



THERMAL
PROCESS
SYSTEMS

TPS

SNDRTM

STORAGE NITRIFICATION DENTRIFICATION REACTOR

***Your Best Solution
for Biosolids Conditioning***

Storage Nitrification Denitrification Reactor™

The digestion of biosolids, either aerobically or anaerobically, releases nitrogen which is quickly converted to ammonia. Ammonia raises the pH of the digested biosolids and often results in higher requirements of chemical conditioners and polymers for dewatering.

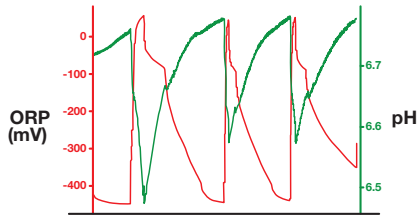
With the patenting of the Storage Nitrification Denitrification Reactor™ (SNDR), biosolids can be dewatered more economically, generating a very high quality end product. The SNDR provides optimum temperature, pH, alkalinity and aeration conditions for nitrification and denitrification.

This reactor is operated at just under 100° F, a temperature ideal for the

optimal growth of nitrifying and denitrifying bacteria.

pH set points can be used to control the nitrification and denitrification process by creating aerobic or anoxic conditions. The nitrification process reduces alkalinity and therefore lowers the pH of the system. This provides an ideal method of control for the SNDR process.

After dewatering beneficial nitrifying/denitrifying bacteria are returned to the plant headworks to reseed the aeration basins. In addition, the SNDR can provide a method of pre-scrubbing any ammonia laden off-gas from an upstream process.



Typical oxic and anoxic cycles that occur in the SNDR as indicated by the variance in ORP and pH conditions.

“Before we installed the SNDR tank to our ATAD system we experienced numerous violations in effluent ammonia, turbidity, and suspended solids. The SNDR tank lowered the ammonia levels in our de-watered sludge, resulting in improved plant effluent ammonia, turbidity, and suspended solids. The de-watered cake sludge has no odors.”

Dave Gromm
 Director of Wastewater
 Collections and Plant Operations
 Calera Creek Water Recycling Plant
 Pacifica, California



*SNDR -
 Decatur, Indiana*

SNDR Advantages

- **Lower Disposal Costs**

SNDR provides additional VS and TS reduction to any treatment process operations, even high rate processes. The SNDR process conditions the solids to allow dewatering equipment to produce higher solids concentration and therefore less volume to be hauled from the facility.

- **Single Reactor System**

Nitrification and denitrification is carried out in a single tank.

- **Possible Capital Cost Savings**

The SNDR can be retrofitted into virtually any tank configuration. This offers capital costs savings by employing existing tankage.

- **Simple Control Strategy**

A control strategy based on pH, temperature and ORP controls the overall process in SNDR.

- **Full Automation**

Automation includes automatic waste, feed, aeration, nitrification and denitrification. The system can be operated with minimal assistance.

- **Lower Nutrient Recycle**

Nitrification and denitrification in the SNDR greatly reduce the ammonium concentration in the recycle streams.

- **Lower Conditioning Costs**

Reduction in soluble COD and ammonium in the SNDR significantly reduces dewatering costs.

- **No External Alkalinity May Be Required**

Depending upon system adaptation, the SNDR may be able to utilize CO₂ released during digestion which can generate carbonate and bi-carbonate alkalinity. This alkalinity, when transferred to the SNDR, is utilized for nitrification, therefore, reducing or eliminating the requirement for external alkalinity addition.



SNDR Jet Motive Pump Yorkville-Bristol
Sanitary District, Yorkville, Illinois

“Thermal Process Systems SNDR provides the Delphos WWTP with the flexibility to dewater when necessary according to our loadings. Controlling the aeration in this storage tank allows us to nitrify and denitrify, reducing polymer consumption and improving dewaterability. In addition, we see approximately an additional 10% TS destruction across the SNDR which means less biosolids cake product to haul to the field and increased capacity in our solids storage building.”

*Kim Riddell, Wastewater Superintendent
Delphos, Ohio, Wastewater Treatment Plant*

“We’ve always credited the conditioning that the biosolids receives in the SNDR as the reason we have excellent decanting ability in our long term storage tanks. This has allowed us to thicken our biosolids without the cost of chemicals and has cut our land application hauling almost in half.”

*Scott Truedson, Assistant Superintendent
City of Marshall, Minnesota, Wastewater Facility*



TPS SNDR is designed to enhance:

- Existing and proposed operations
- Anaerobic digestion systems
- ATAD operations
(including existing 1st generation ATAD)
- Aerobic digestion systems
- Animal residue treatment operations
- Recycle and return sidestreams

TPS SNDR offers:

- Single reactor system
- Energy efficiency
- Lower conditioning costs
- Lower disposal costs
- Full automation
- Lower nutrient cycle
- Ability to utilize existing tankage
- Additional solids reduction

The **experience** to know what works.
The **innovation** to make it work better.

Thermal Process Systems was founded by experienced wastewater treatment professionals, who understand the complex issues of biosolids processing and re-use. Hindered by the compromises that were necessary with existing systems — and the inability of these processes to meet regulatory requirements — they formed their own company focused on the development of solids treatment processes, which have been subjected to rigorous field testing in full-scale operating systems, and pilot testing at various sites since 1995. Thermal Process Systems' on-going research and operational experience continues to provide process improvements and new technologies consistent with our corporate mission.

Contact us today for a no obligation analysis of your
biosolids management needs (219) 663-1034



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