

GROWING PAINS?

PRESCRIPTIVE VEGETATIVE DEVELOPMENT ON COAL COMBUSTION RESIDUAL IMPOUNDMENTS A COLLABORATIVE SOLUTION FOR SURFACE IMPOUNDMENT CLOSURE USING SPECIALIZED VEGETATION DEVELOPMENT

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ASK US ABOUT:

- ✓ Project Success
- ✓ Client Cost Savings
- ✓ CEC's Innovation
- ✓ Client Satisfaction

ASSESS

PROJECT CHALLENGES

- Regulations require CCR units to close, generally with a geosynthetic cap.
- High moisture content specifically near the surface of the CCR (20-50%) makes trafficability difficult creating worker and equipment safety concerns. When deploying geosynthetics.



High water content observed near the impoundment surface.



~5 psi ground pressure equipment sinking directly into the CCR surface

- Potential Solutions
- Woven Geotextile
- Amphibious Machinery
- Temporary Vegetation**

SMALL SCALE TRIAL

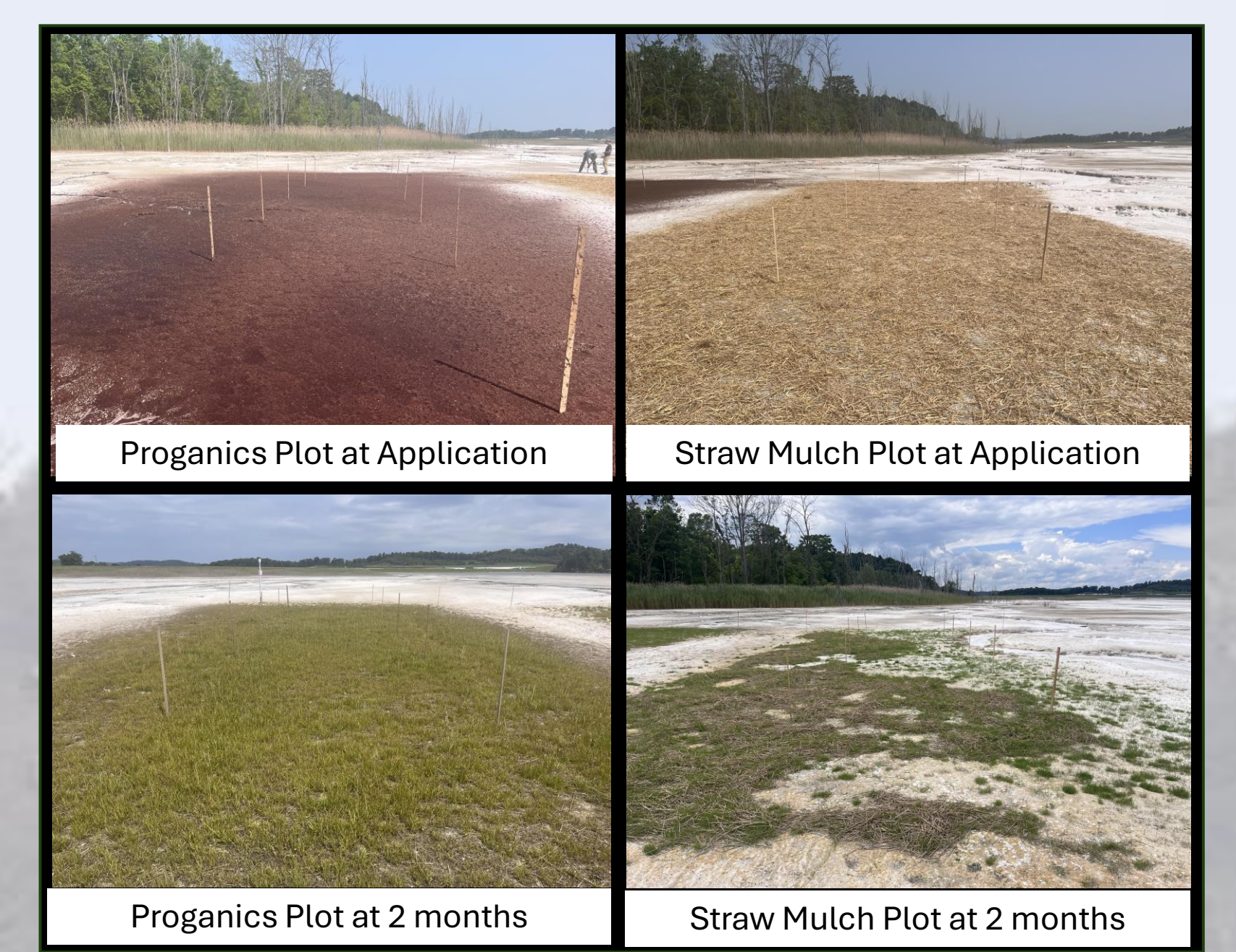
GREENHOUSE TRIAL AND MICROPLOTS

Item	Purpose
20-20-20 Fertilizer	General Fertilizer for Rapid Germination and Growth
BioPak Plus Microbial Inoculant	Bacterial and Fungal Microbe Community Boost
Methylated Urea	Slow-Release Nitrogen
ProSol Micronutrient	Full suite of micronutrient

Seed Mix
Nurse crop (oats or rye, seasonal)
Creeping foxtail
Tall fescue
Orchardgrass
Birdsfoot trefoil
Yellow blossom sweetclover



Growth chamber experimentation at CEC



Proganics Plot at Application, Straw Mulch Plot at Application, Proganics Plot at 2 months, Straw Mulch Plot at 2 months

LARGE SCALE TRIAL

60-ACRE TEST AREA OF MULCH OPTIONS



Early germination, November, in Proganics



Rooting depth average 10.5" Proganics (8" paper mulch)



60 acres treated for large scale trial, 30-acres Proganics, 30-acres paper mulch
Next step: Apply to entire site



Successful vegetation!

IMPLEMENT

HOW DOES THIS IMPROVE CEC'S SERVICES?

- Significant financial savings to the client – **efficient project completion and proof of concept**
- These methods are universal across industries for **hard-to-vegetate areas**
- Already succeeded in **winning projects and applying these findings** across multiple states in industrial and renewable site development

