# Innovative Solutions in Reclamation Monitoring

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## **Industry Challenges**

- We are all after the same goal: permit release and project closeout
- Platform inconsistencies
- Many different inspectors with varied regulatory/inspection/environmental expertise
  - = many different opinions
- As volume increases
  - Bottlenecks are created
  - Back-log frustration
  - Data becomes hard to manage

## The History

2016 (9 yrs. ago)

We began developing analytics using remotely sensed data

- Goals
  - Factual, Unbiased Data
  - Ground truth to improve
  - Accurate & Repeatable
  - Consistency
  - Common Platform
- Reliable Desktop Inspection







- Reclamation & Restoration
- Environmental Services
- Stormwater Management
- Punch List
- 3.1 M Acres Successfully Reclaimed



## SUSTAINABLE SUCCESS



- Soil Sciences
- Custom Reclamation Plans
- Site-specific Solutions
- Agronomic Research





- Asset Management
- Vegetation Analytics
- Field Validation
- Machine Controls

## **How We did it**





**STEP 1:** 

Basin-wide Assessment LIDAR



SCIENCE

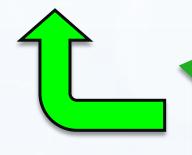
STEP 2:

Field Validation
Site Assessment



ENHANCE MODEL







**STEP 4:** 

Reclamation Process
Maintenance







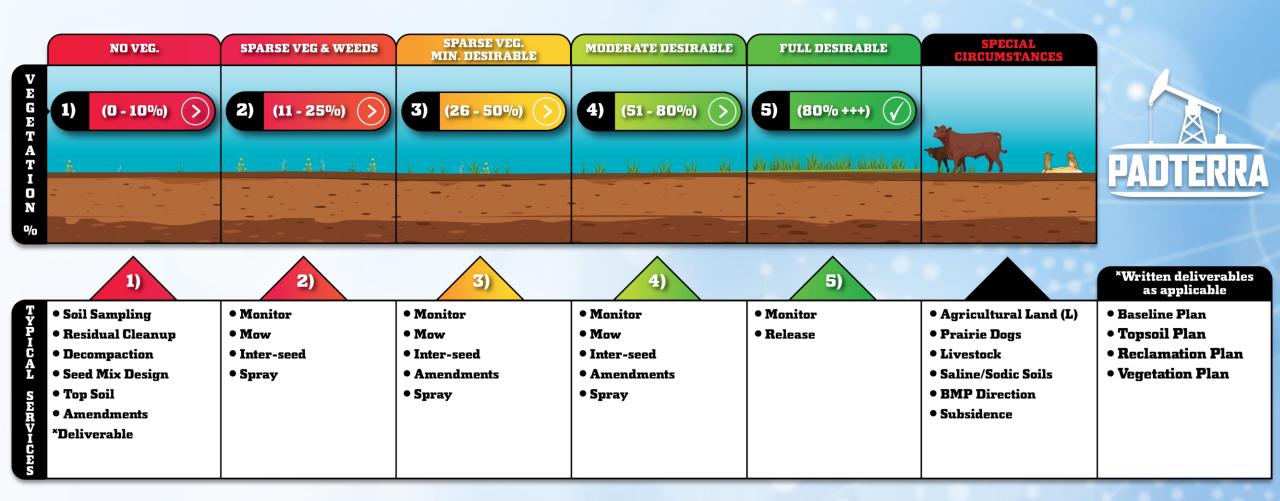
**STEP 3:** 

Site Characterization #5 or Higher



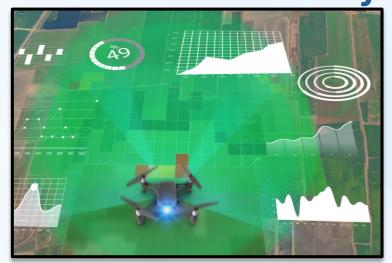
SUBMIT TO ECMC

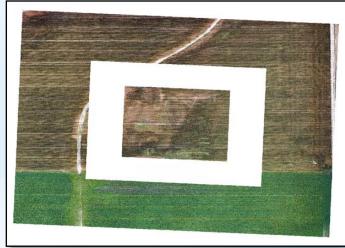
## PadTerra Scale

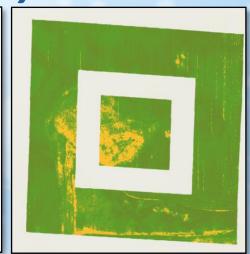


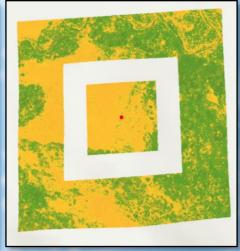
# PadTerra Vegetation Assessment

THEN: RGB Near Infrared Photogrammetry



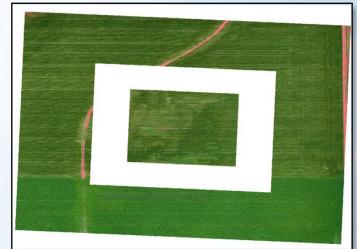






NOW: 4 Band/Multispectral + LiDAR





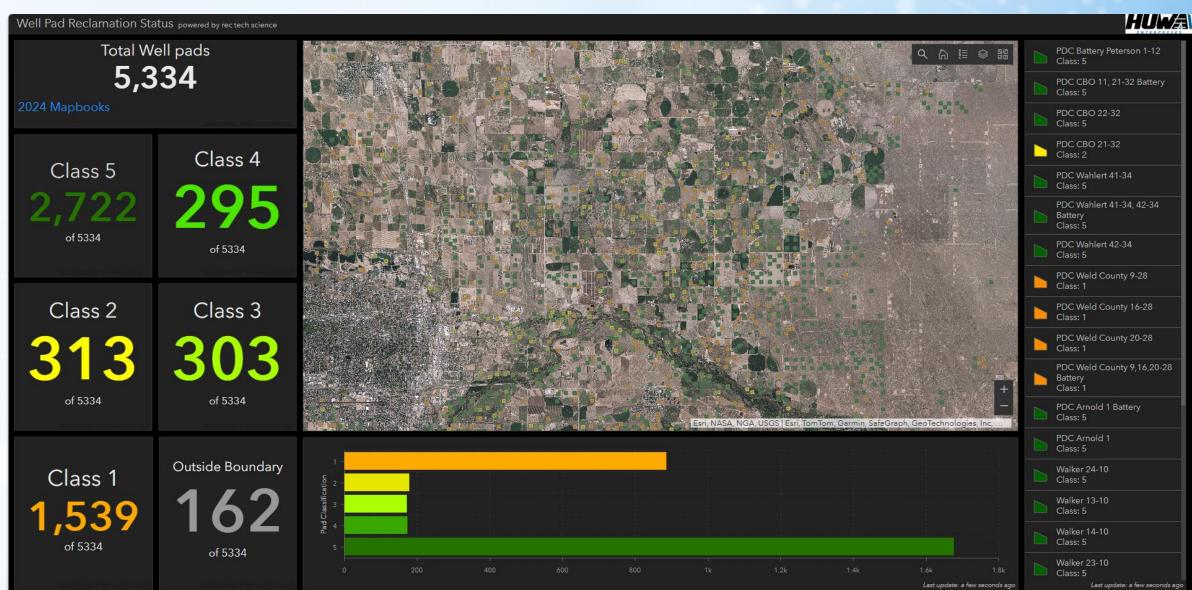




# **Technology**

- Flight image
- Unbiased data

- Backlog creation
- Efficiencies



#### Successes to date

- Found 4100 duplicated well sites in backlog
- Developed version of pad distinction
- Flew 700,000 acs in 2024, doubling in 2025
- Increased Form 4 submittals from a few to several hundred
- Building common platform (field visits with Chevron, ECMC, us = never been done before for proactive measures)
- Safety
- ESG aspects







#### **Futuristic Outlook**

- Continue training the model with regulation and operator input
- Collect more data

## Thank you!

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