# *Challenges in Selecting New Biosolids Treatment and Disposal Equipment for the Mattabassett WPCF*

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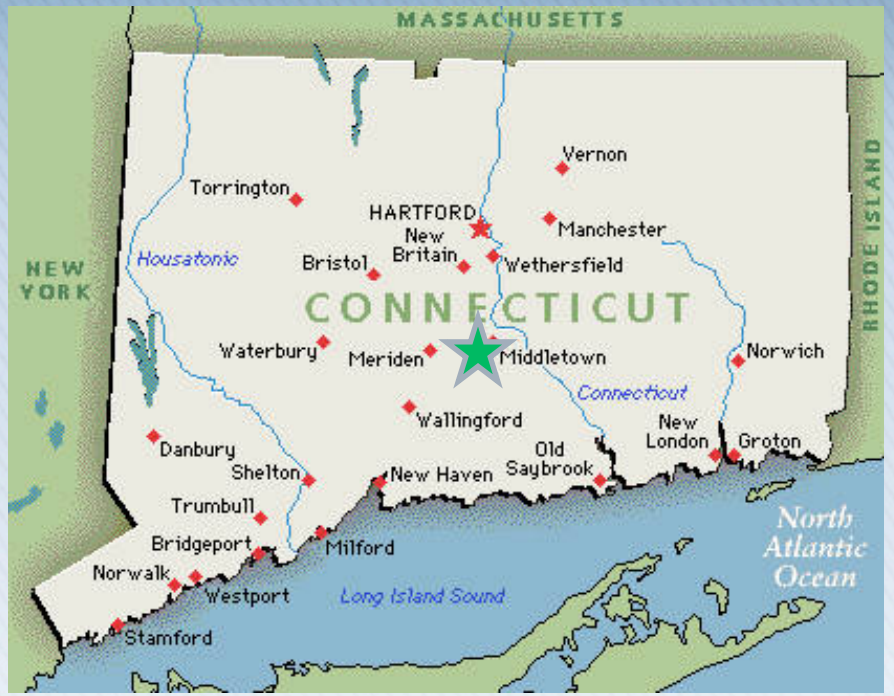
# The Mattabassett District

- Regional WPCF
  - Serves 4 member communities:
  1. New Britain,
  2. Berlin,
  3. Middletown,
  4. Cromwell &
  5. Portions of Farmington, Rocky Hill & Newington, CT



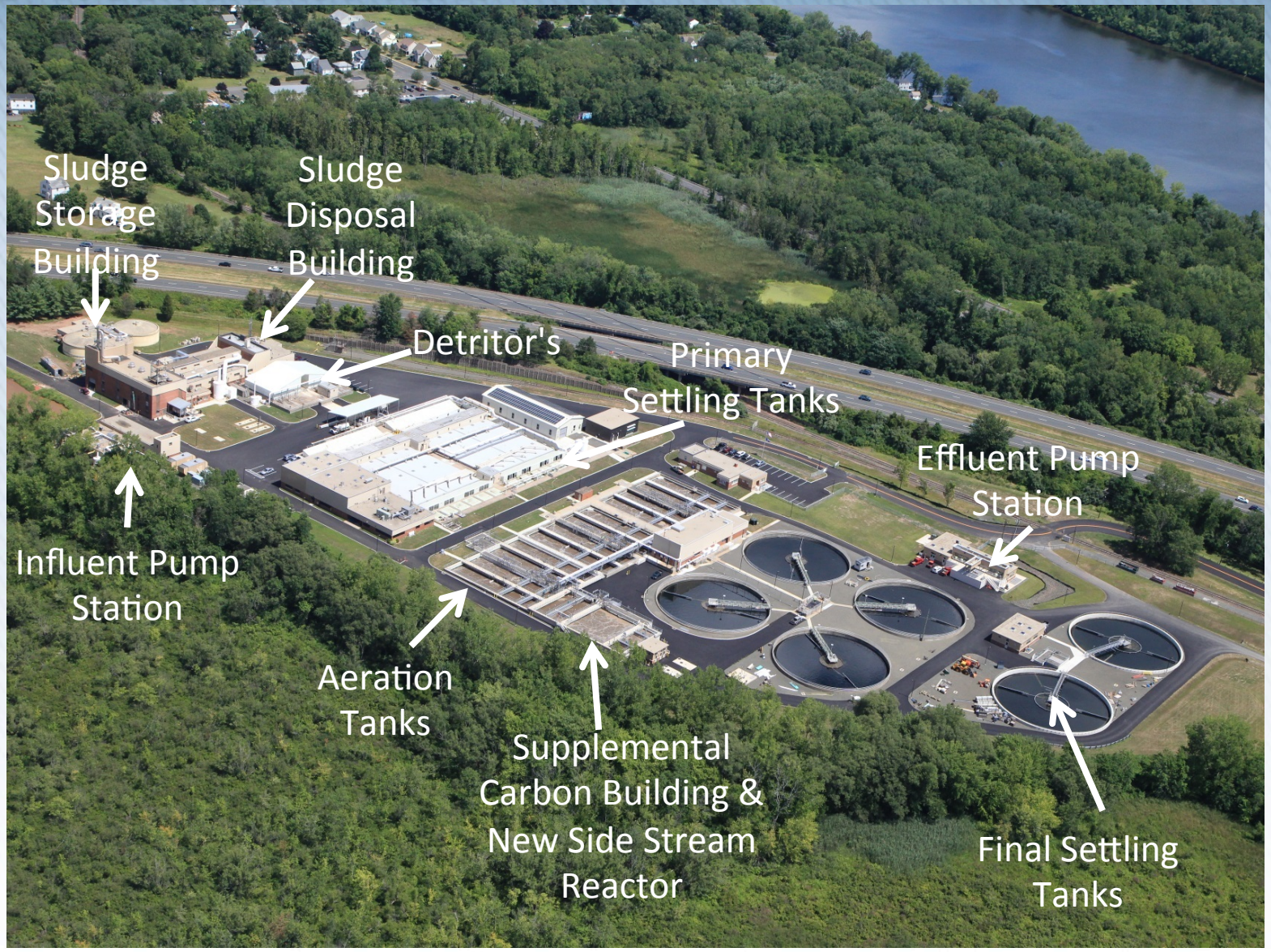

- Initial Operation – 1965
- Secondary Treatment Upgrade – 1989
- Nutrient Removal & Capacity Expansion – 2015

Annual Average Flow – 35 MGD

Maximum Monthly Flow – 55 MGD

CEPT – 55 – 110 MGD

# Overview of the Treatment Plant




Fall 2015

# Equipment Conditions Prior to Upgrade

- Multiple Hearth Incinerator – Installed in 1960's
- Fluidized Bed Incinerator – Installed in 1980's
- Belt Filter Presses/ Sludge Pumps - Installed in 1980's
- Polymer System  - Installed in 1980's

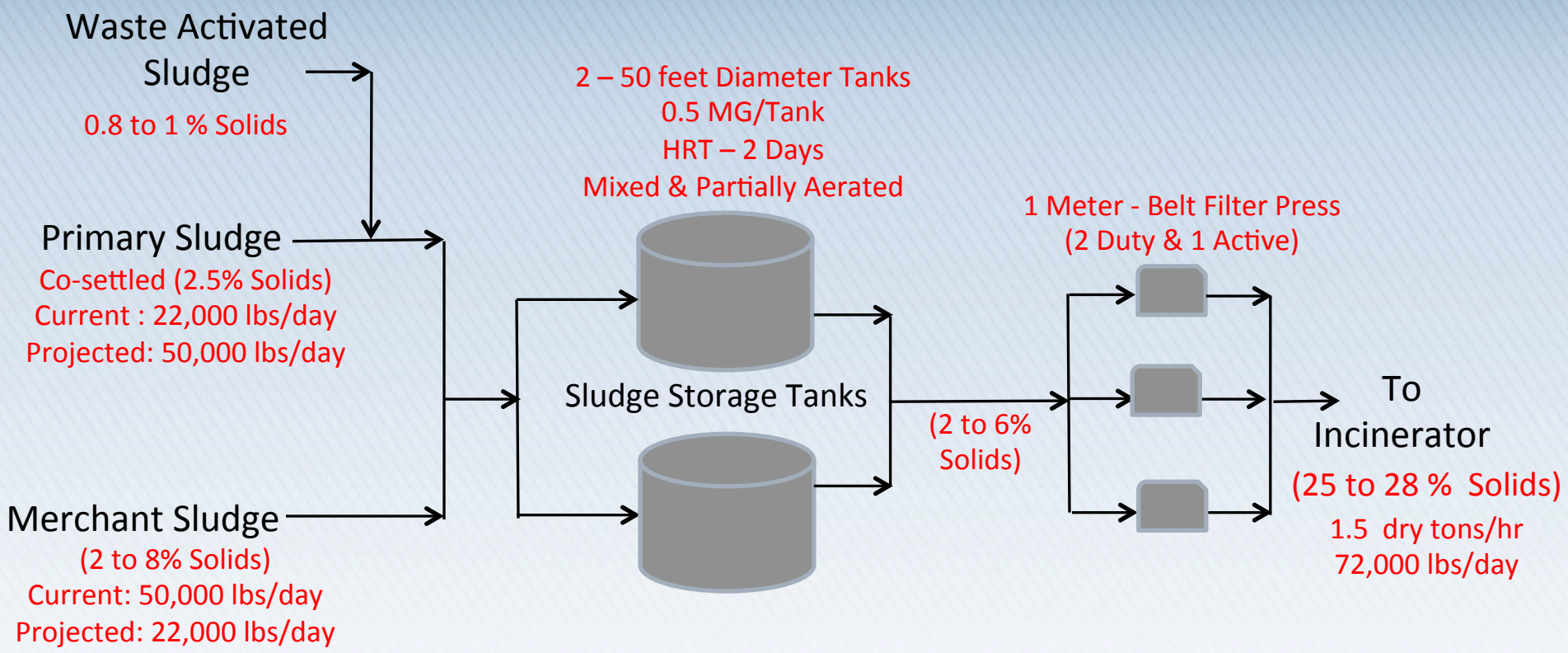
# Goals
# Sludge Dewatering Upgrade

- Incinerating onsite vs disposing sludge offsite

- Autogenous Incinerator Operation
  - Minimize supplementary fuel required
  - 24% to 28% cake dryness

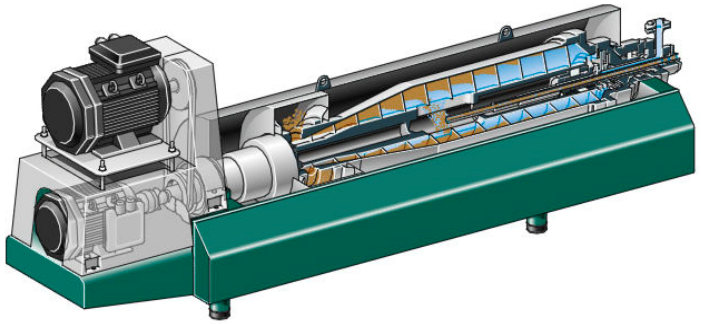
- Ability to handle varying sludge conditions

# Sludge Process



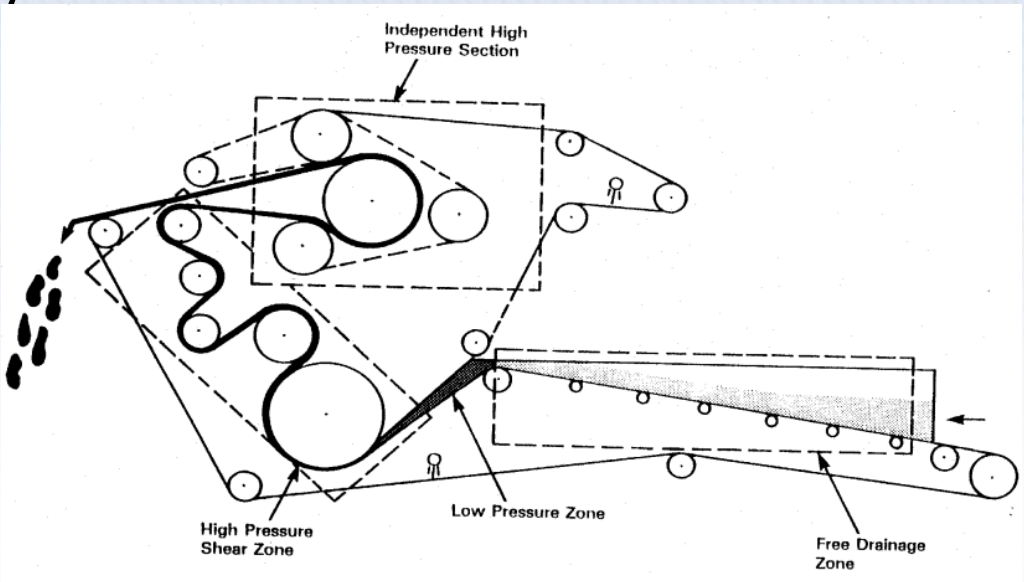
# Recommendations Facilities Plan 2004

- Dewatering Alternatives Recommended
  1. Belt Filter Press Dewatering
  2. Centrifuge Dewatering
  3. Rotary Press Dewatering



# Alternative 1
# Belt Filter Press

- Replace with three new 1.5 M belt filter presses (2 duty, 1 backup)
- BFP capacity was calculated at an average influent feed loading concentration of 2.8%
- If co-thickening is eliminated thickening of the WAS will be needed using a gravity belt thickener



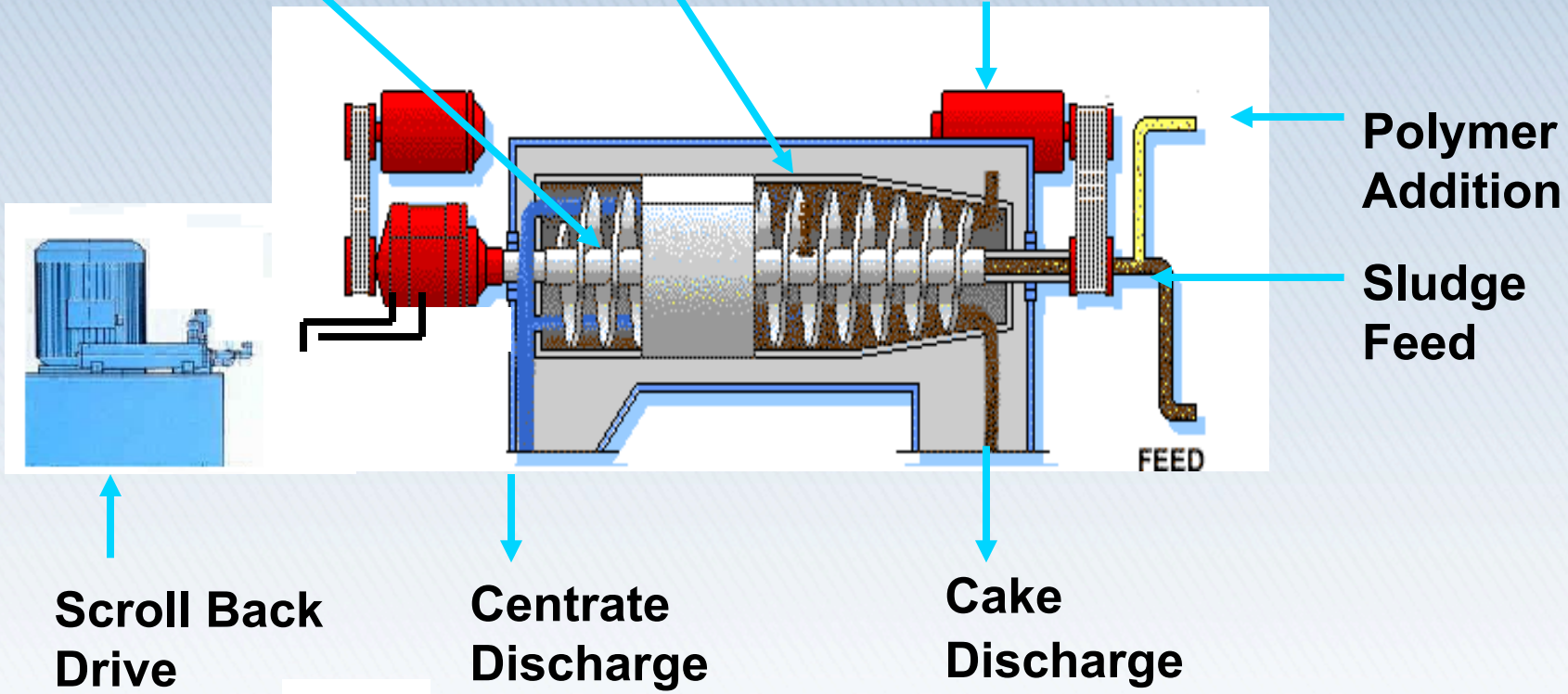
# Alternative 1
# Belt Filter Press

- Advantages
  - Equipment can be started and shut down quickly
  - Less noise associated to other equipment
  - Most maintenance work can be done by plant staff except for belt replacement
- Disadvantages
  - Odors not easily contained
  - Requires high pressure/volume wash water for cleaning
  - Greasy sludge can blind belts
  - Requires more cleanup and can be time consuming

# Alternative 2
# Centrifuges

- Replace with 3 new centrifuges (2 duty and 1 back up)
- Centrifuge  can handle influent loading concentration of 2.3%
- If co-thickening is eliminated, thickening of the WAS will be needed using a gravity belt thickener

# Centrifuge


Scroll
Bowl
Centrifuge Main Drive
Polymer Addition
Sludge Feed
FEED
Scroll Back Drive
Centrate Discharge
Cake Discharge

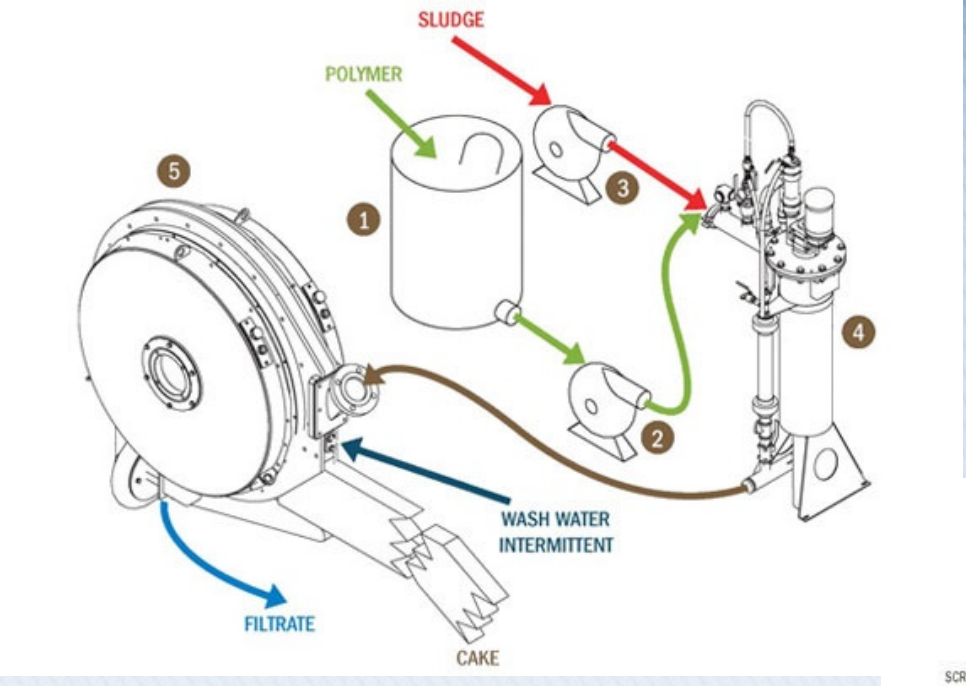
# Alternative 2 Centrifuges

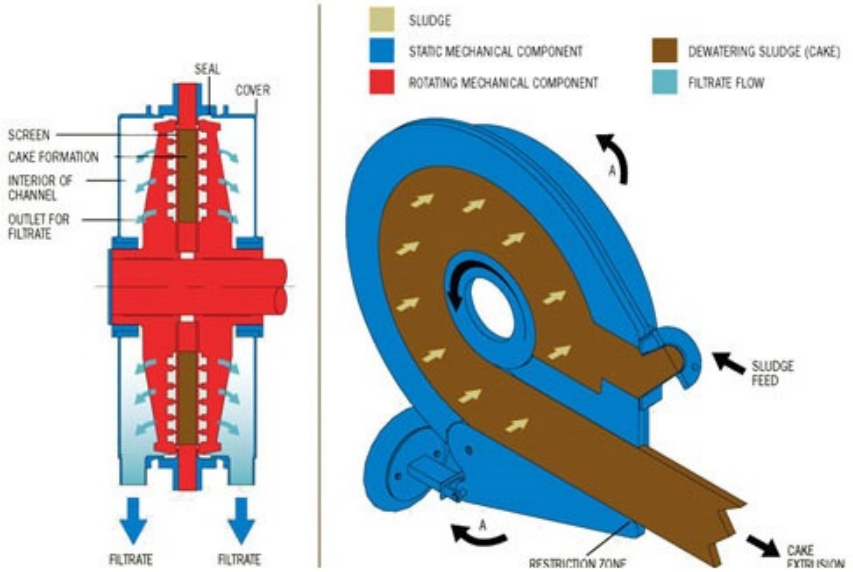
- Advantages
  - Ability to control cake dryness
  - High throughput in small footprint
  - Fully enclosed for minimal odors
  - Minimal wash water requirements
- Disadvantages
  - Highest energy requirements
  - High operating noise level
  - Maintenance requirements higher than other technologies

# Alternative 3
# Rotary Press

- Replace with 3, six channel rotary drum press
- Sizing is a function of solids loading rate and not hydraulic loading rate
- If co-thickening is eliminated, thickening of the WAS will not be needed using a gravity belt thickener

# Rotary Press



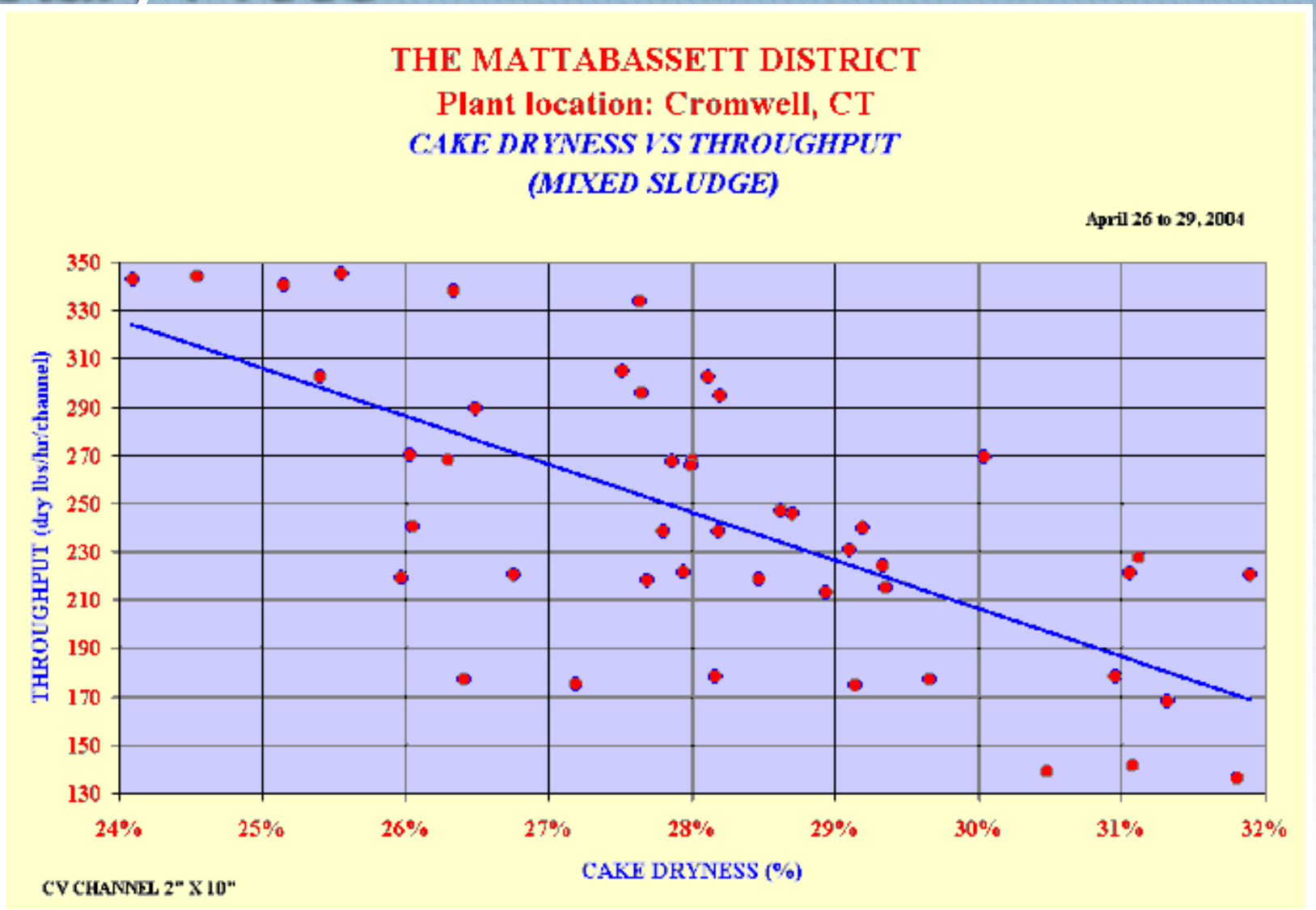



# Alternative 3
# Rotary Press

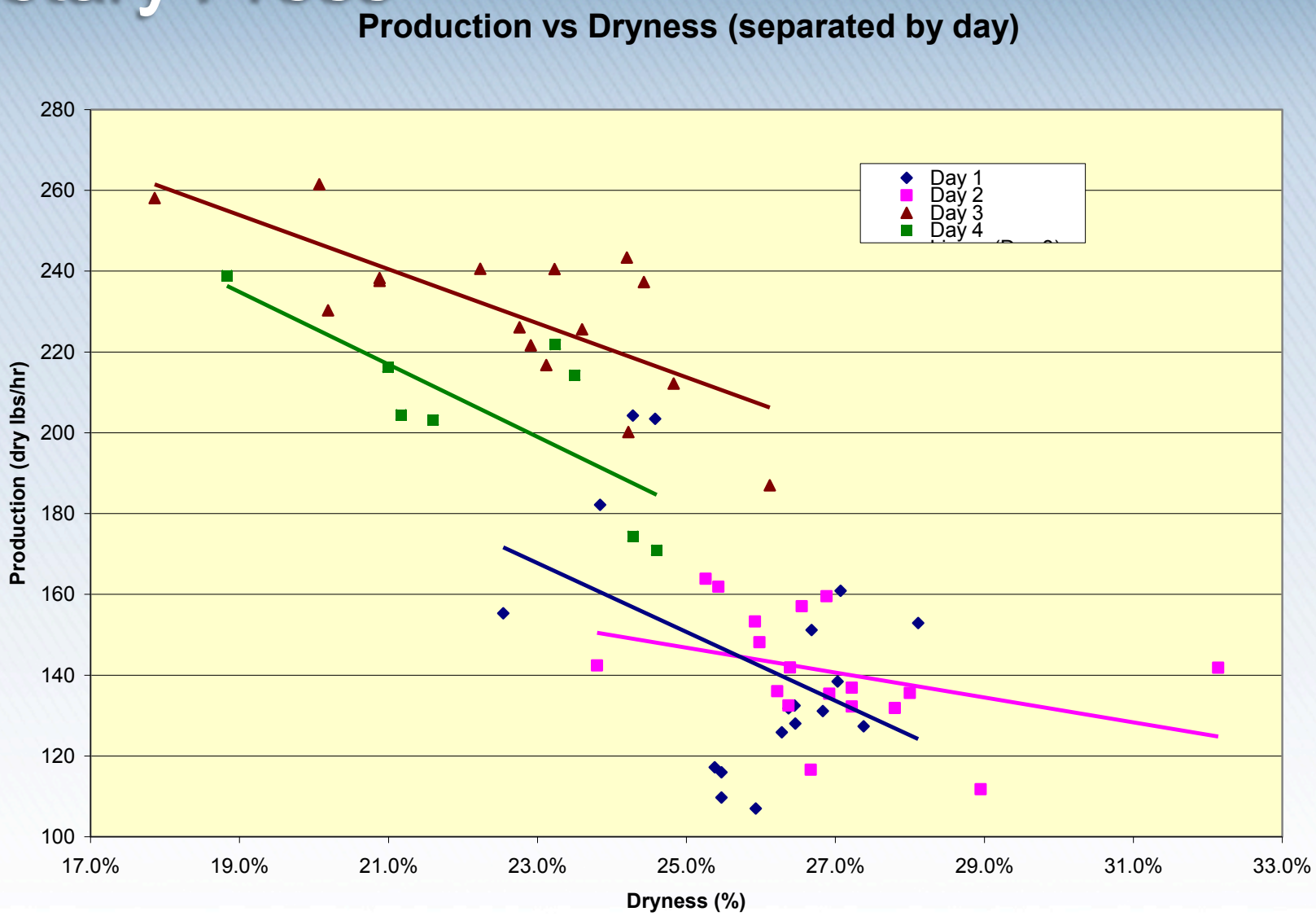
- Advantages
  - Compact
  - Moderate capital costs
  - Relatively enclosed for odor control
  - Can be automated for minimal operational needs

- Disadvantages (2004 Facilities Plan)
  - Limited operating history
  - Only one manufacturer, making equipment proprietary

# 2004 Pilot Test
# Rotary Press



# 2008 Pilot Results
# Rotary Press



# 2009 Pilot Test Centrifuges

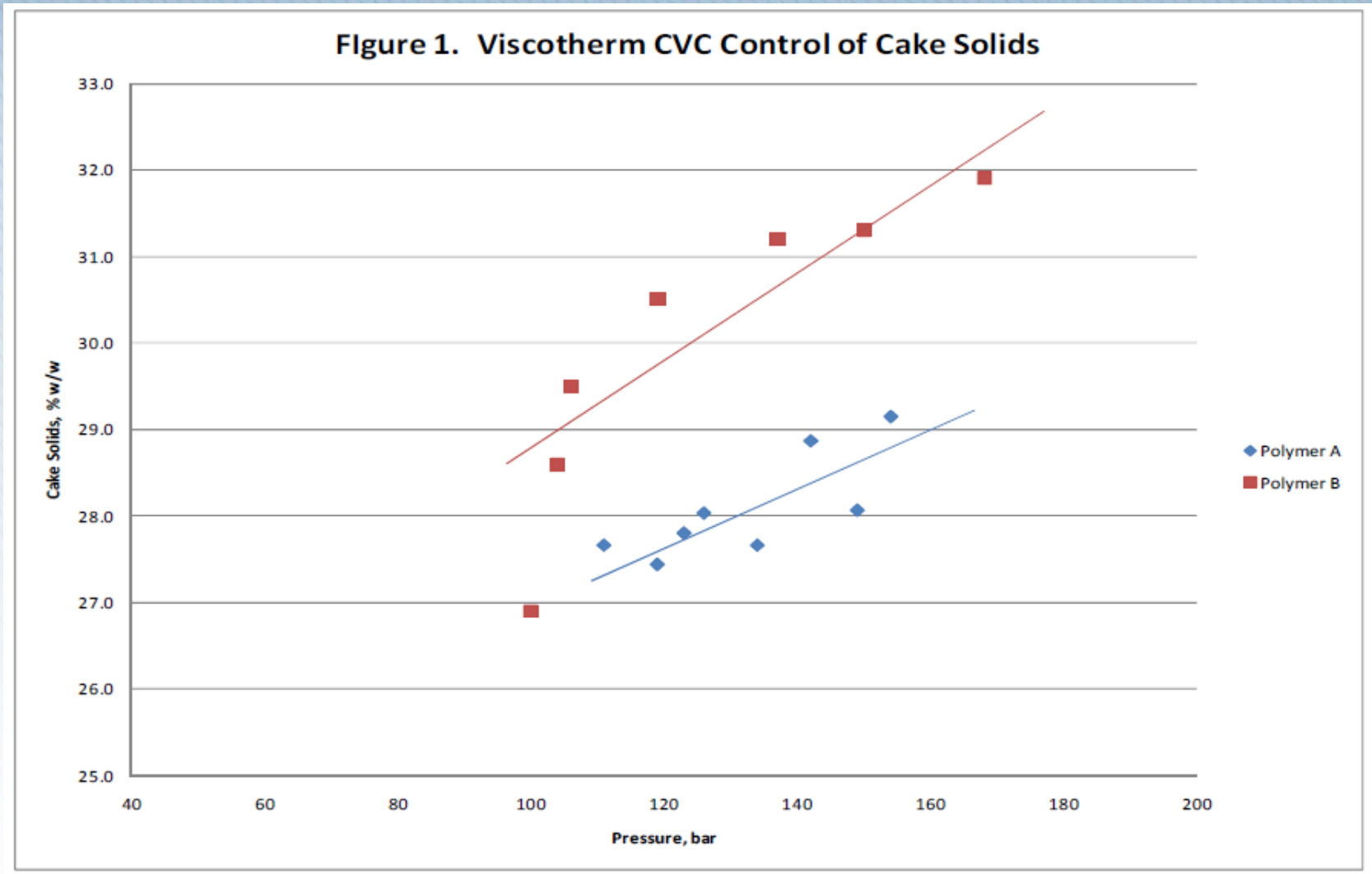
## Model CS18-4 Skid Mounted System

# 2009 Pilot Test Centrifuges

| **FLOW RATES,** Gpm | **CAKE SOLIDS,** % w/w ts | **POLYMER DOSAGE,** #/ton db (active) | **Recovery,** % w/w ss. |
|---|---|---|---|
| 72 | 26.9 - 31.9 | 14.6 – 17.7 [Poly B] | 83.7 - 94.3 |
| 75 | 23.7 - 29.2 | 10.6 – 12.7 [Poly A] | 95.4 - 96.7 |

- Polymer A - Mannich Polymer
- Polymer B - Emulsion Polymer

# 2009 Pilot Test
# Centrifuge Results - Polymer



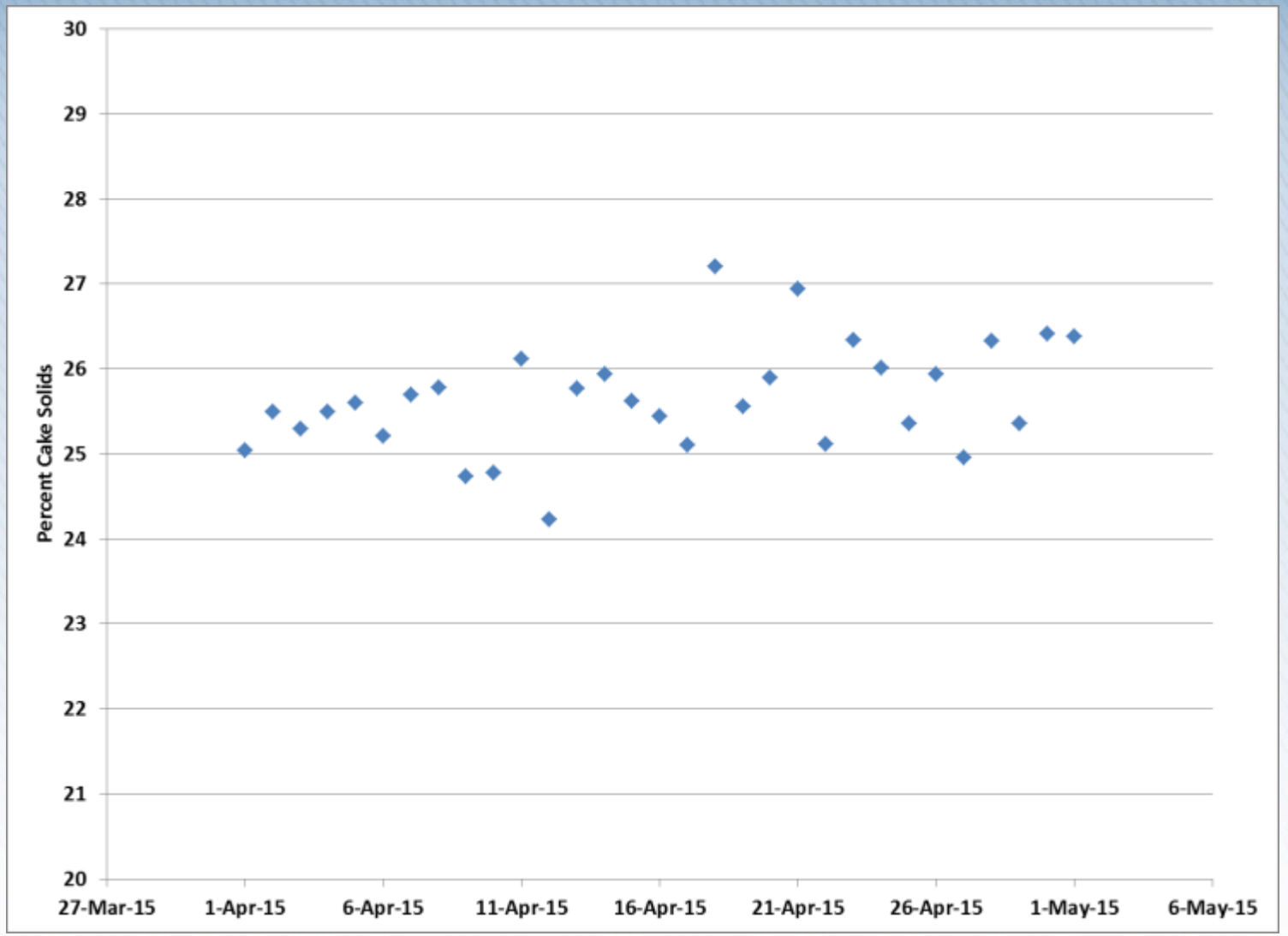
# Summary

- District further evaluated – Visited several installation locations
- Centrifuge Chosen
  - 3 Units – 0.75 tons/hr. per unit each
- Enclosed – Better Odor Control
- Ability to handle a variety of sludge characteristics

**Centrifuges: Westfalia**
**$ 1,060,000**

**General Contractor: CH Nickerson**

# Current Operating Results - Westfalia




**Incinerator Feed Pump:**
**Putzmeister Twin-Cylinder Reciprocating Piston Pump**
**$640,000**

**Stored Sludge Pump:**
**Carter Triplex Plunger Pumps**
**$200,000**

**Mattabassett , CT WPCF**
**Fluidized Bed Incinerator**
**(Manufacturer -Preselected)**
**$ 21,000,000**

**Infilco Degremont Inc.**

# Questions

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