



Extrakt Alliance

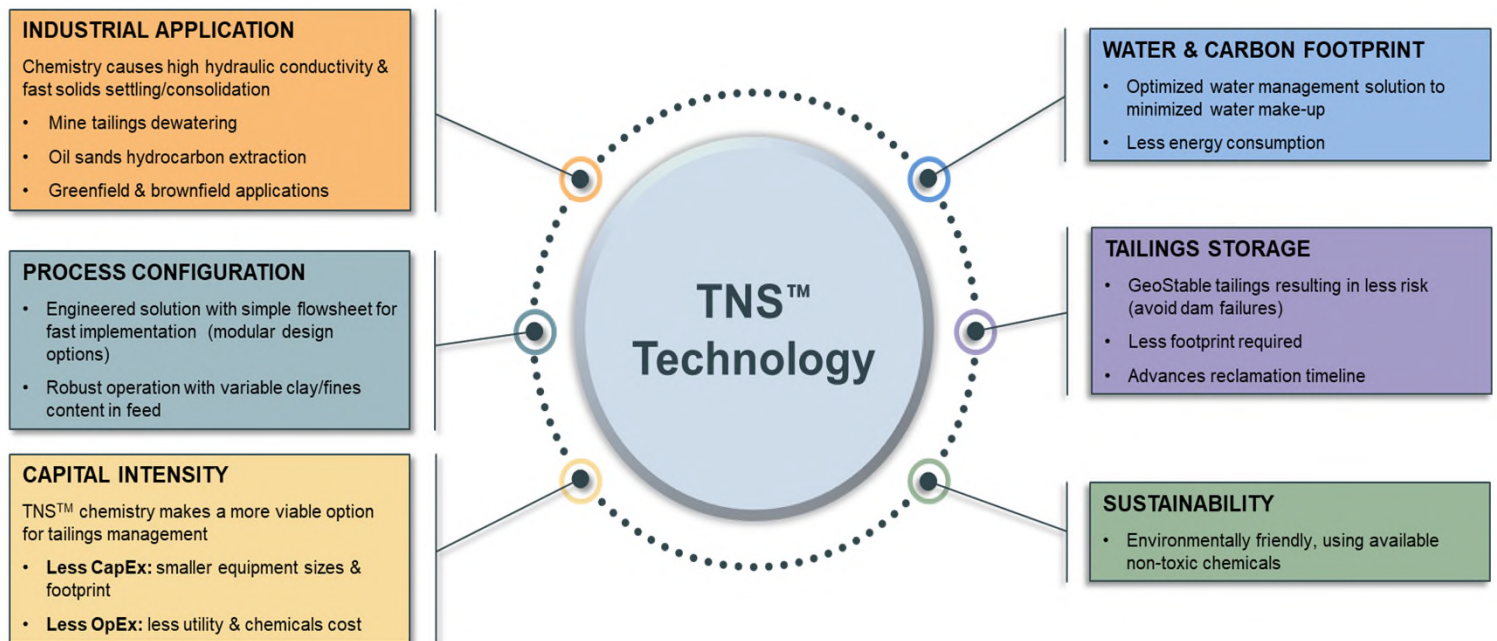
Extrakt Process Solutions, LLC (Extrakt) and Bechtel Energy Technologies & Solutions, Inc. (BETS) have partnered in a strategic global alliance. This alliance marks a significant milestone in the commercialization of Extrakt's solid-liquid separation technology, known as TNS™, by leveraging Bechtel's experience in engineering and delivering solutions globally.

Dewatering of tailings has presented long standing challenges to mining companies. TNS™ can help address challenges regarding mine tailings management, by providing faster dewatering, drier tailings, and in some cases improved metals recovery in a sustainable and cost-effective manner.

The Alliance Offering:

The alliance will provide **1) Lab/Pilot Testing, 2) Studies, 3) Licenses and Process Design Packages, 4) TNS™ Chemical and Equipment Supply and 5) Post-startup Services.**

To achieve this Bechtel will lead the marketing and provide engineering services to support the commercialization of TNS™ in the Energy and Mining & Metals sectors; and Extrakt will continue to improve & manage intellectual property regarding TNS™ technology and provide licensor support.



How does TNS™ Technology Impact Solid Liquid Separation?

TNS™ is designed with an innovative approach for dewatering and facilitating hydrocarbon/solid separation in contrast to conventional chemistries that attempt to modify the particle surface chemistry. **TNS™ differs from conventional technologies by disrupting the particle surface charge allowing them to collapse and consolidate quickly and efficiently improving separation performance.**

For most operators, issues with fine clays make separation difficult, resulting in high GHG for biological processes, poor filter press filtration performance or reduced thickener throughput creating operational constraints and economic loss.

The typical constraints and risks associated with separating oil contaminated streams are reduced through the TNS™ technology, offering a competitive advantage over conventional technological solutions.

Delivering a sustainable solution by combining:

- ✓ Establish and deploy a **team with expertise** in geotechnical, chemical, and environmental disciplines
- ✓ **Integrate TNS™ and dewatering solution** without disrupting existing operations
- ✓ **Scale-up: simple and efficient**
- ✓ **Significant lab and pilot** plant experiences

Main Advantages of TNS™ Technology

- ✓ TNS requires **minimal mixing** and allows flocculation at **higher solids concentrations**.
- ✓ The **ease** of flocculation and **efficient** capture of ultra-fines produce a clear supernatant/filtrate/dilbit.
- ✓ **Reduce** tailing construction storage **costs** and reduce **fresh-water consumption** via recycled water.
- ✓ The **higher dewatering rates reduce the CapEx and OpEx** of dewatering equipment such as tailings thickeners and filters.
- ✓ The TNS™ chemistry **improves** flocculation, **allows faster dewatering rates** than the conventional polymer technology.
- ✓ The **consistency** in dewatering will translate to a significant risk reduction associated with plant performance and storage of filtered tailings.



TNS™ Applications

The filtered tailings benefit can now be achieved even with tailings that have extremely high/difficult clay contents. The TNS™ technology makes possible the reduction of fresh-water intake through improved water recovery and thereby better water utilization as well as reducing the potential of liquefaction of tailings storage facilities by reducing the water content within the stored tailings. The technology has successfully been tested on various tailings streams including:

- Ease of use for processing challenging tailings
- Improve metals recovery (gold, silver, copper)
- Iron tailings streams (slimes – coarse mixtures)
- Oil spill remediation & reclaiming hydrocarbons (Clean-up of contaminated sands)
- Oil sand extraction from surface mining



Extrakt Pilot Plant for the TNS™ Technology Demonstration (Bowling Green – Kentucky, USA)

Service Available for TNS Technology Implementation

- ❖ Test-work and conceptual studies.
- ❖ Consulting & optimizations studies.
- ❖ Pre-feasibility or feasibility studies.
- ❖ Pilot or demonstration test work.
- ❖ License and technology design package.
- ❖ Detailed engineering, procurement, construction (EPC).
- ❖ Commissioning, maintenance, technical support and asset optimization services.