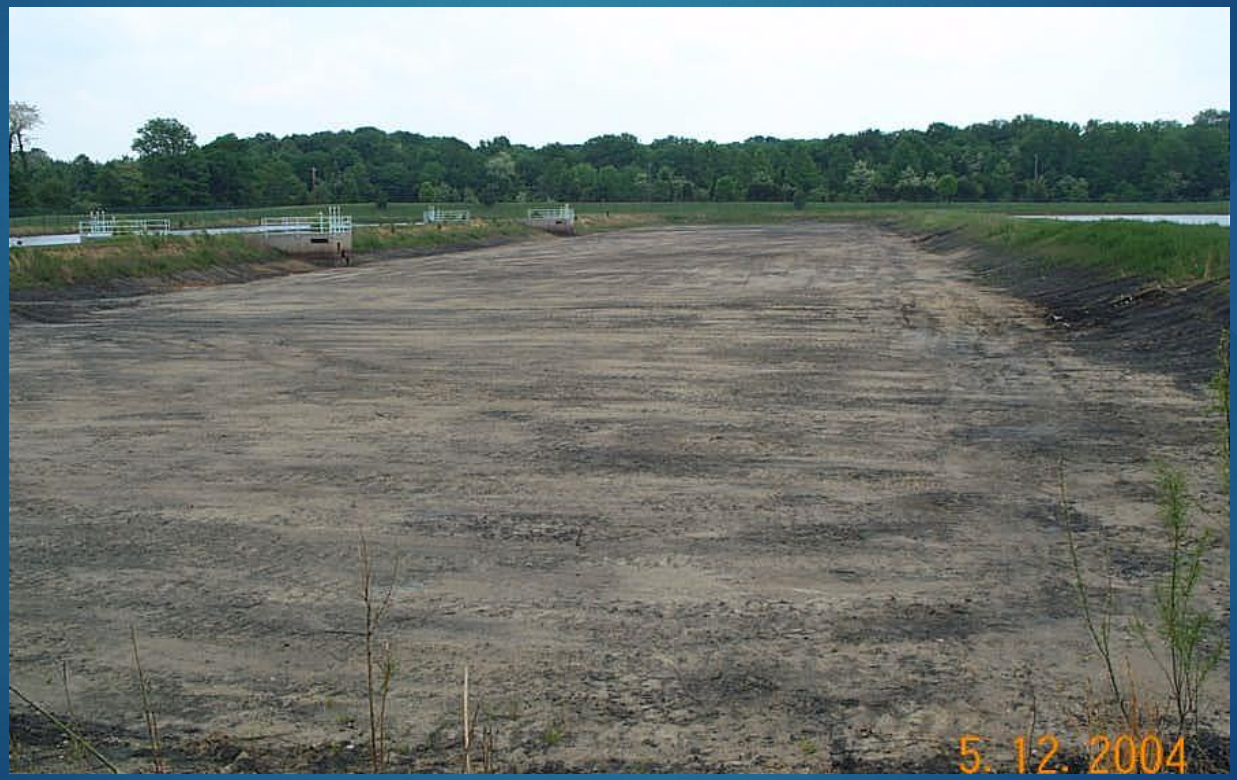


Plate and Frame Filter Press

Sludge Lagoons

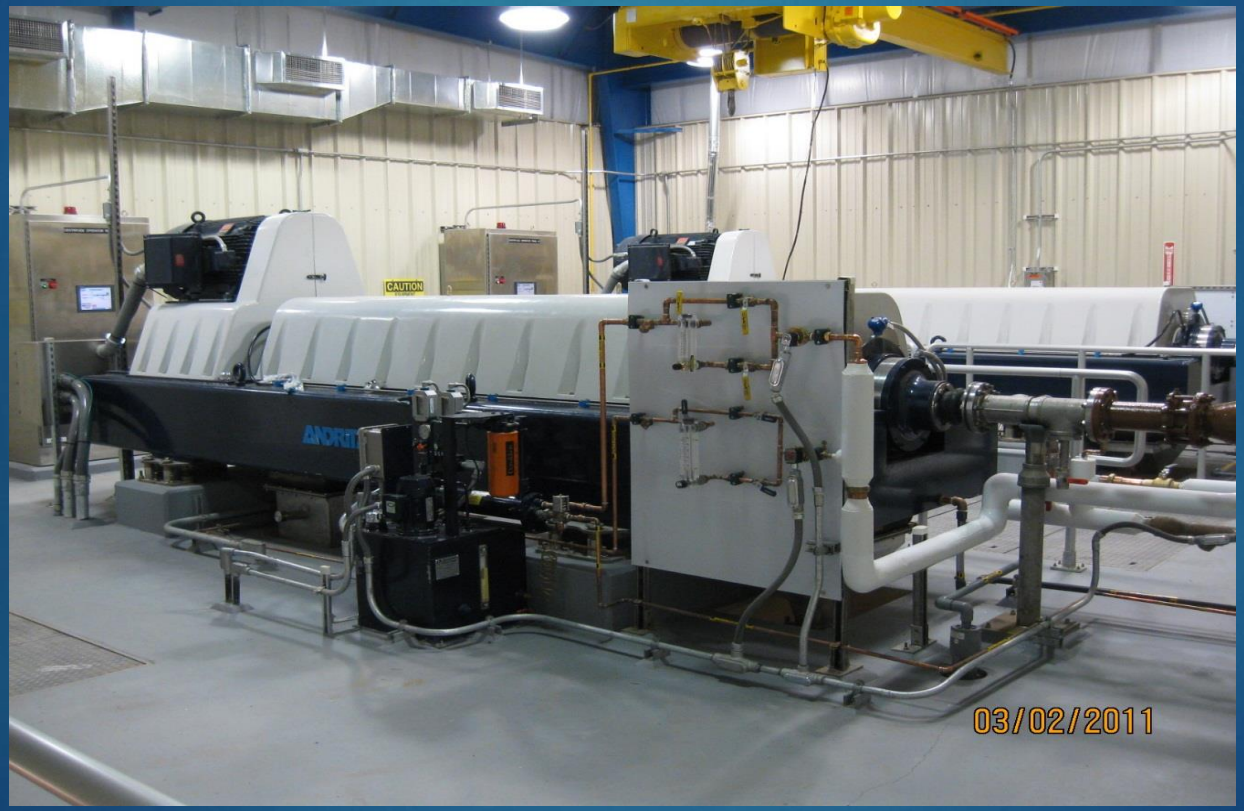


Clean Sludge Lagoons



El Yunque WTP, PR

Centrifuges



So What Did We Learn

- Determine what can be optimized *(The low hanging fruit)*
- Determine the cost of each process to be optimized
- Make a plan, and document the results
- Optimize one thing at a time
- Calculate the savings on a monthly, yearly, life cycle basis
- How will these changes affect the finished water quality or effluent quality
- Determine if capital expenditures are needed to optimize a process
- Re-adjust you budget projections

That's All Folks

Questions