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## APPENDIX A – Meeting Agenda

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### Certification of Mineral Soil Pads in the Boreal Region – A Path Forward

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#### MEETING AGENDA

**Location:** InnoTech Alberta, 250 Karl Clark Road, Edmonton

**Date:** December 11, 2019 (1:00 to 4:30 pm)

**Participation Options:** In Person; Skype for Business

The **purpose of the meeting** is to facilitate a productive discussion related to change in land use requests.

The **objective** is to inform a path forward for a policy framework that provides clarity on the **process** to request a change in land use and the **criteria** for evaluating the requests.

Time	Topic	Facilitator
12:30 – 1:10	Arrival, Light Refreshments	Bonnie
1:10 – 1:20	Welcome, Safety Moment and Introductions	Bonnie and Chris
1:20 – 1:50	Purpose of the Overall PTAC Pads-in-Place Project and Summary of Results to Date	Bonnie
1:50 – 2:00	Roles of AEP and AER in the Project	Susan and Nadia
2:00 – 2:15	Discuss Key Considerations for Evaluating Ecological Implications of Mineral Soil Pads in Peatlands	All
2:15 – 2:30	Present Preliminary Decision Support Tools for Considering a Change in Land Use	Bonnie
2:30 – 2:45	Break	All
2:50 – 3:15	Table Discussions – Preliminary Decision Support Tools 1, 2 and 3	All
3:15 – 3:40		All
3:40 – 4:05		All
4:10 – 4:30	Summary and Next Steps	Chris and Bonnie

# Evaluation of Reclamation Practices on Forested Upland and Peatland Wellsites

A Path Forward Working Session

December 11, 2019



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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



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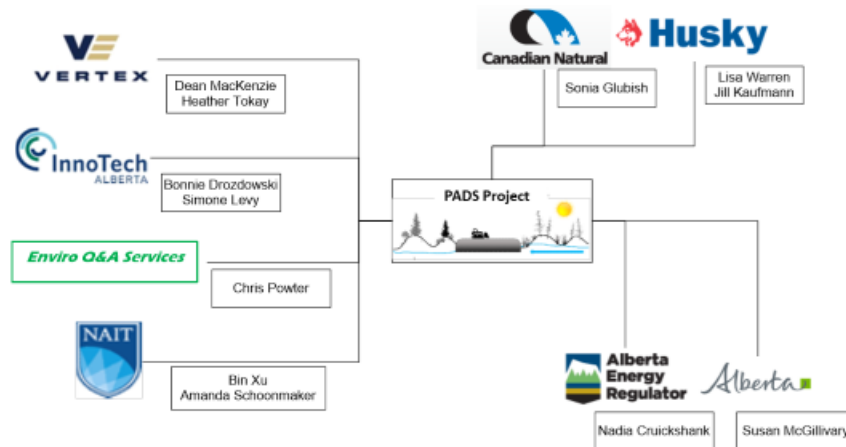
## Objective

- 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.**

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## Project Team



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## 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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## 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

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## Outreach – what we asked?

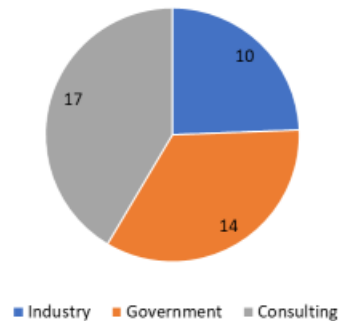
- What would lead you to apply for / approve leaving a mineral soil pad in place in a peatland
- What would lead you to apply for/approve a criteria variance and/or a change in land use
- How do you define/evaluate a functioning ecosystem and appropriate trajectories to achieve ELC
- What information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

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## Outreach

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

Distribution of Interviewee Responses



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## Key Findings - General

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



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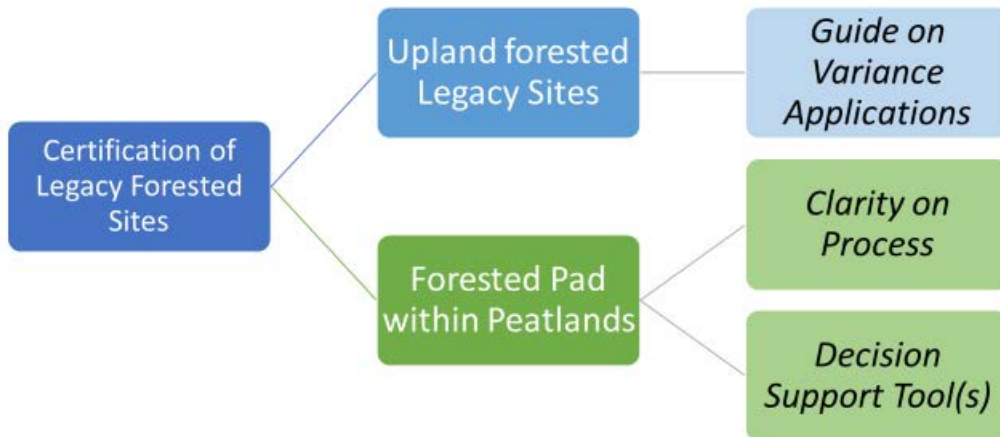
## Key Findings - General

- Confusion about which government agency (and business unit) makes decisions regarding **Variations** 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

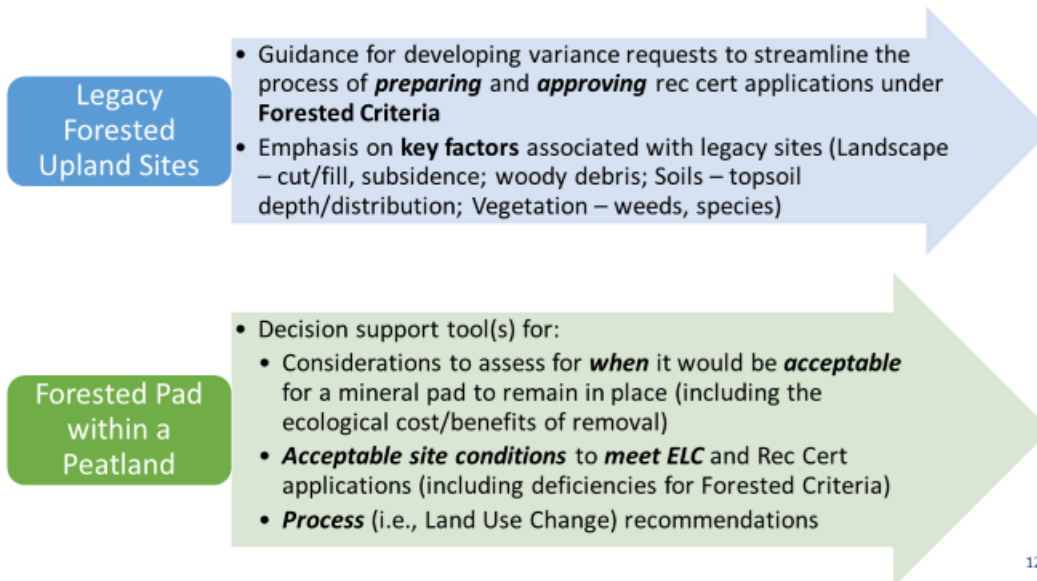


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## Stage 2 – Divergent Paths Forward



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## Key Findings – Pads in Peatlands

- Multiple government agencies involved in each decision:
  - Requires approval from AEP (effectively the “landowner”) for a **Change in land use** request
  - AER **certifies** site if change in land use approved and if site meets forested criteria (vegetation override)
- Formal intake process is lacking, resulting in variable responses and timelines for approvals



Pads left in place with forest cover

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## Precedence – Change in Land Use

- Public Land Management Policy No. 7 regarding borrow activities
  - change in land use should reflect an ecological community found in the natural sub-region of the site
- Peat Operations (AEP 2016) –
  - preferred outcome is to return land to pre-disturbance condition; alternate land uses are an option.
  - “site characteristics, historical practices and/or subsequent land uses” result in requests for change in land use.
  - Should reflect an ecological community found within the natural subregion of the site
- Aggregate operations (ASRD 2010)
  - End land uses are site specific and depend on pre-disturbance conditions which depend on: regional limitations (soil type, climate, landforms within region), surrounding land uses, and costs

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## Key Findings - Pads in Peatlands

- Ultimately there is a lack of clarity on the **process** to obtain approvals and the **criteria** for evaluating the requests
  - Likely why we found a diverse range in response's to leaving pads in place



Offsite impacts from access road pad material

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### What site/local/regional characteristics and/or conditions would lead you to apply for / approve leaving a mineral soil pad in place?

#### Supporting

- Need to consider landscape scale for considerations even at a site scale
- Change in land use needs to be justified by more than “vegetation establishment on a mineral soil pad”; other considerations – regional implications, borrow material, borrow pit, surrounding landscape, etc.
- Justification is ECOLOGICALLY based
- Demonstrated that there are NO ADVERSE IMPACTS (vegetation, hydrology, pooling water, erosion, slumping, etc.)
- Would “partial” reclamation (pad removal) be a viable option?
- Borrow unavailable to receive fill material (already a functioning wetland and/or revegetated)
- Need evidence that removing pad is “doing more harm” than leaving it in place
- Consider the structure and composition of established vegetation

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## What site/local/regional characteristics and/or conditions would lead you to apply for / approve leaving a mineral soil pad in place?

### Opposed

- In general, leaving a pad in place creates a negative impact on the environment
- Extremely time consuming to review requests, particularly when not ecologically based
- Do not want to encourage/condone poor practices
- Company “historical practices” factored into decision
- “pads” do not produce the same type of forest that reclaimed upland forests produce
- Wetland policy considerations required (to change land use – requires offsets)
- Need to ensure “forests” are not considered ecologically more valuable than “wetlands”
- Industry should be doing what they agreed to in the disposition
- Cost is not an appropriate justification for leaving a pad in place
- Vegetation is likely to be impeded in the long term

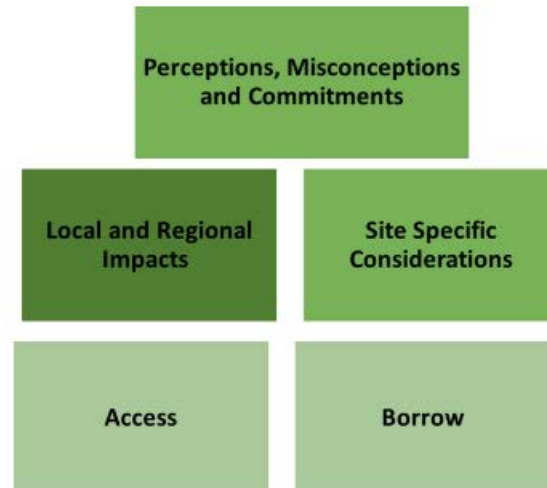
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## Key Findings - Pads in Peatlands

- There have been instances where leaving pads in place has been accepted when: 1) pads are not causing significant impact off-site and 2) pads are forested or on a trajectory to becoming a forest
- 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)

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Key findings from Stage 1 broken down into the following categories:



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**Perceptions, Misconceptions and Commitments**

Need to address “non-technical” aspects to enable meaningful change.

Comments such as:

- In general, leaving a pad in place creates a negative impact on the environment
- “Forest” end land use is being considered ecologically more valuable than “wetlands”
- Primary driver for leaving pad in place is “cost”
- Government not willing to consider applications for a change in land use regardless of rationale
- Industry should be doing what they agreed to in the disposition

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## Local and Regional Impacts

“Hydrology is by far the most important factor for the development and functioning of natural peatlands”.

- Key factors to consider at the local and regional scale:
  - Offsite impacts
    - water pooling,
    - water chemistry,
    - erosion/sedimentation,
    - vegetation changes
  - Hydrologic impacts vary with
    - wetland type (bog vs fen);
    - direction of water flow;
    - type of feature (pad vs road);
    - size of feature
  - Wetland policy
    - relative abundance,
    - historical loss
    - impact



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## Local and Regional Impacts

“Need for establishing a cumulative effects threshold based on scientific and geographical approaches”.

- Key factors to consider at the local and regional scale:
  - Upland/peatland complexes present in local region
    - end land use is compatible with the natural subregion
  - Regional cumulative impacts
    - water quality,
    - hydrology,
    - biodiversity
  - Need for regional planning; one pad in place may not have adverse impacts, but multiple pads left in place may have larger implications

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## Local and Regional Impacts

“Access roads are more likely to have impacts than well pads”.

- Key factors to consider at the local and regional scale:
  - Implications of removal in terms of returning functional peatland
    - Do benefits outweigh ecological costs associated with removal?
    - Potential for successful peatland reclamation
      - by peatland type and
      - proximity to upland landforms



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## Access

“Cost of reclamation due to ‘remoteness’ is not an appropriate justification for leaving a pad in place”

- Key factors to consider:
  - Is access to the site restricted (i.e., revegetated, only available via winter access?)
  - Is access to the site limited (i.e., extremely remote, only available via winter access?)
  - Is there an opportunity to coordinate activities with others completing reclamation in the area?
  - If access road is revegetated – would it meet the appropriate criteria?
    - Need for consideration for “net environmental benefit” associated with reclamation efforts for access vs well pad.

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## Borrow

“consider net environmental benefit to removing mineral soil material and returning to borrow pit”

- Key factors to consider:
  - Is the borrow pit available to receive the materials? If yes – what is it’s status?
  - “Many borrows that were constructed 20 to 30 years ago have developed functional wetlands and are providing a similar ecosystem service at a regional scale as the 1 ha disturbance of the wellsite”
  - “landscape” borrows often have already revegetated naturally and blend well with the natural subregion.

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## Site Specific Considerations

“Need to understand the end goal to determine what trajectory the site should be on”

- Key factors to consider:
  - If the site is revegetated would it pass a DSA w/ or w/out a vegetation override using the Forested Criteria
    - Does it have the appropriate species assemblage, plant health, tree growth, structural layers, etc.
  - Are there any other limitations to the long term sustainability of an upland ecosystem (e.g., rooting restrictions, topsoil/nutrient availability, soil chemistry, etc.)
  - Are there any other “reclamation deficiencies”
    - CWD, topsoil, subsidence, contour, soil chemistry, etc.

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**Site Specific Considerations**

“Net cost to the environment to ‘fix’ the problem needs to be taken into consideration.”

- Key factors to consider:
  - Does the site need to be recontoured to blend in with the landscape within the natural sub-region?
  - Third party impacts



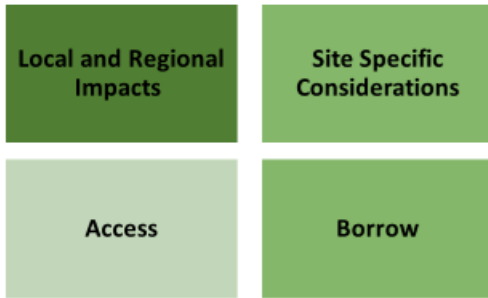
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Local and Regional Impacts	Site Specific Considerations
Access	Borrow

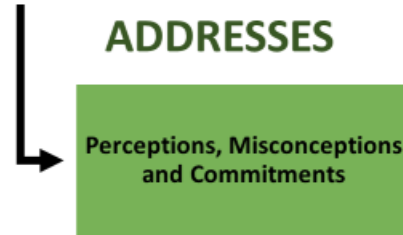
“Holistic, ecological approach to evaluate “change in land use” requests”

- Decision makers want to see:
- empirical data,
  - cost/benefit analysis specific to the site in question,
  - that the site meets ELC and provides necessary ecosystem functions,
  - that there are minimal risks of adverse effects to off-site areas,
  - information associated with cumulative effects, and
  - how the site fits into the regional landscape

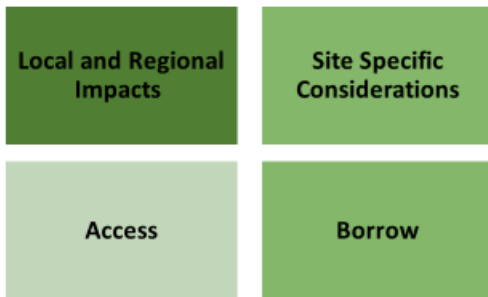
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A decision framework, built together, that uses a holistic, ecological approach to evaluate “change in land use” requests and incorporates the elements from all four of these key considerations



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A decision framework, built together, that uses a holistic, ecological approach to evaluate “change in land use” requests and incorporates the elements from all four of these key considerations



**Let's Discuss**

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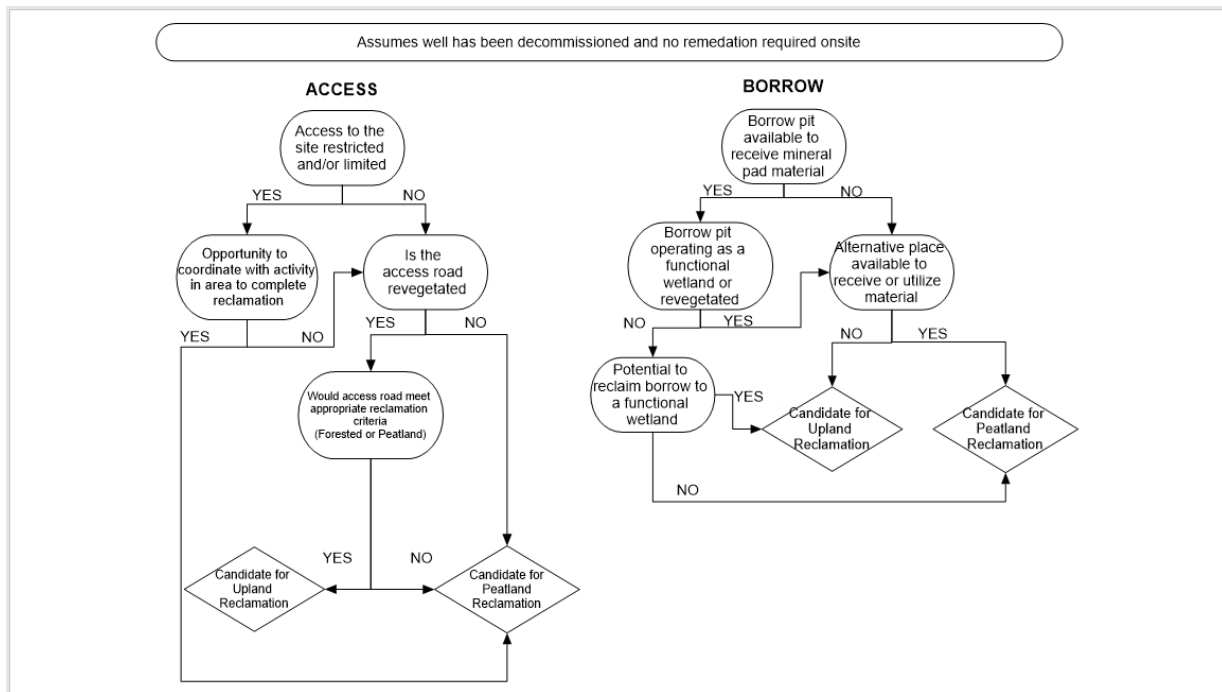


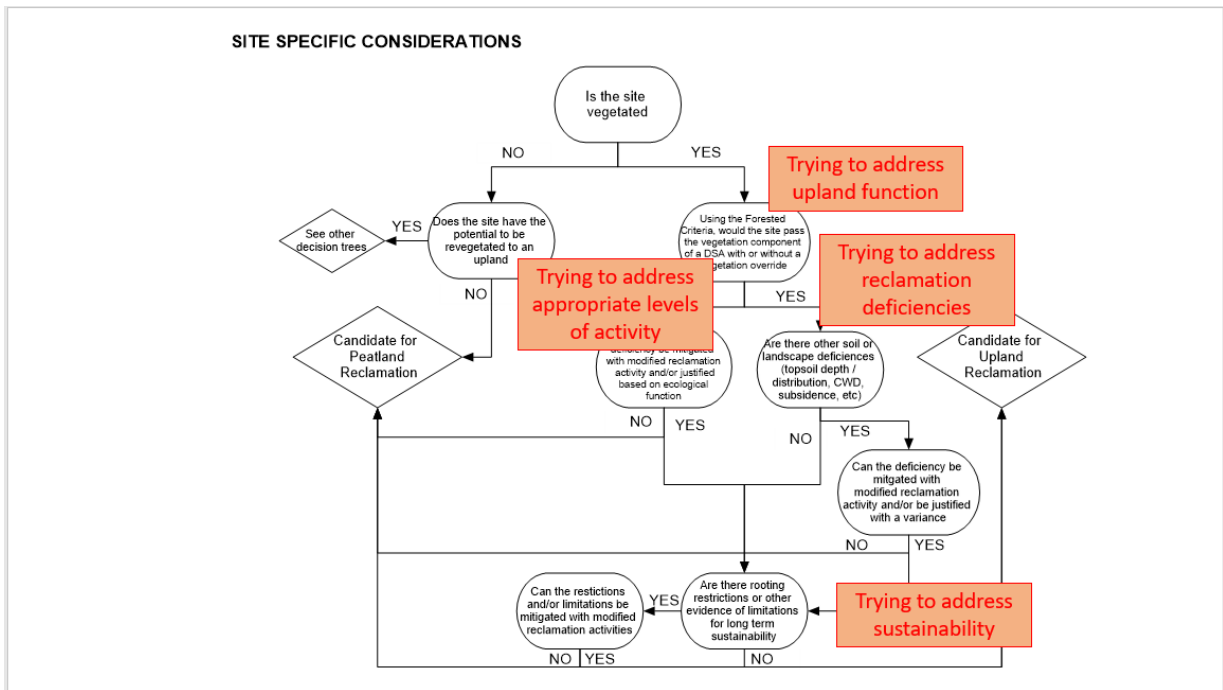
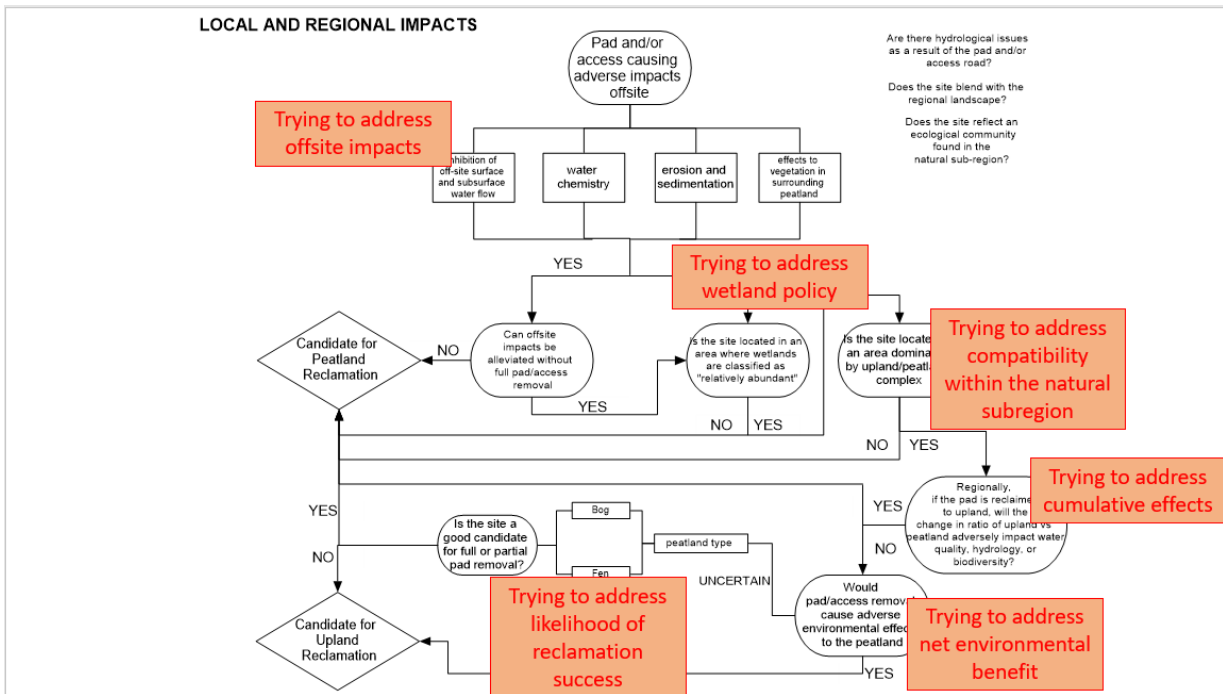
## APPENDIX C – Preliminary Decision Support Tools

# Preliminary Decision Support Tools



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The following charts were presented to show options for merging the results from the four decision support tools into a final decision.

