

Lincoln City WWTP Biosolids On The Coast

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Agenda

- Background
- Current Biosolids Operation
- Centrifuge Project
- Conclusions, Recommendations and Next Steps



Existing Wastewater System

- Population: 8,040 people (2013 US Census)
 - 28 Lift Stations, 74.4 miles of gravity, 11.25 miles of force mains & 1898 manholes
- Flow:
 - ADWF: 2.1 mgd
 - AWWF: 3.3 mgd
- Liquid treatment:
 - Screens & grit removal -> SBR -> Disc filtration -> UV -> Discharge to Schooner Creek
- Solids treatment:
 - Aerobic digestion -> lagoon storage -> land application

Facility Overview

Legend

Existing Facility



Current Biosolids Operation

- Incomplete VSR in digesters
 - Currently VSR ~ 10%
 - 38% VSR required for Class B Biosolids
 - Achieve Class B in Sludge Lagoon
- Sludge lagoons reaching capacity due higher solids loading
 - Inadequate winter storage volume
- Inadequate mixing and aeration in aerobic digesters
- Concerns about digester capacity under peak loading conditions

Current Biosolids – Land Application

- Reaching N limit on local land application sites
 - City conducting soil testing
- Total 4 sites: 232 acres
 - Approximately half (160 acres) receive applications each year
 - Several no longer available
- Public acceptance concerns regarding land application

Biosolids Product Types

Dewatered Product

- Class B, Total Solids Content: 16-22%

Pros:

- Requires minimal operational staff
- Low energy cost for production
- Minimal capital investment

Cons:

- Potential for regulations around Class B to change in the future
- Higher hauling costs



Thermal Dried Product

- Class A, Total solids content: 90-95%

Pros:

- Pathogen free product with multiple market uses
- Minimum transportation costs

Cons:

- High operating (fuel) costs for production
- More operational staff required to run the dryers
- Higher odor generation



Regulatory Requirements: Pathogen limits

Class A

Process to Further Reduce pathogens (PFRP) plus:

- Fecal coliform densities < 1000 MPN per g total solids or
- Salmonella < 3 MPN per 4 g total solids*

Class B

Process to Significantly Reduce Pathogens (PSRP) or

Fecal coliform densities < 2,000,000 MPN or 2,000,000 Colony forming units per gram total solids*

*Based on a geometric mean of 7 samples

Biosolids End Use Options

- Coffin Butte Landfill:
 - Anaerobic Class B Dewatered Cake: \$305/DT
 - Anaerobic Class A Thermal Product: \$74.09/DT
- Contract for Land Application
 - Average cost for 4 utilities in NW with land application for Class B: \$150/DT
 - Range of costs: \$74 – 184/DT

Centrifuge Project

Elements

1. Temporary dewatering solution
2. Room for expansion
3. Land application

Pilot Testing Summary

- 4 Vendors piloted 5 systems
- Pilot duration: 2-3 days
- # of tests: 5- 10 batch tests each
- Varied polymer addition rate



Pilot Testing Summary

Equipment Model	Manufacturer	Test dates	Solids concentration %	Capture rate, % TSS	Polymer use, pounds per DT
RFP 36 Rotary Fan Press 2.0	Prime Solutions	Sept 3-4, 2015	15.7	95.8	12.65
C4E Centrifuge	Flottweg	Oct 20-22, 2015	16 - 20	98 - 99	15.5 - 21
SHX-200x1500L Screw Press ^a	FKC	Sept 13-14, 2015	14 - 18	NA	11 - 43
SC 4020 Screw Press	Andritz	Oct 13-21, 2015	15.5 - 19	93 - 95	30 - 34
Paddle Dryer	Andritz	Oct 12-23, 2015	90 - 92	N/A	N/A

Andritz Centrifuge

Application	Municipal Sludge Dewatering
Type of sludge	Current: Aerobically Digested WAS from SBR Future: Anaerobically digested sludge
Number of Units	1 duty
Current Aerobic	Solids Load: 2,200 lb/day x 7 days per week = 15,400 lb/wk Solids Concentration: 1.0-1.5% TS Operation: 4 days per week x 8 hours per day Design Solids Load: 480 lb/hr Design Hydraulic Load = 80 gpm (at 1.2% TS)
Future Anaerobic	Solids Load: 4,000 lb/day x 7 days per week = 28,000 lb/wk Solids Concentration: 2.5% TS Operation: 5 days per week x 8 hours per day Design Solids Load: 700 lb/hr Design Hydraulic Load = 56 gpm (at 2.5% TS)

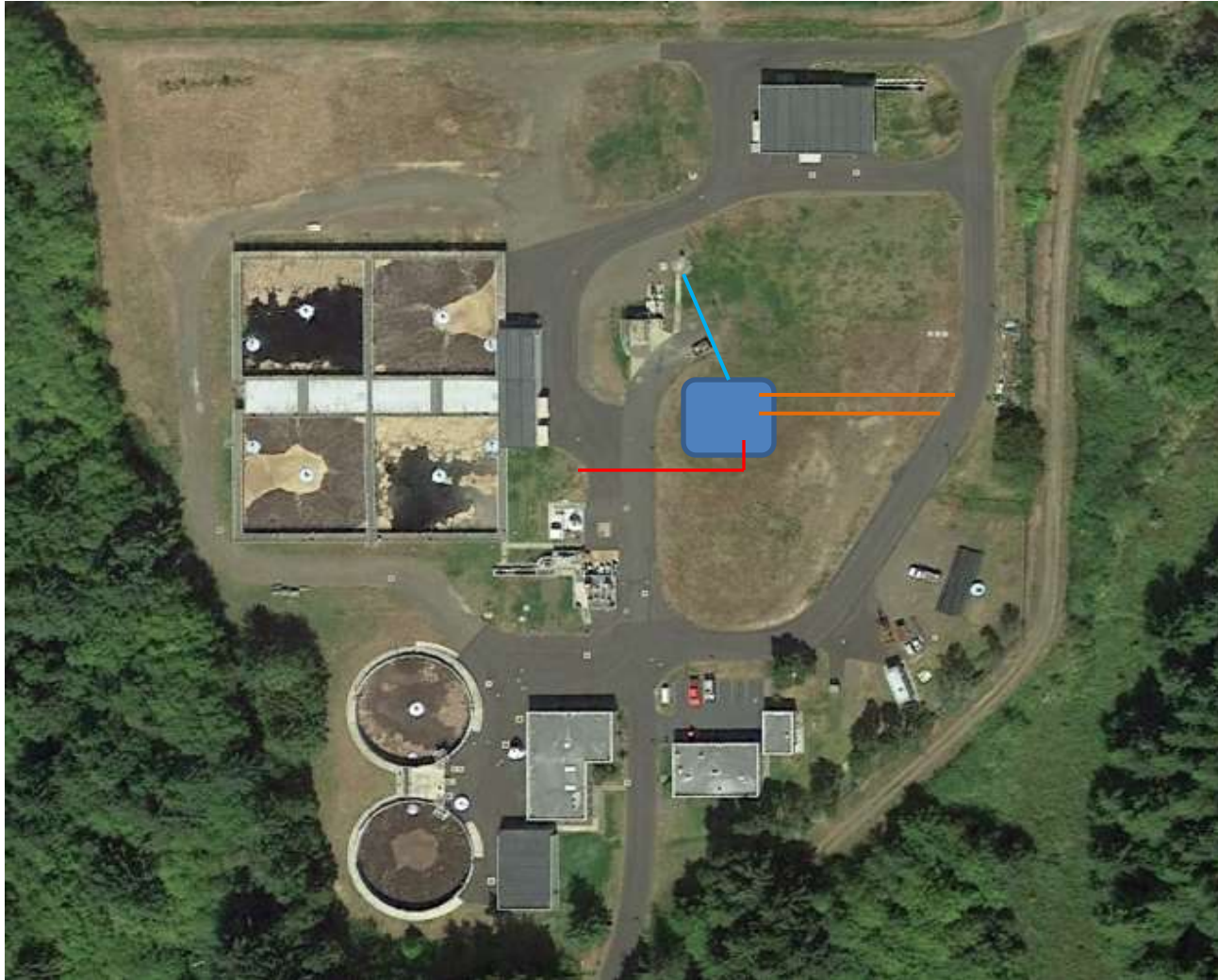
Dewatering Building



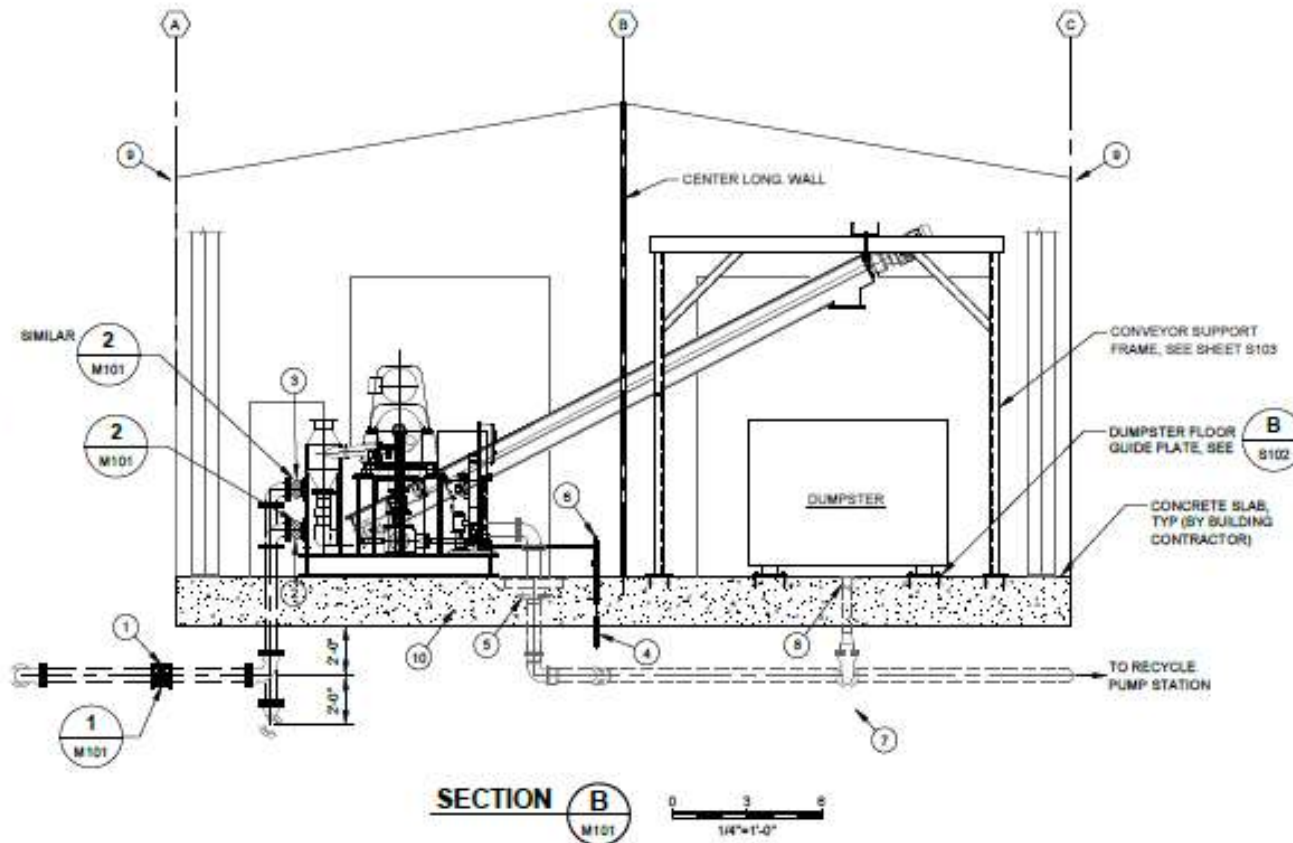
Dewatering Building



Dewatering Building



Dewatering Building



Challenges

- Geotechnical
- HVAC
- Electrical



Potential Next Steps

- Anaerobic Digestion
- Addition of dryer to dewatering building

Questions/Discussion

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