



Midwest Biosolids Association – Annual Meeting

Addressing Perceived Risks in Biosolids Management Programs

May 2025

SYNAGRO

YOUR PARTNER FOR A CLEANER, GREENER WORLD

- EPA Biosolids Risk Assessment
 - Synagro's view and observations
- Approach to managing biosolids program risks in the era of PFAS
 - Strategic Actions
 - Tactical/Operational, and
 - Technology Based

- **Synagro's view of Health Risk Assessment (HRA)**

- The HRA, as issued, was an incomplete and misleading analysis. The science was flawed.
 - Overly conservative assumptions about farm family modeled - e.g., no waiting period between applications.
 - Ignores existing regulations for avoidance of run-off into waterways.
 - Does not consider recent research on plant uptake and bioavailability of PFOS/PFOA.
- The risk management component was omitted; no perspective on relative risks. For example,
 - No benefits of biosolids land application are considered.
 - Should compare risk to other exposures (e.g., cosmetics, carpeting, food packaging, cookware? Risk of using chemical fertilizer versus biosolids?
- Biosolids management is NOT optional and the HRA fails to consider the risks of alternatives.

- **Impacts Observed**

- Created uncertainty and confusion and increased costs within the regulated industry.
- Drove several state legislatures to move forward with their own PFAS/Biosolids related rulemaking.

- **Current Status**

- Changing personnel and rulemaking approach may slow process.
- Draft HRA comment period extended, science and framework challenged – Final model unlikely until 2027.
- Both sides of isle now seem to recognize need for “polluter pays” and “passive receiver” liability protection.

Mitigating Perceived Risks

A Multi-Tiered Approach to Managing Biosolids in the PFAS Era

Three-Tiered Approach to Managing Perceived Risks

1. Strategic Approaches
2. Tactical / Operational Changes
3. Evaluate Potential Technology-Based Solutions

Strategic Approaches

1. Consistently deliver key messages
2. Build and support industry coalitions to educate policy makers
3. Defending biosolids beneficial use

Key Messages

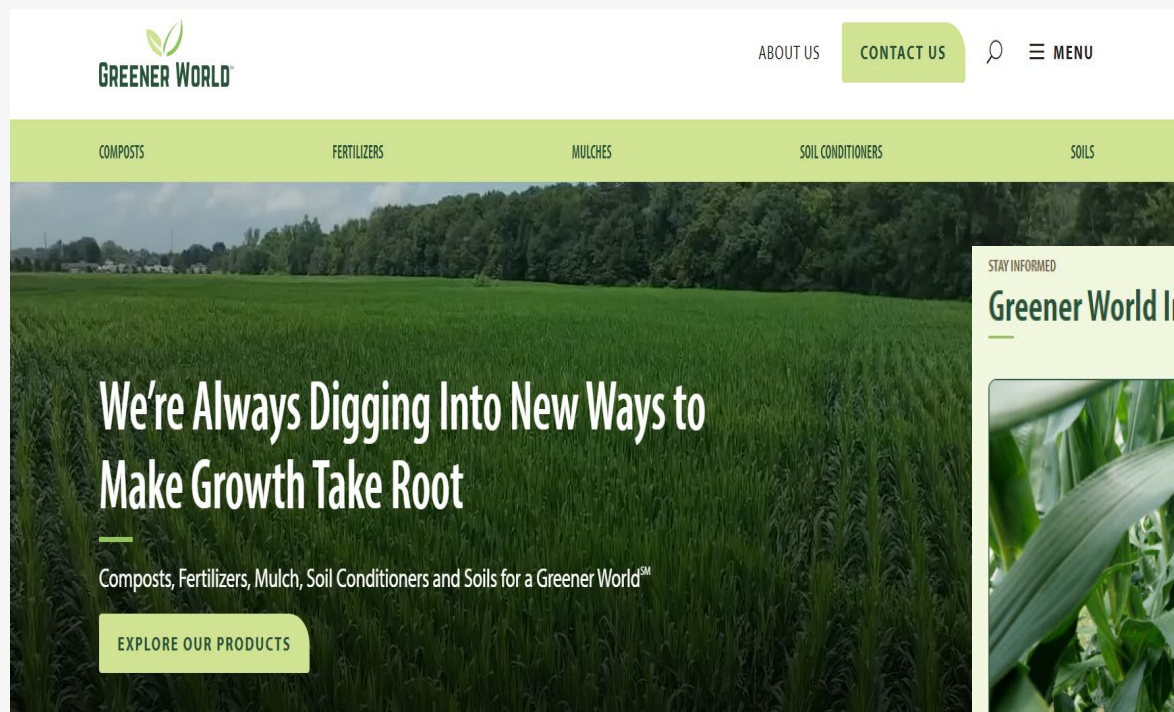
- Advocating for source control – It has worked in the past and will work here.
- Continuity of “polluter pays” principle (passive receiver exemption)
- Supporting study and testing in various states – Collecting data to make good decisions
- Opposing bans and de-facto bans that use non-scientific numeric standards.
- Be quick to study and slow to regulate
 - A lot of research ongoing, let it happen before we make rules
- Supporting interim state regs based on samples from generators
- Supporting national science-based regulations as good for everyone.



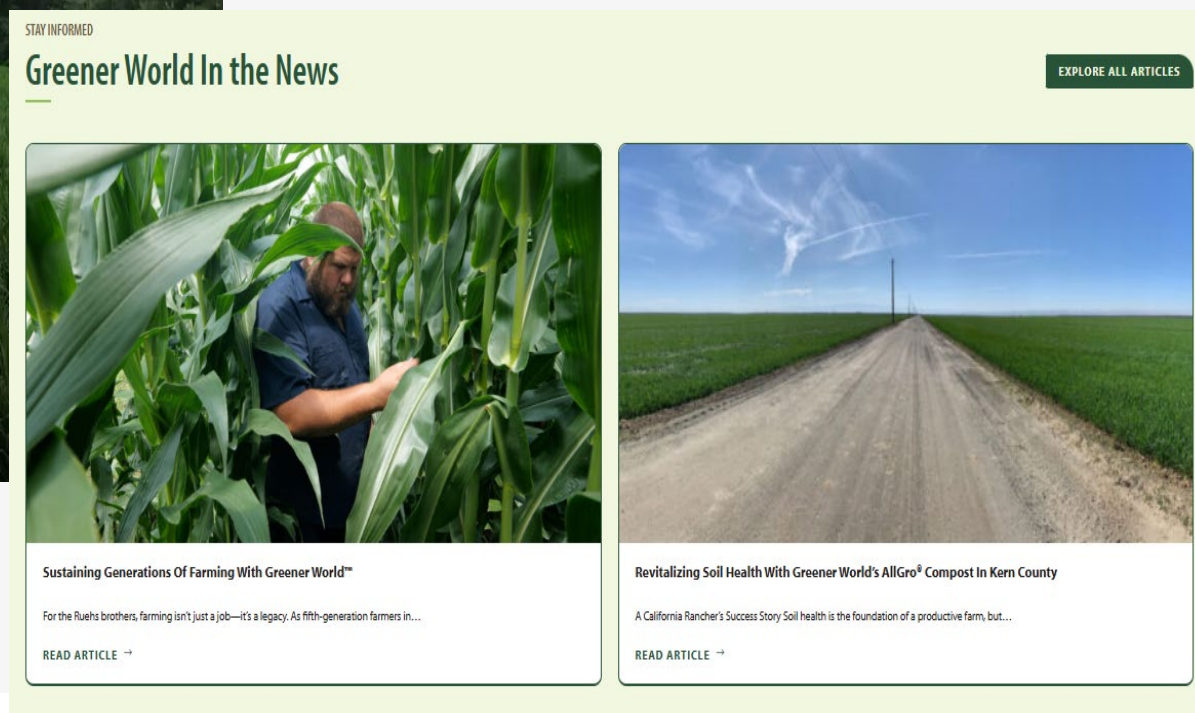
CRROPS
*Coalition of
Recyclers of
Residual
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Providers of
Sustainability*

- Organizational Changes to Address Federal and State Legislation Initiatives
 - At Synagro that has meant adding senior level resources to coordinate communications with regional internal teams and external stakeholders – e.g., regulators, policy makers, and trade groups.
 - Decide who on your team is tracking these initiatives.
- Customer/Internal communications
 - Do your research, learn your numbers – Synagro is researching levels at our Class A facilities and our largest land application customers. Need data to understand and speak credibly.
 - Identify and address potential dischargers.
 - Many customers evaluating drying – Volume reduction and as a first-step toward other technologies.
- External communications
 - Focused on educating end users.
 - Developed PFAS fact sheets for FAQ and tool to calculate loading rates.
 - Response to media articles about PFAS and biosolids risks – Try to educate and balance.
 - Commissioned a third-party study on PFAS and biosolids land application.

In the face of constant noise, let's not let people forget the benefits of biosolids beneficial use...



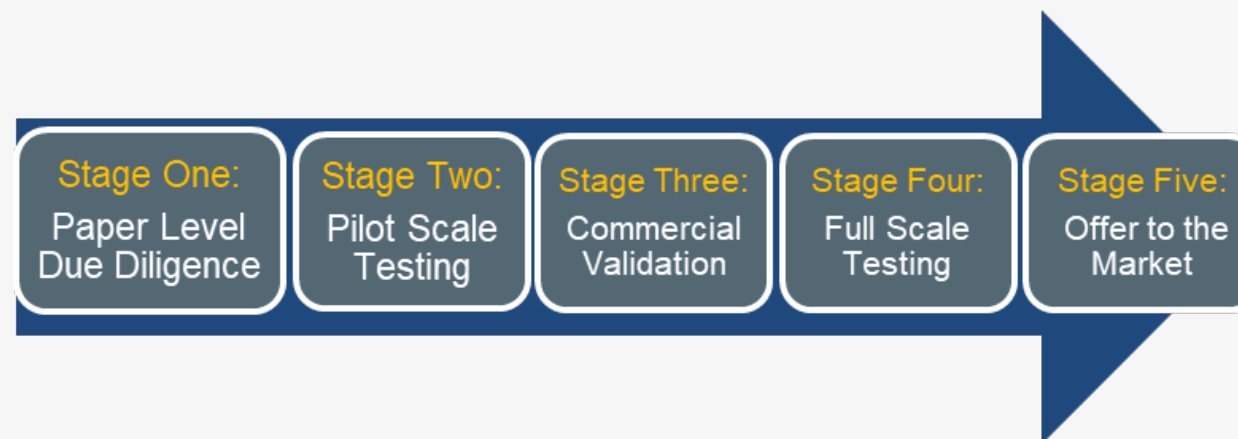
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Using Technology to Manage PFAS

- Synagro is a Solution Provider - We consider ourselves “technology neutral.”
- We are not consultants, but we routinely evaluate new technologies via our Stage Gate process.

Stage Gate Process for Technology Review



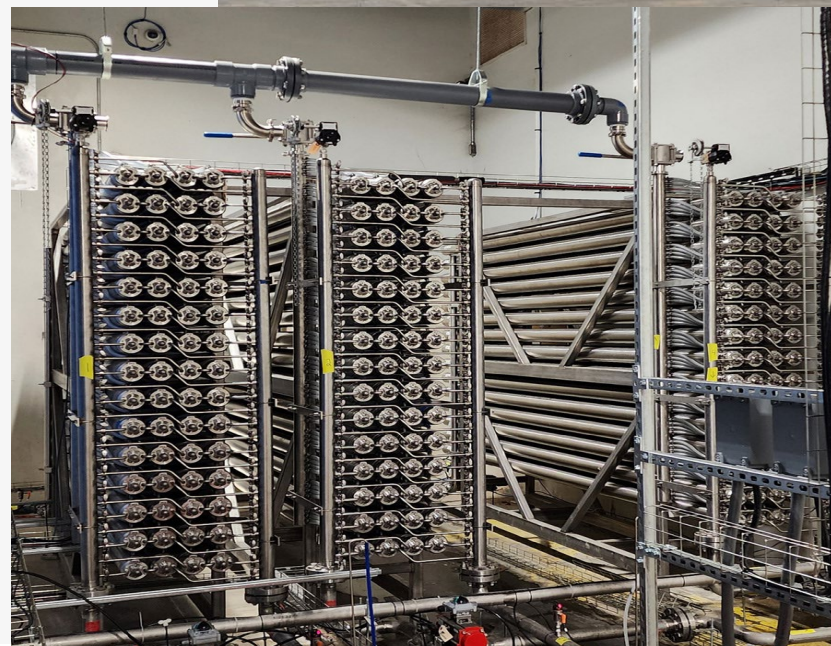
- Heat drying – Appears to reduce PFAS and is a good step – Class A product and volume reduction are strong bets in uncertain times.
- Lime addition may mineralize PFAS, while destroy volatile solids may concentrate PFAS.
- Many thermal technologies are still emerging, in our view – Exit in small scale or single-installation facilities. We are working with various manufacturers to help commercialize these systems.
- Often, core systems work but there are issues with scaling, systems integration, and materials handling.

Examples of PFAS-friendly technologies that have recently passed our Stage Gate screening include:

- SynaPure
- Char Pyrolysis
- Pyrocal Gasification
- Deep Well Injection

SynaPure – Containerized Wastewater Treatment

- Combines membrane ultra/nanofiltration and reverse osmosis.
- Excellent treatment for lower-flow liquid sources.
- Removes PFAS to non-detection levels.
- Cost effective compared to most haul-away options.
- Waste streams treated include:
 - PFAS users (pre-treatment)
 - Landfill leachate (passive receivers)
 - Metals removal
 - High strength food wastes
 - Water and wastewater treatment lagoon flows



CHAR - High Temperature Pyrolysis

- Indirect rotary kiln - Syngas recovery, RTO for emissions control.
- Follows bench and small-scale pilots - 10 DT/day pilot at the City of Baltimore, Back River plant
- Demonstrate at least 6 months sustained performance.
- Verify the PFAS characteristics (if any) and fate across the HTP.

Pyrocal – Biosolids Gasification

- Pyrocal is an integrated technology manufacturer and system supplier.
- Logan Water facility is processing 100% biosolids – Started as a demo and is now a full-scale facility with three years of continuous operation.
- Integrated belt drying and gasification.
- Collecting data on PFAS destruction and fate.



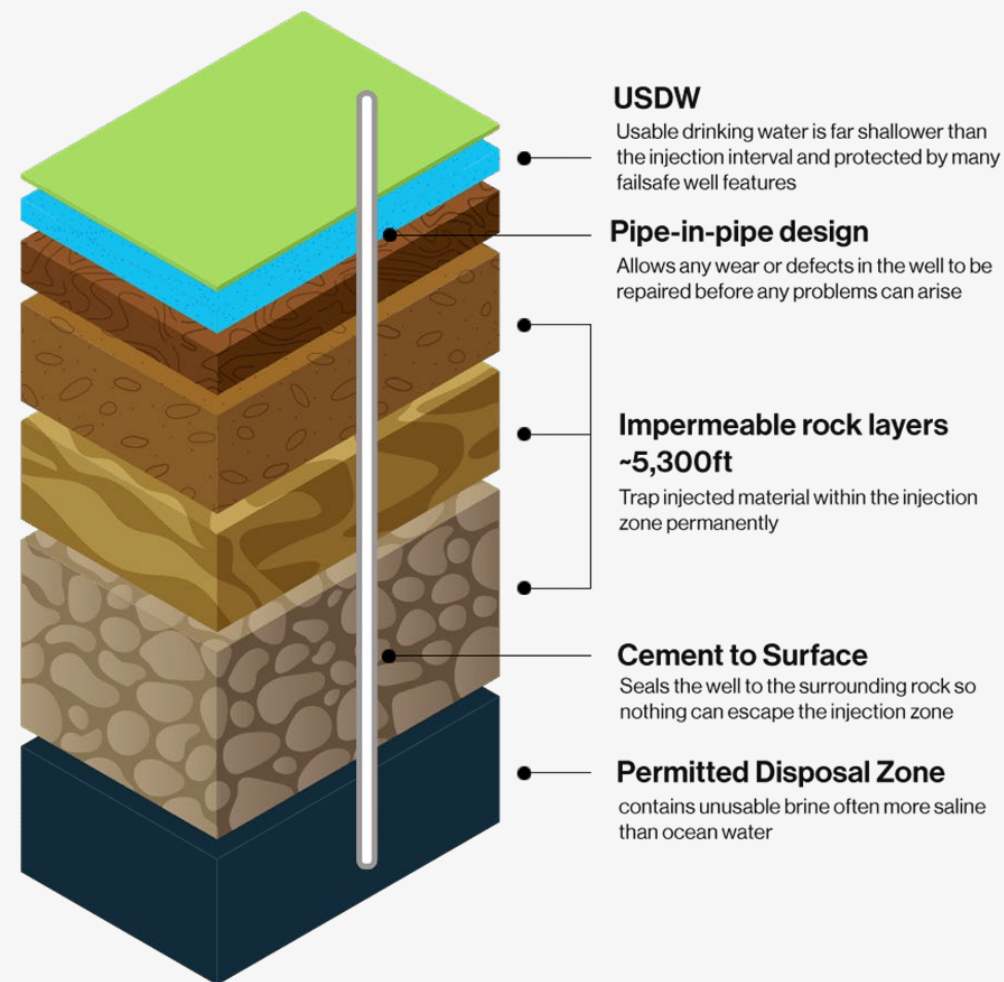
Char High Temperature Pyrolysis – Full Scale Demo



Pyrocal – Biosolids Gasification Unit – Logan, Queensland, Australia

Carbon Sequestration by Deep Well Injection

- Vaulted operates the only two permitted biosolids deep injection wells in the United States.
- TIRE – Partnership with the City of Los Angeles: 10+ year successful operating history.
- Deep Injection Well management of wastes is proven technology.
- A wide variety of waste products are managed via deep well injection, including:
 - Oil & gas waste, brines, Haz Waste Landfill leachate, wastewater effluent
- Inject slurries at 8% to 10% dry solids using high pressure to expand or create new spaces in the target formation.



- Andrew's view – Beneficial use of biosolids is going to survive
 - Risks are minimal
 - Benefits are well documented
 - Emerging state-level models after researching levels (e.g., MN)
- Pollution prevention was, is, and will continue to be the right approach
- Rule changes are coming, so get prepared
- What you can do:
 - Research your numbers and your industrial users.
 - Push hard on source control – Like metals reductions in from pre-503, this is the key.
- Technology options are evolving rapidly and moving quickly to commercial viability