PROCESS: CalPrex® Water Research Foundation (WRF) Pilot Project

WRF Pilot Recovered the Highest Rate of Total P

Water Research Foundation (WRF) Pilot

The CalPrex® pilot ran at Nine Springs Treatment Plant, a 42 MGD facility in Madison, Wisconsin in 2018. The pilot was a 10 gallon per minute system.

- Pilot between the acidogenic and methanogenic digesters
- CalPrex fed with acid digest
- [1] Centrisys CS10-4 decanter centrifuge dewatered the feed to 20% solids, which were conveyed to a [2] recombination tank
- Centrate dosed with [3] calcium hydroxide, causing the precipitation brushite, a form of phosphorus
- Brushite settled in a lamella clarifier
- Clarifier overflow recombined with the [2] acid digest cake and discharged to the methanogenic digester
- Settled brushite dewatered and cake dried as a high-quality fertilizer for a USDA-funded fertilizer study

How CalPrex Works

CalPrex incorporates thickened sludge from a fermentation tank or acid digester to increase the amount of soluble phosphorus which increases the phosphorus recovery potential. CalPrex is uniquely suited for recovering a high rate of soluble phosphorus by adding calcium hydroxide without the need of ammonium. 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 and post-aerobic digestion (PAD)

CalPrex is a viable solution for utilities seeking to mitigate operations and maintenance issues related to struvite scaling and poor sludge dewaterability.

Contact Centrisys/CNP for pilot testing capabilities.

PILOT RESULTS

Nine Springs Treatment Plant

Solublized **66%** of the feed phosphorus

Mineralized **90%** of the feed phosphorous

Recovered **70%** of the feed soluble phosphorus as brushite

Recovered **45%** total phosphorous

Designed & Built in the USA

Discover more at **Centrisys-CNP.com**

centrisys cnp

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11 Organizations
Involved in WRF Pilot

- Water Research Foundation (WRF)
- Nine Springs Treatment Plant (Madison, WI)
- Milwaukee Metropolitan Sewerage District (Milwaukee, WI)
- Metro Wastewater Reclamation District (Denver, CO)
- Massachusetts Water Resources Authority (Boston, MA)
- Colorado School of Mines (Golden, CO)
- University of Wisconsin-Madison (Madison, WI)
- Black and Veatch (Madison, WI)
- Hazen and Sawyer (Virginia Beach, VA)
- Centrisys/CNP (Kenosha, WI)
- Nutrient Recovery and Upcycling (Madison, WI)

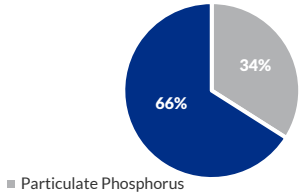
WRF published a peer-reviewed study to elaborate on the CalPrex process performance, benefits, costs and larger scale impact.

STEADY STATE

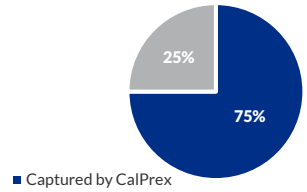
Steady State™ is a sustainable fertilizer brand by Nutrient Recovery and Upcycling (NRU). NRU is the distribution channel for the recovered nutrients from MagPrex and CalPrex. To learn more, visit www.newsteadystate.com or www.nrutech.com.

CalPrex Pilot Phosphorus Recovery
Madison Metropolitan Sewerage District's Nine Springs Treatment Plant
Pilot Test Fall 2018

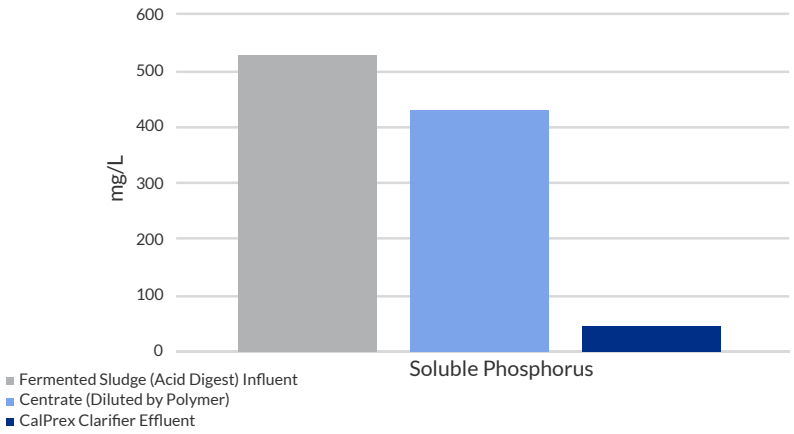
Influent Total Phosphorus



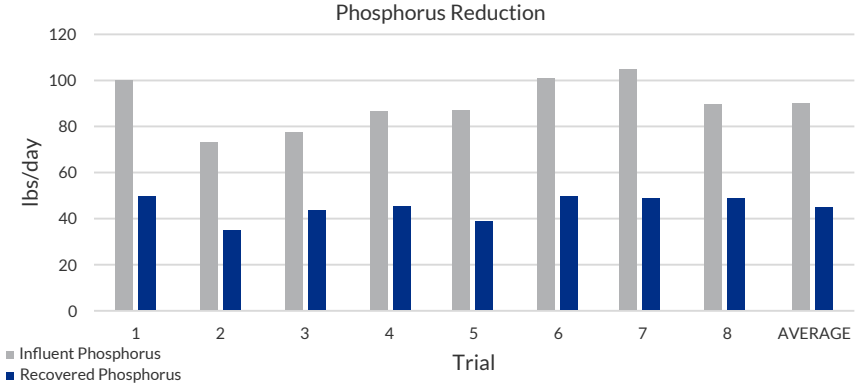
Soluble Phosphorus Recovery



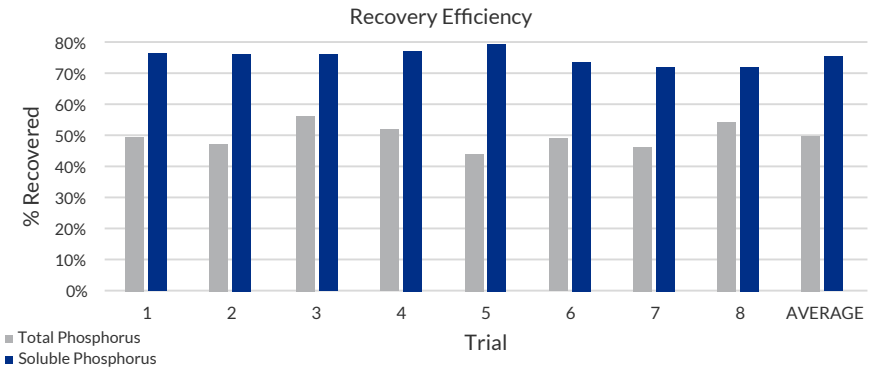
Soluble Phosphorus Concentrations



Phosphorus Reduction



Recovery Efficiency



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9586 58th Place | Kenosha, WI 53144 USA | +1 (262) 654-6006 | info@centrisys-cnp.com
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