Fixed Earth Innovations

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FIXED EARTH

About Us

We founded Fixed Earth Innovations in late 2019 with the goal of developing technologies to improve the world around us. We are a small team of people who share the common vision of running the business right and doing the best job possible. While we are a young company, we have been developing some of our technologies for almost a decade and are well versed in the remediation industry.

Our Lab – Fort St. John, BC

May, 2020

In April 2020 we moved to our new lab in Fort St. John, BC. At this location we have an office as well as lab spaces dedicated to microbiological research & development, plant growth promotion research, chemistry, and the ability to produce products for field deployment. Call or email to arrange for a time to visit.

Challenges Posed by Legacy Sites

Topsoil

Legacy sites rarely have topsoil strippings that can be used for site restoration or soil has been poorly managed

Water Stress

Clay subsoil dries quickly, can form crusts that prevent seed germination, and is slow to absorb water

Erosion

Sites are prone to erosion, resulting in offsite impacts, movement of pollutants, or loss of soil

Contamination

Sites are frequently contaminated with hydrocarbons, salts, and pesticides that must be removed at high cost

Budgets

Limited budgets mean less sites can be restored each year. One polluted site can consume most of the budget.

The Solution – Think Small

Remediate sites while completing reclamation and restoration through the use of microbial communities

In Situ Remediation

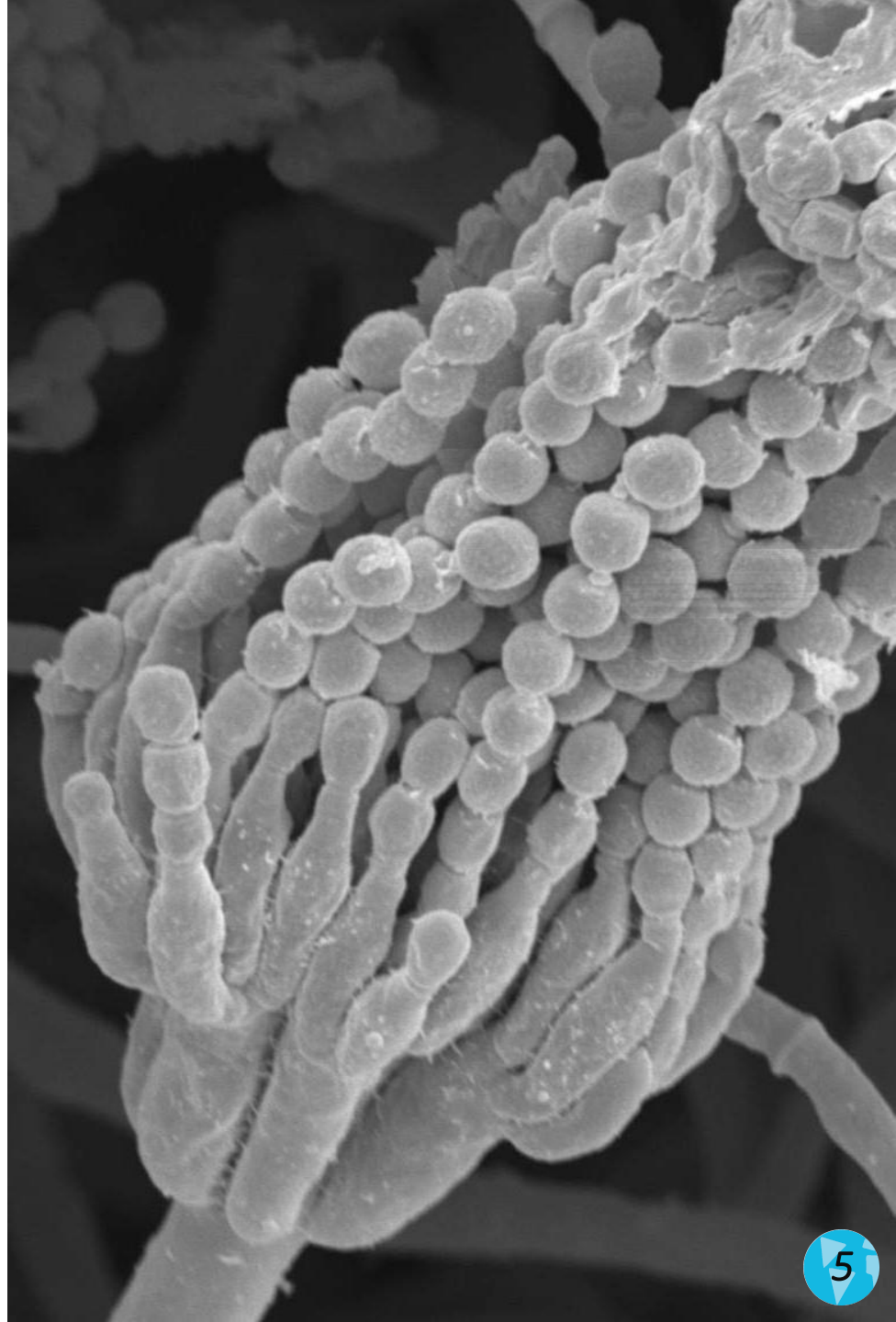
Remediate pollutants without removing the soil. Less environmental disturbance and lower carbon footprint

Plant-Microbe Symbiosis

Many of the same microbes used to degrade pollutants help plants grow under high-stress conditions

Technology Partnerships

Partner with other technology providers and local organizations to provide the best solutions possible



Plant Growth Promotion

Seed Germination

Microbial partnerships improve seed germination and establishment

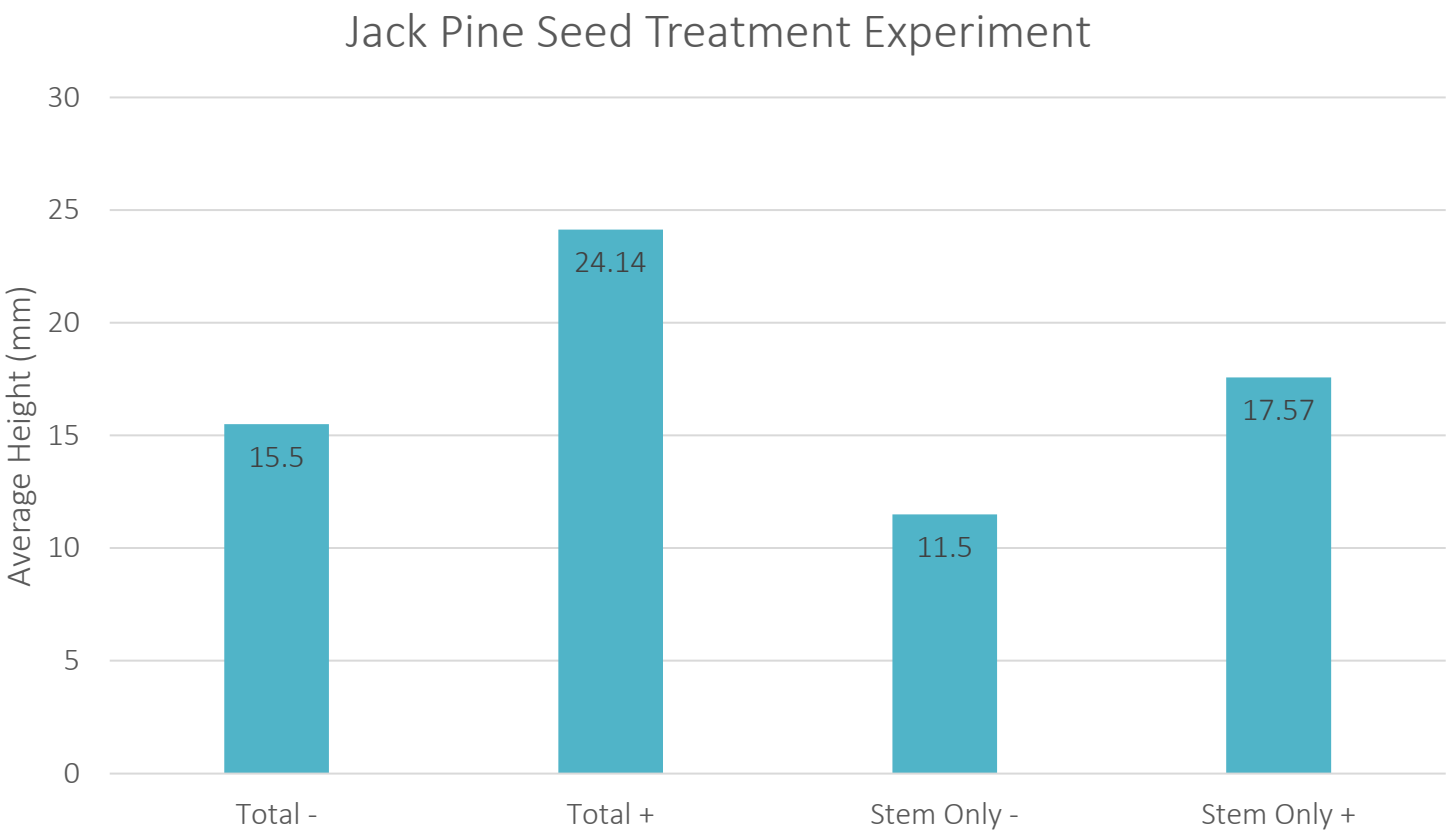
Water Uptake

Water uptake is improved through increased root hair numbers and fungal hyphae

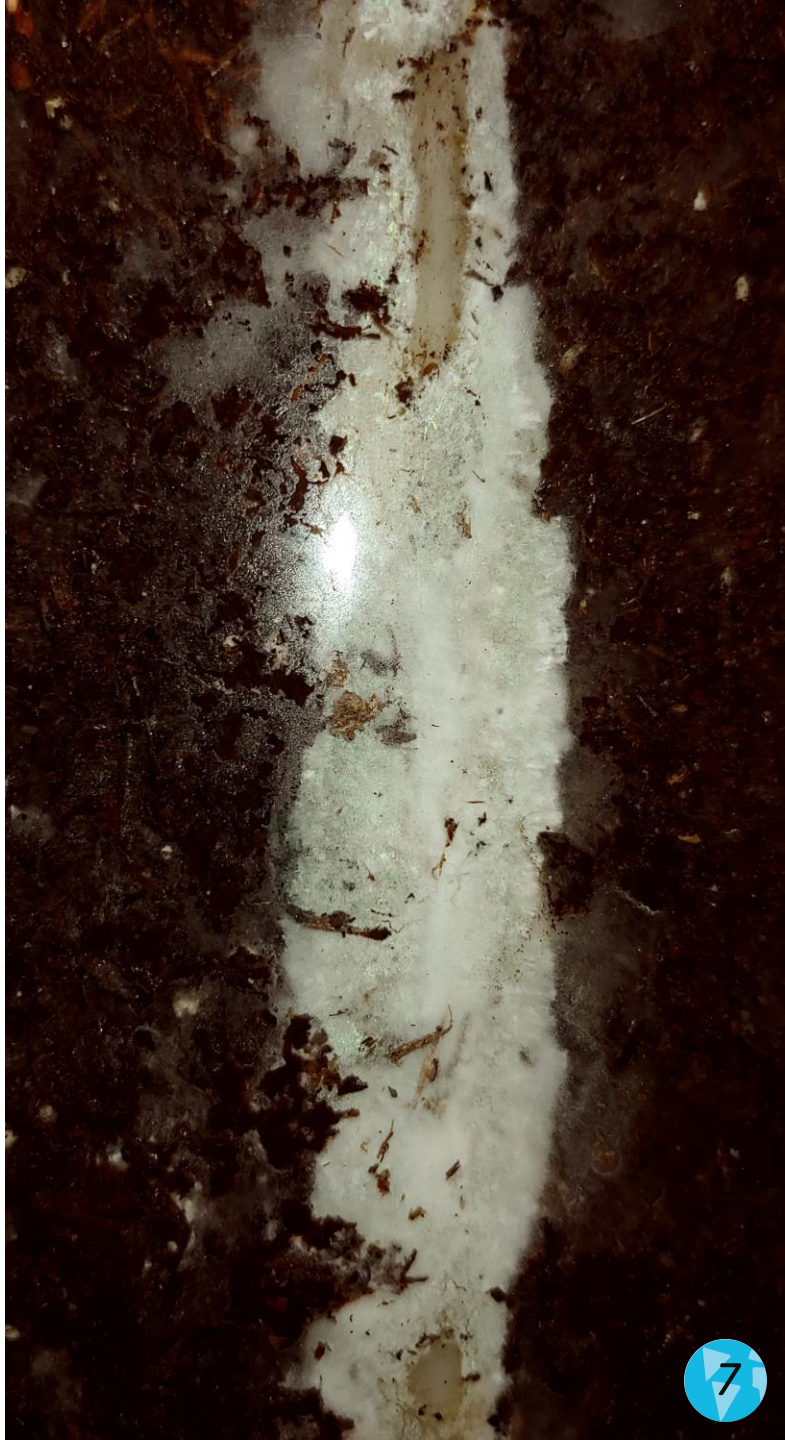
Faster Growth

Plants with symbiotic microbes grow larger faster, making them less prone to environmental changes

Tree Growth Promotion



We have both seed coating products that enhance early tree seedling establishment as well as a biodegradable tree root “spike” that can be used to provide beneficial microbes to already established trees.

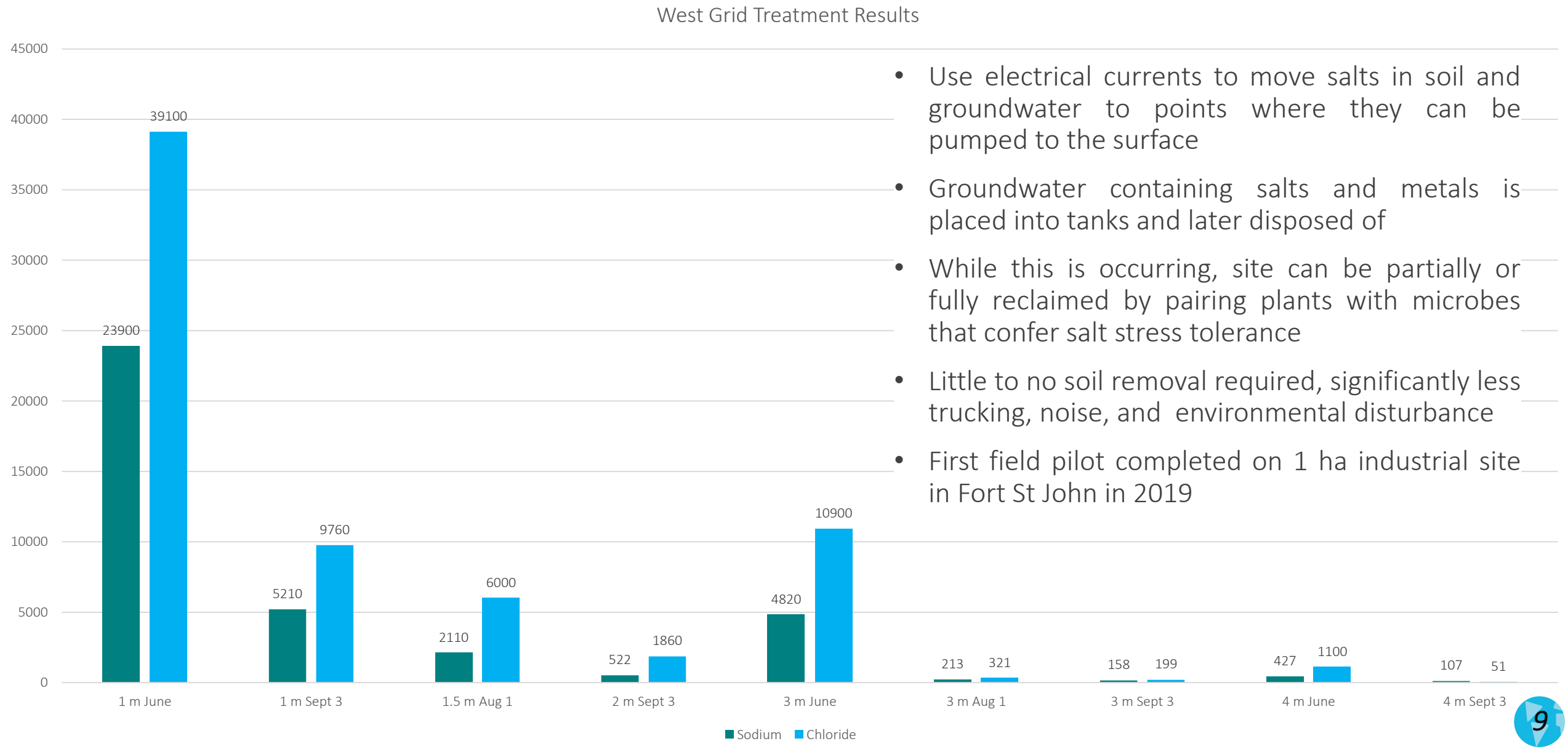


Hydrocarbon Remediation

Parameter	Standard	Pre-Treatment	15 Days of Treatment 1	15 Days of Treatment 2	15 Days of Treatment 3
C10-C19	2 000 mg/kg	820 mg/kg	42 mg/kg	<20 mg/kg	36 mg/kg
C19-C32	5 000 mg/kg	25 400 mg/kg	1 020 mg/kg	158 mg/kg	788 mg/kg

- Use electrical currents to generate oxygen below ground, allowing for the maximum microbial activity
- Application of multiple hydrocarbon degrading microbes to ensure all hydrocarbon types are degraded
- Other technologies, including biodegradable surfactants, make microbes more efficient
- Faster than traditional bioremediation techniques, the above site was completed in under one month
- Lower cost than traditional dig & dump methods (< 60 %)
- Minimal ground disturbance, was completed around underground infrastructure such as gas lines and sanitary sewers
- Some of the microbes used for degrading hydrocarbons are also used to promote plant growth, making site restoration at the same time as remediation possible

Salt Remediation



- Use electrical currents to move salts in soil and groundwater to points where they can be pumped to the surface
- Groundwater containing salts and metals is placed into tanks and later disposed of
- While this is occurring, site can be partially or fully reclaimed by pairing plants with microbes that confer salt stress tolerance
- Little to no soil removal required, significantly less trucking, noise, and environmental disturbance
- First field pilot completed on 1 ha industrial site in Fort St John in 2019

Other Pollutants

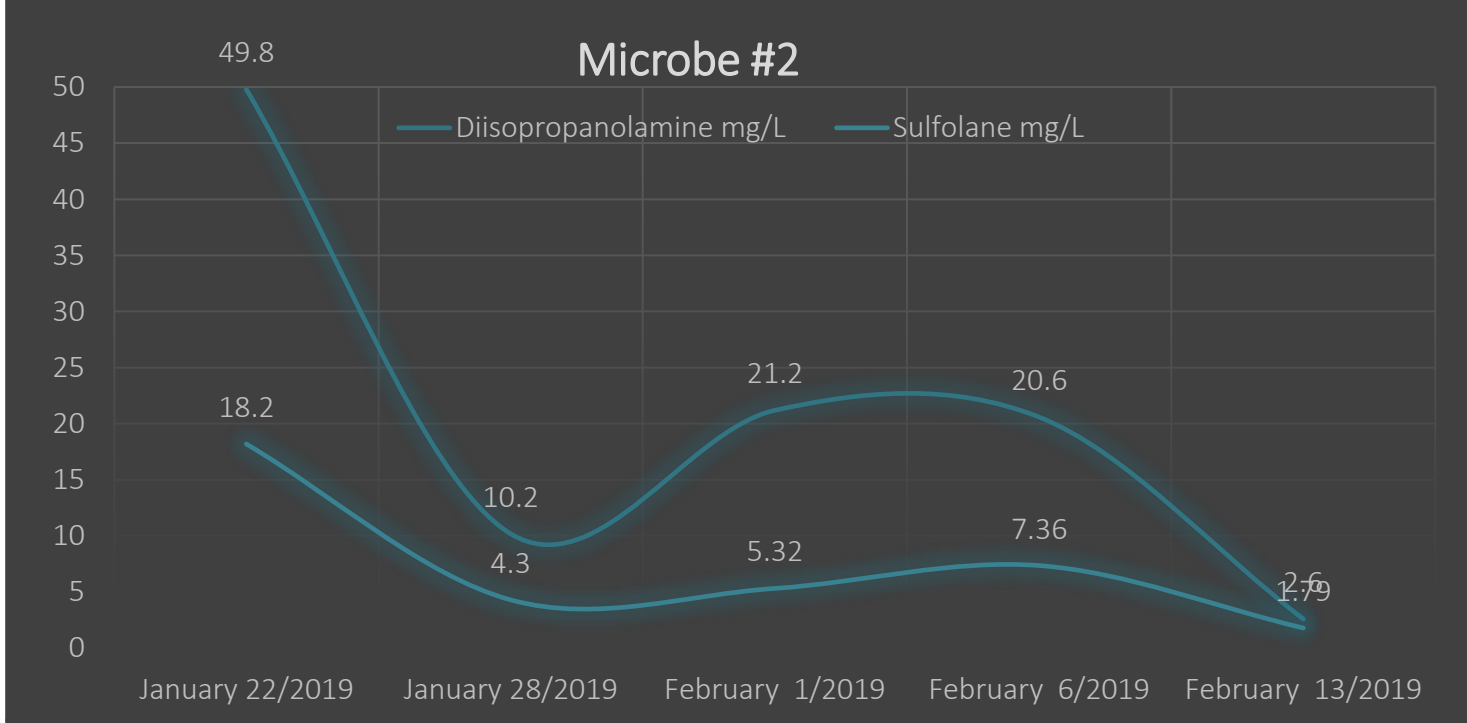
In addition to the remediation of common pollutants, we are always seeking new challenges to remediate other difficult chemicals. We currently also have microbes to remediate:

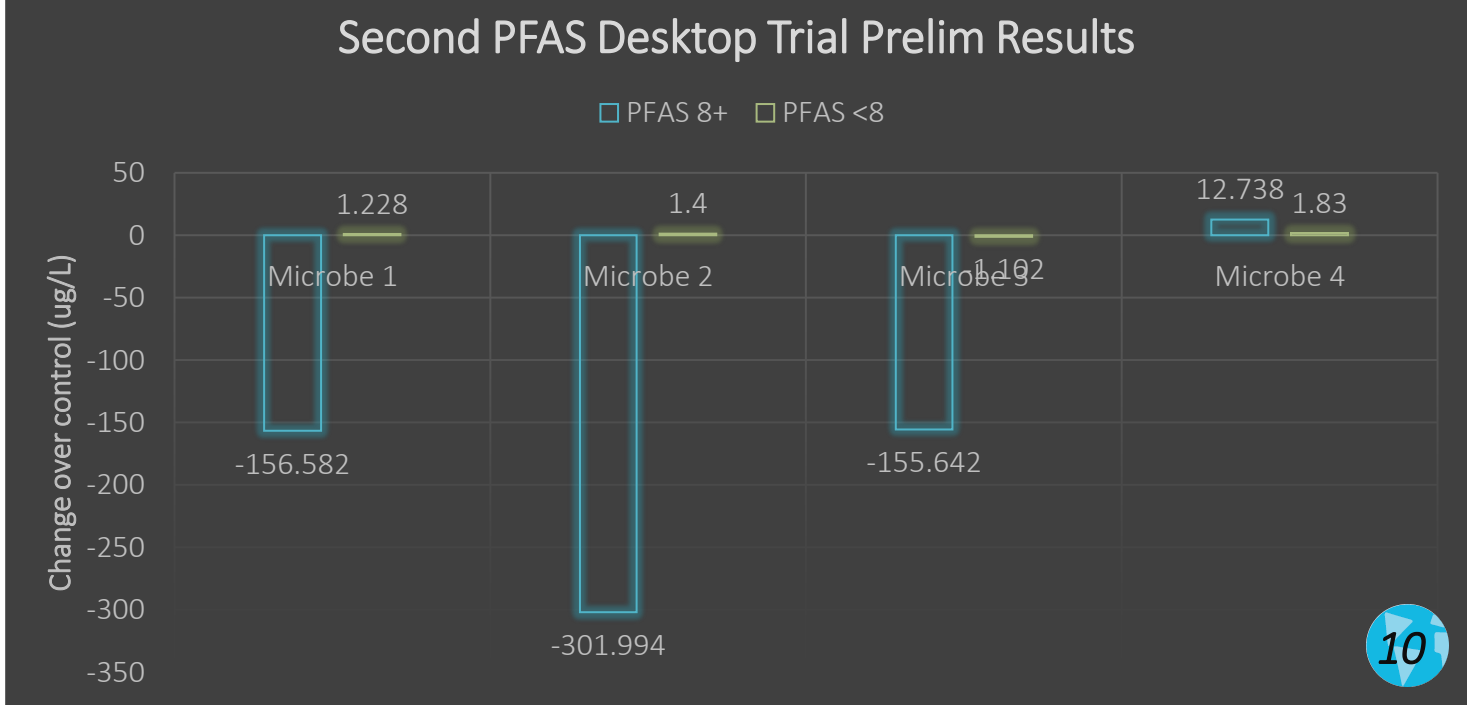
Sulfolane/DIPA

Hexavalent Chromium

PFAS

And we are developing methods to isolate microbes to begin researching remediation of arsenic and selenium.





Current Research and Development

Can we make remediation and site restoration faster and more efficient still?

Ecosystem Restoration

One of the major challenges in reclamation is introducing ecologically relevant species to previously disturbed site. We are developing easy ways to do this.

Microbial Nutrient Production

Rather than apply fertilizer to sites to promote plant growth and help with remediation, can we use microbes to provide the needed nutrients?

BTEX Remediation

While our products work on benzene, toluene, ethylbenzene, and xylenes, we would like to improve the rate that these hydrocarbons are removed

Our Partners

SIGNUM ENVIRONMENTAL

ROYNORTHERN Land and Environmental

DENBOW innovating naturally

Eco Remediation Alliance

OIL OUT Non-Toxic Environmentally Friendly

In Science We Trust GreenSTEM Technology

Dirty Dirt Services

Enviro Hazmat Emergency Response

ZEN EARTH CORP