

High-Efficiency P-Recovery and Digester Protection

Pilot test unit.

Fermentation: the Biological Solution for Phosphorus Solubilization

CalPrex works with high concentrations of soluble phosphorus and is a viable solution for utilities seeking to mitigate operations and maintenance issues related to struvite scaling and poor sludge dewaterability.

The end recovered product, brushite, is a fertilizer comparable to leading phosphate fertilizers on the market today.

This high-value solution is for facilities needing phosphorus removal and recovery:

- Prior to thermal hydrolysis
- From waste activated sludge and/or primary sludge prior to anaerobic digestion
- From aerobic or post-aerobic digestion (PAD)

CalPrex reactor sits between the fermentation tank and gas phase digesters.

- Fermentation for 12-36 hours prior to the anaerobic digester provides a low-oxygen environment
 - Facilitates the rapid release of soluble phosphorus in Bio-P sludge along with the dissolution of crystallized and organically-bound phosphorus
 - Over 60% solubilization of P can occur in the fermentation without using any additional chemicals
 - In non-Bio-P plants, up to 40% of the phosphorus solubilizes using a fermentation step
- Fermented sludge is dewatered
- Centrate is sent to the CalPrex reactor
 - Centrate precipitates the dissolved phosphorus with the addition of calcium hydroxide
 - Maintains the solution around 6.5 pH
 - Recovers phosphorus as a brushite crystal ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$)

Contact Centrisys/CNP for pilot testing capabilities.

THE BENEFITS

High Efficiency P-Recovery and Digester Protection



Reduce Disposal Costs up to **50%**



Divert Over **70%** of the Soluble P from the Digester



Reduce up to **50%** of the Total P in Biosolids



Reduce **Struvite Buildup** in the Digester



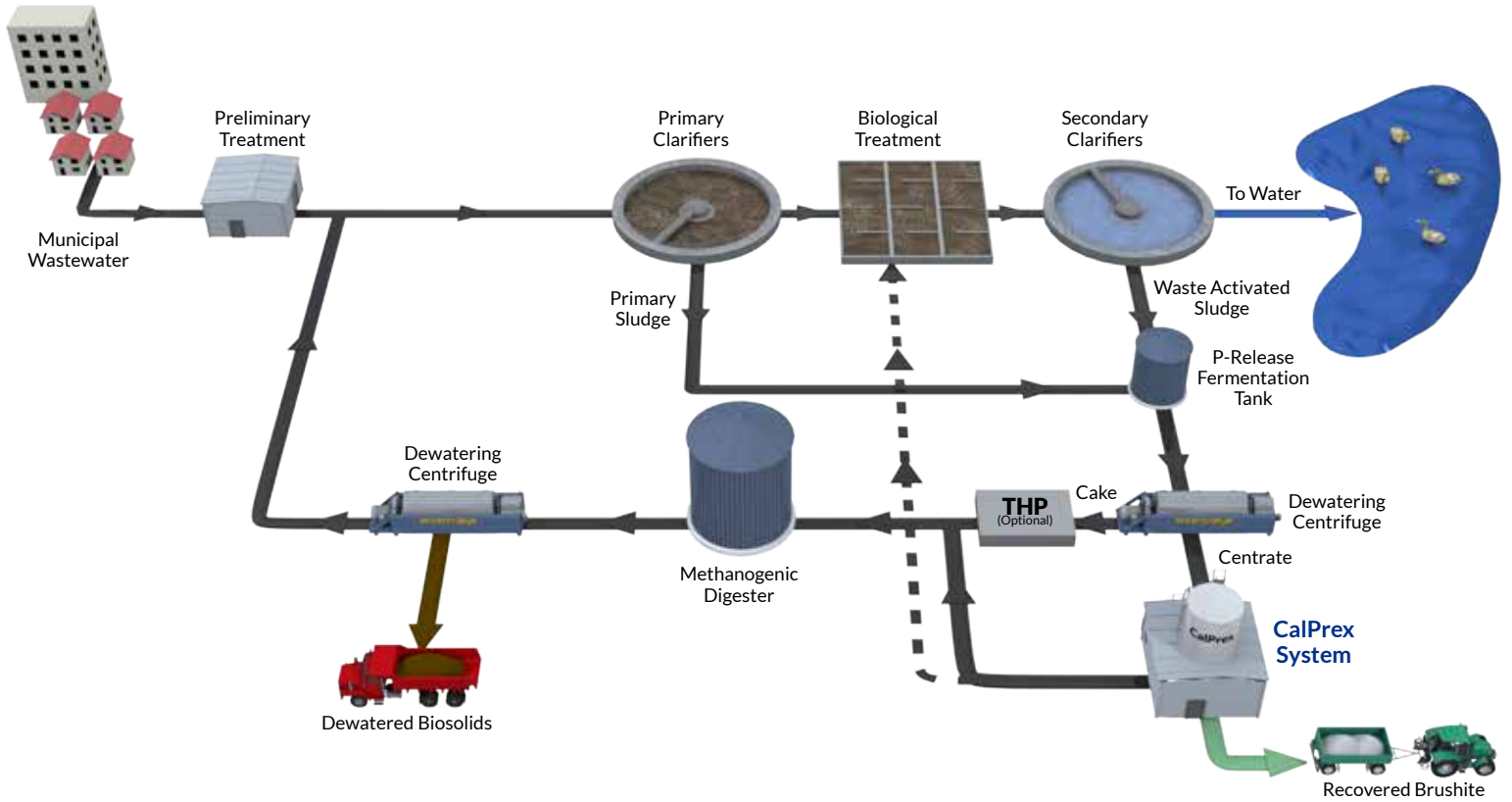
No Ammonium Required



Create a **Valuable Fertilizer** from Brushite



PROCESS: CalPrex®



	Centrate Recovery	WAS Fermentation + Centrate Recovery	CalPrex®
Reduce Phosphorus Recycle	✓	✓	✓
Recovery of Marketable Fertilizer	✓	✓	✓
Reduce Struvite Maintenance	✓	✓	✓
Reduce Digester Struvite Buildup	✗	✓	✓
Compact Reactor	✗	✗	✓
Recover P from No/Low Ammonia System	✗	✗	✓
Recover P from Non-Bio-P Plant	✗	✗	✓
Lower Chemical Cost Per P Recovered	✗	✗	✓
Lower Chloride Addition Per P Recovered	✗	✗	✓
High Total P Capture	✗	✗	✓

The CalPrex® Technology is licensed by Nutrient Recovery and Upcycling LLC.