# End Stream Delivery (ESD)
## Optimization & Improvements

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# Agenda

- **End Stream Delivery within the Liquid Waste System**
  - Combining two facilities – A "Power as One" Organization
- **The Optimization Challenge**
- **Increasing Reliability**
- **Continuous Improvements**
- **Take Aways**

# End Stream Delivery

# ETF + SS = End Stream Delivery

- **Power as One: 2 Facilities, 1 Organization**
  - Name derived from Oil and Gas industry
  - Tank Farm (upstream); DWPF & SWPF (midstream) and Saltstone and Effluent Treatment Facility (end stream)
  - Delivery –> mission complete as early as possible with a lower cost
- **Build Reliability using:**
  - Complementary operational cadence
  - Shift staffing
  - Eliminated need to hire 4th shift for SS
- **ESD placed under SWPF Organizationally**
  - Combine into standing Directorate
  - Utilize SWPF support organizations
  - Optimizes SWPF direct feed

ETF – Effluent Treatment Facility
SS – Saltstone
DWPF – Defense Waste Processing Facility
SWPF – Salt Waste Processing Facility
ESD – End Stream Delivery

# Effluent Treatment Facility Mission

## Treat wastewater to meet discharge limits for safe release to the environment

- SCDES permitted facility
- Treats industrial water from contributing SRS facilities
- Discharged to Upper Three Runs Creek outfall

SCDES – South Carolina Department of Environmental Services

# Saltstone Mission

## Immobilize Decontaminated Salt Solution (DSS) into Grout

- Take in DSS from SWPF (either Tank 50 or direct)
- Mix dry feeds with DSS
- Send grout mixture to Saltstone Disposal Units

# Saltstone Process




SDU – Saltstone Disposal Unit

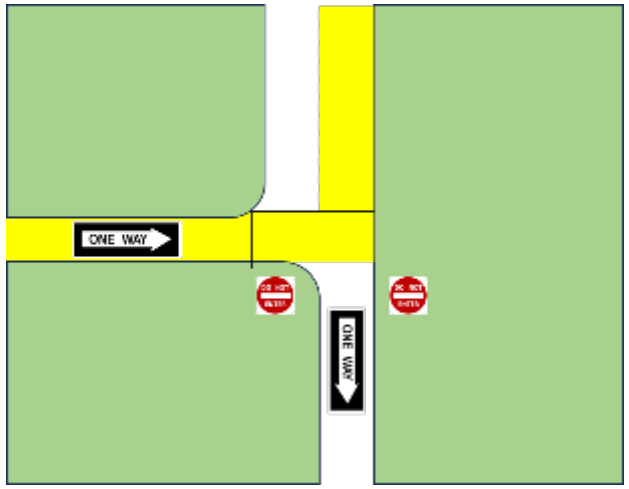
# The Optimization Challenge

- SWPF Tie-ins in 2020
- ~2-3x Production increase since SWPF came on-line
- Climb to Nine requires ~3x improvement
- Series of improvements in anticipation of the Climb to Nine effort

# Using Tank 50 (Step 1)

- **Most common route to date**
- **Provides greatest de-coupling from Saltstone**
- Most traffic on the transfer highway

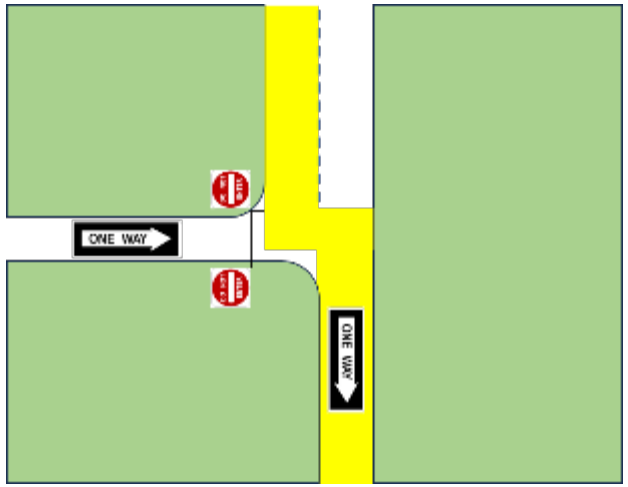





# Using Tank 50 (Step 2)

- Most common route to date
- Provides greatest de-coupling from Saltstone
- **Most traffic on the transfer highway**

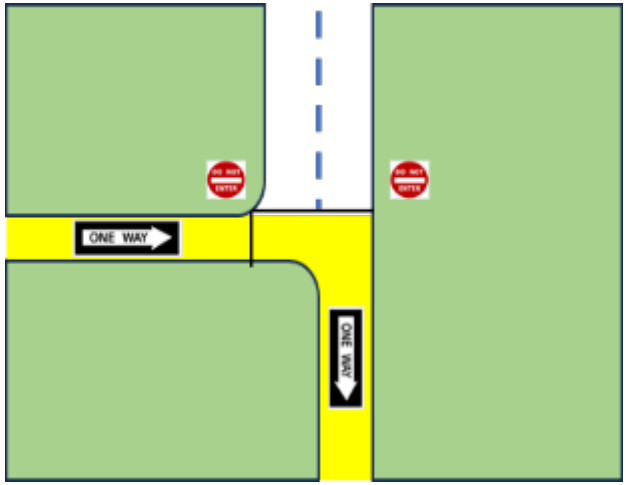





# Direct Transfer

- **Most efficient use of the transfer lines**
- **Requires Operational Cadence**





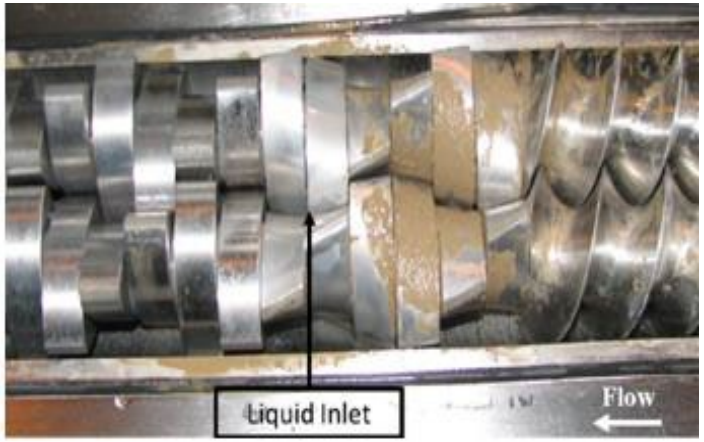

# Control Room Consolidation

- **Brings Effluent Treatment Facility controls together with Saltstone**
- **Single Shift Manager has command and control of both facilities**
- **Expanded roles for Control Room Operators**
- **Dedicated Maintenance and Support staff for both facilities**
- **Supports the complementary operational cadence**
- **Developing ESD Simulator adding ETF model to existing Saltstone**

ESD – End Stream Delivery
ETF – Effluent Treatment Facility

# 299-H Mixer Rebuilds

- Previously rebuilt Saltstone mixer in process room
- 2+ weeks or more to rebuild in place with significant labor
- Rebuilding in 299-H allows the rebuild to take place while processing continues
- "Fly-in"/"Fly-out" methodology provides greater than 50% reduction in rebuild duration




# Dry Feed Delivery Optimization

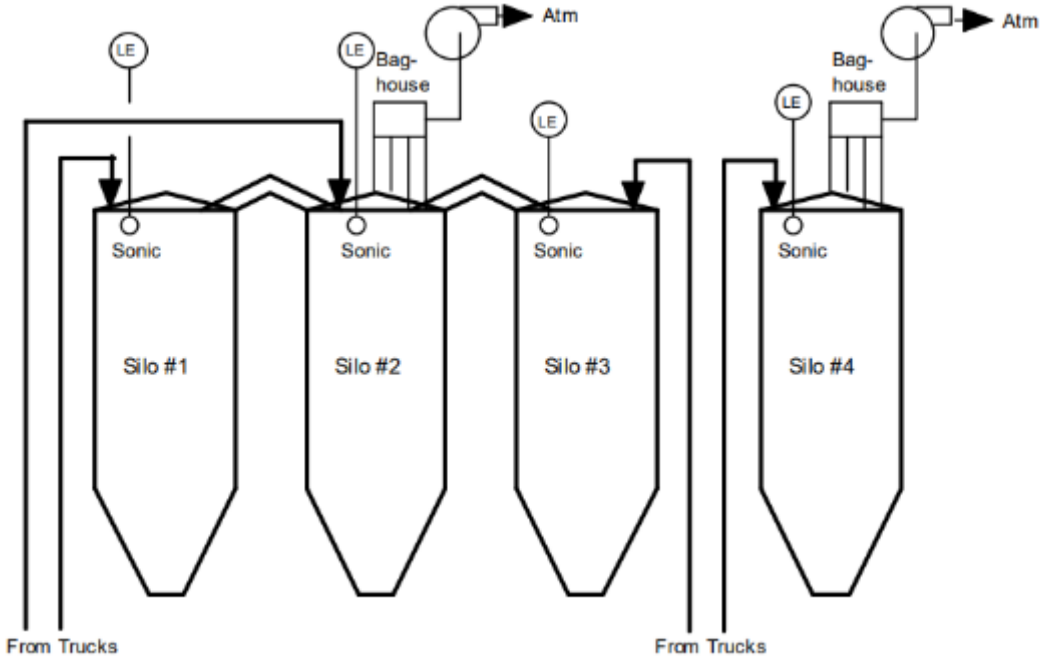
- **Expanded parking for dry feed trailers**
- **Dedicated lead driver for off-load and scheduling**
- **Expanded delivery hours**
- **Solid Vendor support and relationship**
- **Production requires ~1 truck per hour**

# Dry Feeds Upgrade

- Refurbish membrane in silo and air slides for easier unloading
- Re-pipe air system to reduce clogging
- New process air compressors to allow 3 trucks to unload simultaneously
- Mods underway to unload a 4th truck simultaneously

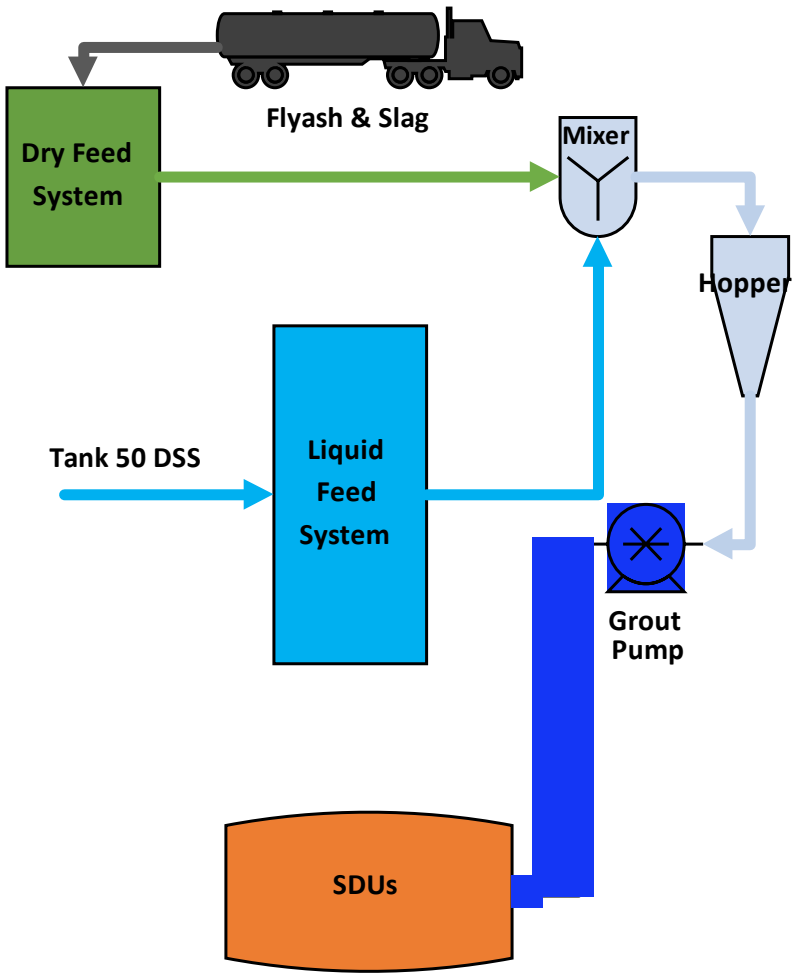
# Continuous Improvements

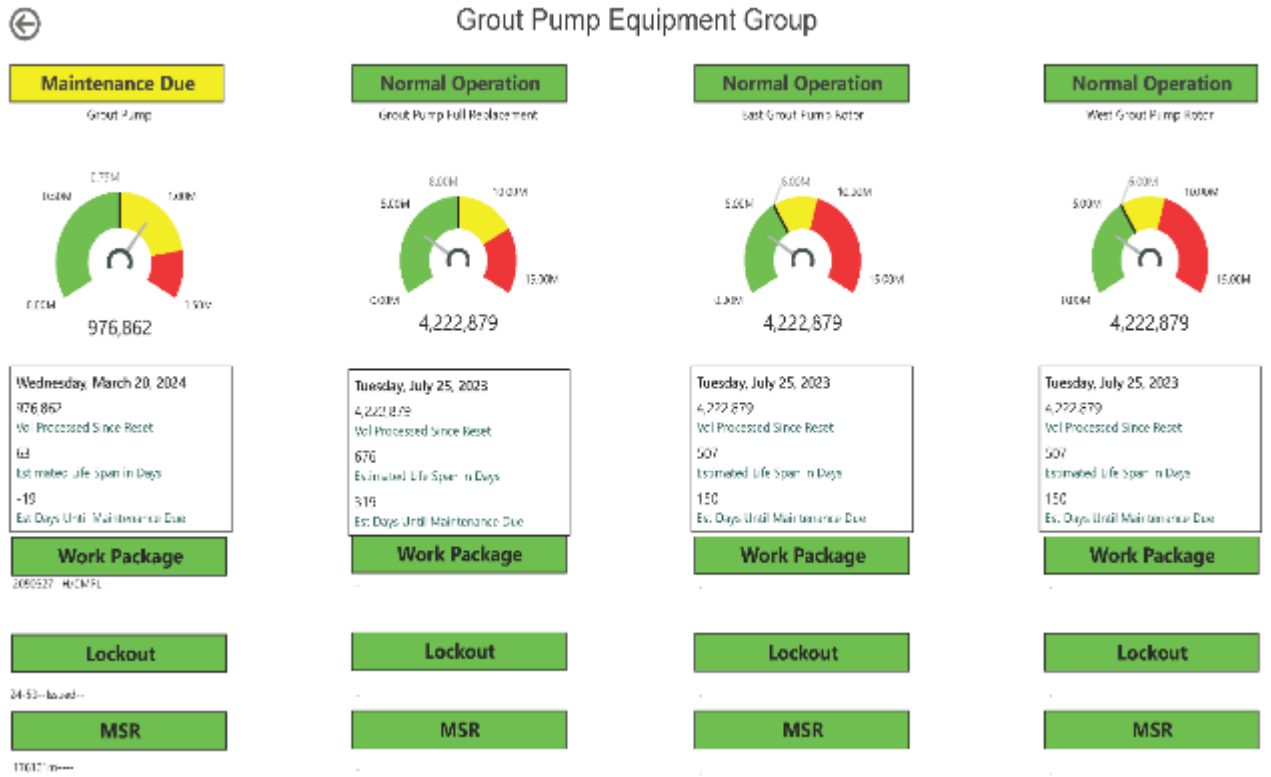
## Cement-Free Operation




| | | | | |
|---|---|---|---|---|
| Old: | (Spare) | Slag | Flyash | Cement |
| New: | Flyash | Slag | Slag | Flyash |

# Process Critical Equipment



# Take Aways

- **End Stream Delivery is:**
  - Safely reducing risks by combining two facilities into a single, Power as One organization
  - Improving Reliability by optimization upgrades in dry feeds and Process Critical equipment
  - Delivering increased throughput with cement free grout, strong vendor relationships, and direct transfer
  - Continuously improving by use of 299-H and similar efforts to save time and improve the  reliability of our equipment