Evaluation of Reclamation Practices on Forested Upland and Peatland Wellsites

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remediation technologies symposium 2019

InnoTech ALBERTA

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What's the Problem?

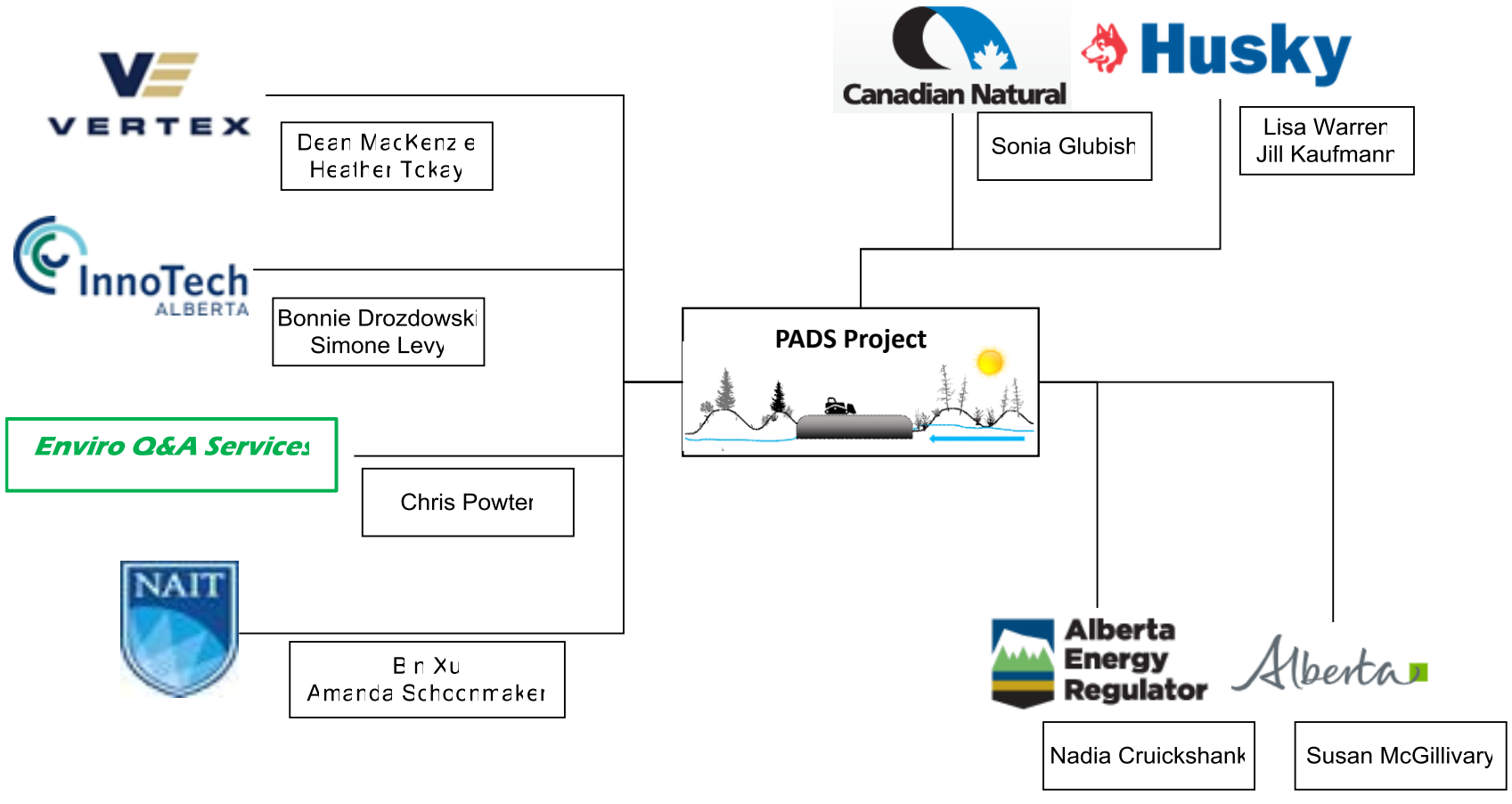
- Certification of legacy upland and peatland wellsites
  - Forested sites that have had natural vegetation establishment
  - Mineral soil pads in peatlands
- Recognized that sites can be on a trajectory towards a sustainable plant community and not require further disturbance/reclamation to enhance ecological outcomes
- A consistent and standard method to define and address these circumstances is required

Objective

- Document basis for current industry practices and regulatory decision for legacy sites
- Provide recommendations for an acceptable policy framework/decision support tool(s) to enable decisions regarding certification of legacy sites

The goal is to ensure that legacy sites that have developed functioning ecosystems can proceed through the reclamation certification process with an appropriate level of activity.

Project Team



Research Approach

3 stage project from 2018 to 2020

- Stage 1 – Desktop review
  - Literature and regulatory review
  - Outreach program
- Stage 2 – Site specific reviews
  - Guidance document for Upland Sites
  - Development of policy framework/decision support tool(s)
  - Consultation in the field
- Stage 3 – Recommendations

Goals

Identify site characteristics that have led industry and regulators to agree that no or minimal further disturbance was required on:

- Upland forested legacy sites
- Mineral soil pads within peatlands

1) Based on Stage 1 findings, develop a framework for advancing legacy sites through the certification process.
2) Test the framework in the field with industry and government participation

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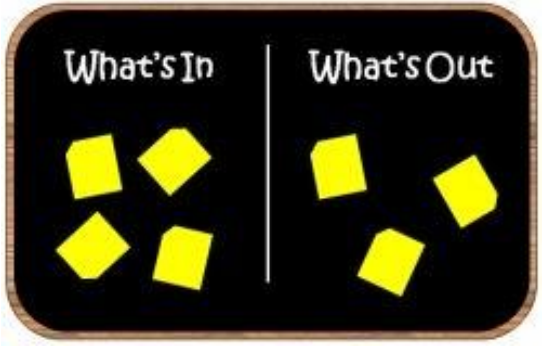
Initial Challenges

- Scope



- Definitions and Jurisdiction

- Participation

Literature Review

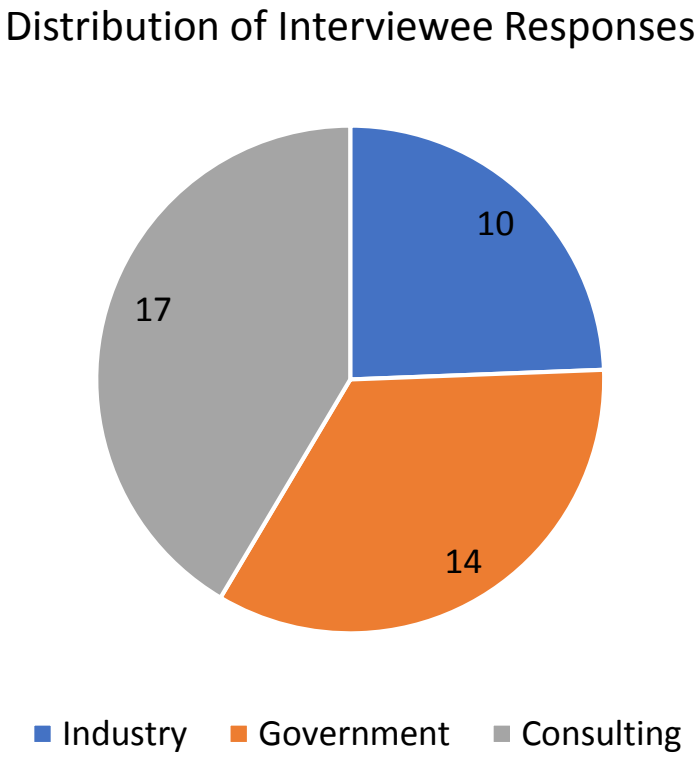
- Regulatory review of applicable legislation, authorizations, guidelines and policies
- Emphasis on:
  - Factors affecting ecosystem function for naturally revegetated upland forested sites
  - Factors affecting functional peatland ecosystems
- Reviewed assessment methods outside oil and gas

Outreach – what we asked?

- What would lead you to apply for / approve leaving a mineral soil pad in place in a peatland
- What would lead you to apply for/approve a criteria variance
- How do you define/evaluate a functioning ecosystem and appropriate trajectories to achieve ELC
- What information would be useful to enable decisions and/or for discussion with regulator/government
- How have decisions regarding certification been reached thus far

Outreach

- 41 participants
- 12 questions
  - 8 – All participants
  - 2 – industry and practitioners
  - 2 – regulator/government



Key Findings - General

- Technical
  - Compiled relevant information from peer reviewed/grey literature and supported that from interviews
- Non Technical
  - Feelings, beliefs and perceptions

Key Findings - General

- Confusion about which government agency (and business unit) makes decisions regarding ***Variances*** and/or ***Land Use Changes***
- Inconsistency in terminology between Criteria (AEP) and SED 002 (AER) creates confusion
  - SED 002 – uses term "*Variance*" to refer to formal requests for deviations from applicable criteria
  - "*Variance*" is not used in either the Forested Criteria or Peatland Criteria
  - SED 002 does not use Forested Criteria term "*Vegetation Override*" – presumed to be a specific type of variance

Key Findings - Uplands

- AER approves majority variance/justifications for reclamation certification
- AEP only involved in decision for an improvement left in place (i.e., a pad left in place)

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- AER approves majority variance/justifications for reclamation certification
- AEP only involved in decision for an improvement left in place (i.e., a pad left in place)
- Diverse range of what is interpreted as acceptable/unacceptable for soil parameters
- More consistency with landscape parameters and weeds
- Key is vegetation has an overstory or on a trajectory towards a forest

Before Topsoil Removal

After Topsoil Removal

Key Findings - Uplands

- Overall there is good support for accepting variance to criteria providing rationale is properly justified (ecologically based)
- Poor quality justification with little back up information will result in rejected wellsite certification application

Approved variance for subsidence and Canada thistle

Summary - Uplands

- ✓ Vegetation
- ✗ Soils
- ✗ Landscape

Request for Variance

?

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Request for Variance

Alberta Energy Regulator

Decision entirely responsibility of AER

Assess sites based on Ecosystem Function

- ✗ Reject
- ✓ Accept

Guide to Preparing a Request for Variance to Forested Criteria

Reclamation Certificate

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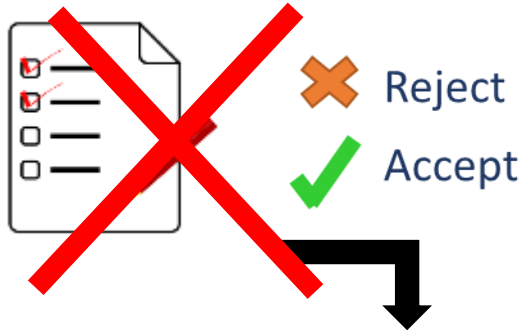


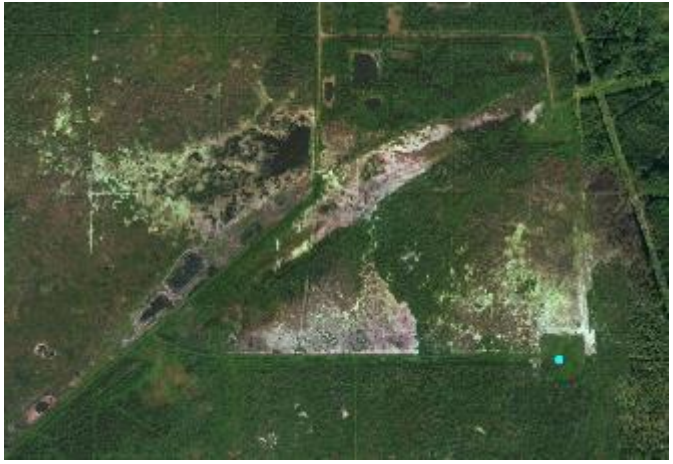
Reclamation Certificate

Guide to Preparing a Request for Variance to Forested Criteria

- Lack of a guide to preparing a request for variance to criteria
- Consistency and/or clarification in terms and definitions between the Forested Criteria, SED 002
- Lack of clarity for how decisions are being made to accept or reject requests for variances

Key Findings - Peatlands

- Diverse range in response's to leaving pads in place
- Many of respondents feel negative impacts to environment is a barrier to leaving pads in place, if hydrology was not an issue other factors were brought up
- Significant knowledge gaps – effects off-site and sustainability of forests developed on pads



Offsite impacts from access road pad material

Key Findings - Peatlands

- Pads left in place require approval from AEP (landowner)
- Formal intake process is lacking resulting in variable responses to approvals
- AER certifies site if change in land use approved and if site meets forested criteria (vegetation override)
- Overall there is acceptance to leaving pads in place if 1) pads are not causing significant impact off-site and 2) pads are forested or on a trajectory to becoming a forest

Pads left in place with forest cover

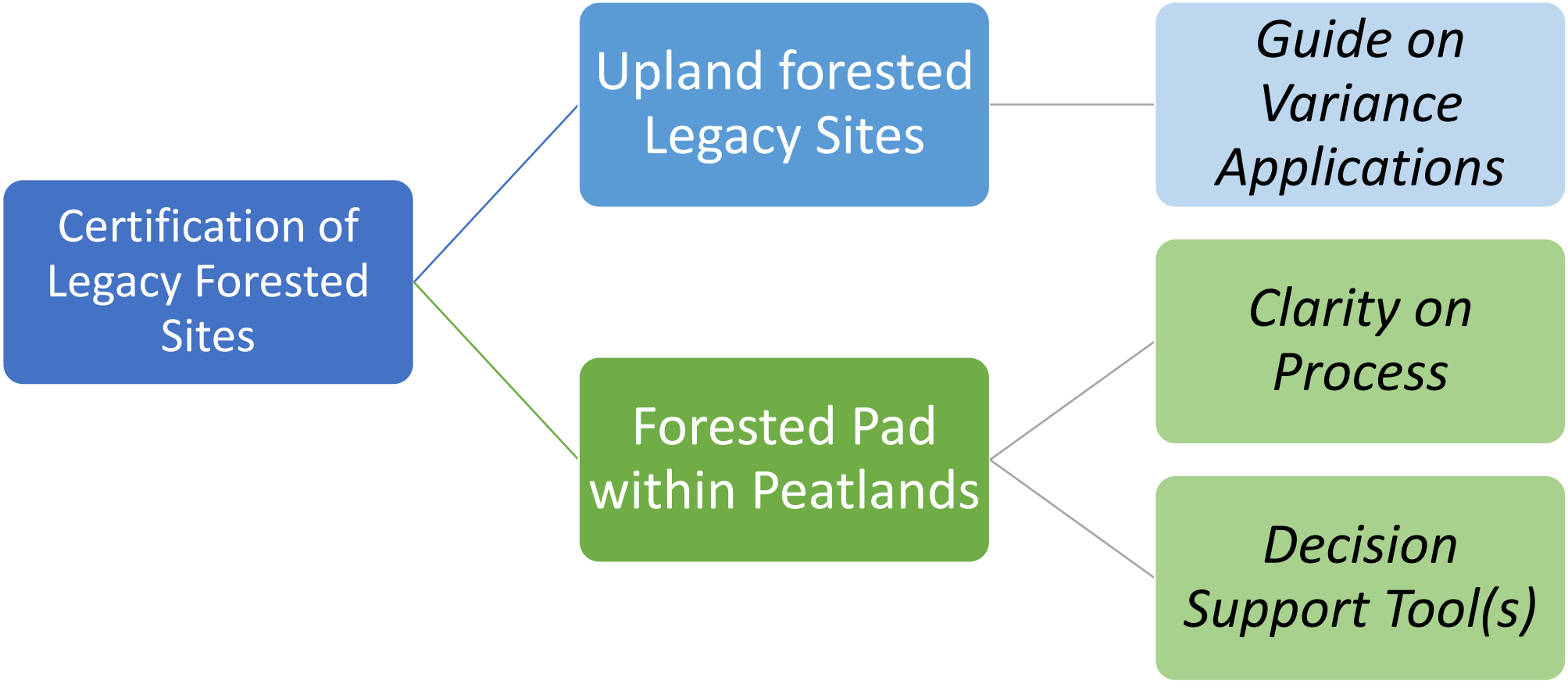
Key Findings - Peatlands

- Factors to consider for leaving pads in place
  - Offsite impacts (water pooling, vegetation changes)
  - Uplands present in local region
  - Upland forest function (species assemblage and structure)
  - Borrow pit (is it functioning as a wetland, or can it receive the pad material?)
  - Cumulative impacts
  - Implications of removal in terms of returning functional peatland
    - Do benefits outweigh ecological costs associated with removal?
    - Potential for successful peatland reclamation (by type)

Summary - Peatlands

- Key Challenge:
  - Leaving mineral soil features (well pad or access road) in place in peatland settings has not been well studied
  - What to do when a site is not causing significant adverse effects off site and the vegetation on site meets the forested land criteria (with or without a variance to criteria)
- **Change in land use** request required which involves multiple government agencies (AER and AEP)
- Lack of clarity on the ***process*** to obtain approvals and the ***criteria*** for evaluating the requests

Stage 2 – Divergent Paths Forward



Legacy Forested Upland Sites

- Guidance for developing variance requests to streamline the process of ***preparing*** and ***approving*** rec cert applications under **Forested Criteria**
- Emphasis on **key factors** associated with legacy sites (Landscape – cut/fill, subsidence; woody debris; Soils – topsoil depth/distribution; Vegetation – weeds, species)

Forested Pad within a Peatland

- Decision support tool(s) for:
  - Considerations to assess for ***when*** it would be ***acceptable*** for a mineral pad to remain in place (including the ecological cost/benefits of removal)
  - ***Acceptable site conditions*** to ***meet ELC*** and Rec Cert applications (including deficiencies for Forested Criteria)
  - ***Process*** (i.e., Land Use Change) recommendations

Thank You!

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