Presented By:

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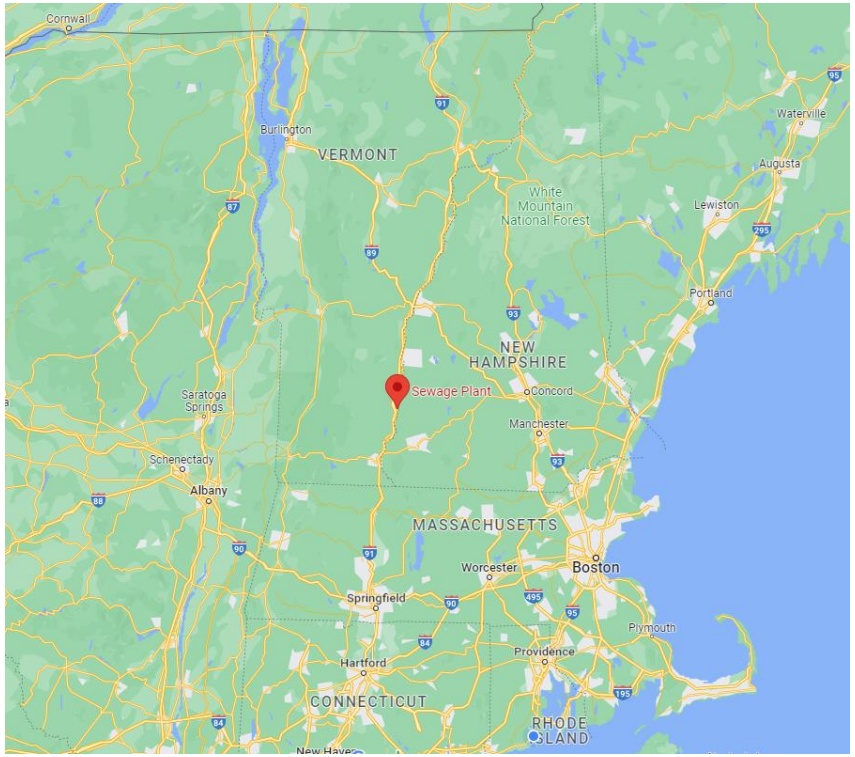
Sludge Dewatering and Sludge Drying:

What Bellows Falls has gained in 5 years of Dewatering and 2 years of Drying Sludge

Bellows Falls, Vermont

- Bellows Falls is an incorporated village located in the town of Rockingham in Windham County, Vermont, with a population of about 3000 people
- Fun Fact: The first bridge to be built anywhere on the 410-mile long Connecticut River was across the narrow Bellows Falls gorge



Bellows Falls WWTF

- 1962- Built as a Primary-only plant (with digesters)
- 1988- added secondary treatment- RBC, anerobic digester
- 2010/2011- Upgraded headworks and septage receiving
- 2012- Rehabilitated RBC's
- 2017- major upgrade including BFP, rehabbed digesters, and dewatering equipment upgrade

- Currently process 0.5MGD plus ~ 2.2MGY of residential septage and light industrial wastewater

- Prior to 2017: Composting at Claremont, NH

- Shortly after our 2017 upgrade- landfill (Claremont became unavailable)
  - 1 landfill available, no affordable fallback options- Yikes!

Dewatering Upgrade 2017

- Cake solids, disposal and transport costs became important
  - Loss of local composition
  - Long travel distance to landfill
- Belt Filter press required supervision, expensive maintenance
- We did our research, at first a Fan Press became the ‘front runner’
- PW tech Volute Press pilot unit happened to be in the area (2015)
  - Entire team agreed that the Volute press met the needs best of all technologies considered
- Went into design in 2016
  - No Volute presses in the area at the time, engineer had to travel to see one!
- Volute Press installed and started up in early 2017

The Volute Story

- Developed in Japan in mid 90's by Amcon Inc. and Japan Sewage Works Authority
- In 2004 PWTech (CDS at the time) became the exclusive North American Distributer.
- 1st North American Installation, July 2005 at Port Deposit, MD (Now at >280 installations)
- Over 4500 Installations in over 80 countries (Growing Fast) – The most used screw press around the world over this time period

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Dewatering Drum Design

- The Dewatering Drum design is the critical difference between the Volute and other screw presses
- Dewatering Drum is made of a combination of fixed and moving rings around a screw auger.
- Dewatering Drum can achieve both thickening and dewatering of the feed sludge.

Stop by our booth!

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Dewatering Upgrade Results

- Operated at 15-20 gpm of ~4% feed solids sludge (prior to dryer addition)
- Unsupervised operation
- Only routine maintenance since start up
- 5000 hours of total run time
- 20-25% cake

- Polymer water temperature matters!

Drying Upgrade 2020

- We were still very limited in biosolids handling/ disposal options

➢ Dryer manufacturer/ rep stopped in to show dried samples
  ➢ Realized quickly that drying could provide more handling / disposal options
➢ Brattleboro finished piloting, asked us if we wanted to try it
  ➢ Entered a pilot/ rental agreement to limit risk
➢ Pilot ultimately very successful
  ➢ Worked thru some mechanical issues, used a local IT company for program changes
➢ We kept the unit!

Dryer:

- Shincci Sludge Dehumidification
  - Biosolids dehumidification system
  - Reduce volume 60% to 80%
  - Dry solids to >90%
  - Interior system temp is 70 to 75 degrees C
  - Uses 3x to 5x LESS energy than other sludge dryers
  - Does not require odor control, dust suppression, or explosion proof ratings

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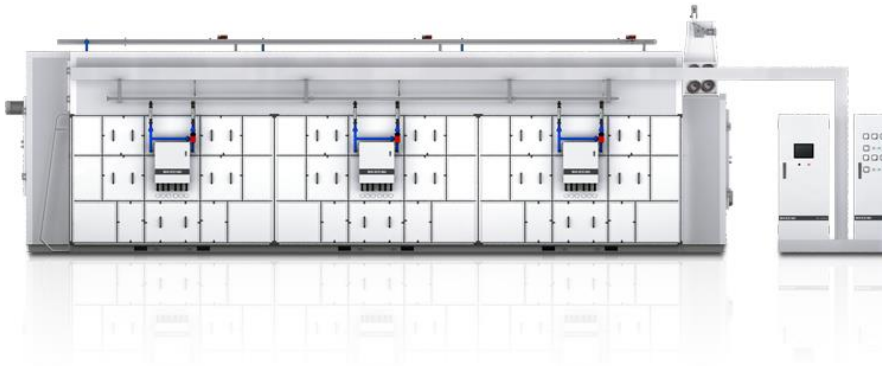
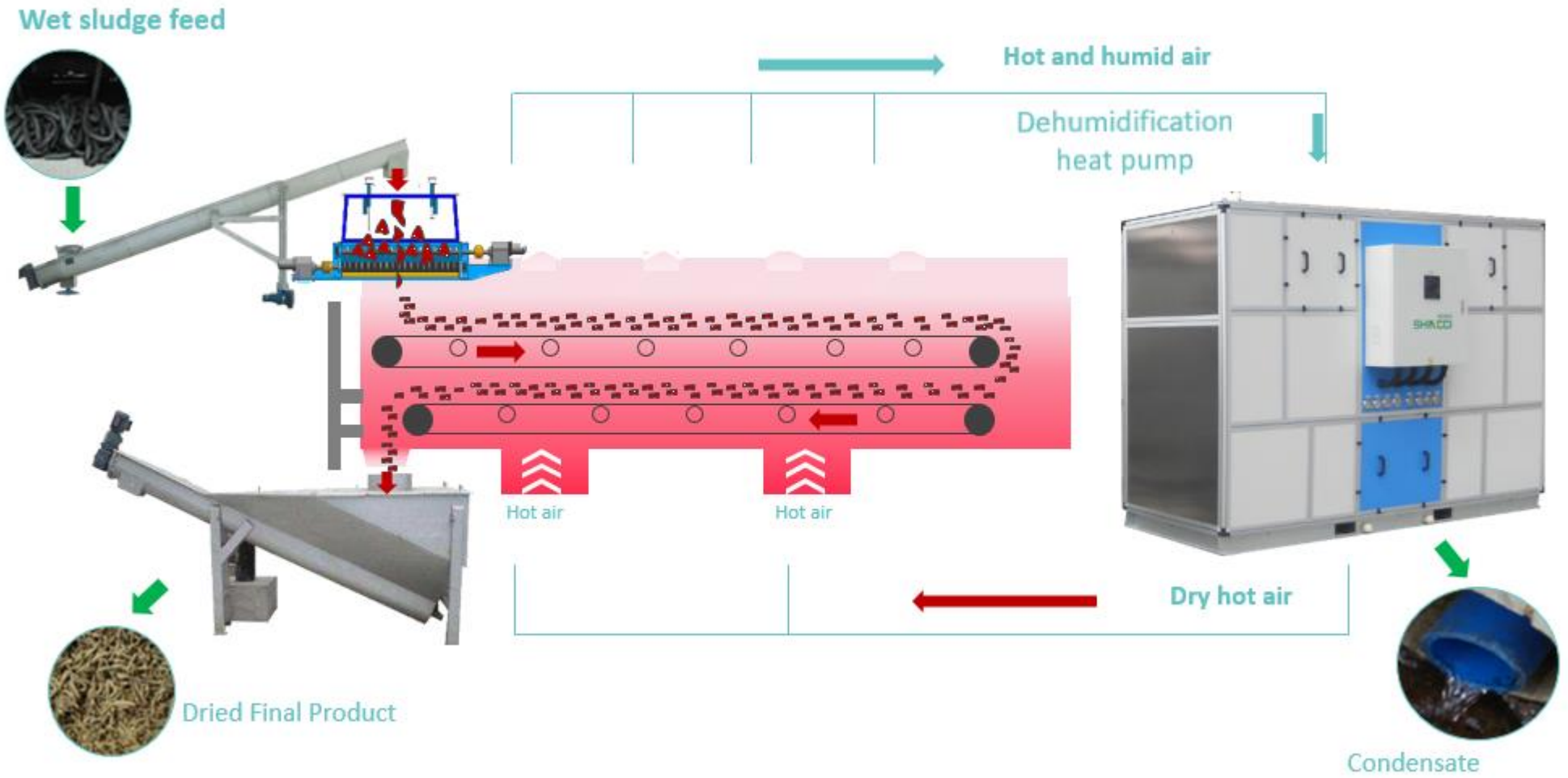


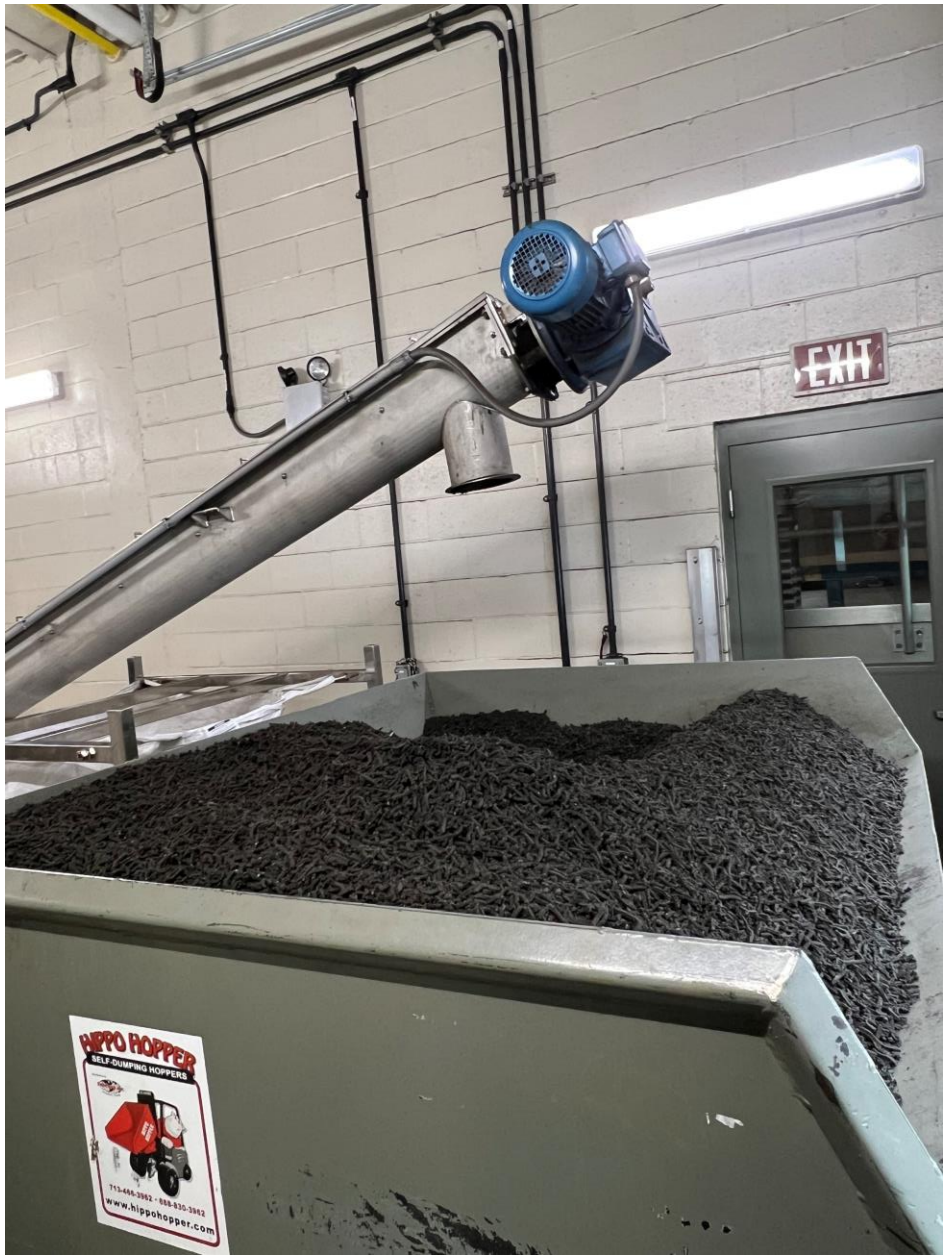
PRINCIPLES OF OPERATION



Drying Results

- 85%-95% Class A biosolids
- 4:1 reduction in solids to handle/ dispose of
- Currently approved to land apply in NH and VT
  - With the volume/ weight reduction, we could adjust to new requirements very quickly
- Operate at 10 GPM, 8 hours per day
- Short runs, daily start-up/ shut down work for us
- ~ 600 KW per day ($75 at $0.17/ KWHr)
- Farmers simply pick up 1-Ton Super Sacks

- The combination of Dewatering and Drying technologies work very well together
  - Dryer warm up takes about an hour, press is a few minutes
  - Easy on/off operation of the press so that dryer can keep up
  - Ease of shutdown at the end of each day



What Bellows Falls, Vt, Has Gained in Five Years of Dewatering and Two Years of Drying Sludge

- Significant Biosolids cost savings
  - Estimated ROI of less than 5 years
  - Transport and disposal savings
  - Flexibility for future unknowns
- Efficient operation
  - Simple reliable dewatering and drying
  - We run ‘low and slow’
- Plans and Nex Steps
  - Working with Efficiency VT.
    - Hope to add a silo/ eliminate super sacks
  - Adding additional solar power to offset electrical costs

Questions?

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Represented by

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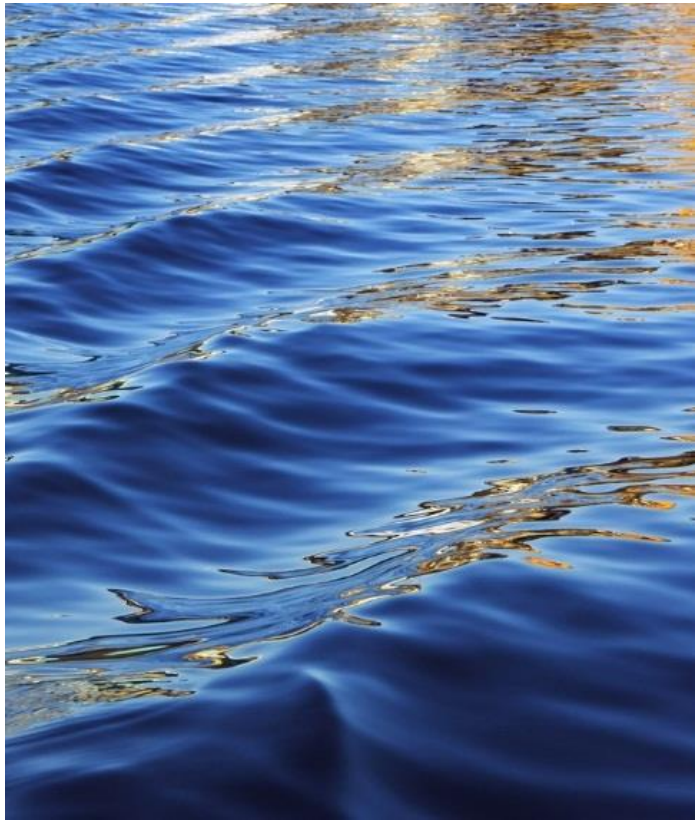
In New England

J. ANDREW LANGE, INC.

In New York State



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