Peatland Restoration
Why Peatland Criteria?

Equivalent Capability

- Carbon Sequestration
- Water Storage Reservoir
  - Filter Precipitation as it recharges the groundwater
- Wildlife habitat

Water For Life Strategy

2013 Provincial Wetland Policy

- Avoidance, Mitigation, Compensation
AEPEA/C&R Regulation

* Duty to reclaim and conserve specified land

  * must obtain reclamation certificate (EPEA s. 137)

  * must meet equivalent land capability
    (Conservation and Reclamation Reg. s. 2)
Closure Tools

Specified Lands (EPEA)
Reclamation Criteria
- Upstream Oil and Gas and associated facilities*
- Oil Sands Exploration*
Conservation And Reclamation Plans
- Sand and Gravel
- Oil Sands Mines*
- In situ Oil Sands*
- Coal Mines*
- Peat Extraction
- Solar Plants

Non-Specified Land (PLAR and MMA)
- Forestry Permanent Roads under LOC disposition
- Geophysical*
- Miscellaneous leases (campgrounds, recreational, airstrip etc.)

Note: * AER regulated activities
“Equivalent land capability” is defined in the Conservation and Reclamation Regulation as “the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical.”

In context to restoring Peatlands, the objective outlined in the C&R plan must focus on a land function that will support the production of goods and services consistent in quality and quantity to peatland communities found in the area.
...a condition in which the ecosystem processes on the land are capable of producing goods and services of a quality and in a quantity that is at least equivalent to that which existed before the disposition was issued to the holder.
Reclamation: Desired Outcomes

1. Return disturbed land to equivalent capability.

2. Promote prompt re-vegetation of disturbed lands.

3. Revegetate disturbed land to target the establishment of a self-sustaining, ecologically suitable species, integrated with the surrounding area.

4. Re-establish the original landform and drainage.
If restoration/reclamation is a viable option, widespread reclamation of wetlands to upland sites is poor stewardship.

Reclaiming these areas to upland ecosystems will not restore their peat-accumulating or hydrologic function.
Integrated Standards & Guidelines

- Consolidated guidelines to streamline regulatory processes
- Identifies pre-application requirements prior to applying through Enhanced Approval Process
- Defines
  - Desired Outcomes
  - Approval Standards
  - Operating Conditions
  - Best Management Practices
Vegetation: Desired Outcomes

1. **Restore vegetation cover with desirable species.** Site should demonstrate a positive successional pathway that provides assurance that the site will achieve a community similar to the offsite.


3. Minimize negative effects of vegetation control activities.


5. Reduce the risk of wildfire.


7. Minimize the introduction of noxious and restricted invasive plants (weeds).
Integrated Standards & Guidelines

Reclamation: Best Management Practices

1. Associated facilities should be reclaimed immediately following abandonment.

2. Construction, operation, and reclamation plans for activities occurring in bogs and fens should address the maintenance of surface and subsurface flow to prevent impacts as a consequence of flow obstruction and consider that all areas infill should be removed during reclamation (e.g., well pads and roads).

3. Native revegetation should be considered in all cases of interim and final reclamation

Note: applies to LOC, MSL, PLA, PIL.
Reclamation: Operating Conditions

* 200.5.1: **Conduct progressive reclamation** and interim clean-up, including built but not drilled sites, for the wellsites and all associated disturbances (log decks, remote sumps, campsites, borrow sites, etc) of that disposition as per External Directive SD 2010-02 Progressive Reclamation and Interim Clean up

* 200.5.2: For final reclamation, follow the Reclamation Criteria for Wellsites and Associated Facilities documents.

Note: applies to *LOC, MSL, PLA, PIL*. 
Integrated Standards & Guidelines

Vegetation: Operating Conditions

- **200.2.1:** Manage all weeds as per the *Weed Control Act*.

- **200.2.7:** Natural recovery (a technique for reclaiming sites by allowing land to re-vegetate naturally (without seeding) by conserving and replacing reclamation material) shall be used for activities on native landscapes forested and peatlands for all areas of the site, not required for operations or **padded with clay**.

Natural recovery is to be implemented within 6 months of completions (post-drill) and for sites that have been prepared but not drilled within 6 months of construction. Assisted natural recovery on native grasslands, forested or peatland sites is allowed on high erosion sites, or sites prone to weeds, or agronomic invasion, or padded sites (forested and peatland).

Note: applies to **LOC, MSL, PLA, PIL**.
Vegetation: Operating Conditions

200.2.7:

a. During assisted natural recovery on forested and peatland sites when reseeding with herbaceous seed native to Natural Subregion or Land Area Officer approved agronomic annuals, seed mixes shall be free of the species listed in the Weed Control Act. A seed certificate (under the rules and regulation of the Canada Seeds Act) for each species shall be provided, to ESRD, upon request.

b. On forested and peatlands, assisted natural recovery can be used for planting woody species for the purposes of accelerated reclamation. The woody species must be native to the Natural Subregion and follow the Alberta Forest Genetic Resource Management and Conservation Standards.

c. Note: applies to LOC, MSL, PLA, PIL.
Vegetation: Operating Conditions

200.2.9: Revegetation with trees or shrubs within the Green Area shall be consistent with the Alberta Forest Genetic Resource Management and Conservation Standards document.

Note: applies to LOC, MSL, PLA, PIL.
Conservation and Reclamation Plans

Proposed Reporting

• Submitted with the application
• Updated with renewals (every 10 years)
• Final Conservation and Reclamation Plans ~ 2 years from final harvest.
Tips for Conservation and Reclamation Plans

- Progressive Reclamation
- X-Sections and site diagrams
- Performance Measures (pass/fail thresholds)
  - Tip: Multiple structural layers (sphagnum/ericaceous shrubs and trees)
- Restoration outcomes, objectives and methods for all infrastructure and terrain units (uplands, bogs, fens/roads, ponds, maintenance yards etc.).
Towards Progressive Reclamation

- May require rethinking operational sequencing
- Which areas need to be opened & closed first?
- Consider re-establishment of drainage hydrology
- Consider source and use of reclamation materials in the sequencing of operation
- Reclamation source material outside of mined area also subject to reclamation
X-Sections
Criteria and Indicators

Goal (Regulatory Requirement)

Equivalent Land Capability

1.0 Design and create a landform capable of supporting natural processes

2.0 The landform is self-sustaining

3.0 Natural functions are occurring on a heterogeneous landform

Objectives

1.1 Topography is appropriate to the planned landform
1.2 Soil conditions are appropriate to planned ecotype
1.3 Hydrology is appropriate to planned ecotype

2.1 Native vegetation is established
2.2 Soils are stable
2.3 The landform is resilient to natural disturbance

3.1 The water table is stable
3.2 Organic matter is accumulating

Criteria

Reclamation Outcome (Goal)

Naturally appearing boreal forest wetlands that provide a suite of ecological goods and services similar to those that existed prior to disturbance
## Criteria and Indicators

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Indicator</th>
<th>Measurement</th>
<th>Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treed Bog</td>
<td>Sphagnum spp., ericaceous shrubs and trees</td>
<td>% canopy cover</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stem Count/Height</td>
<td>2010 Forested Criteria (Upland) or the Oil Sands Reclamation Guide (low land)– tree/ha for non-commercial black spruce sites</td>
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<tr>
<td></td>
<td></td>
<td>Branch leader growth</td>
<td>Qualitative comparison to offsite/reference community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% Cover Undesirable Species</td>
<td>Qualitative comparison to offsite/reference community</td>
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Policy in the Works

* Wellsites and Associated Facilities - Peatland Reclamation Guidelines for Reclamation Certification
* Research on Public Land Directive
* Peat Extraction Policy Framework (Includes reclamation outcomes and liability management)
* Conservation and Reclamation Report Requirements for Peat Extraction
Contact

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